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

CERTIFICATE OF ANALYSIS

151322

Client:

Larry Cook & Associates
PO Box 8146
TUMBI UMBI
NSW 2261

Attention: Larry Cook

Sample log in details:

Your Reference:	<u>Larry Cook - Ardmore Park</u>
No. of samples:	12 Waters
Date samples received / completed instructions received	05/08/16 / 05/08/16

Analysis Details:

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

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

Report Details:

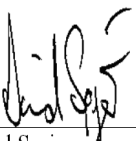
Date results requested by: / Issue Date: 12/08/16 / 26/08/16
Date of Preliminary Report: Not issued

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Tests not covered by NATA are denoted with *.

Results Approved By:



David Springer
General Manager

Envirolab Reference: 151322
Revision No: R 00



vTRH(C6-C10)/BTEXN in Water Our Reference: Your Reference	UNITS ----- -	151322-4 BHAP10	151322-5 BH1	151322-6 BH2	151322-7 BH3	151322-8 BH4
Date Sampled Type of sample	----- -----	27/07/2016 Water	27/07/2016 Water	27/07/2016 Water	27/07/2016 Water	27/07/2016 Water
Date extracted	-	08/08/2016	08/08/2016	08/08/2016	08/08/2016	08/08/2016
Date analysed	-	08/08/2016	08/08/2016	08/08/2016	08/08/2016	08/08/2016
TRHC ₆ - C ₉	µg/L	<100	<10	<10	<10	<10
TRHC ₆ - C ₁₀	µg/L	<100	<10	<10	<10	<10
TRHC ₆ - C ₁₀ less BTEX (F1)	µg/L	[NA]	<10	<10	<10	<10
Benzene	µg/L	<10	<1	<1	<1	<1
Toluene	µg/L	<10	<1	<1	<1	<1
Ethylbenzene	µg/L	<10	<1	<1	<1	<1
m+p-xylene	µg/L	<20	<2	<2	<2	<2
o-xylene	µg/L	<10	<1	<1	<1	<1
Naphthalene	µg/L	<10	<1	<1	<1	<1
Surrogate Dibromofluoromethane	%	97	99	88	85	98
Surrogate toluene-d8	%	99	99	97	98	96
Surrogate 4-BFB	%	102	102	101	100	101

vTRH(C6-C10)/BTEXN in Water Our Reference: Your Reference	UNITS ----- -	151322-9 BH5	151322-10 BH6	151322-11 Phils Spring	151322-12 Southern Spring
Date Sampled Type of sample	----- -----	27/07/2016 Water	27/07/2016 Water	27/07/2016 Water	27/07/2016 Water
Date extracted	-	09/08/2016	08/08/2016	08/08/2016	08/08/2016
Date analysed	-	09/08/2016	08/08/2016	08/08/2016	08/08/2016
TRHC ₆ - C ₉	µg/L	<10	<10	<10	<10
TRHC ₆ - C ₁₀	µg/L	<10	<10	<10	<10
TRHC ₆ - C ₁₀ less BTEX (F1)	µg/L	<10	<10	<10	<10
Benzene	µg/L	<1	<1	<1	<1
Toluene	µg/L	<1	<1	<1	<1
Ethylbenzene	µg/L	<1	<1	<1	<1
m+p-xylene	µg/L	<2	<2	<2	<2
o-xylene	µg/L	<1	<1	<1	<1
Naphthalene	µg/L	<1	<1	<1	<1
Surrogate Dibromofluoromethane	%	97	99	98	99
Surrogate toluene-d8	%	98	98	97	97
Surrogate 4-BFB	%	101	100	101	101

Client Reference: Larry Cook - Ardmore Park

svTRH (C10-C40) in Water						
Our Reference:	UNITS	151322-5	151322-6	151322-7	151322-8	151322-9
Your Reference	-----	BH1	BH2	BH3	BH4	BH5
	-					
Date Sampled	-----	27/07/2016	27/07/2016	27/07/2016	27/07/2016	27/07/2016
Type of sample		Water	Water	Water	Water	Water
Date extracted	-	08/08/2016	08/08/2016	08/08/2016	08/08/2016	08/08/2016
Date analysed	-	08/08/2016	08/08/2016	08/08/2016	08/08/2016	09/08/2016
TRHC ₁₀ - C ₁₄	µg/L	<50	<50	<50	<50	<50
TRHC ₁₅ - C ₂₈	µg/L	<100	<100	<100	<100	<100
TRHC ₂₉ - C ₃₆	µg/L	<100	<100	<100	<100	<100
TRH>C ₁₀ - C ₁₆	µg/L	<50	<50	<50	<50	<50
TRH>C ₁₀ - C ₁₆ less Naphthalene (F2)	µg/L	<50	<50	<50	<50	<50
TRH>C ₁₆ - C ₃₄	µg/L	<100	<100	<100	<100	<100
TRH>C ₃₄ - C ₄₀	µg/L	<100	<100	<100	<100	<100
Surrogate o-Terphenyl	%	87	86	88	76	87

svTRH (C10-C40) in Water				
Our Reference:	UNITS	151322-10	151322-11	151322-12
Your Reference	-----	BH6	Phils Spring	Southern Spring
	-			
Date Sampled	-----	27/07/2016	27/07/2016	27/07/2016
Type of sample		Water	Water	Water
Date extracted	-	08/08/2016	08/08/2016	08/08/2016
Date analysed	-	09/08/2016	09/08/2016	09/08/2016
TRHC ₁₀ - C ₁₄	µg/L	<50	<50	<50
TRHC ₁₅ - C ₂₈	µg/L	<100	<100	<100
TRHC ₂₉ - C ₃₆	µg/L	<100	<100	<100
TRH>C ₁₀ - C ₁₆	µg/L	<50	<50	<50
TRH>C ₁₀ - C ₁₆ less Naphthalene (F2)	µg/L	<50	<50	<50
TRH>C ₁₆ - C ₃₄	µg/L	<100	<100	<100
TRH>C ₃₄ - C ₄₀	µg/L	<100	<100	<100
Surrogate o-Terphenyl	%	85	82	78

Ion Balance						
Our Reference:	UNITS	151322-1	151322-2	151322-3	151322-4	151322-5
Your Reference	-----	BHAP1	BHAP5	BHAP6	BHAP10	BH1
	-					
Date Sampled	-----	27/07/2016	27/07/2016	27/07/2016	27/07/2016	27/07/2016
Type of sample		Water	Water	Water	Water	Water
Date prepared	-	05/08/2016	05/08/2016	05/08/2016	05/08/2016	05/08/2016
Date analysed	-	05/08/2016	05/08/2016	05/08/2016	05/08/2016	05/08/2016
Calcium - Dissolved	mg/L	14	27	130	75	43
Potassium - Dissolved	mg/L	1.1	0.9	3.6	8.1	1.1
Sodium - Dissolved	mg/L	91	16	210	400	180
Magnesium - Dissolved	mg/L	9.7	75	69	100	49
Hydroxide Alkalinity (OH ⁻) as CaCO ₃	mg/L	<5	<5	<5	<5	<5
Bicarbonate Alkalinity as CaCO ₃	mg/L	29	220	330	350	210
Carbonate Alkalinity as CaCO ₃	mg/L	<5	<5	<5	<5	<5
Total Alkalinity as CaCO ₃	mg/L	29	220	330	350	210
Sulphate, SO ₄	mg/L	5	26	25	55	6
Chloride, Cl	mg/L	140	53	430	600	280
Ionic Balance	%	7.6	13	6.0	8.7	6.6

Ion Balance						
Our Reference:	UNITS	151322-6	151322-7	151322-8	151322-9	151322-10
Your Reference	-----	BH2	BH3	BH4	BH5	BH6
	-					
Date Sampled	-----	27/07/2016	27/07/2016	27/07/2016	27/07/2016	27/07/2016
Type of sample		Water	Water	Water	Water	Water
Date prepared	-	05/08/2016	05/08/2016	05/08/2016	05/08/2016	05/08/2016
Date analysed	-	05/08/2016	05/08/2016	05/08/2016	05/08/2016	05/08/2016
Calcium - Dissolved	mg/L	9.4	7.2	36	50	52
Potassium - Dissolved	mg/L	0.5	<0.5	0.9	1	0.8
Sodium - Dissolved	mg/L	79	34	33	32	62
Magnesium - Dissolved	mg/L	29	16	55	57	50
Hydroxide Alkalinity (OH ⁻) as CaCO ₃	mg/L	<5	<5	<5	<5	<5
Bicarbonate Alkalinity as CaCO ₃	mg/L	120	130	300	340	310
Carbonate Alkalinity as CaCO ₃	mg/L	<5	<5	<5	<5	<5
Total Alkalinity as CaCO ₃	mg/L	120	130	300	340	310
Sulphate, SO ₄	mg/L	7	3	4	3	6
Chloride, Cl	mg/L	100	7	37	47	81
Ionic Balance	%	7.9	3.2	3.8	3.0	4.1

Ion Balance			
Our Reference:	UNITS	151322-11	151322-12
Your Reference	-----	Phils Spring	Southern Spring
	-		
Date Sampled	-----	27/07/2016	27/07/2016
Type of sample		Water	Water
Date prepared	-	05/08/2016	05/08/2016
Date analysed	-	05/08/2016	05/08/2016
Calcium - Dissolved	mg/L	49	24
Potassium - Dissolved	mg/L	0.9	1.3
Sodium - Dissolved	mg/L	94	58
Magnesium - Dissolved	mg/L	87	30
Hydroxide Alkalinity (OH ⁻) as CaCO ₃	mg/L	<5	<5
Bicarbonate Alkalinity as CaCO ₃	mg/L	420	190
Carbonate Alkalinity as CaCO ₃	mg/L	<5	<5
Total Alkalinity as CaCO ₃	mg/L	420	190
Sulphate, SO ₄	mg/L	13	<1
Chloride, Cl	mg/L	140	69
Ionic Balance	%	4.3	4.7

Miscellaneous Inorganics						
Our Reference:	UNITS	151322-1	151322-2	151322-3	151322-4	151322-5
Your Reference	-----	BHAP1	BHAP5	BHAP6	BHAP10	BH1
	-					
Date Sampled	-----	27/07/2016	27/07/2016	27/07/2016	27/07/2016	27/07/2016
Type of sample		Water	Water	Water	Water	Water
Date prepared	-	05/08/2016	05/08/2016	05/08/2016	05/08/2016	05/08/2016
Date analysed	-	05/08/2016	05/08/2016	05/08/2016	05/08/2016	05/08/2016
pH	pH Units	6.9	8.0	7.2	7.2	7.1
Electrical Conductivity	µS/cm	590	760	1,900	2,600	1,300
Total Dissolved Solids (grav)	mg/L	410	550	1,200	1,600	710

Miscellaneous Inorganics						
Our Reference:	UNITS	151322-6	151322-7	151322-8	151322-9	151322-10
Your Reference	-----	BH2	BH3	BH4	BH5	BH6
	-					
Date Sampled	-----	27/07/2016	27/07/2016	27/07/2016	27/07/2016	27/07/2016
Type of sample		Water	Water	Water	Water	Water
Date prepared	-	05/08/2016	05/08/2016	05/08/2016	05/08/2016	05/08/2016
Date analysed	-	05/08/2016	05/08/2016	05/08/2016	05/08/2016	05/08/2016
pH	pH Units	6.8	7.6	7.6	7.5	7.7
Electrical Conductivity	µS/cm	620	270	690	740	820
Total Dissolved Solids (grav)	mg/L	340	160	380	430	480

Miscellaneous Inorganics			
Our Reference:	UNITS	151322-11	151322-12
Your Reference	-----	Phils Spring	Southern Spring
	-		
Date Sampled	-----	27/07/2016	27/07/2016
Type of sample		Water	Water
Date prepared	-	05/08/2016	05/08/2016
Date analysed	-	05/08/2016	05/08/2016
pH	pH Units	7.4	7.5
Electrical Conductivity	µS/cm	1,200	560
Total Dissolved Solids (grav)	mg/L	630	280

Client Reference: Larry Cook - Ardmore Park

HM in water - total	UNITS	151322-1	151322-2	151322-3	151322-4	151322-5
Our Reference:	-----	BHAP1	BHAP5	BHAP6	BHAP10	BH1
Your Reference	-					
Date Sampled	-----	27/07/2016	27/07/2016	27/07/2016	27/07/2016	27/07/2016
Type of sample		Water	Water	Water	Water	Water
Date prepared	-	08/08/2016	08/08/2016	08/08/2016	08/08/2016	08/08/2016
Date analysed	-	08/08/2016	08/08/2016	08/08/2016	08/08/2016	08/08/2016
Arsenic-Total	µg/L	[NA]	[NA]	[NA]	<1	<1
Cadmium-Total	µg/L	[NA]	[NA]	[NA]	<0.1	<0.1
Chromium-Total	µg/L	[NA]	[NA]	[NA]	6	3
Copper-Total	µg/L	[NA]	[NA]	[NA]	<1	<1
Lead-Total	µg/L	[NA]	[NA]	[NA]	<1	<1
Mercury-Total	µg/L	[NA]	[NA]	[NA]	0.44	<0.05
Nickel-Total	µg/L	[NA]	[NA]	[NA]	37	13
Zinc-Total	µg/L	[NA]	[NA]	[NA]	11	6
Iron-Total	µg/L	150	400	8,300	280	400
Manganese-Total	µg/L	13	13	240	50	<5

HM in water - total	UNITS	151322-6	151322-7	151322-8	151322-9	151322-10
Our Reference:	-----	BH2	BH3	BH4	BH5	BH6
Your Reference	-					
Date Sampled	-----	27/07/2016	27/07/2016	27/07/2016	27/07/2016	27/07/2016
Type of sample		Water	Water	Water	Water	Water
Date prepared	-	08/08/2016	08/08/2016	08/08/2016	08/08/2016	08/08/2016
Date analysed	-	08/08/2016	08/08/2016	08/08/2016	08/08/2016	08/08/2016
Arsenic-Total	µg/L	<1	1	<1	<1	<1
Cadmium-Total	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Chromium-Total	µg/L	7	26	<1	14	<1
Copper-Total	µg/L	4	22	<1	1	<1
Lead-Total	µg/L	1	3	<1	<1	<1
Mercury-Total	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05
Nickel-Total	µg/L	15	37	2	2	2
Zinc-Total	µg/L	23	68	11	38	2
Iron-Total	µg/L	2,000	11,000	78	160	230
Manganese-Total	µg/L	9	38	<5	7	<5

HM in water - total			
Our Reference:	UNITS	151322-11	151322-12
Your Reference	-----	Phils Spring	Southern Spring
	-		
Date Sampled	-----	27/07/2016	27/07/2016
Type of sample		Water	Water
Date prepared	-	08/08/2016	08/08/2016
Date analysed	-	08/08/2016	08/08/2016
Arsenic-Total	µg/L	<1	<1
Cadmium-Total	µg/L	<0.1	<0.1
Chromium-Total	µg/L	<1	<1
Copper-Total	µg/L	<1	<1
Lead-Total	µg/L	<1	<1
Mercury-Total	µg/L	<0.05	<0.05
Nickel-Total	µg/L	<1	4
Zinc-Total	µg/L	<1	<1
Iron-Total	µg/L	160	310
Manganese-Total	µg/L	44	72

MethodID	Methodology Summary
Org-016	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS. Water samples are analysed directly by purge and trap GC-MS. F1 = (C6-C10)-BTEX as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater.
Org-013	Water samples are analysed directly by purge and trap GC-MS.
Org-003	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis.
Metals-020	Determination of various metals by ICP-AES.
Inorg-006	Alkalinity - determined titrimetrically in accordance with APHA latest edition, 2320-B.
Inorg-081	Anions - a range of Anions are determined by Ion Chromatography, in accordance with APHA latest edition, 4110-B. Alternatively determined by colourimetry/turbidity using Discrete Analyser.
Inorg-040	The concentrations of the major ions (mg/L) are converted to milliequivalents and summed. The ionic balance should be within +/- 10% ie total anions = total cations +/-10%.
Inorg-001	pH - Measured using pH meter and electrode in accordance with APHA latest edition, 4500-H+. Please note that the results for water analyses are indicative only, as analysis outside of the APHA storage times.
Inorg-002	Conductivity and Salinity - measured using a conductivity cell at 25oC in accordance with APHA latest edition 2510 and Rayment & Lyons.
Inorg-018	Total Dissolved Solids - determined gravimetrically. The solids are dried at 180+/-5oC.
Metals-022 ICP-MS	Determination of various metals by ICP-MS.
Metals-021	Determination of Mercury by Cold Vapour AAS.

Client Reference: Larry Cook - Ardmore Park

QUALITY CONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
vTRH(C6-C10)/BTEXN in Water						Base II Duplicate II %RPD		
Date extracted	-			08/08/2016	[NT]	[NT]	LCS-W1	08/08/2016
Date analysed	-			08/08/2016	[NT]	[NT]	LCS-W1	08/08/2016
TRHC ₆ - C ₉	µg/L	10	Org-016	<10	[NT]	[NT]	LCS-W1	100%
TRHC ₆ - C ₁₀	µg/L	10	Org-016	<10	[NT]	[NT]	LCS-W1	100%
Benzene	µg/L	1	Org-016	<1	[NT]	[NT]	LCS-W1	98%
Toluene	µg/L	1	Org-016	<1	[NT]	[NT]	LCS-W1	100%
Ethylbenzene	µg/L	1	Org-016	<1	[NT]	[NT]	LCS-W1	100%
m+p-xylene	µg/L	2	Org-016	<2	[NT]	[NT]	LCS-W1	100%
o-xylene	µg/L	1	Org-016	<1	[NT]	[NT]	LCS-W1	100%
Naphthalene	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
Surrogate Dibromofluoromethane	%		Org-016	98	[NT]	[NT]	LCS-W1	98%
Surrogate toluene-d8	%		Org-016	98	[NT]	[NT]	LCS-W1	101%
Surrogate 4-BFB	%		Org-016	100	[NT]	[NT]	LCS-W1	99%
QUALITY CONTROL svTRH(C10-C40) in Water	UNITS	PQL	METHOD	Blank				
Date extracted	-			08/08/2016				
Date analysed	-			08/08/2016				
TRHC ₁₀ - C ₁₄	µg/L	50	Org-003	<50				
TRHC ₁₅ - C ₂₈	µg/L	100	Org-003	<100				
TRHC ₂₈ - C ₃₆	µg/L	100	Org-003	<100				
TRH>C ₁₀ - C ₁₆	µg/L	50	Org-003	<50				
TRH>C ₁₆ - C ₃₄	µg/L	100	Org-003	<100				
TRH>C ₃₄ - C ₄₀	µg/L	100	Org-003	<100				
Surrogate o-Terphenyl	%		Org-003	85				
QUALITY CONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
Ion Balance						Base II Duplicate II %RPD		
Date prepared	-			05/08/2016	151322-1	05/08/2016 05/08/2016	LCS-W1	05/08/2016
Date analysed	-			05/08/2016	151322-1	05/08/2016 05/08/2016	LCS-W1	05/08/2016
Calcium - Dissolved	mg/L	0.5	Metals-020	<0.5	151322-1	14 14 RPD: 0	LCS-W1	100%
Potassium - Dissolved	mg/L	0.5	Metals-020	<0.5	151322-1	1.1 1.0 RPD: 10	LCS-W1	96%
Sodium - Dissolved	mg/L	0.5	Metals-020	<0.5	151322-1	91 90 RPD: 1	LCS-W1	101%
Magnesium - Dissolved	mg/L	0.5	Metals-020	<0.5	151322-1	9.7 9.4 RPD: 3	LCS-W1	100%
Hydroxide Alkalinity (OH ⁻) as CaCO ₃	mg/L	5	Inorg-006	<5	151322-1	<5 <5	[NR]	[NR]
Bicarbonate Alkalinity as CaCO ₃	mg/L	5	Inorg-006	<5	151322-1	29 30 RPD: 3	[NR]	[NR]
Carbonate Alkalinity as CaCO ₃	mg/L	5	Inorg-006	<5	151322-1	<5 <5	[NR]	[NR]

Client Reference: Larry Cook - Ardmore Park

QUALITYCONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
Ion Balance						Base II Duplicate II %RPD		
Total Alkalinity as CaCO ₃	mg/L	5	Inorg-006	<5	151322-1	29 30 RPD: 3	LCS-W1	104%
Sulphate, SO ₄	mg/L	1	Inorg-081	<1	151322-1	5 5 RPD: 0	LCS-W1	108%
Chloride, Cl	mg/L	1	Inorg-081	<1	151322-1	140 150 RPD: 7	LCS-W1	96%
Ionic Balance	%		Inorg-040	[NT]	151322-1	7.6 6.0 RPD: 24	[NR]	[NR]
QUALITYCONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
Miscellaneous Inorganics						Base II Duplicate II %RPD		
Date prepared	-			05/08/2016	151322-1	05/08/2016 05/08/2016	LCS-W1	05/08/2016
Date analysed	-			05/08/2016	151322-1	05/08/2016 05/08/2016	LCS-W1	05/08/2016
pH	pH Units		Inorg-001	[NT]	151322-1	6.9 6.9 RPD: 0	LCS-W1	103%
Electrical Conductivity	µS/cm	1	Inorg-002	<1	151322-1	590 580 RPD: 2	LCS-W1	104%
Total Dissolved Solids (grav)	mg/L	5	Inorg-018	<5	151322-1	410 [N/T]	LCS-W1	91%
QUALITYCONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results		
HM in water - total						Base II Duplicate II %RPD		
Date prepared	-			08/08/2016	151322-1	08/08/2016 08/08/2016		
Date analysed	-			08/08/2016	151322-1	08/08/2016 08/08/2016		
Arsenic-Total	µg/L	1	Metals-022 ICP-MS	<1	[NT]	[NT]		
Cadmium-Total	µg/L	0.1	Metals-022 ICP-MS	<0.1	[NT]	[NT]		
Chromium-Total	µg/L	1	Metals-022 ICP-MS	<1	[NT]	[NT]		
Copper-Total	µg/L	1	Metals-022 ICP-MS	<1	[NT]	[NT]		
Lead-Total	µg/L	1	Metals-022 ICP-MS	<1	[NT]	[NT]		
Mercury-Total	µg/L	0.05	Metals-021	<0.05	[NT]	[NT]		
Nickel-Total	µg/L	1	Metals-022 ICP-MS	<1	[NT]	[NT]		
Zinc-Total	µg/L	1	Metals-022 ICP-MS	<1	[NT]	[NT]		
Iron-Total	µg/L	10	Metals-022 ICP-MS	<10	151322-1	150 150 RPD: 0		
Manganese-Total	µg/L	5	Metals-022 ICP-MS	<5	151322-1	13 13 RPD: 0		
QUALITYCONTROL	UNITS	Dup. Sm#		Duplicate		Spike Sm#	Spike % Recovery	
svTRH (C10-C40) in Water				Base + Duplicate + %RPD				
Date extracted	-	[NT]		[NT]		LCS-W2	08/08/2016	
Date analysed	-	[NT]		[NT]		LCS-W2	08/08/2016	
TRHC ₁₀ - C ₁₄	µg/L	[NT]		[NT]		LCS-W2	128%	
TRHC ₁₅ - C ₂₈	µg/L	[NT]		[NT]		LCS-W2	129%	
TRHC ₂₉ - C ₃₆	µg/L	[NT]		[NT]		LCS-W2	115%	

Client Reference: Larry Cook - Ardmore Park

QUALITY CONTROL svTRH (C10-C40) in Water	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
TRH>C ₁₀ - C ₁₆	µg/L	[NT]	[NT]	LCS-W2	128%
TRH>C ₁₆ - C ₃₄	µg/L	[NT]	[NT]	LCS-W2	129%
TRH>C ₃₄ - C ₄₀	µg/L	[NT]	[NT]	LCS-W2	115%
Surrogate o-Terphenyl	%	[NT]	[NT]	LCS-W2	108%
QUALITY CONTROL Ion Balance	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD		
Date prepared	-	151322-11	05/08/2016 05/08/2016		
Date analysed	-	151322-11	05/08/2016 05/08/2016		
Calcium - Dissolved	mg/L	151322-11	49 46 RPD: 6		
Potassium - Dissolved	mg/L	151322-11	0.9 0.8 RPD: 12		
Sodium - Dissolved	mg/L	151322-11	94 89 RPD: 5		
Magnesium - Dissolved	mg/L	151322-11	87 79 RPD: 10		
Hydroxide Alkalinity (OH ⁻) as CaCO ₃	mg/L	151322-11	<5 <5		
Bicarbonate Alkalinity as CaCO ₃	mg/L	151322-11	420 420 RPD: 0		
Carbonate Alkalinity as CaCO ₃	mg/L	151322-11	<5 <5		
Total Alkalinity as CaCO ₃	mg/L	151322-11	420 420 RPD: 0		
Sulphate, SO ₄	mg/L	151322-11	13 13 RPD: 0		
Chloride, Cl	mg/L	151322-11	140 140 RPD: 0		
Ionic Balance	%	151322-11	4.3 0.61 RPD: 150		
QUALITY CONTROL Miscellaneous Inorganics	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD		
Date prepared	-	151322-11	05/08/2016 05/08/2016		
Date analysed	-	151322-11	05/08/2016 05/08/2016		
pH	pH Units	151322-11	7.4 7.4 RPD: 0		
Electrical Conductivity	µS/cm	151322-11	1200 1200 RPD: 0		
QUALITY CONTROL HM in water - total	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date prepared	-	151322-11	08/08/2016 08/08/2016	LCS-W2	08/08/2016
Date analysed	-	151322-11	08/08/2016 08/08/2016	LCS-W2	08/08/2016
Arsenic-Total	µg/L	151322-11	<1 <1	LCS-W2	95%
Cadmium-Total	µg/L	151322-11	<0.1 <0.1	LCS-W2	101%
Chromium-Total	µg/L	151322-11	<1 <1	LCS-W2	97%
Copper-Total	µg/L	151322-11	<1 <1	LCS-W2	98%
Lead-Total	µg/L	151322-11	<1 <1	LCS-W2	104%
Mercury-Total	µg/L	151322-11	<0.05 <0.05	LCS-W2	97%
Nickel-Total	µg/L	151322-11	<1 <1	LCS-W2	95%
Zinc-Total	µg/L	151322-11	<1 <1	LCS-W2	95%
Iron-Total	µg/L	151322-11	160 180 RPD: 12	LCS-W2	97%
Manganese-Total	µg/L	151322-11	44 46 RPD: 4	LCS-W2	96%

Client Reference: Larry Cook - Ardmore Park

QUALITY CONTROL svTRH (C10-C40) in Water	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date extracted	-	151322-5	08/08/2016 08/08/2016	151322-6	08/08/2016
Date analysed	-	151322-5	08/08/2016 08/08/2016	151322-6	08/08/2016
TRHC ₁₀ - C ₁₄	µg/L	151322-5	<50 <50	151322-6	97%
TRHC ₁₅ - C ₂₈	µg/L	151322-5	<100 <100	151322-6	96%
TRHC ₂₈ - C ₃₆	µg/L	151322-5	<100 <100	151322-6	130%
TRH>C ₁₀ - C ₁₆	µg/L	151322-5	<50 <50	151322-6	97%
TRH>C ₁₆ - C ₃₄	µg/L	151322-5	<100 <100	151322-6	96%
TRH>C ₃₄ - C ₄₀	µg/L	151322-5	<100 <100	151322-6	130%
Surrogate o-Terphenyl	%	151322-5	87 88 RPD: 1	151322-6	86%
QUALITY CONTROL Ion Balance	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date prepared	-	[NT]	[NT]	151322-2	05/08/2016
Date analysed	-	[NT]	[NT]	151322-2	05/08/2016
Calcium - Dissolved	mg/L	[NT]	[NT]	151322-2	#
Potassium - Dissolved	mg/L	[NT]	[NT]	151322-2	94%
Sodium - Dissolved	mg/L	[NT]	[NT]	151322-2	#
Magnesium - Dissolved	mg/L	[NT]	[NT]	151322-2	#
Hydroxide Alkalinity (OH ⁻) as CaCO ₃	mg/L	[NT]	[NT]	[NR]	[NR]
Bicarbonate Alkalinity as CaCO ₃	mg/L	[NT]	[NT]	[NR]	[NR]
Carbonate Alkalinity as CaCO ₃	mg/L	[NT]	[NT]	[NR]	[NR]
Total Alkalinity as CaCO ₃	mg/L	[NT]	[NT]	[NR]	[NR]
Sulphate, SO ₄	mg/L	[NT]	[NT]	151322-2	112%
Chloride, Cl	mg/L	[NT]	[NT]	151322-2	84%
Ionic Balance	%	[NT]	[NT]	[NR]	[NR]

Client Reference: Larry Cook - Ardmore Park

QUALITY CONTROL HM in water - total	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date prepared	-	[NT]	[NT]	151322-2	08/08/2016
Date analysed	-	[NT]	[NT]	151322-2	08/08/2016
Arsenic-Total	µg/L	[NT]	[NT]	151322-2	96%
Cadmium-Total	µg/L	[NT]	[NT]	151322-2	101%
Chromium-Total	µg/L	[NT]	[NT]	151322-2	97%
Copper-Total	µg/L	[NT]	[NT]	151322-2	93%
Lead-Total	µg/L	[NT]	[NT]	151322-2	106%
Mercury-Total	µg/L	[NT]	[NT]	[NR]	[NR]
Nickel-Total	µg/L	[NT]	[NT]	151322-2	91%
Zinc-Total	µg/L	[NT]	[NT]	151322-2	94%
Iron-Total	µg/L	[NT]	[NT]	151322-2	#
Manganese-Total	µg/L	[NT]	[NT]	151322-2	94%

Report Comments:

vTRH in water: Only 1 vial provided for analysis.

Envirolab recommends that 2x40mL vials are provided to ensure QA samples and dilutions can be performed as well as to ensure that no analytes are lost due to headspace.

Note that Sample #4 (BHAP10) was subsampled from a plastic bottle & that PQL has been raised due to the limited amount of sample/s available for testing.

sTRH in water: Insufficient sample for analysis of sample 4

METALS_WLL_8_T: # Percent recovery is not possible to report due to the high concentration of the element/s in the sample/s. However an acceptable recovery was obtained for the LCS.

Total Metals: The preserved sample provided was not identified as either total or dissolved, therefore the analysis was conducted from the unpreserved sample.

Note: there is a possibility some elements may be underestimated

ION_BALANCE: # Percent recovery is not possible to report due to the high concentration of the element/s in the sample/s. However an acceptable recovery was obtained for the LCS.

Asbestos ID was analysed by Approved Identifier:

Not applicable for this job

Asbestos ID was authorised by Approved Signatory:

Not applicable for this job

INS: Insufficient sample for this test

PQL: Practical Quantitation Limit

NT: Not tested

NR: Test not required

RPD: Relative Percent Difference

NA: Test not required

<: Less than

>: Greater than

LCS: Laboratory Control Sample

Quality Control Definitions

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

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

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

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

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

Laboratory Acceptance Criteria

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

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

Spikes for Physical and Aggregate Tests are not applicable.

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

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

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

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

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

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

Measurement Uncertainty estimates are available for most tests upon request.