

Groundwater Results Summary Ecological Comparison
31/3/24-30/3/25

Date	PQL	Aquatic Ecosystem Guideline ^A		26/04/2024	28/05/2024
Sample Purpose		95% Fresh	95% Marine	Characterisation	Characterisation
Sample collected by				RCA-AH/CD	RCA-AH
BH1	Sample Depth (m) ^B			2.93	2.01
	Sample Description			Grey, turbid, slight muddy odour	Grey, turbid and odour of sulfide
Nutrients					
Ammonia as N	0.01	0.9	0.91	<u>1.72</u>	<u>2.14</u>
Nitrite as N	0.01			<0.01	<0.01
Nitrate as N ^C	0.01	2.4	2.4	0.02	<0.01
Nitrite + Nitrate as N ^D	0.01	0.04		0.02	<0.01
Total Phosphorus as P ^D	0.01	0.025		0.33	0.26
Benzene, Toluene, Ethylbenzene, Xylene (BTEX)					
Benzene	0.001	0.95	0.5	--	<0.001
Toluene	0.002	0.18	0.18	--	<0.002
Ethylbenzene	0.002	0.08	0.005	--	<0.002
meta- and para-Xylene	0.002	0.275	0.275	--	<0.002
ortho-Xylene	0.002	0.35	0.35	--	<0.002
Total Recoverable Hydrocarbons (TRH)					
TRH C ₆ -C ₄₀	0.32	0.007		0.16	0.16
Polycyclic Aromatic Hydrocarbons (PAH)					
Naphthalene	0.0001	0.016	0.07	--	<0.0001
Phenanthrene ^E	0.0001	0.002	0.002	--	<0.0001
Anthracene ^E	0.0001	0.0004	0.0004	--	<0.0001
Fluoranthene ^E	0.0001	0.0014	0.0014	--	<0.0001
Benzo(a) pyrene ^E	0.00005	0.0002	0.0002	--	<0.00005
BH3	Sample Depth (m) ^B			3.11	3.15
	Sample Description			Pale yellow, clear, no odour	Grey, turbid, odour of sulfide
Nutrients					
Ammonia as N	0.01	0.9	0.91	<u>1.89</u>	<u>1.93</u>
Nitrite as N	0.01			<0.1	<0.01
Nitrate as N ^C	0.01	2.4	2.4	<0.1	<0.01
Nitrite + Nitrate as N ^D	0.01	0.04		<0.1	<0.01
Total Phosphorus as P ^D	0.01	0.025		0.11	0.14
Benzene, Toluene, Ethylbenzene, Xylene (BTEX)					
Benzene	0.001	0.95	0.5	--	<0.001
Toluene	0.002	0.18	0.18	--	<0.002
Ethylbenzene	0.002	0.08	0.005	--	<0.002
meta- and para-Xylene	0.002	0.275	0.275	--	<0.002
ortho-Xylene	0.002	0.35	0.35	--	<0.002
Total Recoverable Hydrocarbons (TRH)					
TRH C ₆ -C ₄₀	0.32	0.007		--	0.16
Polycyclic Aromatic Hydrocarbons (PAH)					
Naphthalene	0.0001	0.016	0.07	--	<0.0001
Phenanthrene ^E	0.0001	0.002	0.002	--	<0.0001
Anthracene ^E	0.0001	0.0004	0.0004	--	<0.0001
Fluoranthene ^E	0.0001	0.0014	0.0014	--	<0.0001
Benzo(a) pyrene ^E	0.00005	0.0002	0.0002	--	<0.00005

All results are in units of mg/L

Blank Cell indicates no criterion available

PQL = Practical Quantitation Limit.

^A Ecological criteria % Protection Level for Receiving Water Type.

^B Sample depths presented from top of pipe are as encountered prior to commencement of sampling

^C Updating nitrate toxicity effects on freshwater aquatic species as directed from the ANZG website

^D Guidelines for Lowland (Coastal) Rivers in NSW

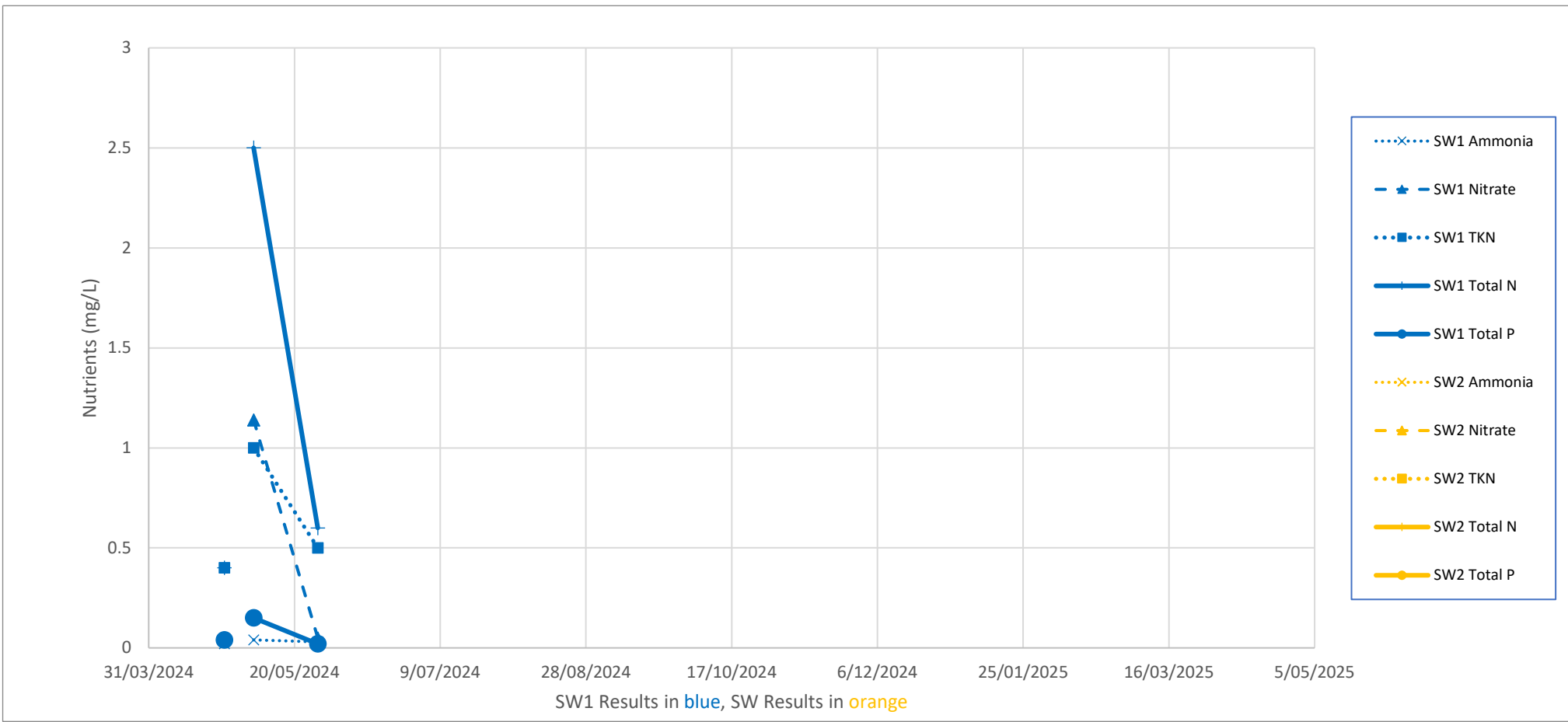
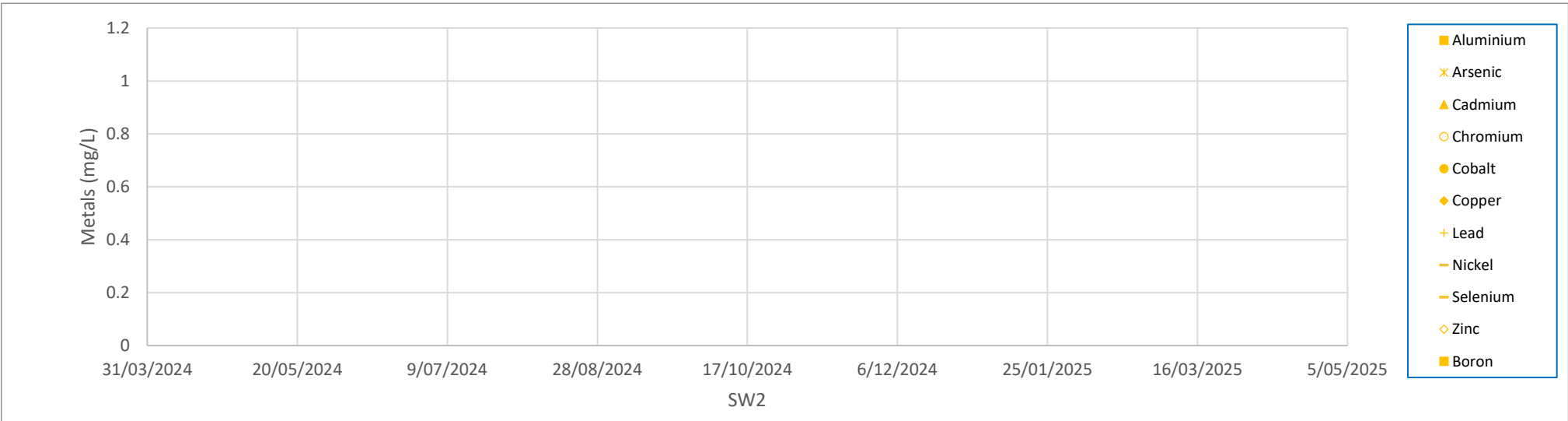
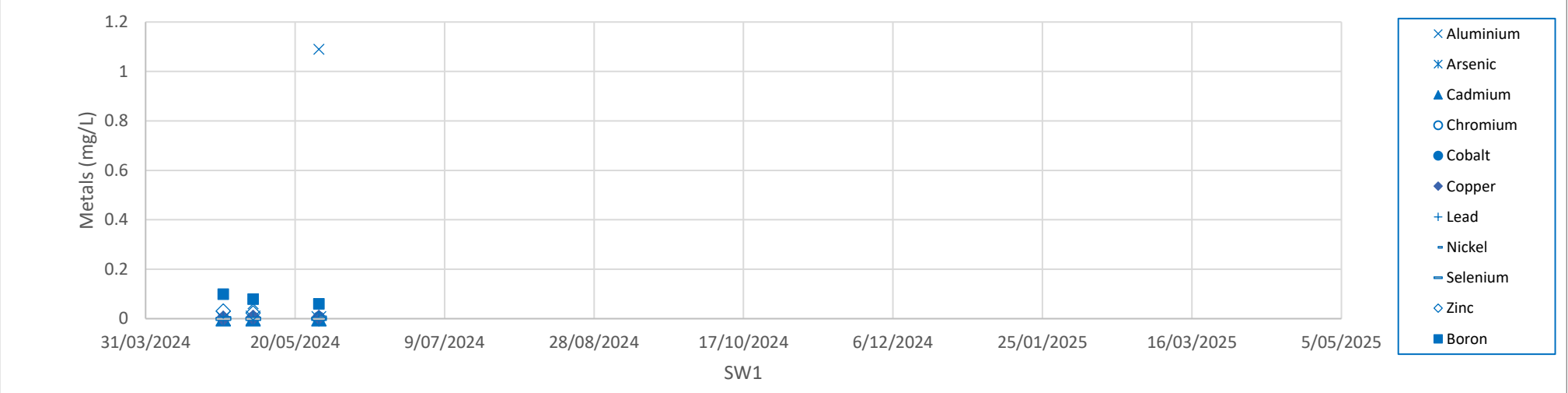
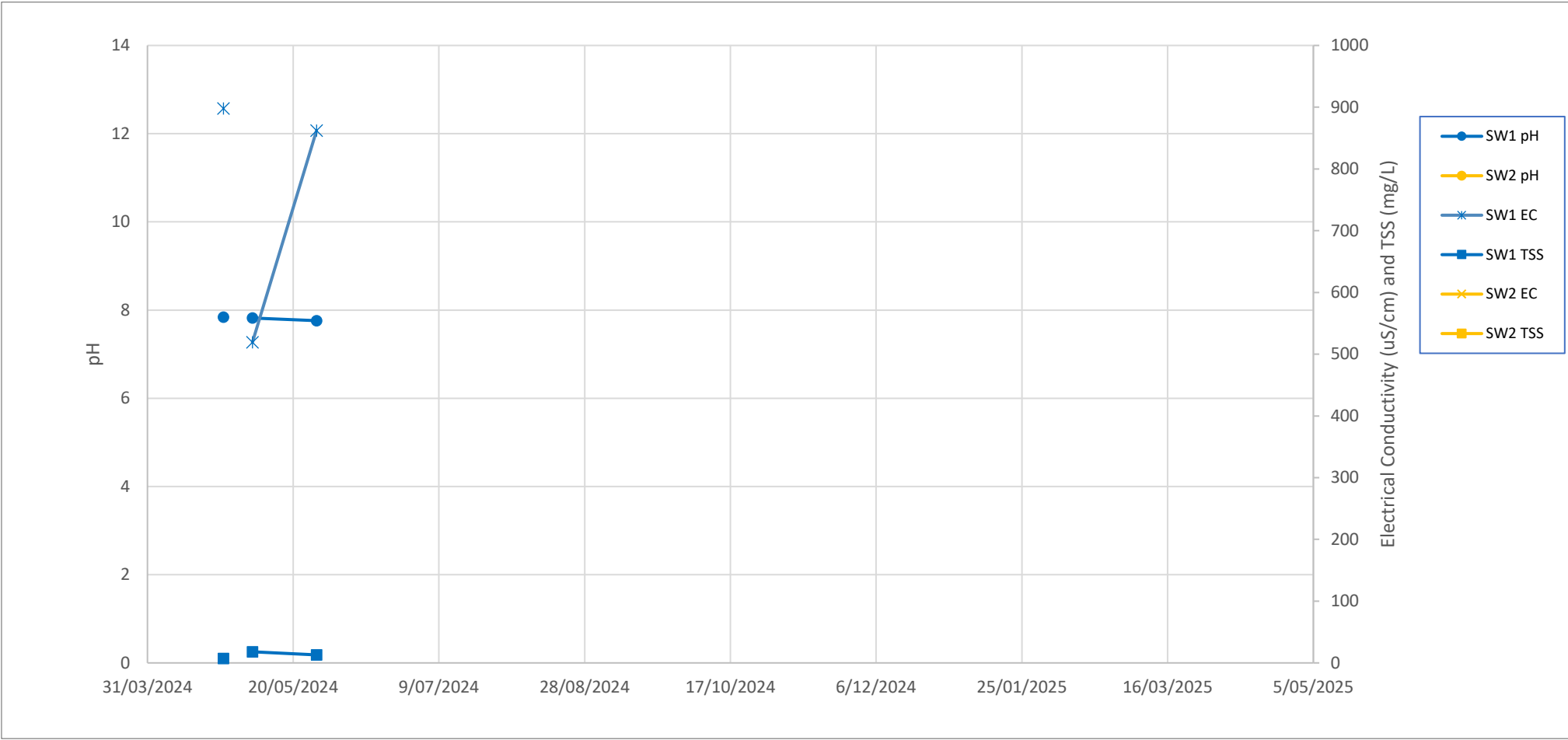
^E Bioaccumulative Compounds

Results shown in **BOLD** are in excess of the 95% fresh water aquatic ecosystems guidelines or the lowland (coastal) river guidelines

Results shown in UNDERLINE are in excess of the 95% marine water aquatic ecosystems guidelines

Date	PQL	Management Triggers ^A	6/04/2024	26/04/2024	3/05/2024	6/05/2024	28/05/2024
Sample Purpose			Discharge	Characterisation	Discharge	Discharge	Characterisation
Sample collected by			Concrush	RCA-AH/CD	RCA-AH	RCA-AH	RCA-AH
SW1 (North - Racecourse Road)			No sample	Clear, no odour	No Sample	Pale yellow, slightly turbid, no odour	Clear, no dour
General Water Quality							
pH Value (pH units)	0.01	6.5-8		7.84		7.82	7.76
Electrical Conductivity (µS/cm @ 25C)	1	125-2200		898		519	862
Total Suspended Solids	5			7		18	13
Metals							
Aluminium	0.01	0.08		<0.01		0.06	1.09
Arsenic	0.001	0.094		0.002		0.003	0.001
Cadmium	0.0001	0.0004		<0.0001		<0.0001	<0.0001
Chromium	0.001	0.02		<0.001		0.004	0.006
Hexavalent Chromium	0.01	0.0033		<0.001		<0.01	<0.001
Cobalt	0.001	0.015		<0.001		<0.001	0.001
Copper	0.001	0.02		0.002		0.006	0.006
Lead	0.001	0.0056		<0.001		<0.001	<0.001
Nickel	0.001	0.013		0.003		0.001	0.006
Selenium	0.01	0.018		<0.01		<0.01	<0.01
Zinc	0.005	0.015		0.031		0.023	<0.005
Boron	0.05	0.68		0.1		0.08	0.06
Total Recoverable Hydrocarbons (TRH)							
TRH >C ₆ -C ₁₀	0.02			<0.02		<0.02	<0.02
TRH >C ₁₀ -C ₁₆	0.1			<0.1		<0.1	<0.1
TRH >C ₁₆ -C ₃₄	0.1			<0.1		<0.1	<0.1
TRH >C ₃₄ -C ₄₀	0.1			<0.1		<0.1	<0.1
TRH C ₆ -C ₄₀	0.32	10		0.16		0.16	0.16
Nutrients							
Ammonia as N	0.01	0.0264		0.02		0.04	0.03
Nitrite as N	0.01			<0.01		0.35	<0.01
Nitrate as N	0.01	0.44		0.05		1.14	0.05
Nitrite + Nitrate as N	0.01	0.491		0.05		1.49	0.05
Total Kjeldahl Nitrogen as N	0.1			0.4		1.0	0.5
Total Nitrogen as N	0.1	0.645		0.4		2.5	0.6
Total Phosphorus as P	0.01	0.0168		0.04		0.15	0.02
SW2 (South - Railway Line)			No sample	The location is inaccessible - No sample	The location is inaccessible - No sample	The location is inaccessible - No sample	The location is inaccessible - No sample
General Water Quality							
pH Value (pH units)	0.01	6.5-8					
Electrical Conductivity (µS/cm @ 25C)	1	125-2200					
Total Suspended Solids	5						
Metals							
Aluminium	0.01	0.08					
Arsenic	0.001	0.094					
Cadmium	0.0001	0.0004					
Chromium	0.001	0.02					
Hexavalent Chromium	0.01	0.0033					
Cobalt	0.001	0.015					
Copper	0.001	0.02					
Lead	0.001	0.0056					
Nickel	0.001	0.013					
Selenium	0.01	0.018					
Zinc	0.005	0.015					
Boron	0.05	0.68					
Total Recoverable Hydrocarbons (TRH)							
TRH >C ₆ -C ₁₀	0.02						
TRH >C ₁₀ -C ₁₆	0.1						
TRH >C ₁₆ -C ₃₄	0.1						
TRH >C ₃₄ -C ₄₀	0.1						
TRH C ₆ -C ₄₀	0.32	10					
Nutrients							
Ammonia as N	0.01	0.0264					
Nitrite as N	0.01						
Nitrate as N	0.01	0.44					
Nitrite + Nitrate as N	0.01	0.491					
Total Kjeldahl Nitrogen as N	0.1						
Total Nitrogen as N	0.1	0.645					
Total Phosphorus as P	0.01	0.0168					

All results are in units of mg/L except where noted
Blank Cell indicates no criterion available
^A As specified in Water Discharge Management Plan, noting that the off-site waters are not necessarily representative of discharging water
Results shown in **BOLD** are in excess of the management triggers



Date	PQL	Management Triggers ^A	6/04/2024	26/04/2024	3/05/2024	6/05/2024	28/05/2024
Sample Purpose			Discharge	Characterisation	Discharge	Discharge	Characterisation
Sample Collected by			Concrush	RCA - AH/CD	RCA - AH	RCA - AH	RCA - AH
			Leachate Pond	Leachate Pond	Leachate Pond	Leachate Pond	Leachate Pond
Sample Description			No sample	Pale yellow, clear, no odour	No sample	No sample	Pale yellow, clear, no odour
General Water Quality							
pH Value (pH units)	0.01	6.5-8		7.68			7.67
Electrical Conductivity (µS/cm @ 25C)	1	125-2200		678			632
Total Suspended Solids	5			<5			<5
Nutrients							
Ammonia	0.01	0.0264		0.02			0.6
Nitrite as N	0.01			<0.01			<0.01
Nitrate as N ^D	0.01	0.44		<0.01			<0.01
Nitrite + Nitrate as N	0.01	0.491		<0.01			<0.01
Total Kjeldahl Nitrogen as N	0.1			2.2			2.3
Total N	0.1	0.645		2.2			2.3
Total Phosphorus as P	0.01	0.0168		0.56			0.54
			Wetland	Wetland	Wetland	Wetland	Wetland
Sample Description			No sample	Pale yellow, clear, no odour	No sample	No sample	Pale yellow, clear, odour of algae degradation
General Water Quality							
pH Value (pH units)	0.01	6.5-8		7.28			7.22
Electrical Conductivity (µS/cm @ 25C)	1	125-2200		616			418
Total Suspended Solids	5			<5			<5
Nutrients							
Ammonia	0.01	0.0264		0.02			0.01
Nitrite as N	0.01			<0.01			<0.01
Nitrate as N ^D	0.01	0.44		<0.01			<0.01
Nitrite + Nitrate as N	0.01	0.491		<0.01			<0.01
Total Kjeldahl Nitrogen as N	0.1			2.5			2.0
Total N	0.1	0.645		2.5			2.0
Total Phosphorus as P	0.01	0.0168		0.88			0.65

All results are in units of mg/L except where noted

^A As specified in Water Discharge Management Plan, noting that the leachate and wetland waters are not necessarily representative of discharging water

Results shown in **BOLD** are in excess of the management triggers

Date	PQL	Management Triggers ^A	6/04/2024	26/04/2024	3/05/2024	6/05/2024	28/05/2024
Sample Purpose			Discharge	Characterisation	Discharge	Discharge	Characterisation
Sample Collected by			Concrush	RCA - AH/CD	RCA - AH	RCA - AH	RCA - AH
			Sediment Basin 2	Sediment Basin 2	Sediment Basin 2	Sediment Basin 2	Sediment Basin 2
Sample Description			No sample	Pale yellow, clear, no odour	No sample	No sample	Brown, turbid, no odour
General Water Quality							
pH Value (pH units)	0.01	6.5-8		9.42			9.13
Electrical Conductivity (µS/cm @ 25C)	1	125-2200		454			505
Total Suspended Solids	5			11			50
Metals							
Aluminium	0.01	0.08		0.14			0.14
Arsenic	0.001	0.094		0.006			0.011
Cadmium	0.0001	0.0004		<0.0001			<0.0001
Chromium	0.001	0.02		0.022			0.033
Hexavalent Chromium	0.001	0.0033		0.02			0.035
Cobalt	0.001	0.015		<0.001			0.001
Copper	0.001	0.02		0.006			0.009
Lead	0.001	0.0056		<0.001			<0.001
Nickel	0.001	0.013		0.001			0.002
Selenium	0.01	0.018		<0.01			<0.01
Zinc	0.005	0.015		<0.005			<0.005
Boron	0.05	0.68		<0.05			0.06
Total Recoverable Hydrocarbons (TRH)							
TRH >C ₆ -C ₁₀	0.02			<0.02			<0.02
TRH >C ₁₀ -C ₁₆	0.1			<0.1			<0.1
TRH >C ₁₆ -C ₃₄	0.1			<0.1			<0.1
TRH >C ₃₄ -C ₄₀	0.1			<0.1			<0.1
TRH C ₆ -C ₄₀	0.32	10		0.16			0.16
Nutrients							
Ammonia	0.01	0.0264		0.04			0.12
Nitrite as N	0.01			0.51			0.13
Nitrate as N ^D	0.01	0.44		2.0			6.0
Nitrite + Nitrate as N	0.01	0.491		2.51			6.17
Total Kjeldahl Nitrogen as N	0.1			1.2			2.0
Total N	0.1	0.645		3.7			8.2
Total Phosphorus as P	0.01	0.0168		0.1			0.24

All results are in units of mg/L except where noted

^A As specified in Water Discharge Management Plan, noting that the Sediment 2 water not necessarily representative of discharging water

Results shown in **BOLD** are in excess of the management triggers

Date	PQL	Management Triggers ^A	6/04/2024	26/04/2024	3/05/2024	6/05/2024	28/05/2024
Sample Purpose			Discharge	Characterisation	Discharge	Discharge	Characterisation
Sample Collected by			Concrush	RCA - AH/CD	RCA - AH	RCA - AH	RCA - AH
			Sediment Basin 2 Spillway	Sediment Basin 2 Spillway	Sediment Basin 2 Spillway	Sediment Basin 2 Spillway	Sediment Basin 2 Spillway
Sample Description			No sample	No sample	Pale yellow, slightly turbid, no odor	Light grey, slightly turbid, no odor	No sample
General Water Quality							
pH Value (pH units)	0.01	6.5-8	--	--	9.93	9.96	
Electrical Conductivity (µS/cm @ 25C)	1	125-2200	--	--	419	400	
Total Suspended Solids	5		--	--	32	90	
Metals							
Aluminium	0.01	0.08	--	--	0.23	0.21	
Arsenic	0.001	0.094	--	--	0.004	0.005	
Cadmium	0.0001	0.0004	--	--	<0.0001	<0.0001	
Chromium	0.001	0.02	--	--	0.026	0.025	
Hexavalent Chromium	0.01	0.0033	--	--	0.03	0.03	
Cobalt	0.001	0.015	--	--	<0.001	<0.001	
Copper	0.001	0.02	--	--	0.007	0.007	
Lead	0.001	0.0056	--	--	<0.0001	<0.001	
Nickel	0.001	0.013	--	--	0.001	0.001	
Selenium	0.01	0.018	--	--	<0.01	<0.01	
Zinc	0.005	0.015	--	--	0.005	<0.005	
Boron	0.05	0.68	--	--	0.05	<0.05	
Total Recoverable Hydrocarbons (TRH)							
TRH >C ₆ -C ₁₀	0.02		--	--	<0.02	<0.02	
TRH >C ₁₀ -C ₁₆	0.1		--	--	<0.1	<0.1	
TRH >C ₁₆ -C ₃₄	0.1		--	--	<0.1	<0.1	
TRH >C ₃₄ -C ₄₀	0.1		--	--	<0.1	<0.1	
TRH C ₆ -C ₄₀	0.32	10	--	--	0.16	0.16	
Nutrients							
Ammonia	0.01	0.0264	--	--	0.04	0.04	
Nitrite as N	0.01		--	--	0.88	0.8	
Nitrate as N ^D	0.01	0.44	--	--	2.61	2.33	
Nitrite + Nitrate as N	0.01	0.491	--	--	3.49	3.13	
Total Kjeldahl Nitrogen as N	0.1		--	--	<1.0	1.4	
Total N	0.1	0.645	--	--	3.5	4.5	
Total Phosphorus as P	0.01	0.0168	--	--	<0.10	0.19	

All results are in units of mg/L except where noted

^A As specified in Water Discharge Management Plan

Results shown in **BOLD** are in excess of the management triggers

Date	PQL	Management Triggers ^A	6/04/2024	26/04/2024	3/05/2024	6/05/2024	28/05/2024
Sample Purpose			Discharge	Characterisation	Discharge	Discharge	Characterisation
Sample Collected by			Concrush	RCA - AH/CD	RCA - AH	RCA - AH	RCA - AH
			Sediment Basin 1	Sediment Basin 1	Sediment Basin 1	Sediment Basin 1	Sediment Basin 1
Sample Description			No sample	Light grey, clear, no odour	No sample	No sample	Clear, no dour
General Water Quality							
pH Value (pH units)	0.01	6.5-8	--	10.4	--	--	9.94
Electrical Conductivity (µS/cm @ 25C)	1	125-2200	--	472	--	--	507
Total Suspended Solids	5		--	9	--	--	<5
Metals							
Aluminium	0.01	0.08	--	0.52	--	--	0.22
Arsenic	0.001	0.094	--	0.003	--	--	0.003
Cadmium	0.0001	0.0004	--	<0.0001	--	--	<0.0001
Chromium	0.001	0.02	--	0.044	--	--	0.05
Hexavalent Chromium	0.01	0.0033	--	0.038	--	--	0.055
Cobalt	0.001	0.015	--	0.001	--	--	0.002
Copper	0.001	0.02	--	0.005	--	--	0.006
Lead	0.001	0.0056	--	<0.001	--	--	<0.001
Nickel	0.001	0.013	--	0.001	--	--	<0.001
Selenium	0.01	0.018	--	<0.01	--	--	<0.01
Zinc	0.005	0.015	--	<0.005	--	--	<0.005
Boron	0.05	0.68	--	<0.05	--	--	0.06
Total Recoverable Hydrocarbons (TRH)							
TRH >C ₆ -C ₁₀	0.02		--	<0.02	--	--	<0.02
TRH >C ₁₀ -C ₁₆	0.1		--	<0.1	--	--	<0.1
TRH >C ₁₆ -C ₃₄	0.1		--	<0.1	--	--	<0.1
TRH >C ₃₄ -C ₄₀	0.1		--	<0.1	--	--	<0.1
TRH C ₆ -C ₄₀	0.32	10	--	0.16	--	--	0.16
Nutrients							
Ammonia	0.01	0.0264	--	0.06	--	--	0.09
Nitrite as N	0.01		--	0.98	--	--	0.67
Nitrate as N ^D	0.01	0.44	--	1.72	--	--	3.95
Nitrite + Nitrate as N	0.01	0.491	--	2.7	--	--	4.62
Total Kjeldahl Nitrogen as N	0.1		--	0.7	--	--	0.9
Total N	0.1	0.645	--	3.4	--	--	5.5
Total Phosphorus as P	0.01	0.0168	--	0.02	--	--	<0.01

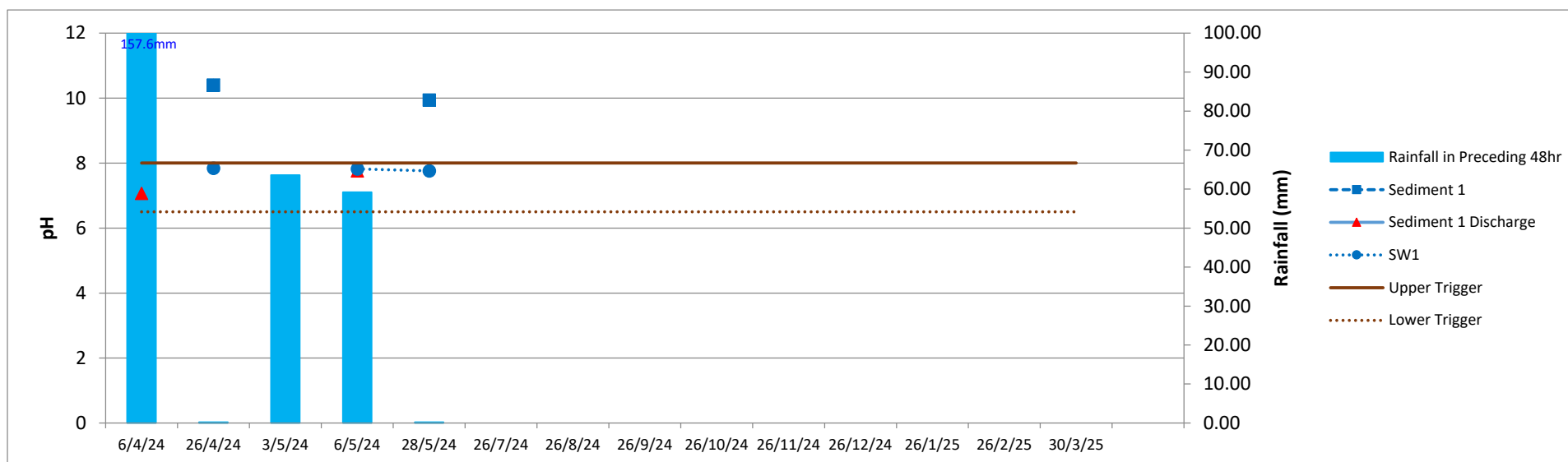
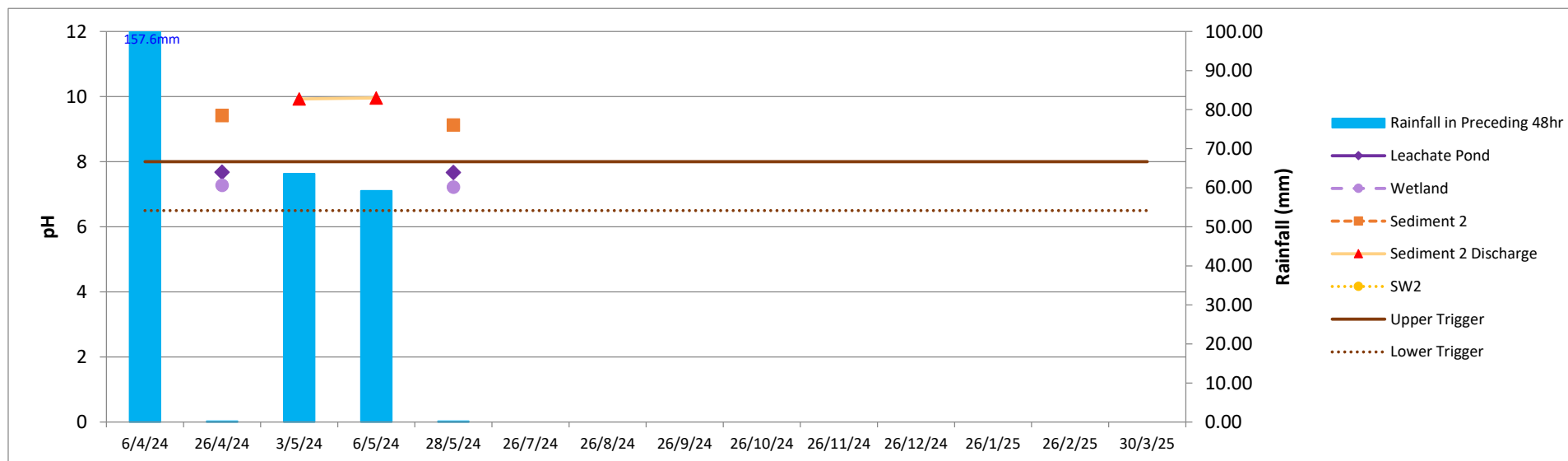
All results are in units of mg/L except where noted

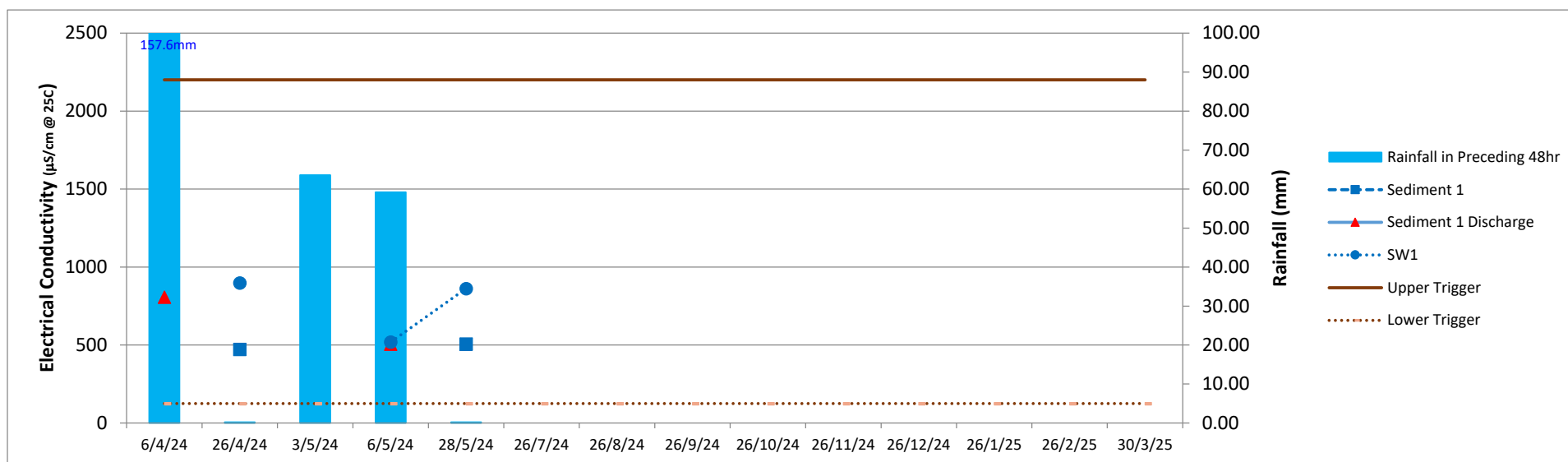
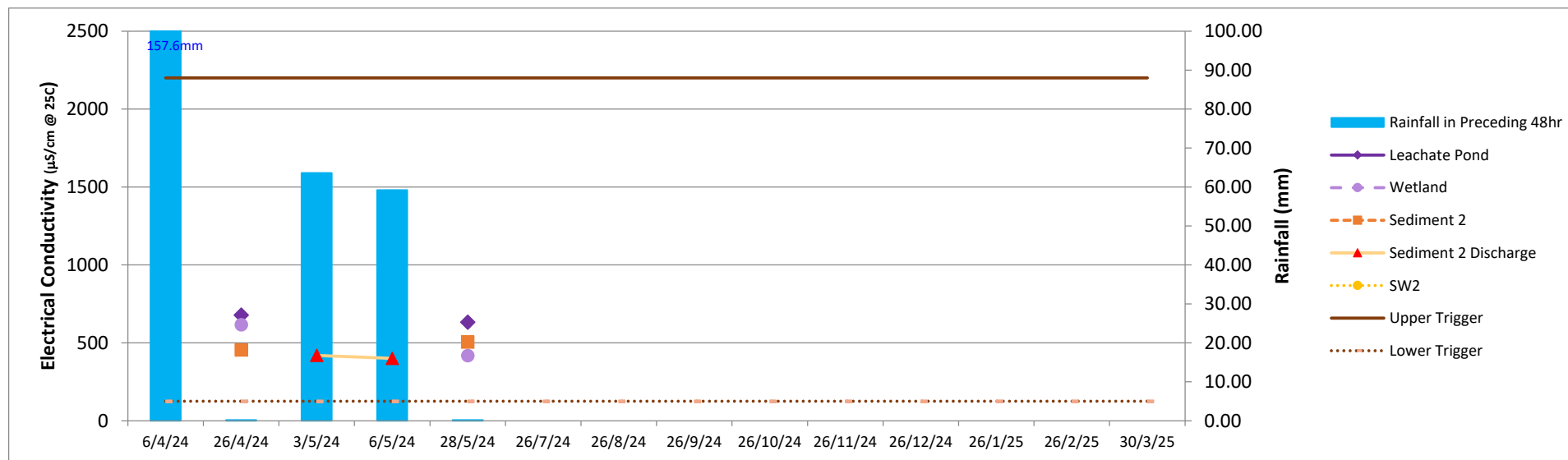
^A As specified in Water Discharge Management Plan, noting that the Sediment 1 water not necessarily representative of discharging water

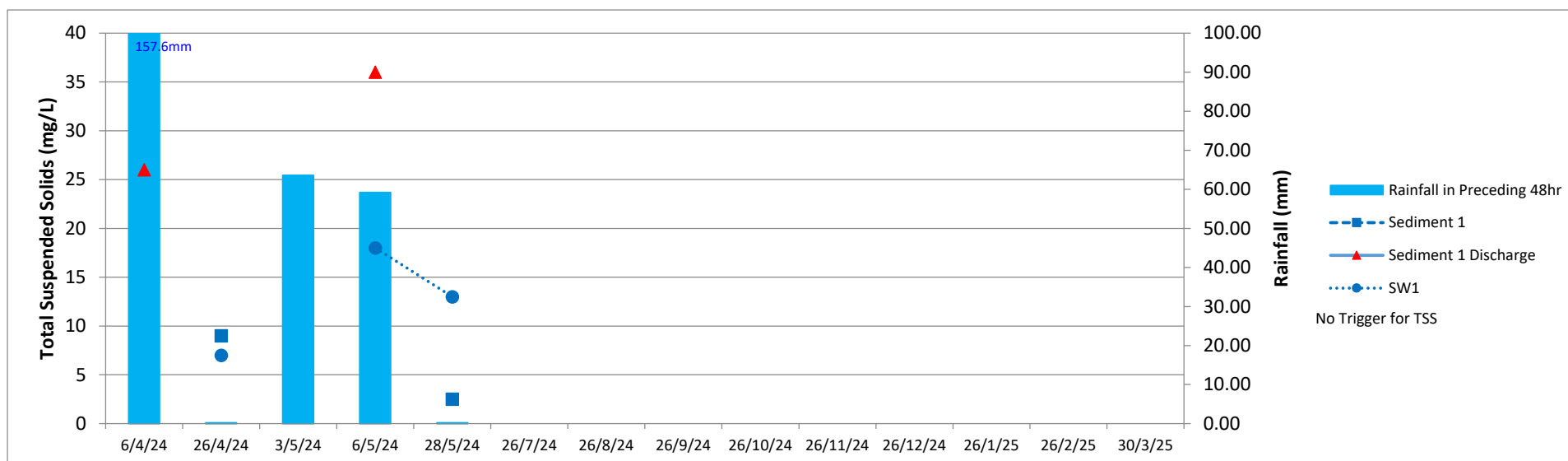
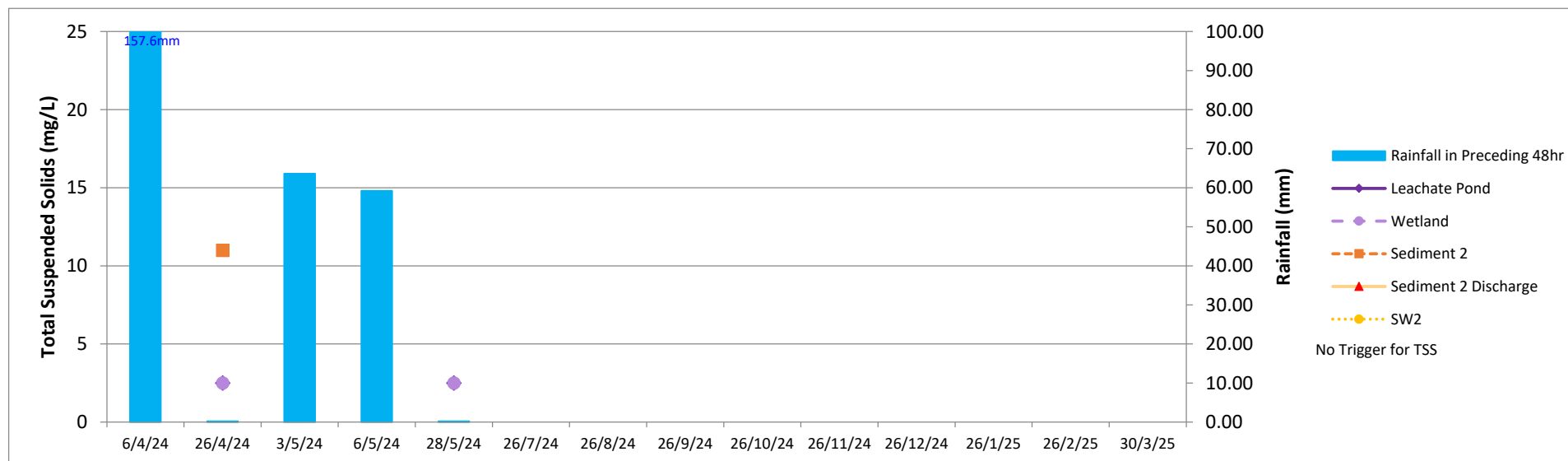
Results shown in **BOLD** are in excess of the management triggers

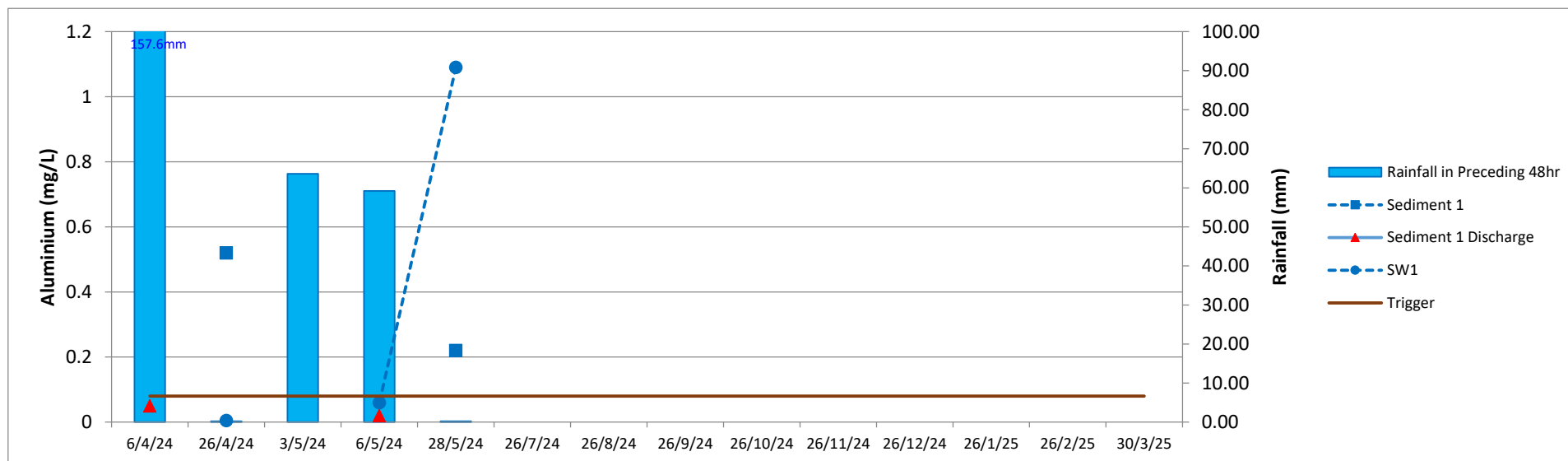
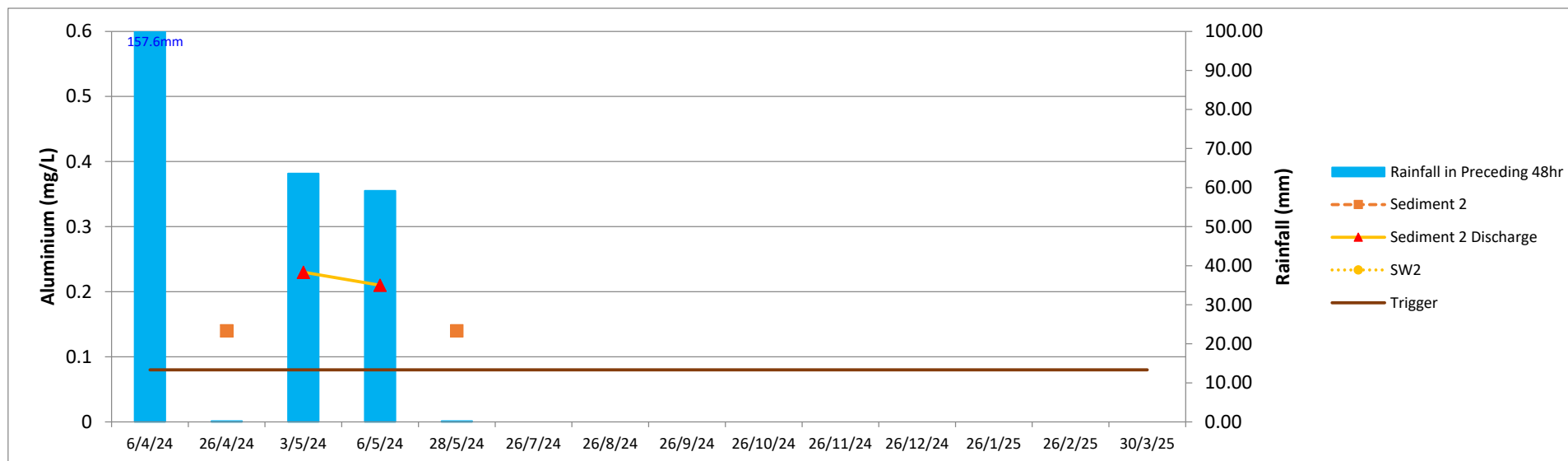
Date	PQL	Management Triggers ^A	6/04/2024	26/04/2024	3/05/2024	6/05/2024	28/05/2024
Sample Purpose			Discharge	Characterisation	Discharge	Discharge	Characterisation
Sample Collected by			Concrush	RCA - AH/CD	RCA - AH	RCA - AH	RCA - AH
			Sediment Basin 1 Spillway	Sediment Basin 1 Spillway	Sediment Basin 1 Spillway	Sediment Basin 1 Spillway	Sediment Basin 1 Spillway
Sample Description			Pale grey, slightly turbid, no odour	No sample	No sample	Pale grey, slightly turbid, no odour	No sample
General Water Quality							
pH Value (pH units)	0.01	6.5-8	7.07	--	--	7.76	
Electrical Conductivity (µS/cm @ 25C)	1	125-2200	807	--	--	506	
Total Suspended Solids	5		26	--	--	36	
Metals							
Aluminium	0.01	0.08	0.05	--	--	0.02	
Arsenic	0.001	0.094	0.004	--	--	0.003	
Cadmium	0.0001	0.0004	<0.0001	--	--	<0.0001	
Chromium	0.001	0.02	0.003	--	--	0.006	
Hexavalent Chromium	0.01	0.0033	<0.01	--	--	<0.01	
Cobalt	0.001	0.015	<0.001	--	--	<0.001	
Copper	0.001	0.02	0.01	--	--	0.008	
Lead	0.001	0.0056	<0.001	--	--	<0.001	
Nickel	0.001	0.013	0.001	--	--	<0.001	
Selenium	0.01	0.018	<0.01	--	--	<0.01	
Zinc	0.005	0.015	0.016	--	--	0.008	
Boron	0.05	0.68	0.24	--	--	0.09	
Total Recoverable Hydrocarbons (TRH) [*]							
TRH >C ₆ -C ₁₀	0.02		--	--	--	<0.02	
TRH >C ₁₀ -C ₁₆	0.1		--	--	--	<0.1	
TRH >C ₁₆ -C ₃₄	0.1		--	--	--	<0.1	
TRH >C ₃₄ -C ₄₀	0.1		--	--	--	<0.1	
TRH C ₆ -C ₄₀	0.32	10	--	--	--	0.16	
Nutrients							
Ammonia	0.01	0.0264	0.02	--	--	0.04	
Nitrite as N	0.01		0.06	--	--	0.33	
Nitrate as N ^D	0.01	0.44	0.31	--	--	1.03	
Nitrite + Nitrate as N	0.01	0.491	0.37	--	--	1.36	
Total Kjeldahl Nitrogen as N	0.1		1.3	--	--	1.2	
Total N	0.1	0.645	1.7	--	--	2.6	
Total Phosphorus as P	0.01	0.0168	0.27	--	--	0.17	

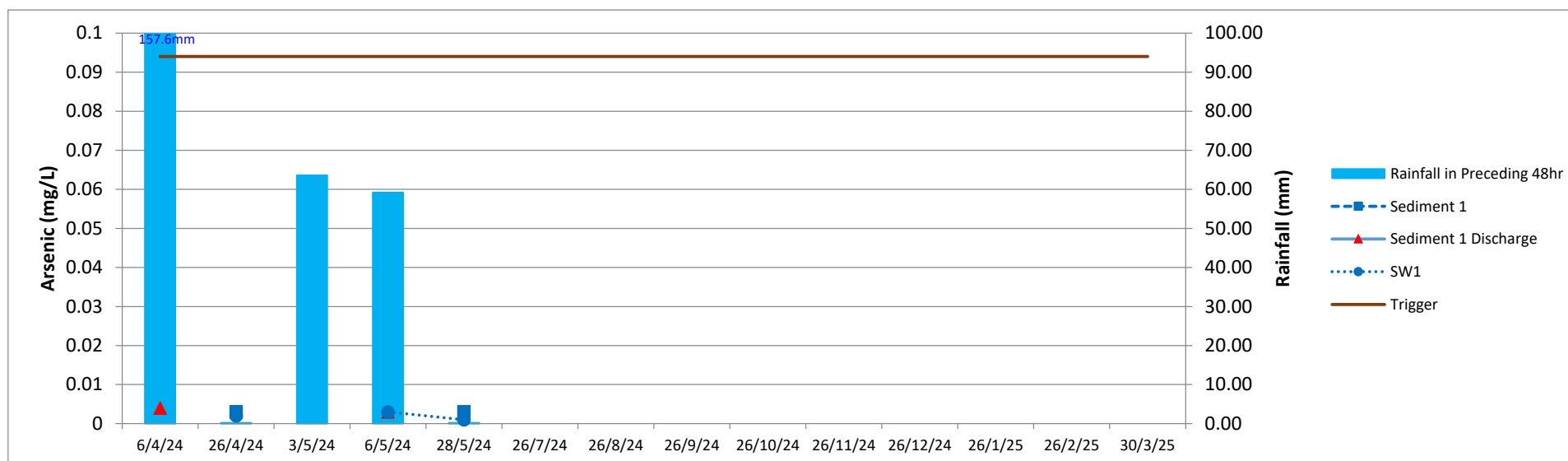
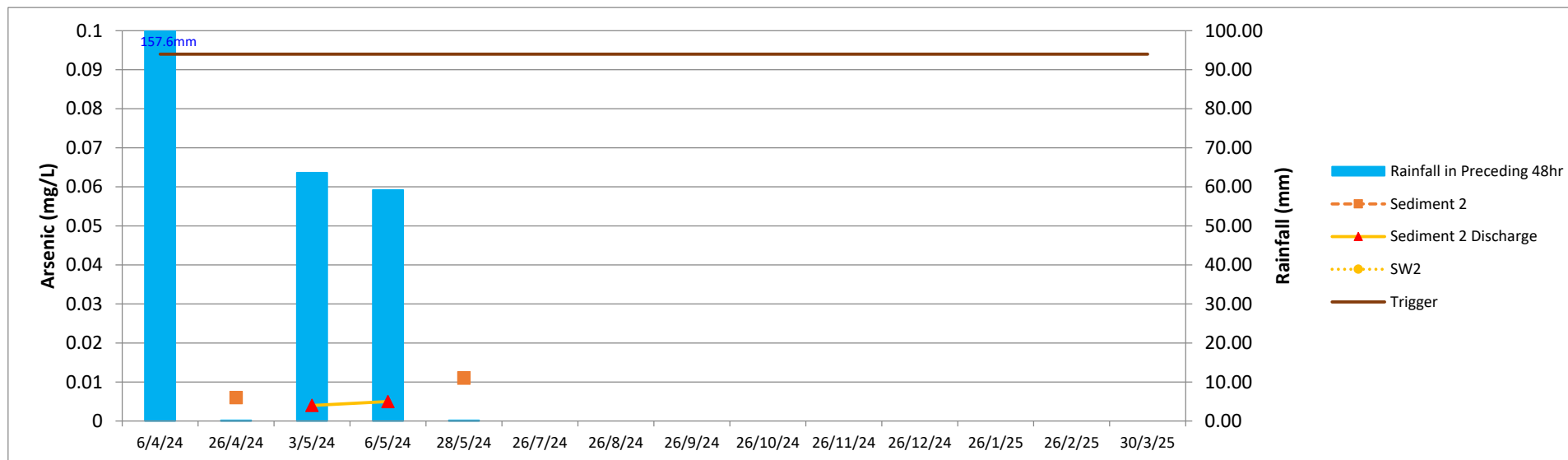
All results are in units of mg/L except where noted
^A As specified in Water Discharge Management Plan
Results shown in **BOLD** are in excess of the management triggers
^{*}Insufficient water volume of discharge for TRH analysis on 6 April 2024

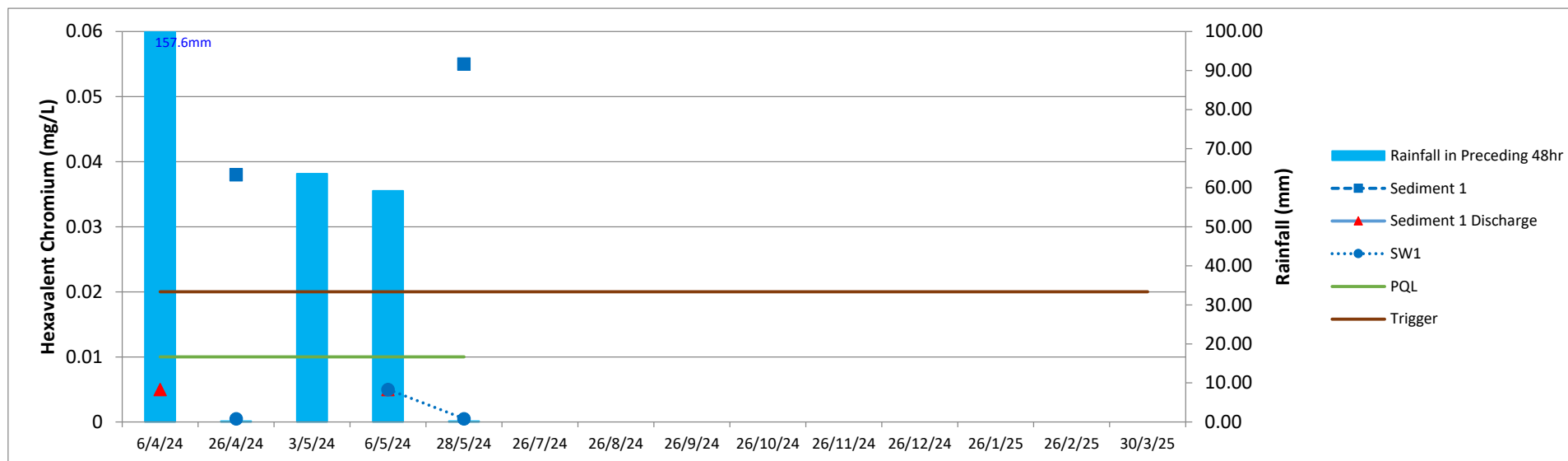
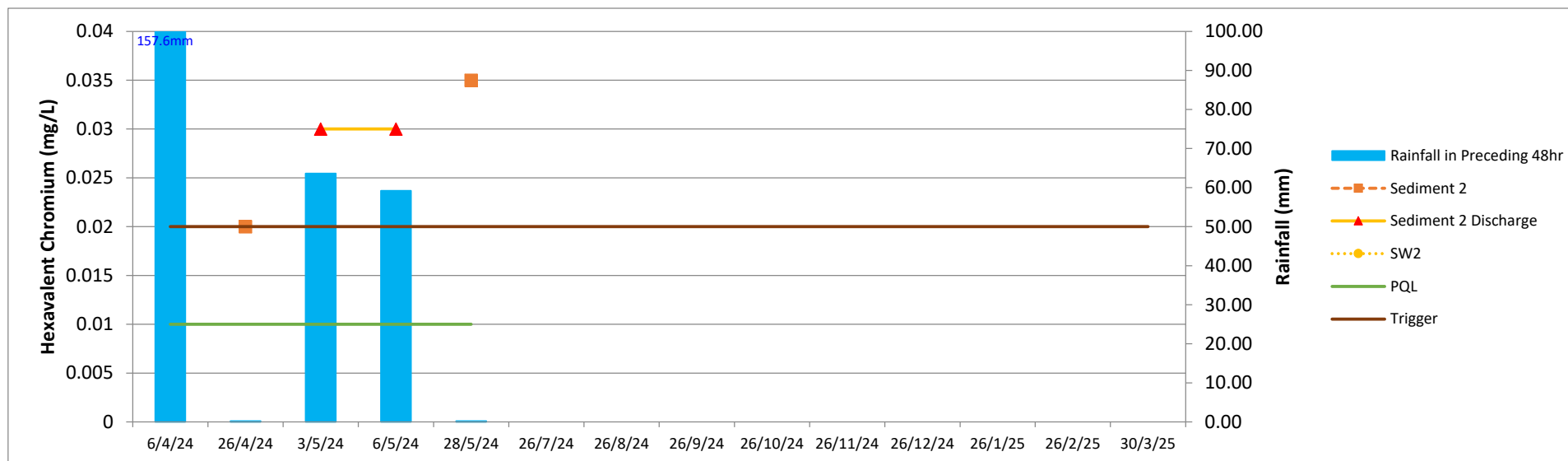


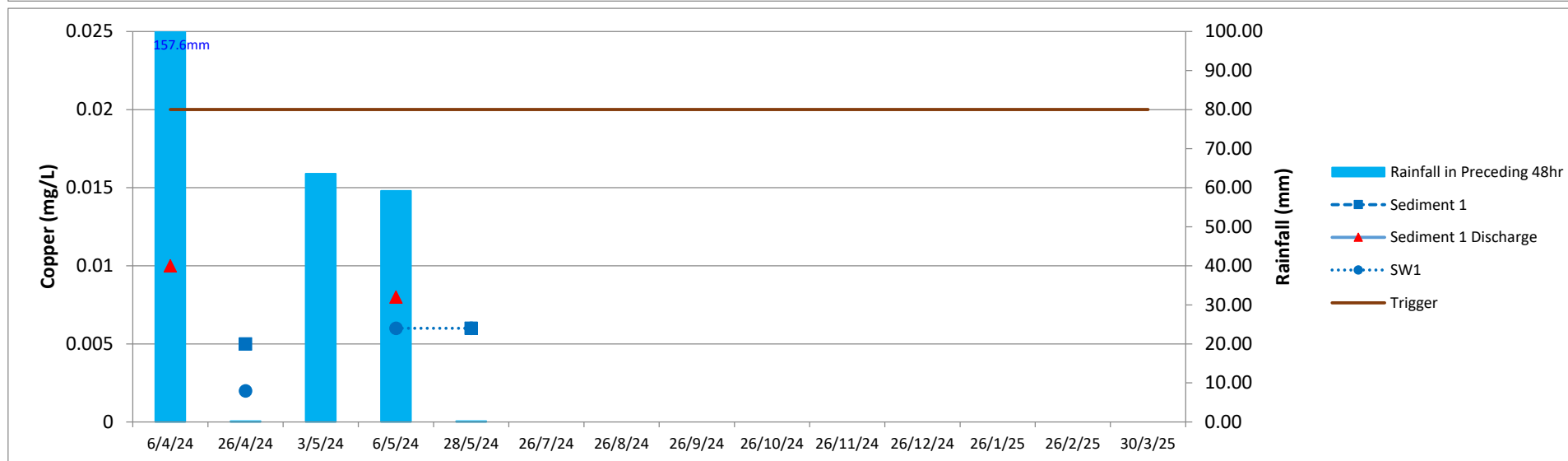
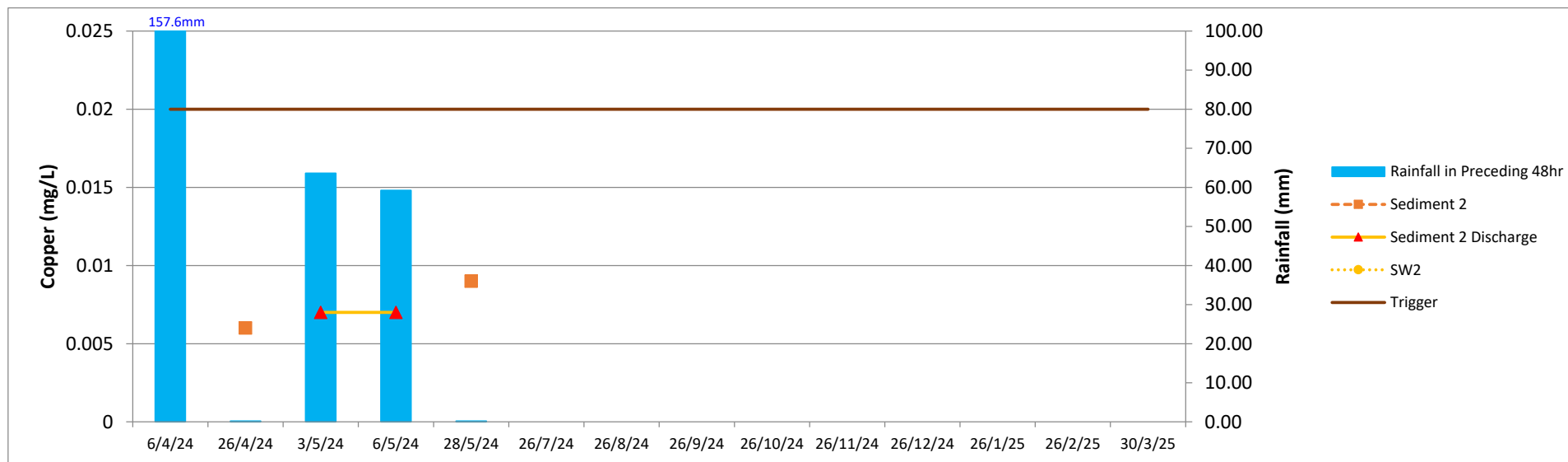


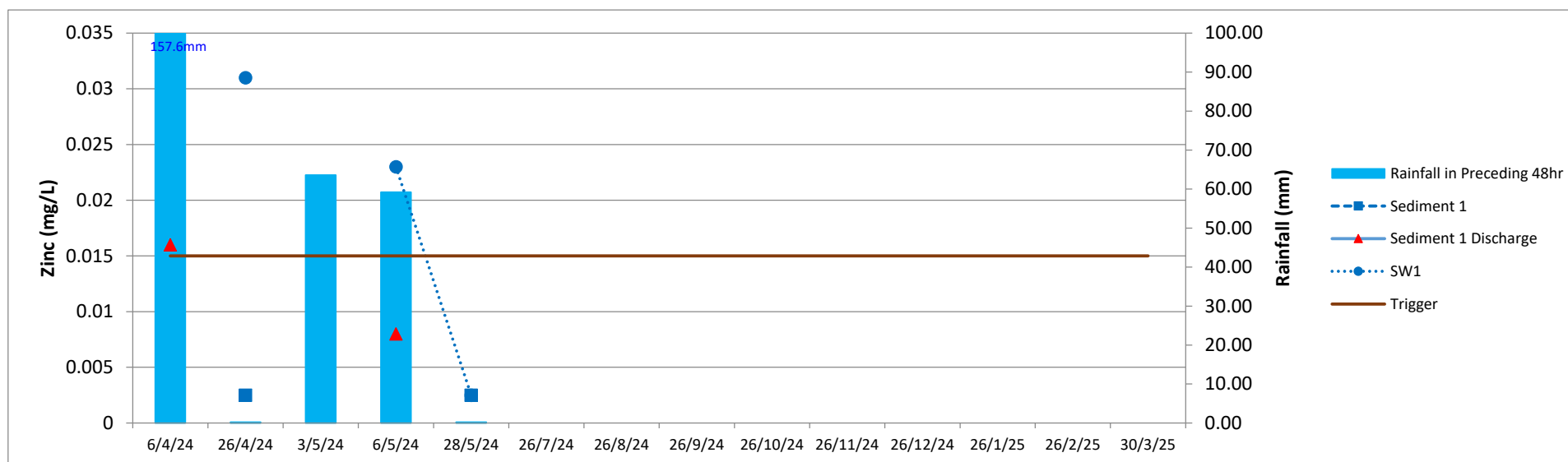
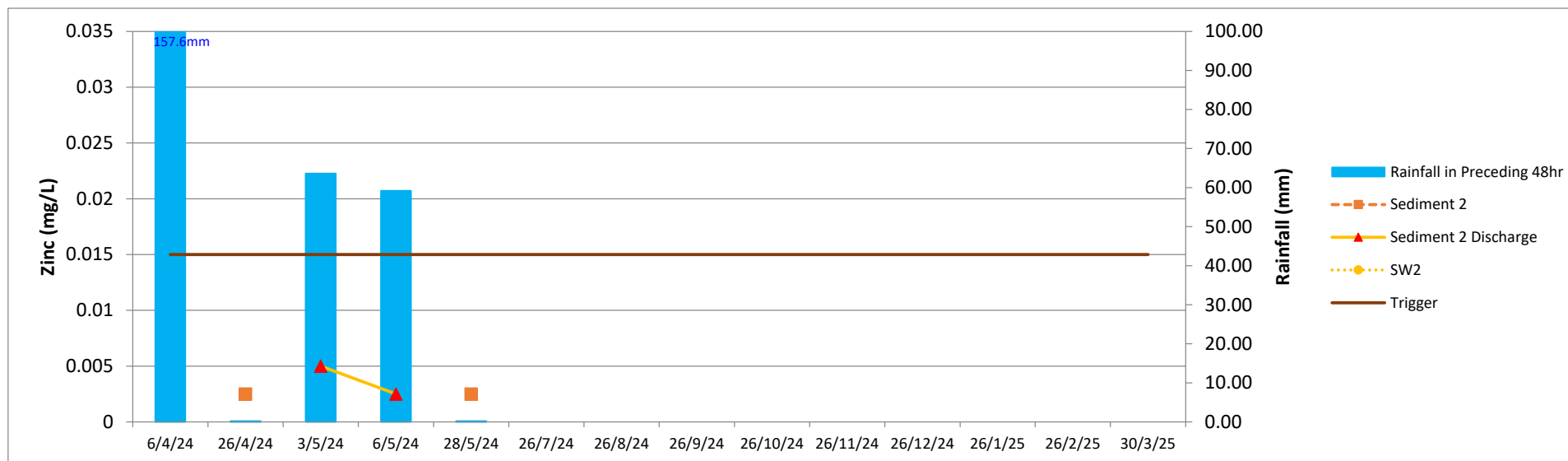


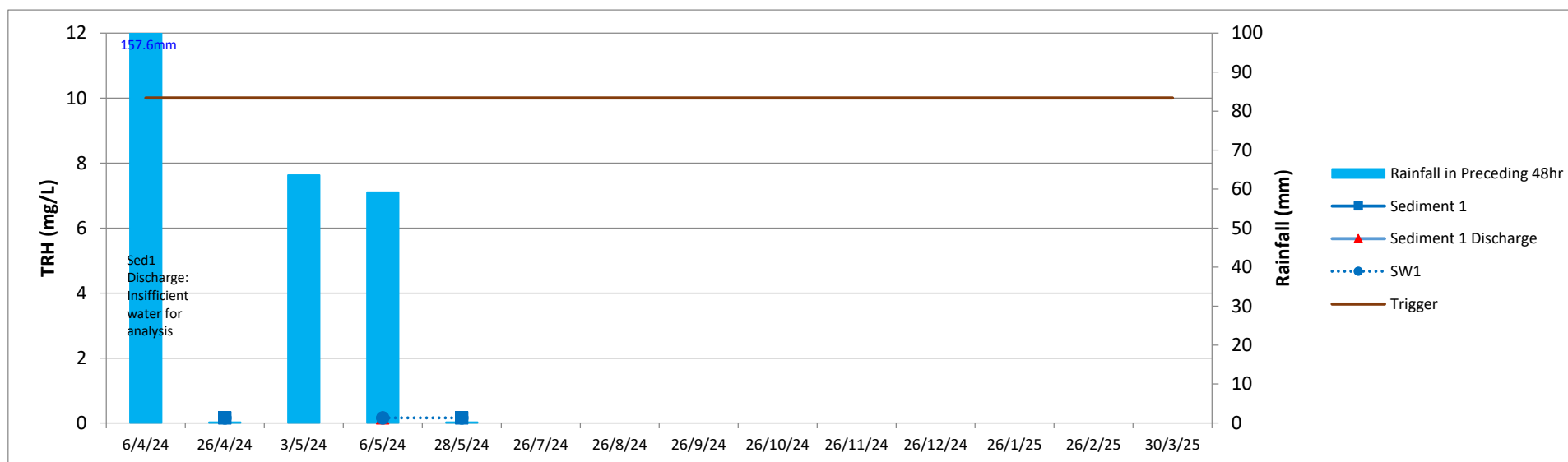
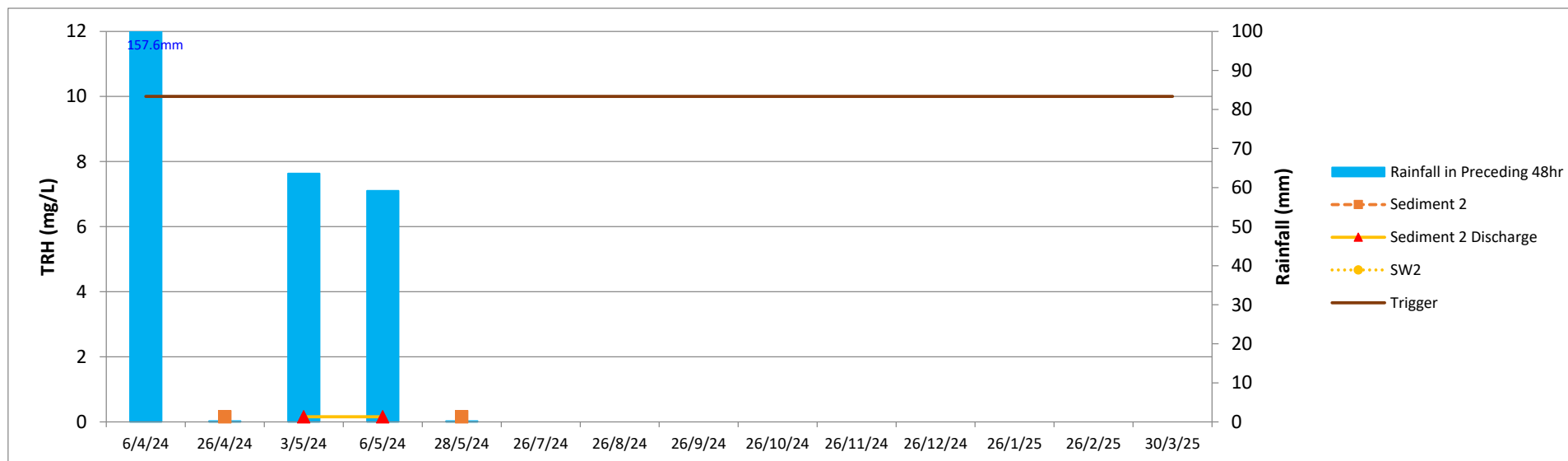


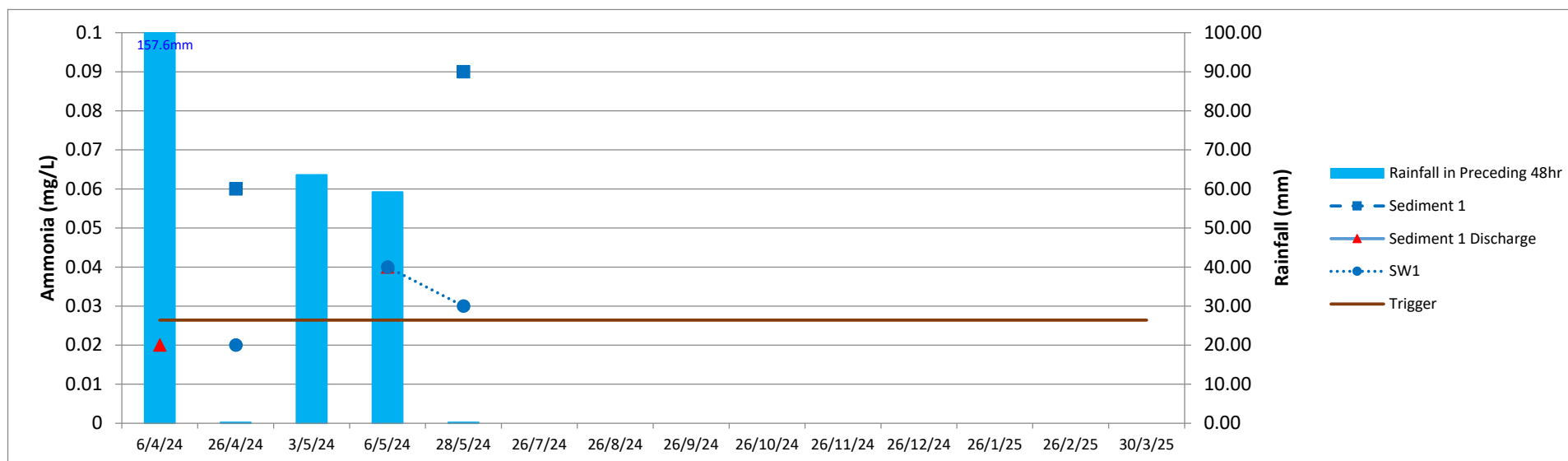
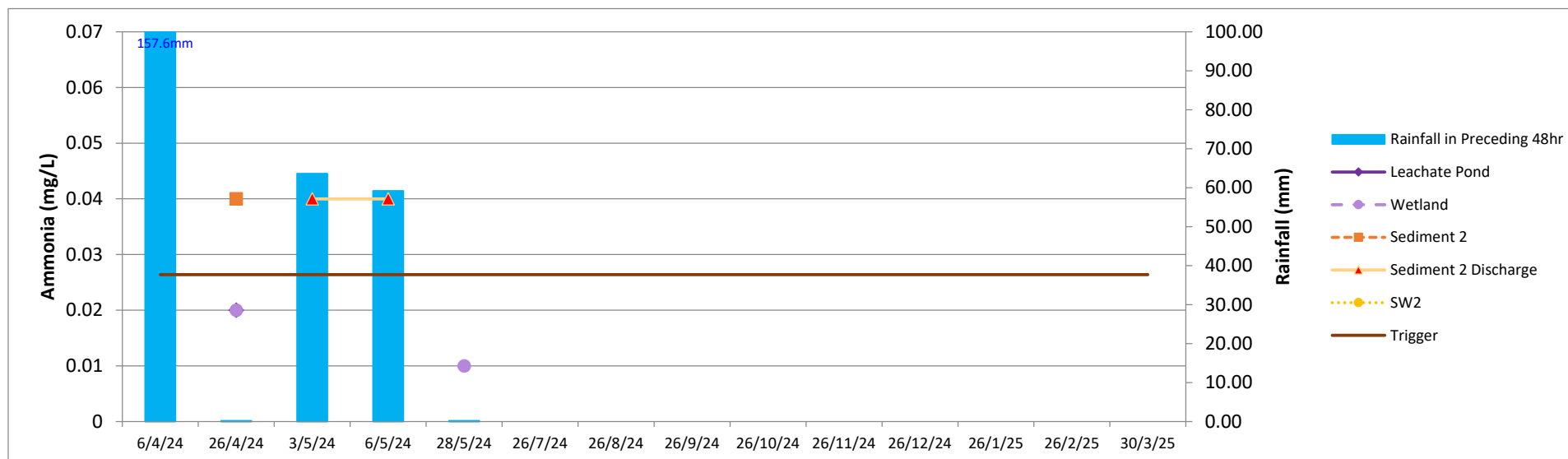


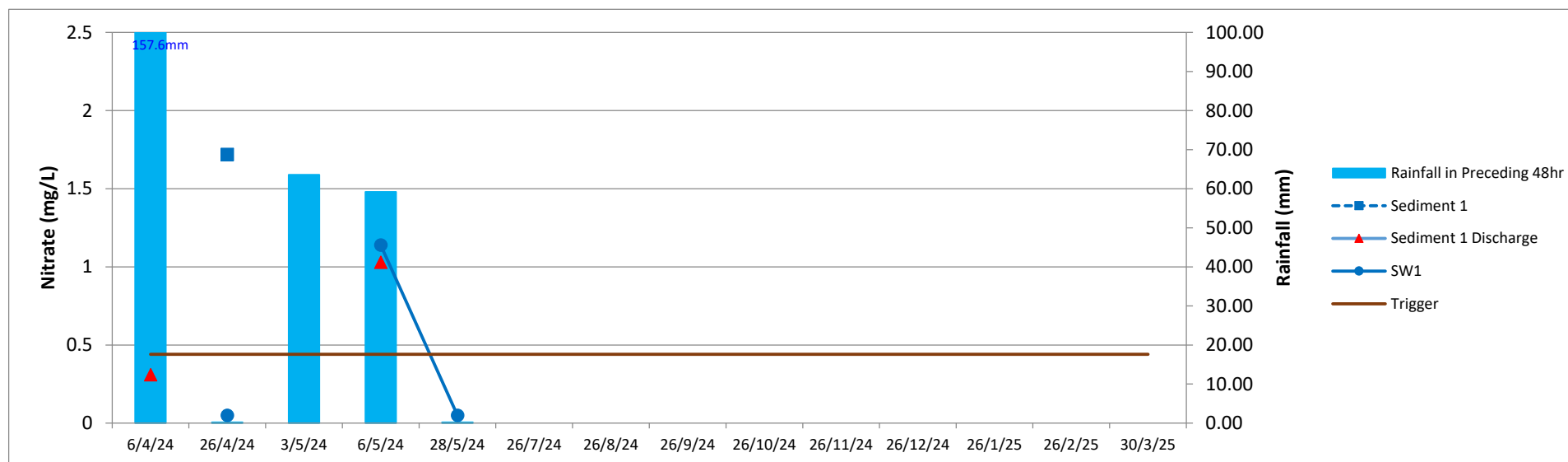
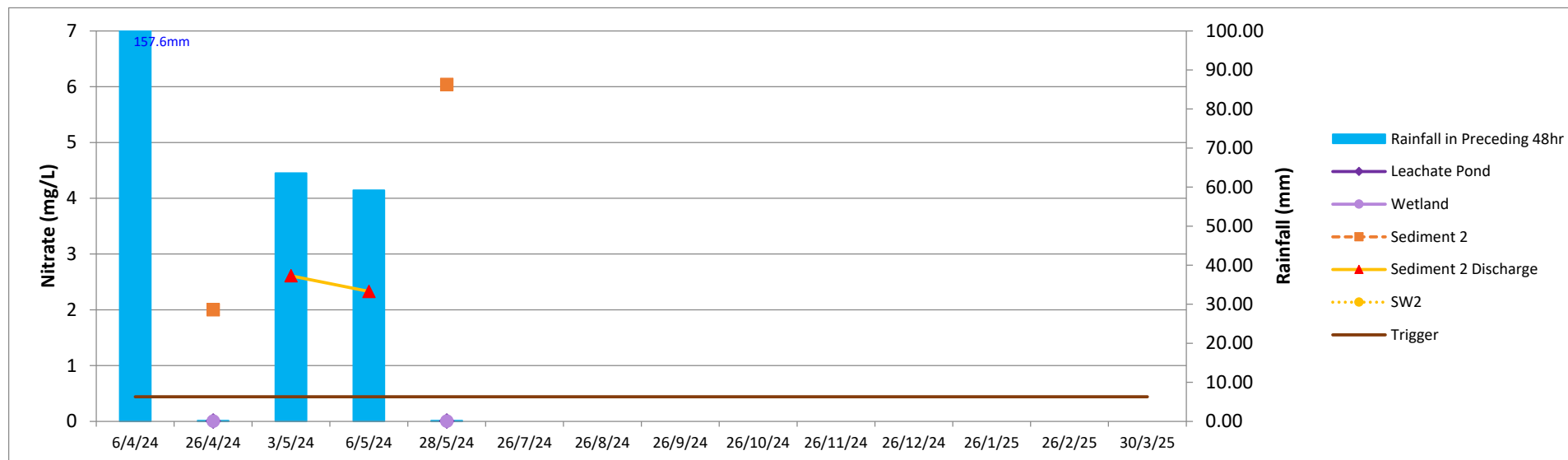


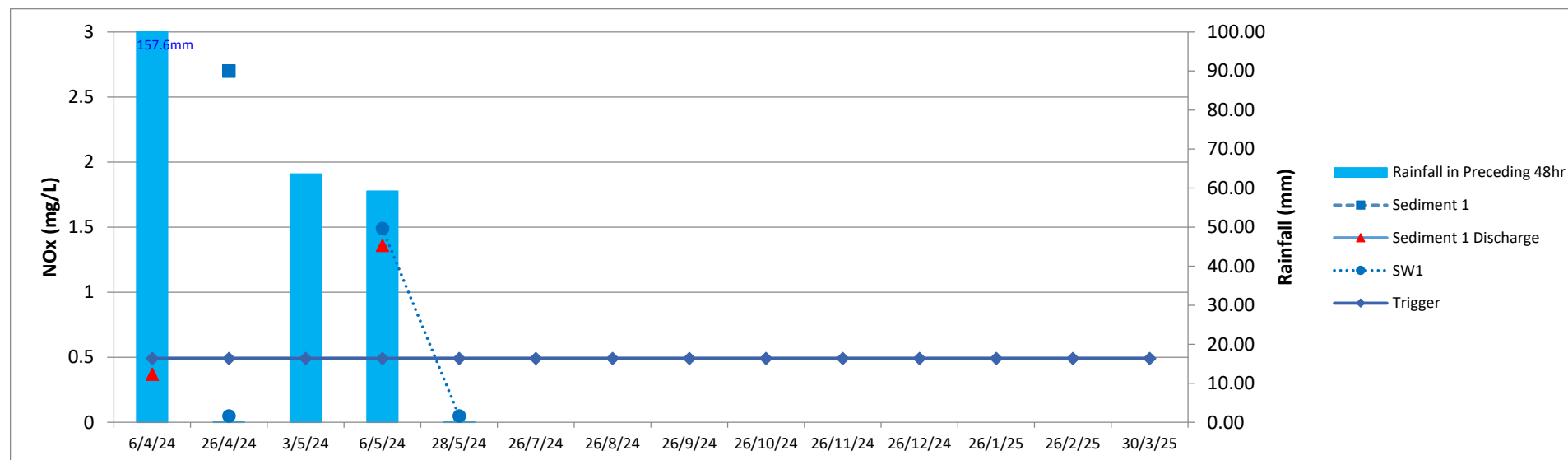
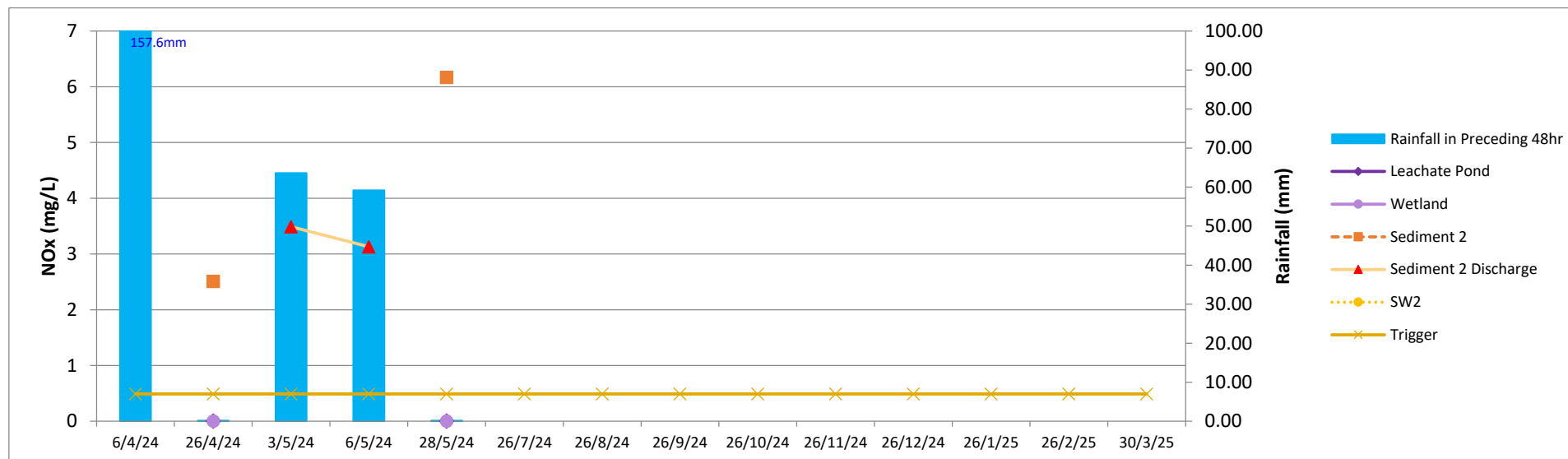


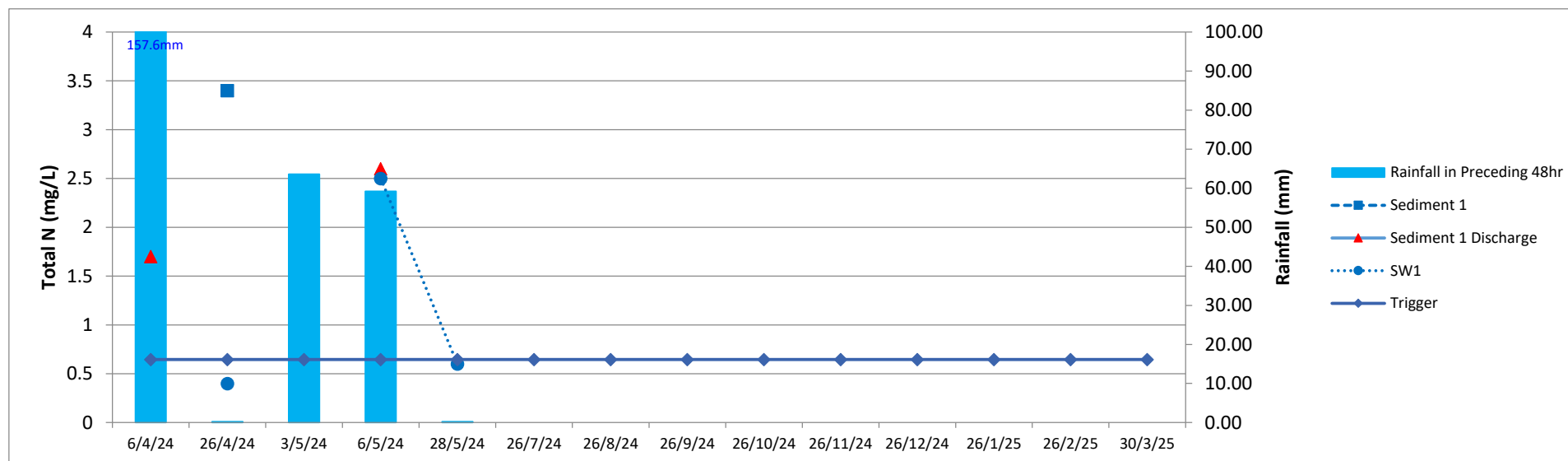
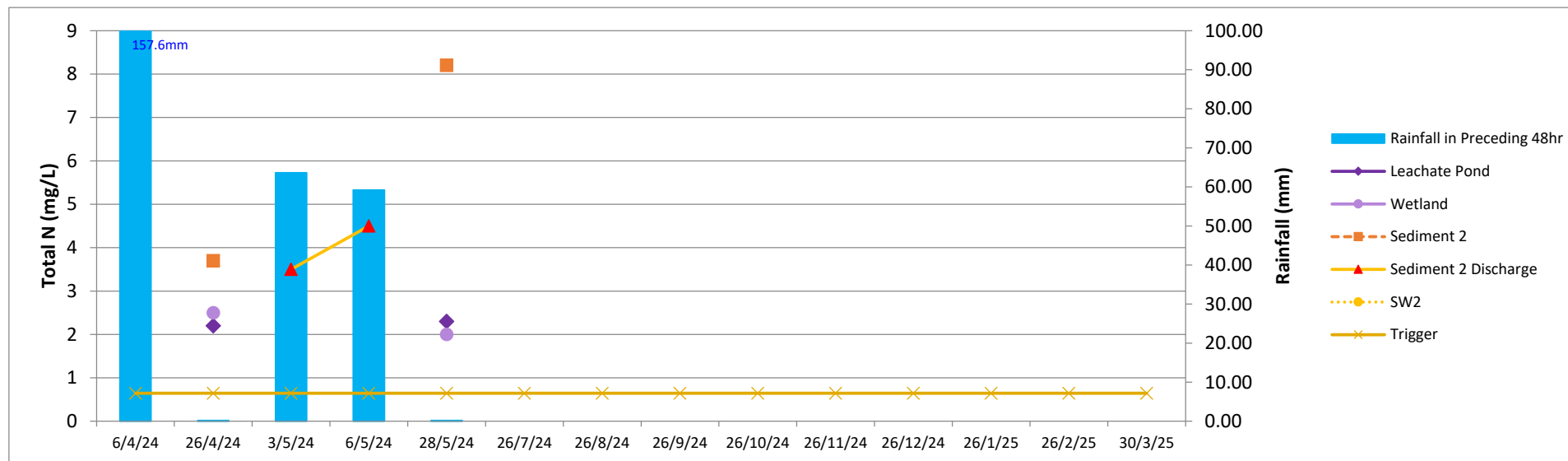


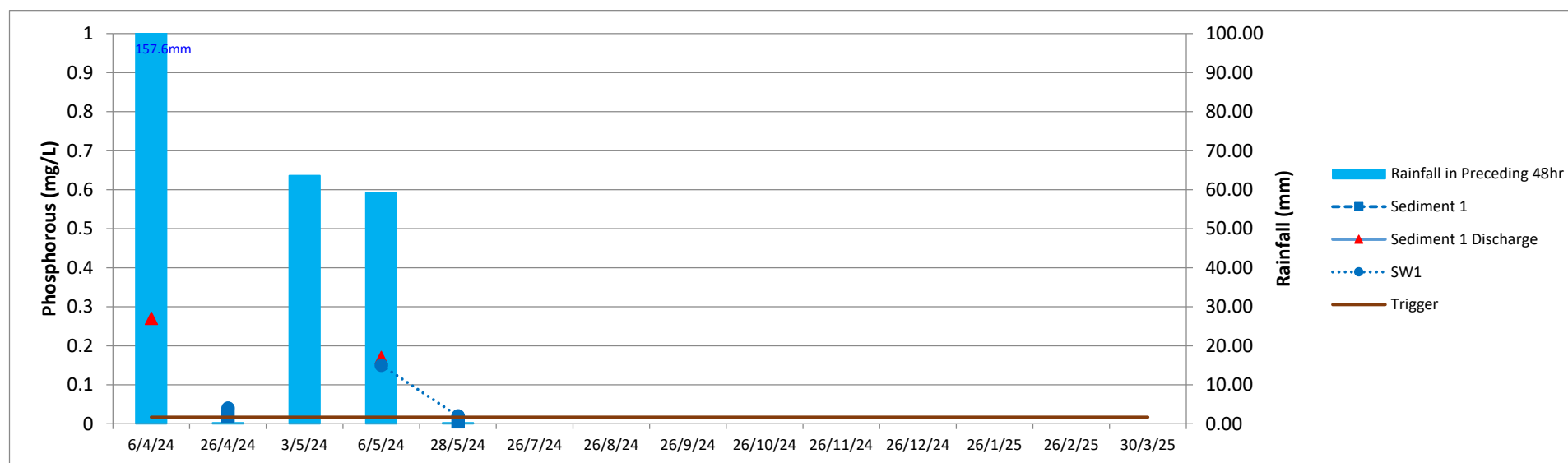
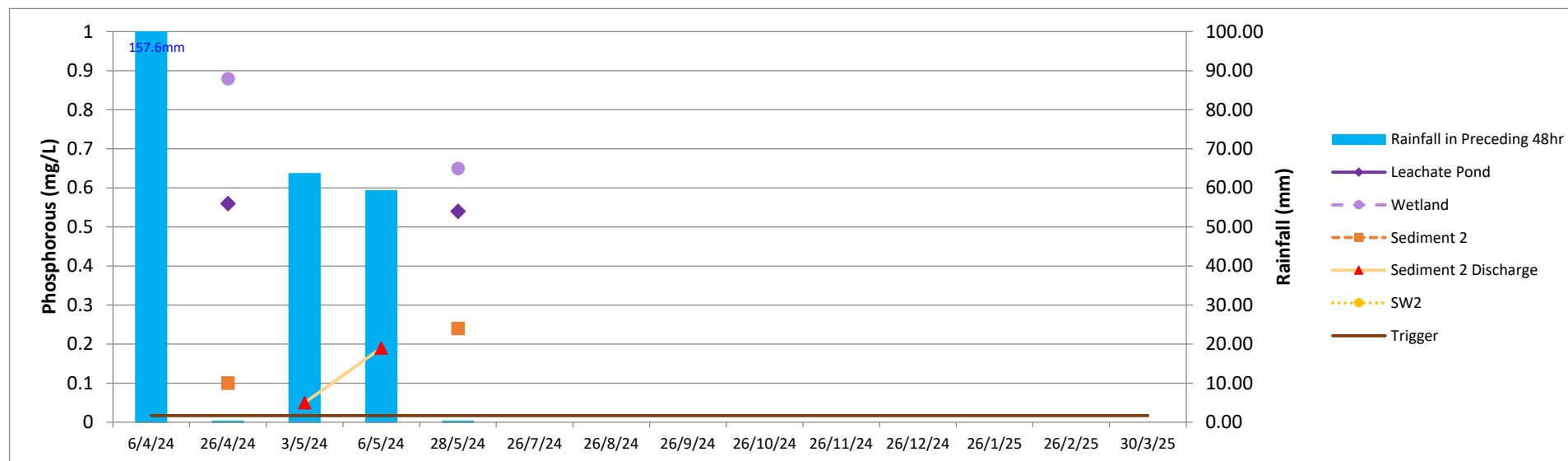














CERTIFICATE OF ANALYSIS

Work Order : ES2414287
Client : ROBERT CARR & ASSOCIATES P/L
Contact : MS FIONA BROOKER
Address : 92 HILL STREET
CARRINGTON NSW 2294
Telephone : +61 02 4902 9200
Project : 13589 - Discharge
Order number : ----
C-O-C number : ----
Sampler : AH
Site : ----
Quote number : EN/222
No. of samples received : 1
No. of samples analysed : 1

Page : 1 of 6
Laboratory : Environmental Division Sydney
Contact : Danae Hambly
Address : 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone : +61-2-8784 8555
Date Samples Received : 03-May-2024 11:04
Date Analysis Commenced : 03-May-2024
Issue Date : 10-May-2024 11:01



Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	Position	Accreditation Category
Ankit Joshi	Senior Chemist - Inorganics	Sydney Inorganics, Smithfield, NSW
Edwandy Fadjjar	Organic Coordinator	Sydney Organics, Smithfield, NSW
Gregory Towers	Technical Officer	Chemistry, Newcastle West, NSW



General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contract for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.

LOR = Limit of reporting

^ = This result is computed from individual analyte detections at or above the level of reporting

ø = ALS is not NATA accredited for these tests.

~ = Indicates an estimated value.

- EP080: Where reported, Total Xylenes is the sum of the reported concentrations of m&p-Xylene and o-Xylene at or above the LOR.
- EK061G: LOR raised for TKN due to sample matrix.
- EK067G: LOR raised for TP due to sample matrix.
- It has been noted that Hexavalent Chromium is greater than Dissolved Chromium, however this difference is within the limits of experimental variation.

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	DIS-Sed2	----	----	----	----
Sampling date / time				03-May-2024 10:00	----	----	----	----	
Compound	CAS Number	LOR	Unit	ES2414287-001	-----	-----	-----	-----	
				Result	----	----	----	----	
EA005: pH									
pH Value	----	0.01	pH Unit	9.93	----	----	----	----	
EA010P: Conductivity by PC Titrator									
Electrical Conductivity @ 25°C	----	1	µS/cm	419	----	----	----	----	
EA025: Total Suspended Solids dried at 104 ± 2°C									
Suspended Solids (SS)	----	5	mg/L	32	----	----	----	----	
EG020F: Dissolved Metals by ICP-MS									
Aluminium	7429-90-5	0.01	mg/L	0.23	----	----	----	----	
Arsenic	7440-38-2	0.001	mg/L	0.004	----	----	----	----	
Cadmium	7440-43-9	0.0001	mg/L	<0.0001	----	----	----	----	
Chromium	7440-47-3	0.001	mg/L	0.026	----	----	----	----	
Copper	7440-50-8	0.001	mg/L	0.007	----	----	----	----	
Cobalt	7440-48-4	0.001	mg/L	<0.001	----	----	----	----	
Nickel	7440-02-0	0.001	mg/L	0.001	----	----	----	----	
Lead	7439-92-1	0.001	mg/L	<0.001	----	----	----	----	
Zinc	7440-66-6	0.005	mg/L	0.005	----	----	----	----	
Selenium	7782-49-2	0.01	mg/L	<0.01	----	----	----	----	
Boron	7440-42-8	0.05	mg/L	0.05	----	----	----	----	
EG050F: Dissolved Hexavalent Chromium									
Hexavalent Chromium	18540-29-9	0.01	mg/L	0.03	----	----	----	----	
EK055G: Ammonia as N by Discrete Analyser									
Ammonia as N	7664-41-7	0.01	mg/L	0.04	----	----	----	----	
EK057G: Nitrite as N by Discrete Analyser									
Nitrite as N	14797-65-0	0.01	mg/L	0.88	----	----	----	----	
EK058G: Nitrate as N by Discrete Analyser									
Nitrate as N	14797-55-8	0.01	mg/L	2.61	----	----	----	----	
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser									
Nitrite + Nitrate as N	----	0.01	mg/L	3.49	----	----	----	----	
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser									



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	DIS-Sed2	----	----	----	----
Sampling date / time					03-May-2024 10:00	----	----	----	----
Compound	CAS Number	LOR	Unit		ES2414287-001	-----	-----	-----	-----
				Result		----	----	----	----
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser - Continued									
Total Kjeldahl Nitrogen as N	----	0.1	mg/L		<1.0	----	----	----	----
EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser									
^ Total Nitrogen as N	----	0.1	mg/L		3.5	----	----	----	----
EK067G: Total Phosphorus as P by Discrete Analyser									
Total Phosphorus as P	----	0.01	mg/L		<0.10	----	----	----	----
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	20	µg/L		<20	----	----	----	----
C10 - C14 Fraction	----	50	µg/L		<50	----	----	----	----
C15 - C28 Fraction	----	100	µg/L		<100	----	----	----	----
C29 - C36 Fraction	----	50	µg/L		<50	----	----	----	----
^ C10 - C36 Fraction (sum)	----	50	µg/L		<50	----	----	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction	C6_C10	20	µg/L		<20	----	----	----	----
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	20	µg/L		<20	----	----	----	----
>C10 - C16 Fraction	----	100	µg/L		<100	----	----	----	----
>C16 - C34 Fraction	----	100	µg/L		<100	----	----	----	----
>C34 - C40 Fraction	----	100	µg/L		<100	----	----	----	----
^ >C10 - C40 Fraction (sum)	----	100	µg/L		<100	----	----	----	----
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	100	µg/L		<100	----	----	----	----
EP080: BTEXN									
Benzene	71-43-2	1	µg/L		<1	----	----	----	----
Toluene	108-88-3	2	µg/L		<2	----	----	----	----
Ethylbenzene	100-41-4	2	µg/L		<2	----	----	----	----
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L		<2	----	----	----	----
ortho-Xylene	95-47-6	2	µg/L		<2	----	----	----	----
^ Total Xylenes	----	2	µg/L		<2	----	----	----	----



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	DIS-Sed2	----	----	----	----
Sampling date / time					03-May-2024 10:00	----	----	----	----
Compound	CAS Number	LOR	Unit		ES2414287-001	-----	-----	-----	-----
				Result		----	----	----	----
EP080: BTEXN - Continued									
^ Sum of BTEX		----	1	µg/L	<1	----	----	----	----
Naphthalene		91-20-3	5	µg/L	<5	----	----	----	----
EP080S: TPH(V)/BTEX Surrogates									
1,2-Dichloroethane-D4		17060-07-0	2	%	100	----	----	----	----
Toluene-D8		2037-26-5	2	%	106	----	----	----	----
4-Bromofluorobenzene		460-00-4	2	%	117	----	----	----	----

Page : 6 of 6
Work Order : ES2414287
Client : ROBERT CARR & ASSOCIATES P/L
Project : 13589 - Discharge



Surrogate Control Limits

Sub-Matrix: WATER		Recovery Limits (%)	
Compound	CAS Number	Low	High
EP080S: TPH(V)/BTEX Surrogates			
1,2-Dichloroethane-D4	17060-07-0	72	143
Toluene-D8	2037-26-5	75	131
4-Bromofluorobenzene	460-00-4	73	137

Inter-Laboratory Testing

Analysis conducted by ALS Newcastle - Water, NATA accreditation no. 825, site no. 1656 (Chemistry) 9854 (Biology).

(WATER) EA005: pH



QUALITY CONTROL REPORT

Work Order	: ES2414287	Page	: 1 of 7
Client	: ROBERT CARR & ASSOCIATES P/L	Laboratory	: Environmental Division Sydney
Contact	: MS FIONA BROOKER	Contact	: Danae Hambly
Address	: 92 HILL STREET CARRINGTON NSW 2294	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone	: +61 02 4902 9200	Telephone	: +61-2-8784 8555
Project	: 13589 - Discharge	Date Samples Received	: 03-May-2024
Order number	: ----	Date Analysis Commenced	: 03-May-2024
C-O-C number	: ----	Issue Date	: 10-May-2024
Sampler	: AH		
Site	: ----		
Quote number	: EN/222		
No. of samples received	: 1		
No. of samples analysed	: 1		



This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	Position	Accreditation Category
Ankit Joshi	Senior Chemist - Inorganics	Sydney Inorganics, Smithfield, NSW
Edwandy Fadjar	Organic Coordinator	Sydney Organics, Smithfield, NSW
Gregory Towers	Technical Officer	Chemistry, Newcastle West, NSW



General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot

CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.

LOR = Limit of reporting

RPD = Relative Percentage Difference

= Indicates failed QC

* = The final LOR has been raised due to dilution or other sample specific cause; adjusted LOR is shown in brackets. The duplicate ranges for Acceptable RPD% are applied to the final LOR where applicable.

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EA005: pH (QC Lot: 5770172)									
WN2405420-002	Anonymous	EA005: pH Value	----	0.01	pH Unit	7.41	7.36	0.7	0% - 20%
WN2405323-004	Anonymous	EA005: pH Value	----	0.01	pH Unit	7.06	7.06	0.0	0% - 20%
EA010P: Conductivity by PC Titrator (QC Lot: 5776091)									
ES2414697-001	Anonymous	EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	362	362	0.0	0% - 20%
ES2414133-001	Anonymous	EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	1540	1550	0.9	0% - 20%
ES2414471-006	Anonymous	EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	542	535	1.1	0% - 20%
ES2414473-008	Anonymous	EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	53000	52900	0.1	0% - 20%
EA025: Total Suspended Solids dried at 104 ± 2°C (QC Lot: 5775503)									
ES2414265-001	Anonymous	EA025H: Suspended Solids (SS)	----	5	mg/L	<5	<5	0.0	No Limit
ES2414323-001	Anonymous	EA025H: Suspended Solids (SS)	----	5	mg/L	98	99	1.0	0% - 50%
ES2414406-002	Anonymous	EA025H: Suspended Solids (SS)	----	5	mg/L	428	432	0.9	0% - 20%
EW2402074-003	Anonymous	EA025H: Suspended Solids (SS)	----	5	mg/L	9	10	0.0	No Limit
EG020F: Dissolved Metals by ICP-MS (QC Lot: 5774144)									
ES2414117-018	Anonymous	EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
		EG020A-F: Arsenic	7440-38-2	0.001	mg/L	105 µg/L	0.096	8.3	0% - 20%
		EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Cobalt	7440-48-4	0.001	mg/L	4 µg/L	0.003	0.0	No Limit
		EG020A-F: Copper	7440-50-8	0.001	mg/L	2 µg/L	0.004	65.3	No Limit
		EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Nickel	7440-02-0	0.001	mg/L	211 µg/L	0.193	9.0	0% - 20%

Page : 3 of 7
 Work Order : ES2414287
 Client : ROBERT CARR & ASSOCIATES P/L
 Project : 13589 - Discharge



Sub-Matrix: WATER				Laboratory Duplicate (DUP) Report							
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)		
EG020F: Dissolved Metals by ICP-MS (QC Lot: 5774144) - continued											
ES2414117-018	Anonymous	EG020A-F: Zinc	7440-66-6	0.005	mg/L	88 µg/L	0.077	12.5	0% - 50%		
		EG020A-F: Aluminium	7429-90-5	0.01	mg/L	<10 µg/L	<0.01	0.0	No Limit		
		EG020A-F: Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	0.0	No Limit		
		EG020A-F: Boron	7440-42-8	0.05	mg/L	0.09	0.10	0.0	No Limit		
ES2414117-027	Anonymous	EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit		
		EG020A-F: Arsenic	7440-38-2	0.001	mg/L	7 µg/L	0.007	0.0	No Limit		
		EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	0.0	No Limit		
		EG020A-F: Cobalt	7440-48-4	0.001	mg/L	<1 µg/L	<0.001	0.0	No Limit		
		EG020A-F: Copper	7440-50-8	0.001	mg/L	3 µg/L	0.002	0.0	No Limit		
		EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.0	No Limit		
		EG020A-F: Nickel	7440-02-0	0.001	mg/L	16 µg/L	0.016	0.0	0% - 50%		
		EG020A-F: Zinc	7440-66-6	0.005	mg/L	6 µg/L	0.006	0.0	No Limit		
		EG020A-F: Aluminium	7429-90-5	0.01	mg/L	290 µg/L	0.28	0.0	0% - 20%		
		EG020A-F: Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	0.0	No Limit		
		EG020A-F: Boron	7440-42-8	0.05	mg/L	0.06	0.05	0.0	No Limit		
		EG050F: Dissolved Hexavalent Chromium (QC Lot: 5777037)									
		ES2414287-001	DIS-Sed2	EG050G-F: Hexavalent Chromium	18540-29-9	0.01	mg/L	0.03	0.04	0.0	No Limit
ES2414374-012	Anonymous	EG050G-F: Hexavalent Chromium	18540-29-9	0.01	mg/L	<0.01	<0.01	0.0	No Limit		
EK055G: Ammonia as N by Discrete Analyser (QC Lot: 5774171)											
ES2414287-001	DIS-Sed2	EK055G: Ammonia as N	7664-41-7	0.01	mg/L	0.04	0.04	0.0	No Limit		
WN2405377-006	Anonymous	EK055G: Ammonia as N	7664-41-7	0.01	mg/L	24.1	23.8	1.2	0% - 20%		
EK057G: Nitrite as N by Discrete Analyser (QC Lot: 5768431)											
ES2414325-001	Anonymous	EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	0.0	No Limit		
ES2414311-001	Anonymous	EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	0.0	No Limit		
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QC Lot: 5774170)											
ES2414287-001	DIS-Sed2	EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	3.49	3.49	0.0	0% - 20%		
WN2405377-006	Anonymous	EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	<0.01	<0.01	0.0	No Limit		
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QC Lot: 5774166)											
ES2414149-001	Anonymous	EK061G: Total Kjeldahl Nitrogen as N	----	0.1 (1.0)*	mg/L	14.6	13.7	6.9	0% - 50%		
EW2402074-003	Anonymous	EK061G: Total Kjeldahl Nitrogen as N	----	0.1 (0.5)*	mg/L	8.3	8.2	1.8	0% - 50%		
EK067G: Total Phosphorus as P by Discrete Analyser (QC Lot: 5774167)											
ES2414149-001	Anonymous	EK067G: Total Phosphorus as P	----	0.01 (0.10)*	mg/L	1.81	2.06	13.0	0% - 20%		
EW2402074-003	Anonymous	EK067G: Total Phosphorus as P	----	0.01	mg/L	2.83	2.77	2.3	0% - 20%		
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 5769543)											
ES2414291-001	Anonymous	EP080: C6 - C9 Fraction	----	20	µg/L	<20	<20	0.0	No Limit		
ES2414291-006	Anonymous	EP080: C6 - C9 Fraction	----	20	µg/L	<20	<20	0.0	No Limit		

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 Client : ROBERT CARR & ASSOCIATES P/L
 Project : 13589 - Discharge



Sub-Matrix: WATER				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 5769543)									
ES2414291-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	0.0	No Limit
ES2414291-006	Anonymous	EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	0.0	No Limit
EP080: BTEXN (QC Lot: 5769543)									
ES2414291-001	Anonymous	EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.0	No Limit
		EP080: Toluene	108-88-3	2	µg/L	<2	<2	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	2	µg/L	<2	<2	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3	2	µg/L	<2	<2	0.0	No Limit
			106-42-3						
		EP080: ortho-Xylene	95-47-6	2	µg/L	<2	<2	0.0	No Limit
ES2414291-006	Anonymous	EP080: Naphthalene	91-20-3	5	µg/L	<5	<5	0.0	No Limit
		EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.0	No Limit
		EP080: Toluene	108-88-3	2	µg/L	<2	<2	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	2	µg/L	<2	<2	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3	2	µg/L	<2	<2	0.0	No Limit
			106-42-3						
		EP080: ortho-Xylene	95-47-6	2	µg/L	<2	<2	0.0	No Limit
		EP080: Naphthalene	91-20-3	5	µg/L	<5	<5	0.0	No Limit



Method Blank (MB) and Laboratory Control Sample (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **WATER**

Sub-Matrix: WATER				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike Concentration	Spike Recovery (%) LCS	Acceptable Limits (%) Low High	
Method: Compound	CAS Number	LOR	Unit	Result				
EA005: pH (QCLot: 5770172)								
EA005: pH Value	----	----	pH Unit	----	7.6 pH Unit	101	98.5	102
EA010P: Conductivity by PC Titrator (QCLot: 5776091)								
EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	<1	220 µS/cm	94.3	89.9	110
				<1	2100 µS/cm	96.5	90.2	111
EA025: Total Suspended Solids dried at 104 ± 2°C (QCLot: 5775503)								
EA025H: Suspended Solids (SS)	----	5	mg/L	<5	150 mg/L	90.7	83.0	129
				<5	1000 mg/L	92.8	82.0	110
				<5	928 mg/L	92.6	83.0	118
EG020F: Dissolved Metals by ICP-MS (QCLot: 5774144)								
EG020A-F: Aluminium	7429-90-5	0.01	mg/L	<0.01	0.5 mg/L	91.3	80.0	116
EG020A-F: Arsenic	7440-38-2	0.001	mg/L	<0.001	0.1 mg/L	89.5	85.0	114
EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	0.1 mg/L	87.5	84.0	110
EG020A-F: Cobalt	7440-48-4	0.001	mg/L	<0.001	0.1 mg/L	89.4	82.0	112
EG020A-F: Copper	7440-50-8	0.001	mg/L	<0.001	0.1 mg/L	87.3	81.0	111
EG020A-F: Nickel	7440-02-0	0.001	mg/L	<0.001	0.1 mg/L	87.0	82.0	112
EG020A-F: Selenium	7782-49-2	0.01	mg/L	<0.01	0.1 mg/L	85.6	85.0	115
EG020A-F: Zinc	7440-66-6	0.005	mg/L	<0.005	0.1 mg/L	89.0	81.0	117
EG020A-F: Boron	7440-42-8	0.05	mg/L	<0.05	0.5 mg/L	91.9	85.0	115
EG050F: Dissolved Hexavalent Chromium (QCLot: 5777037)								
EG050G-F: Hexavalent Chromium	18540-29-9	0.01	mg/L	<0.01	0.05 mg/L	101	86.0	112
EK055G: Ammonia as N by Discrete Analyser (QCLot: 5774171)								
EK055G: Ammonia as N	7664-41-7	0.01	mg/L	<0.01	1 mg/L	99.8	90.0	114
EK057G: Nitrite as N by Discrete Analyser (QCLot: 5768431)								
EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	0.5 mg/L	105	82.0	114
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 5774170)								
EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	<0.01	0.5 mg/L	101	91.0	113
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QCLot: 5774166)								
EK061G: Total Kjeldahl Nitrogen as N	----	0.1	mg/L	<0.1	10 mg/L	91.5	69.0	123
				<0.1	1 mg/L	94.7	70.0	123
				<0.1	5 mg/L	89.8	70.0	123



Sub-Matrix: **WATER**

Sub-Matrix: WATER				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike Concentration	Spike Recovery (%) LCS	Acceptable Limits (%) Low High	
Method: Compound	CAS Number	LOR	Unit	Result				
EK067G: Total Phosphorus as P by Discrete Analyser (QCLot: 5774167)								
EK067G: Total Phosphorus as P	----	0.01	mg/L	<0.01	4.42 mg/L	92.5	71.3	126
				<0.01	0.442 mg/L	93.3	71.3	126
				<0.01	1 mg/L	99.3	70.0	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 5768900)								
EP071: C10 - C14 Fraction	----	50	µg/L	<50	400 µg/L	76.4	53.7	97.0
EP071: C15 - C28 Fraction	----	100	µg/L	<100	600 µg/L	79.1	63.3	107
EP071: C29 - C36 Fraction	----	50	µg/L	<50	400 µg/L	103	58.3	120
EP080/071: Total Petroleum Hydrocarbons (QCLot: 5769543)								
EP080: C6 - C9 Fraction	----	20	µg/L	<20	260 µg/L	101	75.0	127
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 5768900)								
EP071: >C10 - C16 Fraction	----	100	µg/L	<100	500 µg/L	68.7	53.9	95.5
EP071: >C16 - C34 Fraction	----	100	µg/L	<100	700 µg/L	72.9	57.8	110
EP071: >C34 - C40 Fraction	----	100	µg/L	<100	300 µg/L	76.9	50.5	115
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 5769543)								
EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	310 µg/L	98.6	75.0	127
EP080: BTEXN (QCLot: 5769543)								
EP080: Benzene	71-43-2	1	µg/L	<1	10 µg/L	112	68.3	119
EP080: Toluene	108-88-3	2	µg/L	<2	10 µg/L	103	73.5	120
EP080: Ethylbenzene	100-41-4	2	µg/L	<2	10 µg/L	110	73.8	122
EP080: meta- & para-Xylene	108-38-3	2	µg/L	<2	10 µg/L	117	73.0	122
	106-42-3							
EP080: ortho-Xylene	95-47-6	2	µg/L	<2	10 µg/L	113	76.4	123
EP080: Naphthalene	91-20-3	5	µg/L	<5	10 µg/L	116	75.5	124

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	Spike Recovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EG020F: Dissolved Metals by ICP-MS (QCLot: 5774144)							
ES2414117-019	Anonymous	EG020A-F: Arsenic	7440-38-2	1 mg/L	87.6	70.0	130
		EG020A-F: Cadmium	7440-43-9	0.25 mg/L	78.1	70.0	130
		EG020A-F: Cobalt	7440-48-4	1 mg/L	85.3	70.0	130
		EG020A-F: Copper	7440-50-8	1 mg/L	73.5	70.0	130

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 Project : 13589 - Discharge



Sub-Matrix: **WATER**

Sub-Matrix: WATER				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EG020F: Dissolved Metals by ICP-MS (QCLot: 5774144) - continued							
ES2414117-019	Anonymous	EG020A-F: Nickel	7440-02-0	1 mg/L	84.2	70.0	130
		EG020A-F: Zinc	7440-66-6	1 mg/L	78.3	70.0	130
EG050F: Dissolved Hexavalent Chromium (QCLot: 5777037)							
ES2414287-001	DIS-Sed2	EG050G-F: Hexavalent Chromium	18540-29-9	0.05 mg/L	91.7	70.0	130
EK055G: Ammonia as N by Discrete Analyser (QCLot: 5774171)							
ES2414287-001	DIS-Sed2	EK055G: Ammonia as N	7664-41-7	1 mg/L	100	70.0	130
EK057G: Nitrite as N by Discrete Analyser (QCLot: 5768431)							
ES2414311-001	Anonymous	EK057G: Nitrite as N	14797-65-0	0.5 mg/L	103	70.0	130
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 5774170)							
ES2414287-001	DIS-Sed2	EK059G: Nitrite + Nitrate as N	----	0.5 mg/L	# Not Determined	70.0	130
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QCLot: 5774166)							
ES2414149-002	Anonymous	EK061G: Total Kjeldahl Nitrogen as N	----	5 mg/L	90.9	70.0	130
EK067G: Total Phosphorus as P by Discrete Analyser (QCLot: 5774167)							
ES2414149-002	Anonymous	EK067G: Total Phosphorus as P	----	1 mg/L	99.8	70.0	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 5769543)							
ES2414291-001	Anonymous	EP080: C6 - C9 Fraction	----	325 µg/L	98.4	70.0	130
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 5769543)							
ES2414291-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	375 µg/L	98.4	70.0	130
EP080: BTEXN (QCLot: 5769543)							
ES2414291-001	Anonymous	EP080: Benzene	71-43-2	25 µg/L	110	70.0	130
		EP080: Toluene	108-88-3	25 µg/L	98.7	70.0	130
		EP080: Ethylbenzene	100-41-4	25 µg/L	104	70.0	130
		EP080: meta- & para-Xylene	108-38-3	25 µg/L	109	70.0	130
			106-42-3				
		EP080: ortho-Xylene	95-47-6	25 µg/L	109	70.0	130
		EP080: Naphthalene	91-20-3	25 µg/L	100.0	70.0	130



QA/QC Compliance Assessment to assist with Quality Review

Work Order	: ES2414287	Page	: 1 of 7
Client	: ROBERT CARR & ASSOCIATES P/L	Laboratory	: Environmental Division Sydney
Contact	: MS FIONA BROOKER	Telephone	: +61-2-8784 8555
Project	: 13589 - Discharge	Date Samples Received	: 03-May-2024
Site	: ----	Issue Date	: 10-May-2024
Sampler	: AH	No. of samples received	: 1
Order number	: ----	No. of samples analysed	: 1

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO** Method Blank value outliers occur.
- **NO** Duplicate outliers occur.
- **NO** Laboratory Control outliers occur.
- Matrix Spike outliers exist - please see following pages for full details.
- For all regular sample matrices, **NO** surrogate recovery outliers occur.

Outliers : Analysis Holding Time Compliance

- Analysis Holding Time Outliers exist - please see following pages for full details.

Outliers : Frequency of Quality Control Samples

- Quality Control Sample Frequency Outliers exist - please see following pages for full details.

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Client : ROBERT CARR & ASSOCIATES P/L
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Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **WATER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Matrix Spike (MS) Recoveries							
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Ar	ES2414287--001	DIS-Sed2	Nitrite + Nitrate as N	----	Not Determined	----	MS recovery not determined, background level greater than or equal to 4x spike level.

Outliers : Analysis Holding Time Compliance

Matrix: **WATER**

Method		Extraction / Preparation			Analysis		
Container / Client Sample ID(s)		Date extracted	Due for extraction	Days overdue	Date analysed	Due for analysis	Days overdue
EK057G: Nitrite as N by Discrete Analyser							
Clear Plastic Bottle - Natural DIS-Sed2		----	----	----	06-May-2024	05-May-2024	1

Outliers : Frequency of Quality Control Samples

Matrix: **WATER**

Quality Control Sample Type		Count		Rate (%)		Quality Control Specification
Analytical Methods	Method	QC	Regular	Actual	Expected	
Laboratory Duplicates (DUP)						
TRH - Semivolatile Fraction	EP071	0	20	0.00	10.00	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)						
TRH - Semivolatile Fraction	EP071	0	20	0.00	5.00	NEPM 2013 B3 & ALS QC Standard

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for VOC in soils vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **WATER**

Evaluation: ✖ = Holding time breach ; ✔ = Within holding time.

Method	Sample Date	Extraction / Preparation			Analysis		
Container / Client Sample ID(s)		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA005: pH							
Clear Plastic Bottle - Natural (EA005) DIS-Sed2	03-May-2024	----	----	----	03-May-2024	03-May-2024	✓
EA010P: Conductivity by PC Titrator							
Clear Plastic Bottle - Natural (EA010-P) DIS-Sed2	03-May-2024	----	----	----	08-May-2024	31-May-2024	✓



Matrix: **WATER**

Evaluation: ✖ = Holding time breach ; ✔ = Within holding time.

Method	Sample Date	Extraction / Preparation			Analysis		
Container / Client Sample ID(s)		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA025: Total Suspended Solids dried at 104 ± 2°C							
Clear Plastic Bottle - Natural (EA025H) DIS-Sed2	03-May-2024	----	----	----	08-May-2024	10-May-2024	✓
EG020F: Dissolved Metals by ICP-MS							
Clear Plastic Bottle - Nitric Acid; Filtered (EG020A-F) DIS-Sed2	03-May-2024	----	----	----	08-May-2024	30-Oct-2024	✓
EG050F: Dissolved Hexavalent Chromium							
Clear Plastic Bottle - NaOH Filtered (EG050G-F) DIS-Sed2	03-May-2024	----	----	----	09-May-2024	31-May-2024	✓
EK055G: Ammonia as N by Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK055G) DIS-Sed2	03-May-2024	----	----	----	08-May-2024	31-May-2024	✓
EK057G: Nitrite as N by Discrete Analyser							
Clear Plastic Bottle - Natural (EK057G) DIS-Sed2	03-May-2024	----	----	----	06-May-2024	05-May-2024	✗
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK059G) DIS-Sed2	03-May-2024	----	----	----	08-May-2024	31-May-2024	✓
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK061G) DIS-Sed2	03-May-2024	08-May-2024	31-May-2024	✓	08-May-2024	31-May-2024	✓
EK067G: Total Phosphorus as P by Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK067G) DIS-Sed2	03-May-2024	08-May-2024	31-May-2024	✓	08-May-2024	31-May-2024	✓
EP080/071: Total Petroleum Hydrocarbons							
Amber Glass Bottle - Unpreserved (EP071) DIS-Sed2	03-May-2024	06-May-2024	10-May-2024	✓	08-May-2024	15-Jun-2024	✓
Amber VOC Vial - Sulfuric Acid (EP080) DIS-Sed2	03-May-2024	06-May-2024	17-May-2024	✓	06-May-2024	17-May-2024	✓
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions							
Amber Glass Bottle - Unpreserved (EP071) DIS-Sed2	03-May-2024	06-May-2024	10-May-2024	✓	08-May-2024	15-Jun-2024	✓
Amber VOC Vial - Sulfuric Acid (EP080) DIS-Sed2	03-May-2024	06-May-2024	17-May-2024	✓	06-May-2024	17-May-2024	✓
EP080: BTEXN							
Amber VOC Vial - Sulfuric Acid (EP080) DIS-Sed2	03-May-2024	06-May-2024	17-May-2024	✓	06-May-2024	17-May-2024	✓



Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **WATER**

Evaluation: ✖ = Quality Control frequency not within specification ; ✔ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	Method	QC	Regular	Actual	Expected	Evaluation	
Laboratory Duplicates (DUP)							
Ammonia as N by Discrete analyser	EK055G	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Conductivity by Auto Titrator	EA010-P	4	34	11.76	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite A	EG020A-F	2	15	13.33	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Hexavalent Chromium by Discrete Analyser - Dissolved	EG050G-F	2	13	15.38	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite as N by Discrete Analyser	EK057G	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
pH	EA005	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Suspended Solids (High Level)	EA025H	4	40	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Kjeldahl Nitrogen as N By Discrete Analyser	EK061G	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Phosphorus as P By Discrete Analyser	EK067G	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	0	20	0.00	10.00	✗	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Ammonia as N by Discrete analyser	EK055G	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Conductivity by Auto Titrator	EA010-P	3	34	8.82	8.33	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	15	6.67	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Hexavalent Chromium by Discrete Analyser - Dissolved	EG050G-F	1	13	7.69	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite as N by Discrete Analyser	EK057G	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
pH	EA005	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Suspended Solids (High Level)	EA025H	5	40	12.50	12.50	✓	NEPM 2013 B3 & ALS QC Standard
Total Kjeldahl Nitrogen as N By Discrete Analyser	EK061G	3	20	15.00	15.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Phosphorus as P By Discrete Analyser	EK067G	3	20	15.00	15.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Ammonia as N by Discrete analyser	EK055G	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Conductivity by Auto Titrator	EA010-P	2	34	5.88	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	15	6.67	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Hexavalent Chromium by Discrete Analyser - Dissolved	EG050G-F	1	13	7.69	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite as N by Discrete Analyser	EK057G	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Suspended Solids (High Level)	EA025H	2	40	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Kjeldahl Nitrogen as N By Discrete Analyser	EK061G	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Phosphorus as P By Discrete Analyser	EK067G	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard

Page : 5 of 7
 Work Order : ES2414287
 Client : ROBERT CARR & ASSOCIATES P/L
 Project : 13589 - Discharge



Matrix: **WATER**

Evaluation: ✖ = Quality Control frequency not within specification ; ✔ = Quality Control frequency within specification .

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	Method	QC	Regular	Actual	Expected	Evaluation	
Method Blanks (MB) - Continued							
TRH Volatiles/BTEX	EP080	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Ammonia as N by Discrete analyser	EK055G	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	15	6.67	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Hexavalent Chromium by Discrete Analyser - Dissolved	EG050G-F	1	13	7.69	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite as N by Discrete Analyser	EK057G	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Kjeldahl Nitrogen as N By Discrete Analyser	EK061G	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Phosphorus as P By Discrete Analyser	EK067G	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	0	20	0.00	5.00	✗	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard



Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
pH	EA005	WATER	In house: Referenced to APHA 4500 H+ B. pH of water samples is determined by ISE either manually or by automated pH meter. This method is compliant with NEPM Schedule B(3)
Conductivity by Auto Titrator	EA010-P	WATER	In house: Referenced to APHA 2510 B. This procedure determines conductivity by automated ISE. This method is compliant with NEPM Schedule B(3)
Suspended Solids (High Level)	EA025H	WATER	In house: Referenced to APHA 2540D. A gravimetric procedure employed to determine the amount of 'non-filterable' residue in a aqueous sample. The prescribed GFC (1.2um) filter is rinsed with deionised water, oven dried and weighed prior to analysis. A well-mixed sample is filtered through a glass fibre filter (1.2um). The residue on the filter paper is dried at 104+/-2C. This method is compliant with NEPM Schedule B(3)
Dissolved Metals by ICP-MS - Suite A	EG020A-F	WATER	In house: Referenced to APHA 3125; USEPA SW846 - 6020, ALS QWI-EN/EG020. Samples are 0.45µm filtered prior to analysis. The ICPMS technique utilizes a highly efficient argon plasma to ionize selected elements. Ions are then passed into a high vacuum mass spectrometer, which separates the analytes based on their distinct mass to charge ratios prior to their measurement by a discrete dynode ion detector.
Hexavalent Chromium by Discrete Analyser - Dissolved	EG050G-F	WATER	In house: Referenced to APHA 3500 Cr-A & B. Samples are 0.45µm filtered prior to analysis. Hexavalent chromium is determined directly on water sample by Discrete Analyser as received by pH adjustment and colour development using dephenylcarbazine. Each run of samples is measured against a five-point calibration curve. This method is compliant with NEPM Schedule B(3).
Ammonia as N by Discrete analyser	EK055G	WATER	In house: Referenced to APHA 4500-NH3 G. Ammonia is determined by direct colorimetry by Discrete Analyser. This method is compliant with NEPM Schedule B(3)
Nitrite as N by Discrete Analyser	EK057G	WATER	In house: Referenced to APHA 4500-NO2- B. Nitrite is determined by direct colourimetry by Discrete Analyser. This method is compliant with NEPM Schedule B(3)
Nitrate as N by Discrete Analyser	EK058G	WATER	In house: Referenced to APHA 4500-NO3- F. Nitrate is reduced to nitrite by way of a chemical reduction followed by quantification by Discrete Analyser. Nitrite is determined separately by direct colourimetry and result for Nitrate calculated as the difference between the two results. This method is compliant with NEPM Schedule B(3)
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	WATER	In house: Referenced to APHA 4500-NO3- F. Combined oxidised Nitrogen (NO2+NO3) is determined by Chemical Reduction and direct colourimetry by Discrete Analyser. This method is compliant with NEPM Schedule B(3)
Total Kjeldahl Nitrogen as N By Discrete Analyser	EK061G	WATER	In house: Referenced to APHA 4500-Norg D (In house). An aliquot of sample is digested using a high temperature Kjeldahl digestion to convert nitrogenous compounds to ammonia. Ammonia is determined colorimetrically by discrete analyser. This method is compliant with NEPM Schedule B(3)
Total Nitrogen as N (TKN + Nox) By Discrete Analyser	EK062G	WATER	In house: Referenced to APHA 4500-Norg / 4500-NO3-. This method is compliant with NEPM Schedule B(3)
Total Phosphorus as P By Discrete Analyser	EK067G	WATER	In house: Referenced to APHA 4500-P H, Jirka et al, Zhang et al. This procedure involves sulphuric acid digestion of a sample aliquot to break phosphorus down to orthophosphate. The orthophosphate reacts with ammonium molybdate and antimony potassium tartrate to form a complex which is then reduced and its concentration measured at 880nm using discrete analyser. This method is compliant with NEPM Schedule B(3)



<i>Analytical Methods</i>	<i>Method</i>	<i>Matrix</i>	<i>Method Descriptions</i>
TRH - Semivolatile Fraction	EP071	WATER	In house: Referenced to USEPA SW 846 - 8015 The sample extract is analysed by Capillary GC/FID and quantification is by comparison against an established 5 point calibration curve of n-Alkane standards. This method is compliant with the QC requirements of NEPM Schedule B(3)
TRH Volatiles/BTEX	EP080	WATER	In house: Referenced to USEPA SW 846 - 8260 Water samples are directly purged prior to analysis by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. Alternatively, a sample is equilibrated in a headspace vial and a portion of the headspace determined by GCMS analysis. This method is compliant with the QC requirements of NEPM Schedule B(3)
<i>Preparation Methods</i>	<i>Method</i>	<i>Matrix</i>	<i>Method Descriptions</i>
TKN/TP Digestion	EK061/EK067	WATER	In house: Referenced to APHA 4500 Norg - D; APHA 4500 P - H. This method is compliant with NEPM Schedule B(3)
Separatory Funnel Extraction of Liquids	ORG14	WATER	In house: Referenced to USEPA SW 846 - 3510 100 mL to 1L of sample is transferred to a separatory funnel and serially extracted three times using DCM for each extract. The resultant extracts are combined, dehydrated and concentrated for analysis. This method is compliant with NEPM Schedule B(3) . ALS default excludes sediment which may be resident in the container.
Volatiles Water Preparation	ORG16-W	WATER	A 5 mL aliquot or 5 mL of a diluted sample is added to a 40 mL VOC vial for purging.

CHAIN OF CUSTODY

ALS Laboratory: please tick →

☐ **Sydney:** 277 Woodpark Rd, Smithfield NSW 2176
 Ph: 02 8794 8555 E:samples.sydney@aisenviro.com
☐ **Newcastle:** 5 Rosegun Rd, Warabrook NSW 2304
 Ph:02 4968 9433 E:samples.newcastle@aisenviro.com

☐ **Brisbane:** 32 Shand St, Stafford QLD 4063
Ph: 07 3243 7222 E: examples.brisbane@alsenviro.com

☐ **Townsville:** 14-15 Desma Ct, Bohle QLD 4818
Ph: 07 4796 0600 E: townsville.environmental@alsenviro.com

☐ **Melbourne:** 2-4 Westall Rd, Springvale VIC 3171
Ph: 03 8540 9600 E: samples.melbourne@alsenviro.com

☐ **Adelaide:** 2-1 Burna Rd, Pooraka SA 5095
Ph: 08 8359 0890 E: adelaide@alsenviro.com

☐ Perth: 10 Hod Way, Malaga WA 6090
Ph: 08 9209 7655 E: samples.perth@alsenviro.com

☐ Launceston: 27 Wellington St. Launceston TAS 7250
Ph: 03 6331 2158 E: launceston@alsenviro.com

CLIENT: RCA Australia		TURNAROUND REQUIREMENTS : ☐ Standard TAT (List due date):		FOR LABORATORY USE ONLY (Circle)	
OFFICE: 92 Hill Street, Carrington		(Standard TAT may be longer for some tests e.g., Ultra Trace Organics)		Custody Seal Intact? Yes ☒ No ☐ N/A ☐	
RCA Ref No: 13589 - Discharge		ALS QUOTE NO.: SY_496_21		Free ice / frozen ice bricks present upon receipt? Yes ☒ No ☒ N/A ☐	
Teralba				Random Sample Temperature on Receipt: 3.5 °C	
PROJECT MANAGER: Fiona Brooker		CONTACT PH: 0408 687 529		Other comment:	
SAMPLER: AH		SAMPLER MOBILE: 0410230644		RELINQUISHED BY: Anh Hoang	
COC Emailed to ALS? (NO)		EDD FORMAT (or default):		RECEIVED BY: JN	
Email Reports to: administrator@rca.com.au + enviro@rca.com.au		DATE/TIME: 3/5/2024		DATE/TIME: 3/5/24	
Email Invoice to: as above		11:05		1105	

[illegible]

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP = Airfreight Unpreserved Plastic
V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; Su = Sulfuric Preserved
Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottle; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag.

Environmental Division
Sydney
Work Order Reference
ES2414287



Telephone : + 61-2-8784 8555



SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **ES2414287**

Client : **ROBERT CARR & ASSOCIATES P/L**
Contact : **MS FIONA BROOKER**
Address : **92 HILL STREET
CARRINGTON NSW 2294**

E-mail : **fionab@rca.com.au**
Telephone : **+61 02 4902 9200**
Facsimile : **+61 02 4902 9299**

Project : **13589 - Discharge**
Order number : **----**
C-O-C number : **----**
Site : **----**
Sampler : **AH**

Laboratory : **Environmental Division Sydney**
Contact : **Danae Hambly**
Address : **277-289 Woodpark Road Smithfield
NSW Australia 2164**

E-mail : **danae.hambly@alsglobal.com**
Telephone : **+61-2-8784 8555**
Facsimile : **+61-2-8784 8500**

Page : **1 of 3**
Quote number : **EN2023ROBCAR0002 (EN/222)**
QC Level : **NEPM 2013 B3 & ALS QC Standard**

Dates

Date Samples Received : **03-May-2024 11:04**
Client Requested Due : **10-May-2024**
Date

Issue Date : **03-May-2024**
Scheduled Reporting Date : **10-May-2024**

Delivery Details

Mode of Delivery : **Undefined**
No. of coolers/boxes : **1**
Receipt Detail :

Security Seal : **Not Available**
Temperature : **3.5°C - Ice present**
No. of samples received / analysed : **1 / 1**

General Comments

- This report contains the following information:
 - Sample Container(s)/Preservation Non-Compliances
 - Summary of Sample(s) and Requested Analysis
 - Proactive Holding Time Report
 - Requested Deliverables
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- **Sample(s) requiring volatile organic compound analysis received in airtight containers (ZHE).**
- **pH analysis will be conducted by ALS Newcastle-Water**
- Please direct any queries you have regarding this work order to the above ALS laboratory contact.
- Analytical work for this work order will be conducted at ALS Sydney.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months ± 1 week) from receipt of samples.
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.



Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- No sample container / preservation non-compliance exists.

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.

If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: WATER

Laboratory sample ID	Sampling date / time	Sample ID	WATER - EA005: pH	WATER - EA025H Suspended Solids - Standard Level	WATER - EG020F Dissolved Metals by ICP/MS	WATER - EG050G-F Dissolved Hexavalent Chromium	WATER - NT-08 Total Nitrogen + NO2 + NO3 + NH3 + Total P	WATER - TPH TRH (C6-C40)	WATER - W-01 7 Metals
ES2414287-001	03-May-2024 10:00	DIS-Sed2	✓	✓	✓	✓	✓	✓	✓

Matrix: WATER

Laboratory sample ID	Sampling date / time	Sample ID	WATER - EA010P Electrical Conductivity (Auto Titrator)
ES2414287-001	03-May-2024 10:00	DIS-Sed2	✓

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.



Requested Deliverables

ADMINISTRATOR

- *AU Certificate of Analysis - NATA (COA)	Email	administrator@rca.com.au
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	administrator@rca.com.au
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	administrator@rca.com.au
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	administrator@rca.com.au
- A4 - AU Tax Invoice (INV)	Email	administrator@rca.com.au
- Chain of Custody (CoC) (COC)	Email	administrator@rca.com.au
- EDI Format - ENMRG (ENMRG)	Email	administrator@rca.com.au
- EDI Format - ESDAT (ESDAT)	Email	administrator@rca.com.au
- EDI Format - XTab (XTAB)	Email	administrator@rca.com.au

ALL INVOICES

- A4 - AU Tax Invoice (INV)	Email	administrator@rca.com.au
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ENVIRO

- *AU Certificate of Analysis - NATA (COA)	Email	enviro@rca.com.au
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	enviro@rca.com.au
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	enviro@rca.com.au
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	enviro@rca.com.au
- A4 - AU Tax Invoice (INV)	Email	enviro@rca.com.au
- Chain of Custody (CoC) (COC)	Email	enviro@rca.com.au
- EDI Format - ENMRG (ENMRG)	Email	enviro@rca.com.au
- EDI Format - ESDAT (ESDAT)	Email	enviro@rca.com.au
- EDI Format - XTab (XTAB)	Email	enviro@rca.com.au

FIONA BROOKER

- *AU Certificate of Analysis - NATA (COA)	Email	fionab@rca.com.au
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	fionab@rca.com.au
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	fionab@rca.com.au
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	fionab@rca.com.au
- Chain of Custody (CoC) (COC)	Email	fionab@rca.com.au
- EDI Format - ENMRG (ENMRG)	Email	fionab@rca.com.au
- EDI Format - ESDAT (ESDAT)	Email	fionab@rca.com.au
- EDI Format - XTab (XTAB)	Email	fionab@rca.com.au

Inter-Laboratory Testing

Analysis conducted by ALS Newcastle - Water, NATA accreditation no. 825, site no. 1656 (Chemistry) 9854 (Biology).

(WATER) EA005: pH



CERTIFICATE OF ANALYSIS

Work Order : **ES2414486**
Client : **ROBERT CARR & ASSOCIATES P/L**
Contact : MS FIONA BROOKER
Address : 92 HILL STREET
CARRINGTON NSW 2294
Telephone : +61 02 4902 9200
Project : 13589 - Discharge
Order number : ----
C-O-C number : ----
Sampler : AH
Site : ----
Quote number : EN/222
No. of samples received : 3
No. of samples analysed : 3

Page : 1 of 6
Laboratory : Environmental Division Sydney
Contact : Danae Hambly
Address : 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone : +61-2-8784 8555
Date Samples Received : 06-May-2024 12:44
Date Analysis Commenced : 06-May-2024
Issue Date : 13-May-2024 13:52



Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	Position	Accreditation Category
Ankit Joshi	Senior Chemist - Inorganics	Sydney Inorganics, Smithfield, NSW
Edwandy Fadjjar	Organic Coordinator	Sydney Organics, Smithfield, NSW
Gregory Towers	Technical Officer	Chemistry, Newcastle West, NSW



General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contract for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- EP080: Where reported, Total Xylenes is the sum of the reported concentrations of m&p-Xylene and o-Xylene at or above the LOR.

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	DIS-Sed2	DIS-Sed1	SW1	----	----
Sampling date / time				06-May-2024 11:00	06-May-2024 11:30	06-May-2024 12:10	----	----	
Compound	CAS Number	LOR	Unit	ES2414486-001	ES2414486-002	ES2414486-003	-----	-----	
				Result	Result	Result	----	----	
EA005: pH									
pH Value	----	0.01	pH Unit	9.96	7.76	7.82	----	----	
EA010P: Conductivity by PC Titrator									
Electrical Conductivity @ 25°C	----	1	µS/cm	400	506	519	----	----	
EA025: Total Suspended Solids dried at 104 ± 2°C									
Suspended Solids (SS)	----	5	mg/L	90	36	18	----	----	
EG020F: Dissolved Metals by ICP-MS									
Aluminium	7429-90-5	0.01	mg/L	0.21	0.02	0.06	----	----	
Arsenic	7440-38-2	0.001	mg/L	0.005	0.003	0.003	----	----	
Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	<0.0001	----	----	
Chromium	7440-47-3	0.001	mg/L	0.025	0.006	0.004	----	----	
Copper	7440-50-8	0.001	mg/L	0.007	0.008	0.006	----	----	
Cobalt	7440-48-4	0.001	mg/L	<0.001	<0.001	<0.001	----	----	
Nickel	7440-02-0	0.001	mg/L	0.001	<0.001	0.001	----	----	
Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	<0.001	----	----	
Zinc	7440-66-6	0.005	mg/L	<0.005	0.008	0.023	----	----	
Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	<0.01	----	----	
Boron	7440-42-8	0.05	mg/L	<0.05	0.09	0.08	----	----	
EG050F: Dissolved Hexavalent Chromium									
Hexavalent Chromium	18540-29-9	0.01	mg/L	0.03	<0.01	<0.01	----	----	
EK055G: Ammonia as N by Discrete Analyser									
Ammonia as N	7664-41-7	0.01	mg/L	0.04	0.04	0.04	----	----	
EK057G: Nitrite as N by Discrete Analyser									
Nitrite as N	14797-65-0	0.01	mg/L	0.80	0.33	0.35	----	----	
EK058G: Nitrate as N by Discrete Analyser									
Nitrate as N	14797-55-8	0.01	mg/L	2.33	1.03	1.14	----	----	
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser									
Nitrite + Nitrate as N	----	0.01	mg/L	3.13	1.36	1.49	----	----	
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser									



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	DIS-Sed2	DIS-Sed1	SW1	----	----
Sampling date / time					06-May-2024 11:00	06-May-2024 11:30	06-May-2024 12:10	----	----
Compound	CAS Number	LOR	Unit		ES2414486-001	ES2414486-002	ES2414486-003	-----	-----
					Result	Result	Result	----	----
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser - Continued									
Total Kjeldahl Nitrogen as N	----	0.1	mg/L		1.4	1.2	1.0	----	----
EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser									
[^] Total Nitrogen as N	----	0.1	mg/L		4.5	2.6	2.5	----	----
EK067G: Total Phosphorus as P by Discrete Analyser									
Total Phosphorus as P	----	0.01	mg/L		0.19	0.17	0.15	----	----
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	20	µg/L		<20	<20	<20	----	----
C10 - C14 Fraction	----	50	µg/L		<50	<50	<50	----	----
C15 - C28 Fraction	----	100	µg/L		<100	<100	<100	----	----
C29 - C36 Fraction	----	50	µg/L		<50	<50	<50	----	----
[^] C10 - C36 Fraction (sum)	----	50	µg/L		<50	<50	<50	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction	C6_C10	20	µg/L		<20	<20	<20	----	----
[^] C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	20	µg/L		<20	<20	<20	----	----
>C10 - C16 Fraction	----	100	µg/L		<100	<100	<100	----	----
>C16 - C34 Fraction	----	100	µg/L		<100	<100	<100	----	----
>C34 - C40 Fraction	----	100	µg/L		<100	<100	<100	----	----
[^] >C10 - C40 Fraction (sum)	----	100	µg/L		<100	<100	<100	----	----
[^] >C10 - C16 Fraction minus Naphthalene (F2)	----	100	µg/L		<100	<100	<100	----	----
EP080: BTEXN									
Benzene	71-43-2	1	µg/L		<1	<1	<1	----	----
Toluene	108-88-3	2	µg/L		<2	<2	<2	----	----
Ethylbenzene	100-41-4	2	µg/L		<2	<2	<2	----	----
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L		<2	<2	<2	----	----
ortho-Xylene	95-47-6	2	µg/L		<2	<2	<2	----	----
[^] Total Xylenes	----	2	µg/L		<2	<2	<2	----	----



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	DIS-Sed2	DIS-Sed1	SW1	----	----
Sampling date / time					06-May-2024 11:00	06-May-2024 11:30	06-May-2024 12:10	----	----
Compound	CAS Number	LOR	Unit	ES2414486-001	ES2414486-002	ES2414486-003	-----	-----	
				Result	Result	Result	----	----	
EP080: BTEXN - Continued									
^ Sum of BTEX		----	1	µg/L	<1	<1	<1	----	----
Naphthalene		91-20-3	5	µg/L	<5	<5	<5	----	----
EP080S: TPH(V)/BTEX Surrogates									
1,2-Dichloroethane-D4		17060-07-0	2	%	101	93.2	103	----	----
Toluene-D8		2037-26-5	2	%	105	98.4	106	----	----
4-Bromofluorobenzene		460-00-4	2	%	116	106	114	----	----



Surrogate Control Limits

Sub-Matrix: WATER		Recovery Limits (%)	
Compound	CAS Number	Low	High
EP080S: TPH(V)/BTEX Surrogates			
1,2-Dichloroethane-D4	17060-07-0	72	143
Toluene-D8	2037-26-5	75	131
4-Bromofluorobenzene	460-00-4	73	137

Inter-Laboratory Testing

Analysis conducted by ALS Newcastle - Water, NATA accreditation no. 825, site no. 1656 (Chemistry) 9854 (Biology).
(WATER) EA005: pH



QUALITY CONTROL REPORT

Work Order : **ES2414486**

Page : 1 of 7

Client : **ROBERT CARR & ASSOCIATES P/L**

Laboratory : Environmental Division Sydney

Contact : MS FIONA BROOKER

Contact : Danae Hambly

Address : 92 HILL STREET
CARRINGTON NSW 2294

Address : 277-289 Woodpark Road Smithfield NSW Australia 2164

Telephone : +61 02 4902 9200

Telephone : +61-2-8784 8555

Project : 13589 - Discharge

Date Samples Received : 06-May-2024

Order number : ----

Date Analysis Commenced : 06-May-2024

C-O-C number : ----

Issue Date : 13-May-2024

Sampler : AH

Site : ----

Quote number : EN/222

No. of samples received : 3

No. of samples analysed : 3



This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	Position	Accreditation Category
Ankit Joshi	Senior Chemist - Inorganics	Sydney Inorganics, Smithfield, NSW
Edwandy Fadjar	Organic Coordinator	Sydney Organics, Smithfield, NSW
Gregory Towers	Technical Officer	Chemistry, Newcastle West, NSW



General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot

CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.

LOR = Limit of reporting

RPD = Relative Percentage Difference

= Indicates failed QC

* = The final LOR has been raised due to dilution or other sample specific cause; adjusted LOR is shown in brackets. The duplicate ranges for Acceptable RPD% are applied to the final LOR where applicable.

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EA005: pH (QC Lot: 5772384)									
EN2404031-001	Anonymous	EA005: pH Value	----	0.01	pH Unit	7.88	7.82	0.8	0% - 20%
ES2414486-001	DIS-Sed2	EA005: pH Value	----	0.01	pH Unit	9.96	10.0	0.4	0% - 20%
EA010P: Conductivity by PC Titrator (QC Lot: 5776391)									
ES2414477-001	Anonymous	EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	736	733	0.4	0% - 20%
ES2414536-006	Anonymous	EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	1500	1510	0.1	0% - 20%
ES2413935-001	Anonymous	EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	1360	1370	0.6	0% - 20%
ES2414858-001	Anonymous	EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	461	459	0.3	0% - 20%
EA025: Total Suspended Solids dried at 104 ± 2°C (QC Lot: 5778822)									
ES2414485-001	Anonymous	EA025H: Suspended Solids (SS)	----	5	mg/L	92	110	17.9	0% - 20%
ES2414765-002	Anonymous	EA025H: Suspended Solids (SS)	----	5	mg/L	1350	1290	4.3	0% - 20%
ES2414765-012	Anonymous	EA025H: Suspended Solids (SS)	----	5	mg/L	<5	<5	0.0	No Limit
ES2414765-022	Anonymous	EA025H: Suspended Solids (SS)	----	5	mg/L	<5	<5	0.0	No Limit
EG020F: Dissolved Metals by ICP-MS (QC Lot: 5775368)									
ES2414239-001	Anonymous	EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
		EG020A-F: Arsenic	7440-38-2	0.001	mg/L	0.002	0.001	0.0	No Limit
		EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Cobalt	7440-48-4	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Copper	7440-50-8	0.001	mg/L	0.002	0.002	0.0	No Limit
		EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Nickel	7440-02-0	0.001	mg/L	0.001	0.001	0.0	No Limit

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 Work Order : ES2414486
 Client : ROBERT CARR & ASSOCIATES P/L
 Project : 13589 - Discharge



Sub-Matrix: WATER				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EG020F: Dissolved Metals by ICP-MS (QC Lot: 5775368) - continued									
ES2414239-001	Anonymous	EG020A-F: Zinc	7440-66-6	0.005	mg/L	0.067	0.067	0.0	0% - 50%
		EG020A-F: Aluminium	7429-90-5	0.01	mg/L	0.02	0.02	0.0	No Limit
		EG020A-F: Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	0.0	No Limit
		EG020A-F: Boron	7440-42-8	0.05	mg/L	<0.05	<0.05	0.0	No Limit
ES2414707-019	Anonymous	EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
		EG020A-F: Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Cobalt	7440-48-4	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Copper	7440-50-8	0.001	mg/L	0.002	0.002	0.0	No Limit
		EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Nickel	7440-02-0	0.001	mg/L	0.002	0.002	0.0	No Limit
		EG020A-F: Zinc	7440-66-6	0.005	mg/L	<0.005	<0.005	0.0	No Limit
		EG020A-F: Aluminium	7429-90-5	0.01	mg/L	0.16	0.16	0.0	0% - 50%
		EG020A-F: Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	0.0	No Limit
		EG020A-F: Boron	7440-42-8	0.05	mg/L	<0.05	<0.05	0.0	No Limit
		EG050F: Dissolved Hexavalent Chromium (QC Lot: 5782732)							
ES2414200-001	Anonymous	EG050G-F: Hexavalent Chromium	18540-29-9	0.01	mg/L	<0.01	<0.01	0.0	No Limit
ES2414200-010	Anonymous	EG050G-F: Hexavalent Chromium	18540-29-9	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EK055G: Ammonia as N by Discrete Analyser (QC Lot: 5776778)									
ES2414817-004	Anonymous	EK055G: Ammonia as N	7664-41-7	0.01	mg/L	<0.01	<0.01	0.0	No Limit
ES2414457-001	Anonymous	EK055G: Ammonia as N	7664-41-7	0.01	mg/L	0.02	0.01	0.0	No Limit
EK057G: Nitrite as N by Discrete Analyser (QC Lot: 5776431)									
ES2414642-001	Anonymous	EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	0.0	No Limit
ES2414642-010	Anonymous	EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QC Lot: 5776777)									
ES2414457-001	Anonymous	EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QC Lot: 5776775)									
ES2414817-001	Anonymous	EK061G: Total Kjeldahl Nitrogen as N	----	0.1 (0.2)*	mg/L	0.4	0.5	0.0	No Limit
ES2414457-001	Anonymous	EK061G: Total Kjeldahl Nitrogen as N	----	0.1	mg/L	0.5	0.4	0.0	No Limit
EK067G: Total Phosphorus as P by Discrete Analyser (QC Lot: 5776776)									
ES2414457-001	Anonymous	EK067G: Total Phosphorus as P	----	0.01	mg/L	0.03	0.04	45.0	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 5771720)									
EN2404021-002	Anonymous	EP080: C6 - C9 Fraction	----	20	µg/L	<20	<20	0.0	No Limit
ES2414523-003	Anonymous	EP080: C6 - C9 Fraction	----	20	µg/L	<20	<20	0.0	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 5771720)									
EN2404021-002	Anonymous	EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	0.0	No Limit

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 Work Order : ES2414486
 Client : ROBERT CARR & ASSOCIATES P/L
 Project : 13589 - Discharge



Sub-Matrix: WATER				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 5771720) - continued									
ES2414523-003	Anonymous	EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	0.0	No Limit
EP080: BTEXN (QC Lot: 5771720)									
EN2404021-002	Anonymous	EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.0	No Limit
		EP080: Toluene	108-88-3	2	µg/L	<2	<2	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	2	µg/L	<2	<2	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	0.0	No Limit
		EP080: ortho-Xylene	95-47-6	2	µg/L	<2	<2	0.0	No Limit
		EP080: Naphthalene	91-20-3	5	µg/L	<5	<5	0.0	No Limit
ES2414523-003	Anonymous	EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.0	No Limit
		EP080: Toluene	108-88-3	2	µg/L	<2	<2	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	2	µg/L	<2	<2	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	0.0	No Limit
		EP080: ortho-Xylene	95-47-6	2	µg/L	<2	<2	0.0	No Limit
		EP080: Naphthalene	91-20-3	5	µg/L	<5	<5	0.0	No Limit

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: WATER				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike Concentration	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result		LCS	Low	High
EA005: pH (QCLot: 5772384)								
EA005: pH Value	----	----	pH Unit	----	7.6 pH Unit	100	98.5	102
EA010P: Conductivity by PC Titrator (QCLot: 5776391)								
EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	<1	220 µS/cm	96.2	89.9	110
				<1	2100 µS/cm	98.3	90.2	111
EA025: Total Suspended Solids dried at 104 ± 2°C (QCLot: 5778822)								
EA025H: Suspended Solids (SS)	----	5	mg/L	<5	150 mg/L	101	83.0	129
				<5	1000 mg/L	99.1	82.0	110
				<5	928 mg/L	96.2	83.0	118
EG020F: Dissolved Metals by ICP-MS (QCLot: 5775368)								
EG020A-F: Aluminium	7429-90-5	0.01	mg/L	<0.01	0.5 mg/L	89.4	80.0	116
EG020A-F: Arsenic	7440-38-2	0.001	mg/L	<0.001	0.1 mg/L	91.8	85.0	114
EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	0.1 mg/L	93.5	84.0	110
EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	0.1 mg/L	90.3	85.0	111
EG020A-F: Cobalt	7440-48-4	0.001	mg/L	<0.001	0.1 mg/L	90.5	82.0	112
EG020A-F: Copper	7440-50-8	0.001	mg/L	<0.001	0.1 mg/L	93.2	81.0	111
EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	0.1 mg/L	88.2	83.0	111
EG020A-F: Nickel	7440-02-0	0.001	mg/L	<0.001	0.1 mg/L	90.8	82.0	112
EG020A-F: Selenium	7782-49-2	0.01	mg/L	<0.01	0.1 mg/L	91.8	85.0	115
EG020A-F: Zinc	7440-66-6	0.005	mg/L	<0.005	0.1 mg/L	92.5	81.0	117
EG020A-F: Boron	7440-42-8	0.05	mg/L	<0.05	0.5 mg/L	90.8	85.0	115
EG050F: Dissolved Hexavalent Chromium (QCLot: 5782732)								
EG050G-F: Hexavalent Chromium	18540-29-9	0.01	mg/L	<0.01	0.05 mg/L	101	86.0	112
EK055G: Ammonia as N by Discrete Analyser (QCLot: 5776778)								
EK055G: Ammonia as N	7664-41-7	0.01	mg/L	<0.01	1 mg/L	101	90.0	114
EK057G: Nitrite as N by Discrete Analyser (QCLot: 5776431)								
EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	0.5 mg/L	112	82.0	114
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 5776777)								
EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	<0.01	0.5 mg/L	101	91.0	113
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QCLot: 5776775)								

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 Work Order : ES2414486
 Client : ROBERT CARR & ASSOCIATES P/L
 Project : 13589 - Discharge



Sub-Matrix: **WATER**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike Concentration	Spike Recovery (%) LCS	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result			Low	High
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QCLot: 5776775) - continued								
EK061G: Total Kjeldahl Nitrogen as N	----	0.1	mg/L	<0.1	10 mg/L	99.5	69.0	123
				<0.1	1 mg/L	101	70.0	123
				<0.1	5 mg/L	93.9	70.0	123
EK067G: Total Phosphorus as P by Discrete Analyser (QCLot: 5776776)								
EK067G: Total Phosphorus as P	----	0.01	mg/L	<0.01	4.42 mg/L	101	71.3	126
				<0.01	0.442 mg/L	97.8	71.3	126
				<0.01	1 mg/L	98.4	70.0	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 5771720)								
EP080: C6 - C9 Fraction	----	20	µg/L	<20	260 µg/L	86.0	75.0	127
EP080/071: Total Petroleum Hydrocarbons (QCLot: 5771983)								
EP071: C10 - C14 Fraction	----	50	µg/L	<50	400 µg/L	74.0	53.7	97.0
EP071: C15 - C28 Fraction	----	100	µg/L	<100	600 µg/L	103	63.3	107
EP071: C29 - C36 Fraction	----	50	µg/L	<50	400 µg/L	101	58.3	120
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 5771720)								
EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	310 µg/L	88.0	75.0	127
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 5771983)								
EP071: >C10 - C16 Fraction	----	100	µg/L	<100	500 µg/L	83.7	53.9	95.5
EP071: >C16 - C34 Fraction	----	100	µg/L	<100	700 µg/L	91.5	57.8	110
EP071: >C34 - C40 Fraction	----	100	µg/L	<100	300 µg/L	91.1	50.5	115
EP080: BTEXN (QCLot: 5771720)								
EP080: Benzene	71-43-2	1	µg/L	<1	10 µg/L	88.0	68.3	119
EP080: Toluene	108-88-3	2	µg/L	<2	10 µg/L	87.7	73.5	120
EP080: Ethylbenzene	100-41-4	2	µg/L	<2	10 µg/L	88.0	73.8	122
EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	10 µg/L	93.2	73.0	122
EP080: ortho-Xylene	95-47-6	2	µg/L	<2	10 µg/L	92.6	76.4	123
EP080: Naphthalene	91-20-3	5	µg/L	<5	10 µg/L	106	75.5	124

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike Concentration	SpikeRecovery(%) MS	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number			Low	High

Page : 7 of 7
 Work Order : ES2414486
 Client : ROBERT CARR & ASSOCIATES P/L
 Project : 13589 - Discharge



Sub-Matrix: **WATER**

Sub-Matrix: WATER				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EG020F: Dissolved Metals by ICP-MS (QCLot: 5775368)							
ES2414239-002	Anonymous	EG020A-F: Arsenic	7440-38-2	1 mg/L	91.8	70.0	130
		EG020A-F: Cadmium	7440-43-9	0.25 mg/L	89.9	70.0	130
		EG020A-F: Chromium	7440-47-3	1 mg/L	86.6	70.0	130
		EG020A-F: Cobalt	7440-48-4	1 mg/L	88.3	70.0	130
		EG020A-F: Copper	7440-50-8	1 mg/L	91.3	70.0	130
		EG020A-F: Lead	7439-92-1	1 mg/L	89.7	70.0	130
		EG020A-F: Nickel	7440-02-0	1 mg/L	87.4	70.0	130
		EG020A-F: Zinc	7440-66-6	1 mg/L	88.9	70.0	130
EG050F: Dissolved Hexavalent Chromium (QCLot: 5782732)							
ES2414200-001	Anonymous	EG050G-F: Hexavalent Chromium	18540-29-9	0.05 mg/L	107	70.0	130
EK055G: Ammonia as N by Discrete Analyser (QCLot: 5776778)							
ES2414457-001	Anonymous	EK055G: Ammonia as N	7664-41-7	1 mg/L	108	70.0	130
EK057G: Nitrite as N by Discrete Analyser (QCLot: 5776431)							
ES2414642-001	Anonymous	EK057G: Nitrite as N	14797-65-0	0.5 mg/L	111	70.0	130
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 5776777)							
ES2414457-001	Anonymous	EK059G: Nitrite + Nitrate as N	----	0.5 mg/L	108	70.0	130
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QCLot: 5776775)							
ES2414457-002	Anonymous	EK061G: Total Kjeldahl Nitrogen as N	----	5 mg/L	90.0	70.0	130
EK067G: Total Phosphorus as P by Discrete Analyser (QCLot: 5776776)							
ES2414457-002	Anonymous	EK067G: Total Phosphorus as P	----	1 mg/L	101	70.0	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 5771720)							
EN2404021-002	Anonymous	EP080: C6 - C9 Fraction	----	325 µg/L	81.4	70.0	130
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 5771720)							
EN2404021-002	Anonymous	EP080: C6 - C10 Fraction	C6_C10	375 µg/L	81.1	70.0	130
EP080: BTEXN (QCLot: 5771720)							
EN2404021-002	Anonymous	EP080: Benzene	71-43-2	25 µg/L	83.5	70.0	130
		EP080: Toluene	108-88-3	25 µg/L	82.5	70.0	130
		EP080: Ethylbenzene	100-41-4	25 µg/L	86.7	70.0	130
		EP080: meta- & para-Xylene	108-38-3	25 µg/L	91.3	70.0	130
			106-42-3				
		EP080: ortho-Xylene	95-47-6	25 µg/L	93.5	70.0	130
		EP080: Naphthalene	91-20-3	25 µg/L	105	70.0	130



QA/QC Compliance Assessment to assist with Quality Review

Work Order	: ES2414486	Page	: 1 of 8
Client	: ROBERT CARR & ASSOCIATES P/L	Laboratory	: Environmental Division Sydney
Contact	: MS FIONA BROOKER	Telephone	: +61-2-8784 8555
Project	: 13589 - Discharge	Date Samples Received	: 06-May-2024
Site	: ----	Issue Date	: 13-May-2024
Sampler	: AH	No. of samples received	: 3
Order number	: ----	No. of samples analysed	: 3

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO** Method Blank value outliers occur.
- **NO** Duplicate outliers occur.
- **NO** Laboratory Control outliers occur.
- **NO** Matrix Spike outliers occur.
- For all regular sample matrices, **NO** surrogate recovery outliers occur.

Outliers : Analysis Holding Time Compliance

- Analysis Holding Time Outliers exist - please see following pages for full details.

Outliers : Frequency of Quality Control Samples

- Quality Control Sample Frequency Outliers exist - please see following pages for full details.



Outliers : Analysis Holding Time Compliance

Matrix: **WATER**

Method	Extraction / Preparation			Analysis		
	Date extracted	Due for extraction	Days overdue	Date analysed	Due for analysis	Days overdue
EK057G: Nitrite as N by Discrete Analyser						
Clear Plastic Bottle - Natural DIS-Sed2, SW1 DIS-Sed1,	----	----	----	09-May-2024	08-May-2024	1

Outliers : Frequency of Quality Control Samples

Matrix: **WATER**

Quality Control Sample Type		Count		Rate (%)		Quality Control Specification
Analytical Methods	Method	QC	Regular	Actual	Expected	
Laboratory Duplicates (DUP)						
TRH - Semivolatile Fraction	EP071	0	6	0.00	10.00	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)						
TRH - Semivolatile Fraction	EP071	0	6	0.00	5.00	NEPM 2013 B3 & ALS QC Standard

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for VOC in soils vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **WATER**

Evaluation: ✖ = Holding time breach ; ✔ = Within holding time.

Method	Sample Date	Extraction / Preparation			Analysis		
Container / Client Sample ID(s)		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA005: pH							
Clear Plastic Bottle - Natural (REGIONAL LAB) (EA005) DIS-Sed2, SW1DIS-Sed1,	06-May-2024	----	----	----	06-May-2024	06-May-2024	✔
EA010P: Conductivity by PC Titrator							
Clear Plastic Bottle - Natural (EA010-P) DIS-Sed2, SW1DIS-Sed1,	06-May-2024	----	----	----	08-May-2024	03-Jun-2024	✔
EA025: Total Suspended Solids dried at 104 ± 2°C							
Clear Plastic Bottle - Natural (EA025H) DIS-Sed2, SW1DIS-Sed1,	06-May-2024	----	----	----	09-May-2024	13-May-2024	✔



Matrix: **WATER**

Evaluation: ✖ = Holding time breach ; ✔ = Within holding time.

Method	Sample Date	Extraction / Preparation			Analysis		
Container / Client Sample ID(s)		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EG020F: Dissolved Metals by ICP-MS							
Clear Plastic Bottle - Natural (EG020A-F) DIS-Sed1	06-May-2024	----	----	----	08-May-2024	02-Nov-2024	✓
Clear Plastic Bottle - Nitric Acid; Filtered (EG020A-F) DIS-Sed2, SW1	06-May-2024	----	----	----	08-May-2024	02-Nov-2024	✓
EG050F: Dissolved Hexavalent Chromium							
Clear Plastic Bottle - NaOH Filtered (EG050G-F) DIS-Sed2, SW1	06-May-2024	----	----	----	10-May-2024	03-Jun-2024	✓
EK055G: Ammonia as N by Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK055G) DIS-Sed2, SW1	06-May-2024	----	----	----	08-May-2024	03-Jun-2024	✓
EK057G: Nitrite as N by Discrete Analyser							
Clear Plastic Bottle - Natural (EK057G) DIS-Sed2, SW1	06-May-2024	----	----	----	09-May-2024	08-May-2024	✗
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK059G) DIS-Sed2, SW1	06-May-2024	----	----	----	08-May-2024	03-Jun-2024	✓
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK061G) DIS-Sed2, SW1	06-May-2024	08-May-2024	03-Jun-2024	✓	08-May-2024	03-Jun-2024	✓
EK067G: Total Phosphorus as P by Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK067G) DIS-Sed2, SW1	06-May-2024	08-May-2024	03-Jun-2024	✓	08-May-2024	03-Jun-2024	✓
EP080/071: Total Petroleum Hydrocarbons							
Amber Glass Bottle - Unpreserved (EP071) DIS-Sed2, SW1	06-May-2024	08-May-2024	13-May-2024	✓	09-May-2024	17-Jun-2024	✓
Amber TOC Vial - Sulfuric Acid (EP080) DIS-Sed1	06-May-2024	07-May-2024	20-May-2024	✓	07-May-2024	20-May-2024	✓
Amber VOC Vial - Sulfuric Acid (EP080) DIS-Sed2, SW1	06-May-2024	07-May-2024	20-May-2024	✓	07-May-2024	20-May-2024	✓



Matrix: WATER

Evaluation: ✖ = Holding time breach ; ✔ = Within holding time.

Method	Sample Date	Extraction / Preparation			Analysis		
Container / Client Sample ID(s)		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions							
Amber Glass Bottle - Unpreserved (EP071) DIS-Sed2, DIS-Sed1, SW1	06-May-2024	08-May-2024	13-May-2024	✓	09-May-2024	17-Jun-2024	✓
Amber TOC Vial - Sulfuric Acid (EP080) DIS-Sed1	06-May-2024	07-May-2024	20-May-2024	✓	07-May-2024	20-May-2024	✓
Amber VOC Vial - Sulfuric Acid (EP080) DIS-Sed2, SW1	06-May-2024	07-May-2024	20-May-2024	✓	07-May-2024	20-May-2024	✓
EP080: BTEXN							
Amber TOC Vial - Sulfuric Acid (EP080) DIS-Sed1	06-May-2024	07-May-2024	20-May-2024	✓	07-May-2024	20-May-2024	✓
Amber VOC Vial - Sulfuric Acid (EP080) DIS-Sed2, SW1	06-May-2024	07-May-2024	20-May-2024	✓	07-May-2024	20-May-2024	✓



Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **WATER**

Evaluation: ✖ = Quality Control frequency not within specification ; ✔ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	Method	QC	Regular	Actual	Expected	Evaluation	
Laboratory Duplicates (DUP)							
Ammonia as N by Discrete analyser	EK055G	2	15	13.33	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Conductivity by Auto Titrator	EA010-P	4	34	11.76	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite A	EG020A-F	2	9	22.22	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Hexavalent Chromium by Discrete Analyser - Dissolved	EG050G-F	2	16	12.50	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	1	7	14.29	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite as N by Discrete Analyser	EK057G	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
pH	EA005	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Suspended Solids (High Level)	EA025H	4	40	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Kjeldahl Nitrogen as N By Discrete Analyser	EK061G	2	19	10.53	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Phosphorus as P By Discrete Analyser	EK067G	1	8	12.50	10.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	0	6	0.00	10.00	✗	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Ammonia as N by Discrete analyser	EK055G	1	15	6.67	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Conductivity by Auto Titrator	EA010-P	3	34	8.82	8.33	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	9	11.11	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Hexavalent Chromium by Discrete Analyser - Dissolved	EG050G-F	1	16	6.25	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	1	7	14.29	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite as N by Discrete Analyser	EK057G	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
pH	EA005	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Suspended Solids (High Level)	EA025H	5	40	12.50	12.50	✓	NEPM 2013 B3 & ALS QC Standard
Total Kjeldahl Nitrogen as N By Discrete Analyser	EK061G	3	19	15.79	15.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Phosphorus as P By Discrete Analyser	EK067G	3	8	37.50	15.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	6	16.67	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Ammonia as N by Discrete analyser	EK055G	1	15	6.67	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Conductivity by Auto Titrator	EA010-P	2	34	5.88	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	9	11.11	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Hexavalent Chromium by Discrete Analyser - Dissolved	EG050G-F	1	16	6.25	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	1	7	14.29	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite as N by Discrete Analyser	EK057G	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Suspended Solids (High Level)	EA025H	2	40	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Kjeldahl Nitrogen as N By Discrete Analyser	EK061G	1	19	5.26	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Phosphorus as P By Discrete Analyser	EK067G	1	8	12.50	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	6	16.67	5.00	✓	NEPM 2013 B3 & ALS QC Standard

Page : 6 of 8
 Work Order : ES2414486
 Client : ROBERT CARR & ASSOCIATES P/L
 Project : 13589 - Discharge



Matrix: **WATER**

Evaluation: ✖ = Quality Control frequency not within specification ; ✔ = Quality Control frequency within specification .

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	Method	QC	Regular	Actual	Expected	Evaluation	
Method Blanks (MB) - Continued							
TRH Volatiles/BTEX	EP080	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Ammonia as N by Discrete analyser	EK055G	1	15	6.67	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	9	11.11	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Hexavalent Chromium by Discrete Analyser - Dissolved	EG050G-F	1	16	6.25	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	1	7	14.29	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite as N by Discrete Analyser	EK057G	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Kjeldahl Nitrogen as N By Discrete Analyser	EK061G	1	19	5.26	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Phosphorus as P By Discrete Analyser	EK067G	1	8	12.50	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	0	6	0.00	5.00	✗	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard



Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
pH	EA005	WATER	In house: Referenced to APHA 4500 H+ B. pH of water samples is determined by ISE either manually or by automated pH meter. This method is compliant with NEPM Schedule B(3)
Conductivity by Auto Titrator	EA010-P	WATER	In house: Referenced to APHA 2510 B. This procedure determines conductivity by automated ISE. This method is compliant with NEPM Schedule B(3)
Suspended Solids (High Level)	EA025H	WATER	In house: Referenced to APHA 2540D. A gravimetric procedure employed to determine the amount of 'non-filterable' residue in a aqueous sample. The prescribed GFC (1.2um) filter is rinsed with deionised water, oven dried and weighed prior to analysis. A well-mixed sample is filtered through a glass fibre filter (1.2um). The residue on the filter paper is dried at 104+/-2C. This method is compliant with NEPM Schedule B(3)
Dissolved Metals by ICP-MS - Suite A	EG020A-F	WATER	In house: Referenced to APHA 3125; USEPA SW846 - 6020, ALS QWI-EN/EG020. Samples are 0.45µm filtered prior to analysis. The ICPMS technique utilizes a highly efficient argon plasma to ionize selected elements. Ions are then passed into a high vacuum mass spectrometer, which separates the analytes based on their distinct mass to charge ratios prior to their measurement by a discrete dynode ion detector.
Hexavalent Chromium by Discrete Analyser - Dissolved	EG050G-F	WATER	In house: Referenced to APHA 3500 Cr-A & B. Samples are 0.45µm filtered prior to analysis. Hexavalent chromium is determined directly on water sample by Discrete Analyser as received by pH adjustment and colour development using dephenylcarbazine. Each run of samples is measured against a five-point calibration curve. This method is compliant with NEPM Schedule B(3).
Ammonia as N by Discrete analyser	EK055G	WATER	In house: Referenced to APHA 4500-NH3 G. Ammonia is determined by direct colorimetry by Discrete Analyser. This method is compliant with NEPM Schedule B(3)
Nitrite as N by Discrete Analyser	EK057G	WATER	In house: Referenced to APHA 4500-NO2- B. Nitrite is determined by direct colourimetry by Discrete Analyser. This method is compliant with NEPM Schedule B(3)
Nitrate as N by Discrete Analyser	EK058G	WATER	In house: Referenced to APHA 4500-NO3- F. Nitrate is reduced to nitrite by way of a chemical reduction followed by quantification by Discrete Analyser. Nitrite is determined separately by direct colourimetry and result for Nitrate calculated as the difference between the two results. This method is compliant with NEPM Schedule B(3)
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	WATER	In house: Referenced to APHA 4500-NO3- F. Combined oxidised Nitrogen (NO2+NO3) is determined by Chemical Reduction and direct colourimetry by Discrete Analyser. This method is compliant with NEPM Schedule B(3)
Total Kjeldahl Nitrogen as N By Discrete Analyser	EK061G	WATER	In house: Referenced to APHA 4500-Norg D (In house). An aliquot of sample is digested using a high temperature Kjeldahl digestion to convert nitrogenous compounds to ammonia. Ammonia is determined colorimetrically by discrete analyser. This method is compliant with NEPM Schedule B(3)
Total Nitrogen as N (TKN + Nox) By Discrete Analyser	EK062G	WATER	In house: Referenced to APHA 4500-Norg / 4500-NO3-. This method is compliant with NEPM Schedule B(3)
Total Phosphorus as P By Discrete Analyser	EK067G	WATER	In house: Referenced to APHA 4500-P H, Jirka et al, Zhang et al. This procedure involves sulphuric acid digestion of a sample aliquot to break phosphorus down to orthophosphate. The orthophosphate reacts with ammonium molybdate and antimony potassium tartrate to form a complex which is then reduced and its concentration measured at 880nm using discrete analyser. This method is compliant with NEPM Schedule B(3)



<i>Analytical Methods</i>	<i>Method</i>	<i>Matrix</i>	<i>Method Descriptions</i>
TRH - Semivolatile Fraction	EP071	WATER	In house: Referenced to USEPA SW 846 - 8015 The sample extract is analysed by Capillary GC/FID and quantification is by comparison against an established 5 point calibration curve of n-Alkane standards. This method is compliant with the QC requirements of NEPM Schedule B(3)
TRH Volatiles/BTEX	EP080	WATER	In house: Referenced to USEPA SW 846 - 8260 Water samples are directly purged prior to analysis by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. Alternatively, a sample is equilibrated in a headspace vial and a portion of the headspace determined by GCMS analysis. This method is compliant with the QC requirements of NEPM Schedule B(3)
<i>Preparation Methods</i>	<i>Method</i>	<i>Matrix</i>	<i>Method Descriptions</i>
TKN/TP Digestion	EK061/EK067	WATER	In house: Referenced to APHA 4500 Norg - D; APHA 4500 P - H. This method is compliant with NEPM Schedule B(3)
Separatory Funnel Extraction of Liquids	ORG14	WATER	In house: Referenced to USEPA SW 846 - 3510 100 mL to 1L of sample is transferred to a separatory funnel and serially extracted three times using DCM for each extract. The resultant extracts are combined, dehydrated and concentrated for analysis. This method is compliant with NEPM Schedule B(3) . ALS default excludes sediment which may be resident in the container.
Volatiles Water Preparation	ORG16-W	WATER	A 5 mL aliquot or 5 mL of a diluted sample is added to a 40 mL VOC vial for purging.



SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **ES2414486**

Client : **ROBERT CARR & ASSOCIATES P/L**
Contact : **MS FIONA BROOKER**
Address : **92 HILL STREET
CARRINGTON NSW 2294**

E-mail : **fionab@rca.com.au**
Telephone : **+61 02 4902 9200**
Facsimile : **+61 02 4902 9299**

Project : **13589 - Discharge**
Order number : **----**
C-O-C number : **----**
Site : **----**
Sampler : **AH**

Laboratory : **Environmental Division Sydney**
Contact : **Danae Hambly**
Address : **277-289 Woodpark Road Smithfield
NSW Australia 2164**

E-mail : **danae.hambly@alsglobal.com**
Telephone : **+61-2-8784 8555**
Facsimile : **+61-2-8784 8500**

Page : **1 of 3**
Quote number : **EN2023ROBCAR0002 (EN/222)**
QC Level : **NEPM 2013 B3 & ALS QC Standard**

Dates

Date Samples Received : **06-May-2024 12:44**
Client Requested Due : **13-May-2024**
Date

Issue Date : **06-May-2024**
Scheduled Reporting Date : **13-May-2024**

Delivery Details

Mode of Delivery : **Undefined**
No. of coolers/boxes : **1**
Receipt Detail :

Security Seal : **Not Available**
Temperature : **3.8°C - Ice present**
No. of samples received / analysed : **3 / 3**

General Comments

- This report contains the following information:
 - Sample Container(s)/Preservation Non-Compliances
 - Summary of Sample(s) and Requested Analysis
 - Proactive Holding Time Report
 - Requested Deliverables
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- **Sample(s) requiring volatile organic compound analysis received in airtight containers (ZHE).**
- **pH analysis will be conducted by ALS Newcastle-Water**
- Please direct any queries you have regarding this work order to the above ALS laboratory contact.
- Analytical work for this work order will be conducted at ALS Sydney.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months ± 1 week) from receipt of samples.
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.



Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

Method Sample ID	Sample Container Received	Preferred Sample Container for Analysis
Dissolved Metals by ICP-MS - Suite A : EG020A-F		
DIS-Sed1	- Clear Plastic Bottle - Natural	- Clear Plastic Bottle - Nitric Acid; Filtered

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.

If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **WATER**

Laboratory sample ID	Sampling date / time	Sample ID	WATER - EA005: pH	WATER - EA025H Suspended Solids - Standard Level	WATER - EG020F Dissolved Metals by ICP/MS	WATER - EG050G-F Dissolved Hexavalent Chromium	WATER - NT-08 Total Nitrogen + NO ₂ + NO ₃ + NH ₃ + Total P	WATER - TPH TRH (C6-C40)	WATER - W-01 7 Metals
ES2414486-001	06-May-2024 11:00	DIS-Sed2	✓	✓	✓	✓	✓	✓	✓
ES2414486-002	06-May-2024 11:30	DIS-Sed1	✓	✓	✓	✓	✓	✓	✓
ES2414486-003	06-May-2024 12:10	SW1	✓	✓	✓	✓	✓	✓	✓

Matrix: **WATER**

Laboratory sample ID	Sampling date / time	Sample ID	WATER - EA010P Electrical Conductivity (Auto Titrator)
ES2414486-001	06-May-2024 11:00	DIS-Sed2	✓
ES2414486-002	06-May-2024 11:30	DIS-Sed1	✓
ES2414486-003	06-May-2024 12:10	SW1	✓

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.



Requested Deliverables

ADMINISTRATOR

- *AU Certificate of Analysis - NATA (COA)	Email	administrator@rca.com.au
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	administrator@rca.com.au
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	administrator@rca.com.au
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	administrator@rca.com.au
- A4 - AU Tax Invoice (INV)	Email	administrator@rca.com.au
- Chain of Custody (CoC) (COC)	Email	administrator@rca.com.au
- EDI Format - ENMRG (ENMRG)	Email	administrator@rca.com.au
- EDI Format - ESDAT (ESDAT)	Email	administrator@rca.com.au
- EDI Format - XTab (XTAB)	Email	administrator@rca.com.au

ALL INVOICES

- A4 - AU Tax Invoice (INV)	Email	administrator@rca.com.au
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ENVIRO

- *AU Certificate of Analysis - NATA (COA)	Email	enviro@rca.com.au
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	enviro@rca.com.au
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	enviro@rca.com.au
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	enviro@rca.com.au
- A4 - AU Tax Invoice (INV)	Email	enviro@rca.com.au
- Chain of Custody (CoC) (COC)	Email	enviro@rca.com.au
- EDI Format - ENMRG (ENMRG)	Email	enviro@rca.com.au
- EDI Format - ESDAT (ESDAT)	Email	enviro@rca.com.au
- EDI Format - XTab (XTAB)	Email	enviro@rca.com.au

FIONA BROOKER

- *AU Certificate of Analysis - NATA (COA)	Email	fionab@rca.com.au
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	fionab@rca.com.au
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	fionab@rca.com.au
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	fionab@rca.com.au
- Chain of Custody (CoC) (COC)	Email	fionab@rca.com.au
- EDI Format - ENMRG (ENMRG)	Email	fionab@rca.com.au
- EDI Format - ESDAT (ESDAT)	Email	fionab@rca.com.au
- EDI Format - XTab (XTAB)	Email	fionab@rca.com.au

Inter-Laboratory Testing

Analysis conducted by ALS Newcastle - Water, NATA accreditation no. 825, site no. 1656 (Chemistry) 9854 (Biology).

(WATER) EA005: pH



CERTIFICATE OF ANALYSIS

Work Order : ES2417412
Client : ROBERT CARR & ASSOCIATES P/L
Contact : MS FIONA BROOKER
Address : 92 HILL STREET
CARRINGTON NSW 2294
Telephone : +61 02 4902 9200
Project : 13589a
Order number : ----
C-O-C number : ----
Sampler : AH
Site : ----
Quote number : EN/222
No. of samples received : 8
No. of samples analysed : 8

Page : 1 of 10
Laboratory : Environmental Division Sydney
Contact : Danae Hambly
Address : 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone : +61-2-8784 8555
Date Samples Received : 28-May-2024 14:19
Date Analysis Commenced : 28-May-2024
Issue Date : 04-Jun-2024 14:03



Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	Position	Accreditation Category
Ankit Joshi	Senior Chemist - Inorganics	Sydney Inorganics, Smithfield, NSW
Edwandy Fadjjar	Organic Coordinator	Sydney Organics, Smithfield, NSW
Gregory Towers	Technical Officer	Chemistry, Newcastle West, NSW
Sanjeshni Jyoti	Senior Chemist Volatiles	Sydney Organics, Smithfield, NSW



General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contract for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.

LOR = Limit of reporting

^ = This result is computed from individual analyte detections at or above the level of reporting

ø = ALS is not NATA accredited for these tests.

~ = Indicates an estimated value.

- EP080: Where reported, Total Xylenes is the sum of the reported concentrations of m&p-Xylene and o-Xylene at or above the LOR.
- EP132: Where reported, Total PAH reported as the sum of Naphthalene, Acenaphthylene, Acenaphthene, Fluorene, Phenanthrene, Anthracene, Fluoranthene, Pyrene, Benz(a)anthracene, Chrysene, Benzo(b)fluoranthene, Benzo(k)fluoranthene, Benzo(a)pyrene, Indeno(1,2,3-cd)pyrene, Dibenzo(a,h)anthracene and Benzo(g,h,i)perylene.

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	GW1	GW3	LP	WL	Sed-2
Sampling date / time				28-May-2024 12:00	28-May-2024 10:30	28-May-2024 10:45	28-May-2024 09:50	28-May-2024 00:00	
Compound	CAS Number	LOR	Unit	ES2417412-001	ES2417412-002	ES2417412-003	ES2417412-004	ES2417412-005	
				Result	Result	Result	Result	Result	
EA005: pH									
pH Value	----	0.01	pH Unit	----	----	7.67	7.22	9.13	
EA010P: Conductivity by PC Titrator									
Electrical Conductivity @ 25°C	----	1	µS/cm	----	----	632	418	505	
EA025: Total Suspended Solids dried at 104 ± 2°C									
Suspended Solids (SS)	----	5	mg/L	----	----	<5	<5	50	
EG020F: Dissolved Metals by ICP-MS									
Aluminium	7429-90-5	0.01	mg/L	----	----	----	----	0.14	
Arsenic	7440-38-2	0.001	mg/L	----	----	----	----	0.011	
Cadmium	7440-43-9	0.0001	mg/L	----	----	----	----	<0.0001	
Chromium	7440-47-3	0.001	mg/L	----	----	----	----	0.033	
Copper	7440-50-8	0.001	mg/L	----	----	----	----	0.009	
Cobalt	7440-48-4	0.001	mg/L	----	----	----	----	0.001	
Nickel	7440-02-0	0.001	mg/L	----	----	----	----	0.002	
Lead	7439-92-1	0.001	mg/L	----	----	----	----	<0.001	
Zinc	7440-66-6	0.005	mg/L	----	----	----	----	<0.005	
Selenium	7782-49-2	0.01	mg/L	----	----	----	----	<0.01	
Boron	7440-42-8	0.05	mg/L	----	----	----	----	0.06	
EG050G LL-F: Dissolved Hexavalent Chromium by Discrete Analyser - Low Level									
Hexavalent Chromium	18540-29-9	0.001	mg/L	----	----	----	----	0.035	
EK055G: Ammonia as N by Discrete Analyser									
Ammonia as N	7664-41-7	0.01	mg/L	2.14	1.93	0.60	0.01	0.12	
EK057G: Nitrite as N by Discrete Analyser									
Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	0.13	
EK058G: Nitrate as N by Discrete Analyser									
Nitrate as N	14797-55-8	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	6.04	
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser									
Nitrite + Nitrate as N	----	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	6.17	
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser									



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	GW1	GW3	LP	WL	Sed-2
Sampling date / time					28-May-2024 12:00	28-May-2024 10:30	28-May-2024 10:45	28-May-2024 09:50	28-May-2024 00:00
Compound	CAS Number	LOR	Unit		ES2417412-001	ES2417412-002	ES2417412-003	ES2417412-004	ES2417412-005
					Result	Result	Result	Result	Result
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser - Continued									
Total Kjeldahl Nitrogen as N	----	0.1	mg/L		----	----	2.3	2.0	2.0
EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser									
[^] Total Nitrogen as N	----	0.1	mg/L		----	----	2.3	2.0	8.2
EK067G: Total Phosphorus as P by Discrete Analyser									
Total Phosphorus as P	----	0.01	mg/L		0.26	0.14	0.54	0.65	0.24
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	20	µg/L		<20	<20	----	----	<20
C10 - C14 Fraction	----	50	µg/L		<50	<50	----	----	<50
C15 - C28 Fraction	----	100	µg/L		110	100	----	----	<100
C29 - C36 Fraction	----	50	µg/L		<50	<50	----	----	<50
[^] C10 - C36 Fraction (sum)	----	50	µg/L		110	100	----	----	<50
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction	C6_C10	20	µg/L		<20	<20	----	----	<20
[^] C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	20	µg/L		<20	<20	----	----	<20
>C10 - C16 Fraction	----	100	µg/L		<100	<100	----	----	<100
>C16 - C34 Fraction	----	100	µg/L		110	<100	----	----	<100
>C34 - C40 Fraction	----	100	µg/L		<100	<100	----	----	<100
[^] >C10 - C40 Fraction (sum)	----	100	µg/L		110	<100	----	----	<100
[^] >C10 - C16 Fraction minus Naphthalene (F2)	----	100	µg/L		<100	<100	----	----	<100
EP080: BTEXN									
Benzene	71-43-2	1	µg/L		<1	<1	----	----	<1
Toluene	108-88-3	2	µg/L		<2	<2	----	----	<2
Ethylbenzene	100-41-4	2	µg/L		<2	<2	----	----	<2
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L		<2	<2	----	----	<2
ortho-Xylene	95-47-6	2	µg/L		<2	<2	----	----	<2
[^] Total Xylenes	----	2	µg/L		<2	<2	----	----	<2



Analytical Results

Sub-Matrix: WATER
 (Matrix: WATER)

Sample ID

				GW1	GW3	LP	WL	Sed-2
Sampling date / time				28-May-2024 12:00	28-May-2024 10:30	28-May-2024 10:45	28-May-2024 09:50	28-May-2024 00:00
Compound	CAS Number	LOR	Unit	ES2417412-001	ES2417412-002	ES2417412-003	ES2417412-004	ES2417412-005
				Result	Result	Result	Result	Result
EP080: BTEXN - Continued								
^ Sum of BTEX	----	1	µg/L	<1	<1	----	----	<1
Naphthalene	91-20-3	5	µg/L	<5	<5	----	----	<5
EP132B: Polynuclear Aromatic Hydrocarbons								
3-Methylcholanthrene	56-49-5	0.1	µg/L	<0.1	<0.1	----	----	----
2-Methylnaphthalene	91-57-6	0.1	µg/L	<0.1	<0.1	----	----	----
7.12-Dimethylbenz(a)anthracene	57-97-6	0.1	µg/L	<0.1	<0.1	----	----	----
Acenaphthene	83-32-9	0.1	µg/L	<0.1	<0.1	----	----	----
Acenaphthylene	208-96-8	0.1	µg/L	<0.1	<0.1	----	----	----
Anthracene	120-12-7	0.1	µg/L	<0.1	<0.1	----	----	----
Benz(a)anthracene	56-55-3	0.1	µg/L	<0.1	<0.1	----	----	----
Benzo(a)pyrene	50-32-8	0.05	µg/L	<0.05	<0.05	----	----	----
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.1	µg/L	<0.1	<0.1	----	----	----
Benzo(e)pyrene	192-97-2	0.1	µg/L	<0.1	<0.1	----	----	----
Benzo(g,h,i)perylene	191-24-2	0.1	µg/L	<0.1	<0.1	----	----	----
Benzo(k)fluoranthene	207-08-9	0.1	µg/L	<0.1	<0.1	----	----	----
Chrysene	218-01-9	0.1	µg/L	<0.1	<0.1	----	----	----
Coronene	191-07-1	0.1	µg/L	<0.1	<0.1	----	----	----
Dibenz(a,h)anthracene	53-70-3	0.1	µg/L	<0.1	<0.1	----	----	----
Fluoranthene	206-44-0	0.1	µg/L	<0.1	<0.1	----	----	----
Fluorene	86-73-7	0.1	µg/L	<0.1	<0.1	----	----	----
Indeno(1.2.3.cd)pyrene	193-39-5	0.1	µg/L	<0.1	<0.1	----	----	----
Naphthalene	91-20-3	0.1	µg/L	<0.1	<0.1	----	----	----
Perylene	198-55-0	0.1	µg/L	<0.1	<0.1	----	----	----
Phenanthrene	85-01-8	0.1	µg/L	<0.1	<0.1	----	----	----
Pyrene	129-00-0	0.1	µg/L	<0.1	<0.1	----	----	----
^ Sum of PAHs	----	0.05	µg/L	<0.05	<0.05	----	----	----
^ Benzo(a)pyrene TEQ (zero)	----	0.05	µg/L	<0.05	<0.05	----	----	----



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	GW1	GW3	LP	WL	Sed-2
Sampling date / time					28-May-2024 12:00	28-May-2024 10:30	28-May-2024 10:45	28-May-2024 09:50	28-May-2024 00:00
Compound	CAS Number	LOR	Unit		ES2417412-001	ES2417412-002	ES2417412-003	ES2417412-004	ES2417412-005
					Result	Result	Result	Result	Result
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	2	%		84.4	80.8	----	----	82.6
Toluene-D8	2037-26-5	2	%		97.9	99.1	----	----	98.6
4-Bromofluorobenzene	460-00-4	2	%		118	118	----	----	118
EP132T: Base/Neutral Extractable Surrogates									
2-Fluorobiphenyl	321-60-8	0.1	%		78.7	78.9	----	----	----
Anthracene-d10	1719-06-8	0.1	%		85.0	93.1	----	----	----
4-Terphenyl-d14	1718-51-0	0.1	%		83.5	122	----	----	----

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	Sed-1	SW1	QA052024	----	----
Sampling date / time				28-May-2024 12:55	28-May-2024 13:35	28-May-2024 00:00	----	----	
Compound	CAS Number	LOR	Unit	ES2417412-006	ES2417412-007	ES2417412-008	-----	-----	
				Result	Result	Result	----	----	
EA005: pH									
pH Value	----	0.01	pH Unit	9.94	7.76	----	----	----	
EA005P: pH by PC Titrator									
pH Value	----	0.01	pH Unit	----	----	8.81	----	----	
EA010P: Conductivity by PC Titrator									
Electrical Conductivity @ 25°C	----	1	µS/cm	507	862	536	----	----	
EA025: Total Suspended Solids dried at 104 ± 2°C									
Suspended Solids (SS)	----	5	mg/L	<5	13	46	----	----	
EG020F: Dissolved Metals by ICP-MS									
Aluminium	7429-90-5	0.01	mg/L	0.22	1.09	0.12	----	----	
Arsenic	7440-38-2	0.001	mg/L	0.003	0.001	0.011	----	----	
Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	<0.0001	----	----	
Chromium	7440-47-3	0.001	mg/L	0.050	0.006	0.033	----	----	
Copper	7440-50-8	0.001	mg/L	0.006	0.006	0.008	----	----	
Cobalt	7440-48-4	0.001	mg/L	0.002	0.001	0.001	----	----	
Nickel	7440-02-0	0.001	mg/L	<0.001	0.006	0.001	----	----	
Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	<0.001	----	----	
Zinc	7440-66-6	0.005	mg/L	<0.005	<0.005	<0.005	----	----	
Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	<0.01	----	----	
Boron	7440-42-8	0.05	mg/L	0.06	0.06	0.06	----	----	
EG050G LL-F: Dissolved Hexavalent Chromium by Discrete Analyser - Low Level									
Hexavalent Chromium	18540-29-9	0.001	mg/L	0.055	<0.001	0.035	----	----	
EK055G: Ammonia as N by Discrete Analyser									
Ammonia as N	7664-41-7	0.01	mg/L	0.09	0.03	0.14	----	----	
EK057G: Nitrite as N by Discrete Analyser									
Nitrite as N	14797-65-0	0.01	mg/L	0.67	<0.01	0.13	----	----	
EK058G: Nitrate as N by Discrete Analyser									
Nitrate as N	14797-55-8	0.01	mg/L	3.95	0.05	5.94	----	----	
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser									



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	Sed-1	SW1	QA052024	----	----
Sampling date / time					28-May-2024 12:55	28-May-2024 13:35	28-May-2024 00:00	----	----
Compound	CAS Number	LOR	Unit		ES2417412-006	ES2417412-007	ES2417412-008	-----	-----
					Result	Result	Result	----	----
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser - Continued									
Nitrite + Nitrate as N	----	0.01	mg/L		4.62	0.05	6.07	----	----
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser									
Total Kjeldahl Nitrogen as N	----	0.1	mg/L		0.9	0.5	2.2	----	----
EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser									
^ Total Nitrogen as N	----	0.1	mg/L		5.5	0.6	8.3	----	----
EK067G: Total Phosphorus as P by Discrete Analyser									
Total Phosphorus as P	----	0.01	mg/L		<0.01	0.02	0.24	----	----
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	20	µg/L		<20	<20	<20	----	----
C10 - C14 Fraction	----	50	µg/L		<50	<50	<50	----	----
C15 - C28 Fraction	----	100	µg/L		<100	<100	<100	----	----
C29 - C36 Fraction	----	50	µg/L		<50	<50	<50	----	----
^ C10 - C36 Fraction (sum)	----	50	µg/L		<50	<50	<50	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction	C6_C10	20	µg/L		<20	<20	<20	----	----
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	20	µg/L		<20	<20	<20	----	----
>C10 - C16 Fraction	----	100	µg/L		<100	<100	<100	----	----
>C16 - C34 Fraction	----	100	µg/L		<100	<100	<100	----	----
>C34 - C40 Fraction	----	100	µg/L		<100	<100	<100	----	----
^ >C10 - C40 Fraction (sum)	----	100	µg/L		<100	<100	<100	----	----
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	100	µg/L		<100	<100	<100	----	----
EP080: BTEXN									
Benzene	71-43-2	1	µg/L		<1	<1	<1	----	----
Toluene	108-88-3	2	µg/L		<2	<2	<2	----	----
Ethylbenzene	100-41-4	2	µg/L		<2	<2	<2	----	----
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L		<2	<2	<2	----	----



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	Sed-1	SW1	QA052024	----	----
Sampling date / time					28-May-2024 12:55	28-May-2024 13:35	28-May-2024 00:00	----	----
Compound	CAS Number	LOR	Unit		ES2417412-006	ES2417412-007	ES2417412-008	-----	-----
					Result	Result	Result	----	----
EP080: BTEXN - Continued									
ortho-Xylene	95-47-6	2	µg/L		<2	<2	<2	----	----
^ Total Xylenes	----	2	µg/L		<2	<2	<2	----	----
^ Sum of BTEX	----	1	µg/L		<1	<1	<1	----	----
Naphthalene	91-20-3	5	µg/L		<5	<5	<5	----	----
EP080S: TPH(V)/BTEX Surrogates									
1,2-Dichloroethane-D4	17060-07-0	2	%		84.5	83.9	116	----	----
Toluene-D8	2037-26-5	2	%		95.9	98.5	105	----	----
4-Bromofluorobenzene	460-00-4	2	%		117	120	108	----	----



Surrogate Control Limits

Sub-Matrix: WATER		Recovery Limits (%)	
Compound	CAS Number	Low	High
EP080S: TPH(V)/BTEX Surrogates			
1,2-Dichloroethane-D4	17060-07-0	72	143
Toluene-D8	2037-26-5	75	131
4-Bromofluorobenzene	460-00-4	73	137
EP132T: Base/Neutral Extractable Surrogates			
2-Fluorobiphenyl	321-60-8	43	135
Anthracene-d10	1719-06-8	48	138
4-Terphenyl-d14	1718-51-0	48	144

Inter-Laboratory Testing

Analysis conducted by ALS Newcastle - Water, NATA accreditation no. 825, site no. 1656 (Chemistry) 9854 (Biology).
(WATER) EA005: pH



QUALITY CONTROL REPORT

Work Order : **ES2417412**

Page : 1 of 11

Client : **ROBERT CARR & ASSOCIATES P/L**

Laboratory : Environmental Division Sydney

Contact : MS FIONA BROOKER

Contact : Danae Hambly

Address : 92 HILL STREET
CARRINGTON NSW 2294

Address : 277-289 Woodpark Road Smithfield NSW Australia 2164

Telephone : +61 02 4902 9200

Telephone : +61-2-8784 8555

Project : 13589a

Date Samples Received : 28-May-2024

Order number : ----

Date Analysis Commenced : 28-May-2024

C-O-C number : ----

Issue Date : 04-Jun-2024

Sampler : AH

Site : ----

Quote number : EN/222

No. of samples received : 8

No. of samples analysed : 8



Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	Position	Accreditation Category
Ankit Joshi	Senior Chemist - Inorganics	Sydney Inorganics, Smithfield, NSW
Edwandy Fadjar	Organic Coordinator	Sydney Organics, Smithfield, NSW
Gregory Towers	Technical Officer	Chemistry, Newcastle West, NSW
Sanjeshni Jyoti	Senior Chemist Volatiles	Sydney Organics, Smithfield, NSW



General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot

CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.

LOR = Limit of reporting

RPD = Relative Percentage Difference

= Indicates failed QC

* = The final LOR has been raised due to dilution or other sample specific cause; adjusted LOR is shown in brackets. The duplicate ranges for Acceptable RPD% are applied to the final LOR where applicable.

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EA005: pH (QC Lot: 5822172)									
WN2406227-001	Anonymous	EA005: pH Value	----	0.01	pH Unit	7.13	8.53	17.9	0% - 20%
WN2406411-001	Anonymous	EA005: pH Value	----	0.01	pH Unit	8.79	8.79	0.0	0% - 20%
EA005P: pH by PC Titrator (QC Lot: 5832230)									
ES2417364-001	Anonymous	EA005-P: pH Value	----	0.01	pH Unit	7.00	7.00	0.0	0% - 20%
ES2417427-003	Anonymous	EA005-P: pH Value	----	0.01	pH Unit	6.34	6.17	2.7	0% - 20%
EA010P: Conductivity by PC Titrator (QC Lot: 5821206)									
ES2417393-001	Anonymous	EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	480	482	0.4	0% - 20%
EA010P: Conductivity by PC Titrator (QC Lot: 5832229)									
EW2402497-007	Anonymous	EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	420	429	2.2	0% - 20%
EW2402497-003	Anonymous	EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	127	108	16.7	0% - 20%
ES2417364-001	Anonymous	EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	203	202	0.6	0% - 20%
ES2417427-003	Anonymous	EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	28	24	16.6	0% - 20%
EA025: Total Suspended Solids dried at 104 ± 2°C (QC Lot: 5824392)									
ES2417276-001	Anonymous	EA025H: Suspended Solids (SS)	----	5	mg/L	96	84	13.1	0% - 50%
ES2417379-003	Anonymous	EA025H: Suspended Solids (SS)	----	5	mg/L	486	458	6.0	0% - 20%
ES2417412-005	Sed-2	EA025H: Suspended Solids (SS)	----	5	mg/L	50	47	7.2	0% - 50%
ES2417427-007	Anonymous	EA025H: Suspended Solids (SS)	----	5	mg/L	<5	<5	0.0	No Limit
EG020F: Dissolved Metals by ICP-MS (QC Lot: 5825331)									
ES2417394-008	Anonymous	EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
		EG020A-F: Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	0.0	No Limit



Sub-Matrix: WATER				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EG020F: Dissolved Metals by ICP-MS (QC Lot: 5825331) - continued									
ES2417394-008	Anonymous	EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Cobalt	7440-48-4	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Copper	7440-50-8	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Nickel	7440-02-0	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Zinc	7440-66-6	0.005	mg/L	<0.005	<0.005	0.0	No Limit
		EG020A-F: Aluminium	7429-90-5	0.01	mg/L	<0.01	<0.01	0.0	No Limit
		EG020A-F: Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	0.0	No Limit
		EG020A-F: Boron	7440-42-8	0.05	mg/L	<0.05	<0.05	0.0	No Limit
ES2417641-004	Anonymous	EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
		EG020A-F: Arsenic	7440-38-2	0.001	mg/L	0.001	0.001	0.0	No Limit
		EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Cobalt	7440-48-4	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Copper	7440-50-8	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Nickel	7440-02-0	0.001	mg/L	0.002	0.002	0.0	No Limit
		EG020A-F: Zinc	7440-66-6	0.005	mg/L	<0.005	<0.005	0.0	No Limit
		EG020A-F: Aluminium	7429-90-5	0.01	mg/L	<0.01	<0.01	0.0	No Limit
		EG020A-F: Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	0.0	No Limit
		EG020A-F: Boron	7440-42-8	0.05	mg/L	0.61	0.57	5.9	0% - 50%
EG050G LL-F: Dissolved Hexavalent Chromium by Discrete Analyser - Low Level (QC Lot: 5830350)									
ES2417412-005	Sed-2	EG050G: Hexavalent Chromium	18540-29-9	0.001	mg/L	0.035	0.035	0.0	0% - 20%
EK055G: Ammonia as N by Discrete Analyser (QC Lot: 5827737)									
ES2417373-001	Anonymous	EK055G: Ammonia as N	7664-41-7	0.01	mg/L	35.2	35.3	0.4	0% - 20%
ES2417412-005	Sed-2	EK055G: Ammonia as N	7664-41-7	0.01	mg/L	0.12	0.11	9.5	0% - 50%
EK057G: Nitrite as N by Discrete Analyser (QC Lot: 5824246)									
ES2417412-001	GW1	EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	0.01	0.0	No Limit
ES2417515-002	Anonymous	EK057G: Nitrite as N	14797-65-0	0.01	mg/L	0.06	0.05	0.0	No Limit
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QC Lot: 5827736)									
ES2417373-001	Anonymous	EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	0.14	0.14	0.0	0% - 50%
ES2417412-005	Sed-2	EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	6.17	6.07	1.6	0% - 20%
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QC Lot: 5827741)									
ES2417373-001	Anonymous	EK061G: Total Kjeldahl Nitrogen as N	----	0.1	mg/L	44.2	46.2	4.4	0% - 20%
ES2417412-005	Sed-2	EK061G: Total Kjeldahl Nitrogen as N	----	0.1 (0.5)*	mg/L	2.0	2.1	0.0	No Limit
EK067G: Total Phosphorus as P by Discrete Analyser (QC Lot: 5827740)									
ES2417373-001	Anonymous	EK067G: Total Phosphorus as P	----	0.01	mg/L	4.91	4.90	0.2	0% - 20%
ES2417412-005	Sed-2	EK067G: Total Phosphorus as P	----	0.01 (0.05)*	mg/L	0.24	0.23	0.0	No Limit

Page : 4 of 11
 Work Order : ES2417412
 Client : ROBERT CARR & ASSOCIATES P/L
 Project : 13589a



Sub-Matrix: WATER				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 5821861)									
ES2417412-001	GW1	EP071: C15 - C28 Fraction	----	100	µg/L	110	<100	0.0	No Limit
		EP071: C10 - C14 Fraction	----	50	µg/L	<50	<50	0.0	No Limit
		EP071: C29 - C36 Fraction	----	50	µg/L	<50	<50	0.0	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 5822469)									
CA2403167-005	Anonymous	EP080: C6 - C9 Fraction	----	20	µg/L	<20	<20	0.0	No Limit
ES2417412-001	GW1	EP080: C6 - C9 Fraction	----	20	µg/L	<20	<20	0.0	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 5825027)									
CA2403167-013	Anonymous	EP080: C6 - C9 Fraction	----	20	µg/L	<20	<20	0.0	No Limit
ES2417464-019	Anonymous	EP080: C6 - C9 Fraction	----	20	µg/L	<20	<20	0.0	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 5821861)									
ES2417412-001	GW1	EP071: >C10 - C16 Fraction	----	100	µg/L	<100	<100	0.0	No Limit
		EP071: >C16 - C34 Fraction	----	100	µg/L	110	<100	11.7	No Limit
		EP071: >C34 - C40 Fraction	----	100	µg/L	<100	<100	0.0	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 5822469)									
CA2403167-005	Anonymous	EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	0.0	No Limit
ES2417412-001	GW1	EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	0.0	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 5825027)									
CA2403167-013	Anonymous	EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	0.0	No Limit
ES2417464-019	Anonymous	EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	0.0	No Limit
EP080: BTEXN (QC Lot: 5822469)									
CA2403167-005	Anonymous	EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.0	No Limit
		EP080: Toluene	108-88-3	2	µg/L	<2	<2	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	2	µg/L	<2	<2	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	0.0	No Limit
		EP080: ortho-Xylene	95-47-6	2	µg/L	<2	<2	0.0	No Limit
		EP080: Naphthalene	91-20-3	5	µg/L	<5	<5	0.0	No Limit
ES2417412-001	GW1	EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.0	No Limit
		EP080: Toluene	108-88-3	2	µg/L	<2	<2	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	2	µg/L	<2	<2	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	0.0	No Limit
		EP080: ortho-Xylene	95-47-6	2	µg/L	<2	<2	0.0	No Limit
		EP080: Naphthalene	91-20-3	5	µg/L	<5	<5	0.0	No Limit
EP080: BTEXN (QC Lot: 5825027)									
CA2403167-013	Anonymous	EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.0	No Limit
		EP080: Toluene	108-88-3	2	µg/L	<2	<2	0.0	No Limit



Sub-Matrix: WATER				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EP080: BTEXN (QC Lot: 5825027) - continued									
CA2403167-013	Anonymous	EP080: Ethylbenzene	100-41-4	2	µg/L	<2	<2	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3	2	µg/L	<2	<2	0.0	No Limit
			106-42-3						
		EP080: ortho-Xylene	95-47-6	2	µg/L	<2	<2	0.0	No Limit
ES2417464-019	Anonymous	EP080: Naphthalene	91-20-3	5	µg/L	<5	<5	0.0	No Limit
		EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.0	No Limit
		EP080: Toluene	108-88-3	2	µg/L	<2	<2	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	2	µg/L	<2	<2	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3	2	µg/L	<2	<2	0.0	No Limit
			106-42-3						
		EP080: ortho-Xylene	95-47-6	2	µg/L	<2	<2	0.0	No Limit
	EP080: Naphthalene	91-20-3	5	µg/L	<5	<5	0.0	No Limit	
EP132B: Polynuclear Aromatic Hydrocarbons (QC Lot: 5821854)									
ES2417412-001	GW1	EP132: Benzo(a)pyrene	50-32-8	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP132: 3-Methylcholanthrene	56-49-5	0.1	µg/L	<0.1	<0.1	0.0	No Limit
		EP132: 2-Methylnaphthalene	91-57-6	0.1	µg/L	<0.1	<0.1	0.0	No Limit
		EP132: 7,12-Dimethylbenz(a)anthracene	57-97-6	0.1	µg/L	<0.1	<0.1	0.0	No Limit
		EP132: Acenaphthene	83-32-9	0.1	µg/L	<0.1	<0.1	0.0	No Limit
		EP132: Acenaphthylene	208-96-8	0.1	µg/L	<0.1	<0.1	0.0	No Limit
		EP132: Anthracene	120-12-7	0.1	µg/L	<0.1	<0.1	0.0	No Limit
		EP132: Benz(a)anthracene	56-55-3	0.1	µg/L	<0.1	<0.1	0.0	No Limit
		EP132: Benzo(b+j)fluoranthene	205-99-2	0.1	µg/L	<0.1	<0.1	0.0	No Limit
			205-82-3						
		EP132: Benzo(e)pyrene	192-97-2	0.1	µg/L	<0.1	<0.1	0.0	No Limit
		EP132: Benzo(g,h,i)perylene	191-24-2	0.1	µg/L	<0.1	<0.1	0.0	No Limit
		EP132: Benzo(k)fluoranthene	207-08-9	0.1	µg/L	<0.1	<0.1	0.0	No Limit
		EP132: Chrysene	218-01-9	0.1	µg/L	<0.1	<0.1	0.0	No Limit
		EP132: Coronene	191-07-1	0.1	µg/L	<0.1	<0.1	0.0	No Limit
		EP132: Dibenz(a,h)anthracene	53-70-3	0.1	µg/L	<0.1	<0.1	0.0	No Limit
		EP132: Fluoranthene	206-44-0	0.1	µg/L	<0.1	<0.1	0.0	No Limit
		EP132: Fluorene	86-73-7	0.1	µg/L	<0.1	<0.1	0.0	No Limit
		EP132: Indeno(1,2,3.cd)pyrene	193-39-5	0.1	µg/L	<0.1	<0.1	0.0	No Limit
		EP132: Naphthalene	91-20-3	0.1	µg/L	<0.1	<0.1	0.0	No Limit
		EP132: Perylene	198-55-0	0.1	µg/L	<0.1	<0.1	0.0	No Limit
		EP132: Phenanthrene	85-01-8	0.1	µg/L	<0.1	<0.1	0.0	No Limit
		EP132: Pyrene	129-00-0	0.1	µg/L	<0.1	<0.1	0.0	No Limit



Method Blank (MB) and Laboratory Control Sample (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **WATER**

Sub-Matrix: WATER				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike Concentration	Spike Recovery (%) LCS	Acceptable Limits (%) Low High	
Method: Compound	CAS Number	LOR	Unit	Result				
EA005: pH (QCLot: 5822172)								
EA005: pH Value	----	----	pH Unit	----	7.6 pH Unit	100	98.5	102
EA005P: pH by PC Titrator (QCLot: 5832230)								
EA005-P: pH Value	----	----	pH Unit	----	4 pH Unit	100	98.8	101
				----	7 pH Unit	100	99.2	101
EA010P: Conductivity by PC Titrator (QCLot: 5821206)								
EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	<1	220 µS/cm	96.2	89.9	110
				<1	2100 µS/cm	95.9	90.2	111
EA010P: Conductivity by PC Titrator (QCLot: 5832229)								
EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	<1	220 µS/cm	102	89.9	110
				<1	2100 µS/cm	99.4	90.2	111
EA025: Total Suspended Solids dried at 104 ± 2°C (QCLot: 5824392)								
EA025H: Suspended Solids (SS)	----	5	mg/L	<5	150 mg/L	95.7	83.0	129
				<5	1000 mg/L	98.2	82.0	110
				<5	928 mg/L	94.9	83.0	118
EG020F: Dissolved Metals by ICP-MS (QCLot: 5825331)								
EG020A-F: Aluminium	7429-90-5	0.01	mg/L	<0.01	0.5 mg/L	94.5	80.0	116
EG020A-F: Arsenic	7440-38-2	0.001	mg/L	<0.001	0.1 mg/L	94.4	85.0	114
EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	0.1 mg/L	93.1	84.0	110
EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	0.1 mg/L	95.3	85.0	111
EG020A-F: Cobalt	7440-48-4	0.001	mg/L	<0.001	0.1 mg/L	93.6	82.0	112
EG020A-F: Copper	7440-50-8	0.001	mg/L	<0.001	0.1 mg/L	94.6	81.0	111
EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	0.1 mg/L	90.7	83.0	111
EG020A-F: Nickel	7440-02-0	0.001	mg/L	<0.001	0.1 mg/L	89.9	82.0	112
EG020A-F: Selenium	7782-49-2	0.01	mg/L	<0.01	0.1 mg/L	88.2	85.0	115
EG020A-F: Zinc	7440-66-6	0.005	mg/L	<0.005	0.1 mg/L	95.4	81.0	117
EG020A-F: Boron	7440-42-8	0.05	mg/L	<0.05	0.5 mg/L	107	85.0	115
EG050G LL-F: Dissolved Hexavalent Chromium by Discrete Analyser - Low Level (QCLot: 5830350)								
EG050G: Hexavalent Chromium	18540-29-9	0.001	mg/L	<0.001	0.05 mg/L	101	81.0	115
EK055G: Ammonia as N by Discrete Analyser (QCLot: 5827737)								
EK055G: Ammonia as N	7664-41-7	0.01	mg/L	<0.01	0.5 mg/L	98.6	90.0	114

Sub-Matrix: WATER				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike Concentration	Spike Recovery (%) LCS	Acceptable Limits (%) LowHigh	
Method: Compound	CAS Number	LOR	Unit	Result				
EK057G: Nitrite as N by Discrete Analyser (QCLot: 5824246)								
EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	0.5 mg/L	102	82.0	114
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 5827736)								
EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	<0.01	0.5 mg/L	107	91.0	113
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QCLot: 5827741)								
EK061G: Total Kjeldahl Nitrogen as N	----	0.1	mg/L	<0.1	10 mg/L	91.7	69.0	123
				<0.1	1 mg/L	89.5	70.0	123
				<0.1	5 mg/L	97.8	70.0	123
EK067G: Total Phosphorus as P by Discrete Analyser (QCLot: 5827740)								
EK067G: Total Phosphorus as P	----	0.01	mg/L	<0.01	4.42 mg/L	96.1	71.3	126
				<0.01	0.442 mg/L	108	71.3	126
				<0.01	1 mg/L	107	70.0	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 5821861)								
EP071: C10 - C14 Fraction	----	50	µg/L	<50	400 µg/L	61.3	53.7	97.0
EP071: C15 - C28 Fraction	----	100	µg/L	<100	600 µg/L	85.7	63.3	107
EP071: C29 - C36 Fraction	----	50	µg/L	<50	400 µg/L	79.2	58.3	120
EP080/071: Total Petroleum Hydrocarbons (QCLot: 5822469)								
EP080: C6 - C9 Fraction	----	20	µg/L	<20	260 µg/L	86.4	75.0	127
EP080/071: Total Petroleum Hydrocarbons (QCLot: 5823482)								
EP071: C10 - C14 Fraction	----	50	µg/L	<50	400 µg/L	67.0	53.7	97.0
EP071: C15 - C28 Fraction	----	100	µg/L	<100	600 µg/L	82.6	63.3	107
EP071: C29 - C36 Fraction	----	50	µg/L	<50	400 µg/L	74.5	58.3	120
EP080/071: Total Petroleum Hydrocarbons (QCLot: 5825027)								
EP080: C6 - C9 Fraction	----	20	µg/L	<20	260 µg/L	85.8	75.0	127
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 5821861)								
EP071: >C10 - C16 Fraction	----	100	µg/L	<100	500 µg/L	59.7	53.9	95.5
EP071: >C16 - C34 Fraction	----	100	µg/L	<100	700 µg/L	58.1	57.8	110
EP071: >C34 - C40 Fraction	----	100	µg/L	<100	300 µg/L	73.4	50.5	115
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 5822469)								
EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	310 µg/L	82.4	75.0	127
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 5823482)								
EP071: >C10 - C16 Fraction	----	100	µg/L	<100	500 µg/L	56.5	53.9	95.5
EP071: >C16 - C34 Fraction	----	100	µg/L	<100	700 µg/L	79.3	57.8	110
EP071: >C34 - C40 Fraction	----	100	µg/L	<100	300 µg/L	67.2	50.5	115
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 5825027)								



Sub-Matrix: **WATER**

Sub-Matrix: WATER				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike Concentration	Spike Recovery (%) LCS	Acceptable Limits (%) Low High	
Method: Compound	CAS Number	LOR	Unit	Result				
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 5825027) - continued								
EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	310 µg/L	86.5	75.0	127
EP080: BTEXN (QCLot: 5822469)								
EP080: Benzene	71-43-2	1	µg/L	<1	10 µg/L	88.1	68.3	119
EP080: Toluene	108-88-3	2	µg/L	<2	10 µg/L	81.1	73.5	120
EP080: Ethylbenzene	100-41-4	2	µg/L	<2	10 µg/L	95.2	73.8	122
EP080: meta- & para-Xylene	108-38-3	2	µg/L	<2	10 µg/L	86.5	73.0	122
	106-42-3							
EP080: ortho-Xylene	95-47-6	2	µg/L	<2	10 µg/L	90.7	76.4	123
EP080: Naphthalene	91-20-3	5	µg/L	<5	10 µg/L	99.4	75.5	124
EP080: BTEXN (QCLot: 5825027)								
EP080: Benzene	71-43-2	1	µg/L	<1	10 µg/L	107	68.3	119
EP080: Toluene	108-88-3	2	µg/L	<2	10 µg/L	96.4	73.5	120
EP080: Ethylbenzene	100-41-4	2	µg/L	<2	10 µg/L	97.9	73.8	122
EP080: meta- & para-Xylene	108-38-3	2	µg/L	<2	10 µg/L	98.7	73.0	122
	106-42-3							
EP080: ortho-Xylene	95-47-6	2	µg/L	<2	10 µg/L	100	76.4	123
EP080: Naphthalene	91-20-3	5	µg/L	<5	10 µg/L	110	75.5	124
EP132B: Polynuclear Aromatic Hydrocarbons (QCLot: 5821854)								
EP132: 3-Methylcholanthrene	56-49-5	0.1	µg/L	<0.1	2 µg/L	105	60.0	120
EP132: 2-Methylnaphthalene	91-57-6	0.1	µg/L	<0.1	2 µg/L	92.8	59.0	123
EP132: 7.12-Dimethylbenz(a)anthracene	57-97-6	0.1	µg/L	<0.1	2 µg/L	111	36.0	144
EP132: Acenaphthene	83-32-9	0.1	µg/L	<0.1	2 µg/L	96.6	64.0	122
EP132: Acenaphthylene	208-96-8	0.1	µg/L	<0.1	2 µg/L	95.2	64.0	126
EP132: Anthracene	120-12-7	0.1	µg/L	<0.1	2 µg/L	120	65.0	127
EP132: Benz(a)anthracene	56-55-3	0.1	µg/L	<0.1	2 µg/L	102	64.0	130
EP132: Benzo(a)pyrene	50-32-8	0.05	µg/L	<0.05	2 µg/L	100	64.0	126
EP132: Benzo(b+j)fluoranthene	205-99-2	0.1	µg/L	<0.1	2 µg/L	101	62.0	126
	205-82-3							
EP132: Benzo(e)pyrene	192-97-2	0.1	µg/L	<0.1	2 µg/L	103	62.0	126
EP132: Benzo(g,h,i)perylene	191-24-2	0.1	µg/L	<0.1	2 µg/L	93.8	56.0	126
EP132: Benzo(k)fluoranthene	207-08-9	0.1	µg/L	<0.1	2 µg/L	98.2	68.0	130
EP132: Chrysene	218-01-9	0.1	µg/L	<0.1	2 µg/L	98.2	66.0	130
EP132: Coronene	191-07-1	0.1	µg/L	<0.1	2 µg/L	111	35.0	133
EP132: Dibenzo(a,h)anthracene	53-70-3	0.1	µg/L	<0.1	2 µg/L	96.4	58.0	128
EP132: Fluoranthene	206-44-0	0.1	µg/L	<0.1	2 µg/L	97.4	65.0	127



Sub-Matrix: **WATER**

Sub-Matrix: WATER				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike Concentration	Spike Recovery (%) LCS	Acceptable Limits (%) Low High	
Method: Compound	CAS Number	LOR	Unit	Result				
EP132B: Polynuclear Aromatic Hydrocarbons (QCLot: 5821854) - continued								
EP132: Fluorene	86-73-7	0.1	µg/L	<0.1	2 µg/L	94.8	64.0	124
EP132: Indeno(1.2.3.cd)pyrene	193-39-5	0.1	µg/L	<0.1	2 µg/L	99.5	57.0	127
EP132: Naphthalene	91-20-3	0.1	µg/L	<0.1	2 µg/L	87.0	54.0	128
EP132: Perylene	198-55-0	0.1	µg/L	<0.1	2 µg/L	99.0	66.0	130
EP132: Phenanthrene	85-01-8	0.1	µg/L	<0.1	2 µg/L	94.8	65.0	129
EP132: Pyrene	129-00-0	0.1	µg/L	<0.1	2 µg/L	97.5	66.0	128

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **WATER**

Sub-Matrix: WATER				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EG020F: Dissolved Metals by ICP-MS (QCLot: 5825331)							
ES2417412-005	Sed-2	EG020A-F: Arsenic	7440-38-2	2 mg/L	105	70.0	130
		EG020A-F: Cadmium	7440-43-9	0.5 mg/L	105	70.0	130
		EG020A-F: Chromium	7440-47-3	2 mg/L	110	70.0	130
		EG020A-F: Cobalt	7440-48-4	2 mg/L	105	70.0	130
		EG020A-F: Copper	7440-50-8	2 mg/L	110	70.0	130
		EG020A-F: Lead	7439-92-1	2 mg/L	113	70.0	130
		EG020A-F: Nickel	7440-02-0	2 mg/L	102	70.0	130
		EG020A-F: Zinc	7440-66-6	2 mg/L	107	70.0	130
EG050G LL-F: Dissolved Hexavalent Chromium by Discrete Analyser - Low Level (QCLot: 5830350)							
ES2417412-005	Sed-2	EG050G: Hexavalent Chromium	18540-29-9	0.05 mg/L	89.4	70.0	130
EK055G: Ammonia as N by Discrete Analyser (QCLot: 5827737)							
ES2417373-001	Anonymous	EK055G: Ammonia as N	7664-41-7	1 mg/L	# Not Determined	70.0	130
EK057G: Nitrite as N by Discrete Analyser (QCLot: 5824246)							
ES2417412-001	GW1	EK057G: Nitrite as N	14797-65-0	0.5 mg/L	106	70.0	130
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 5827736)							
ES2417373-001	Anonymous	EK059G: Nitrite + Nitrate as N	----	0.5 mg/L	102	70.0	130
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QCLot: 5827741)							
ES2417373-002	Anonymous	EK061G: Total Kjeldahl Nitrogen as N	----	5 mg/L	80.1	70.0	130
EK067G: Total Phosphorus as P by Discrete Analyser (QCLot: 5827740)							
ES2417373-002	Anonymous	EK067G: Total Phosphorus as P	----	1 mg/L	96.0	70.0	130

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 Client : ROBERT CARR & ASSOCIATES P/L
 Project : 13589a



Sub-Matrix: **WATER**

Sub-Matrix: WATER				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP080/071: Total Petroleum Hydrocarbons (QCLot: 5821861)							
ES2417412-002	GW3	EP071: C10 - C14 Fraction	----	200 µg/L	86.3	70.0	130
		EP071: C15 - C28 Fraction	----	250 µg/L	90.5	71.0	130
		EP071: C29 - C36 Fraction	----	200 µg/L	82.6	67.0	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 5822469)							
CA2403167-005	Anonymous	EP080: C6 - C9 Fraction	----	325 µg/L	82.7	70.0	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 5825027)							
CA2403167-013	Anonymous	EP080: C6 - C9 Fraction	----	325 µg/L	99.2	70.0	130
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 5821861)							
ES2417412-002	GW3	EP071: >C10 - C16 Fraction	----	250 µg/L	99.3	70.0	130
		EP071: >C16 - C34 Fraction	----	350 µg/L	98.4	75.0	130
		EP071: >C34 - C40 Fraction	----	150 µg/L	76.1	67.0	130
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 5822469)							
CA2403167-005	Anonymous	EP080: C6 - C10 Fraction	C6_C10	375 µg/L	81.0	70.0	130
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 5825027)							
CA2403167-013	Anonymous	EP080: C6 - C10 Fraction	C6_C10	375 µg/L	96.3	70.0	130
EP080: BTEXN (QCLot: 5822469)							
CA2403167-005	Anonymous	EP080: Benzene	71-43-2	25 µg/L	85.1	70.0	130
		EP080: Toluene	108-88-3	25 µg/L	85.1	70.0	130
		EP080: Ethylbenzene	100-41-4	25 µg/L	96.2	70.0	130
		EP080: meta- & para-Xylene	108-38-3	25 µg/L	84.6	70.0	130
			106-42-3				
		EP080: ortho-Xylene	95-47-6	25 µg/L	93.5	70.0	130
	EP080: Naphthalene	91-20-3	25 µg/L	88.9	70.0	130	
EP080: BTEXN (QCLot: 5825027)							
CA2403167-013	Anonymous	EP080: Benzene	71-43-2	25 µg/L	102	70.0	130
		EP080: Toluene	108-88-3	25 µg/L	99.7	70.0	130
		EP080: Ethylbenzene	100-41-4	25 µg/L	102	70.0	130
		EP080: meta- & para-Xylene	108-38-3	25 µg/L	102	70.0	130
			106-42-3				
		EP080: ortho-Xylene	95-47-6	25 µg/L	106	70.0	130
	EP080: Naphthalene	91-20-3	25 µg/L	109	70.0	130	
EP132B: Polynuclear Aromatic Hydrocarbons (QCLot: 5821854)							
ES2417412-001	GW1	EP132: 3-Methylcholanthrene	56-49-5	2 µg/L	104	59.0	115
		EP132: 2-Methylnaphthalene	91-57-6	2 µg/L	88.9	46.0	120
		EP132: 7,12-Dimethylbenz(a)anthracene	57-97-6	2 µg/L	106	21.0	135
		EP132: Acenaphthene	83-32-9	2 µg/L	91.0	62.0	114

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 Project : 13589a



Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP132B: Polynuclear Aromatic Hydrocarbons (QCLot: 5821854) - continued							
ES2417412-001	GW1	EP132: Acenaphthylene	208-96-8	2 µg/L	89.9	61.0	119
		EP132: Anthracene	120-12-7	2 µg/L	114	68.0	116
		EP132: Benz(a)anthracene	56-55-3	2 µg/L	96.1	67.0	122
		EP132: Benzo(a)pyrene	50-32-8	2 µg/L	95.3	72.0	114
		EP132: Benzo(b+j)fluoranthene	205-99-2	2 µg/L	94.4	69.0	119
			205-82-3				
		EP132: Benzo(e)pyrene	192-97-2	2 µg/L	97.0	71.0	119
		EP132: Benzo(g,h,i)perylene	191-24-2	2 µg/L	90.8	49.0	133
		EP132: Benzo(k)fluoranthene	207-08-9	2 µg/L	91.2	71.0	124
		EP132: Chrysene	218-01-9	2 µg/L	93.3	70.0	118
		EP132: Coronene	191-07-1	2 µg/L	109	29.0	138
		EP132: Dibenz(a,h)anthracene	53-70-3	2 µg/L	93.0	60.0	122
		EP132: Fluoranthene	206-44-0	2 µg/L	88.3	65.0	121
		EP132: Fluorene	86-73-7	2 µg/L	91.3	63.0	118
		EP132: Indeno(1,2,3,cd)pyrene	193-39-5	2 µg/L	96.1	57.0	123
		EP132: Naphthalene	91-20-3	2 µg/L	83.3	53.0	115
		EP132: Perylene	198-55-0	2 µg/L	94.2	71.0	118
		EP132: Phenanthrene	85-01-8	2 µg/L	90.0	67.0	120
		EP132: Pyrene	129-00-0	2 µg/L	88.6	70.0	117



QA/QC Compliance Assessment to assist with Quality Review

Work Order	: ES2417412	Page	: 1 of 9
Client	: ROBERT CARR & ASSOCIATES P/L	Laboratory	: Environmental Division Sydney
Contact	: MS FIONA BROOKER	Telephone	: +61-2-8784 8555
Project	: 13589a	Date Samples Received	: 28-May-2024
Site	: ----	Issue Date	: 04-Jun-2024
Sampler	: AH	No. of samples received	: 8
Order number	: ----	No. of samples analysed	: 8

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO** Method Blank value outliers occur.
- **NO** Duplicate outliers occur.
- **NO** Laboratory Control outliers occur.
- Matrix Spike outliers exist - please see following pages for full details.
- For all regular sample matrices, where applicable to the methodology, **NO** surrogate recovery outliers occur.

Outliers : Analysis Holding Time Compliance

- Analysis Holding Time Outliers exist - please see following pages for full details.

Outliers : Frequency of Quality Control Samples

- Quality Control Sample Frequency Outliers exist - please see following pages for full details.



Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: WATER

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Matrix Spike (MS) Recoveries							
EK055G: Ammonia as N by Discrete Analyser	ES2417373--001	Anonymous	Ammonia as N	7664-41-7	Not Determined	----	MS recovery not determined, background level greater than or equal to 4x spike level.

Outliers : Analysis Holding Time Compliance

Matrix: WATER

Method	Extraction / Preparation			Analysis		
Container / Client Sample ID(s)	Date extracted	Due for extraction	Days overdue	Date analysed	Due for analysis	Days overdue
EA005P: pH by PC Titrator						
Clear Plastic Bottle - Natural QA052024	----	----	----	03-Jun-2024	28-May-2024	6

Outliers : Frequency of Quality Control Samples

Matrix: WATER

Quality Control Sample Type		Count		Rate (%)		Quality Control Specification
Analytical Methods	Method	QC	Regular	Actual	Expected	
Laboratory Duplicates (DUP)						
TRH - Semivolatile Fraction	EP071	1	21	4.76	10.00	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)						
TRH - Semivolatile Fraction	EP071	1	21	4.76	5.00	NEPM 2013 B3 & ALS QC Standard

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for VOC in soils vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: WATER

Evaluation: ✖ = Holding time breach ; ✔ = Within holding time.

Method	Sample Date	Extraction / Preparation			Analysis		
Container / Client Sample ID(s)		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA005: pH							
Clear Plastic Bottle - Natural (EA005) LP, Sed-2, SW1	28-May-2024	----	----	----	28-May-2024	28-May-2024	✔



Matrix: **WATER**

Evaluation: ✖ = Holding time breach ; ✔ = Within holding time.

Method	Sample Date	Extraction / Preparation			Analysis		
Container / Client Sample ID(s)		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA005P: pH by PC Titrator							
Clear Plastic Bottle - Natural (EA005-P) QA052024	28-May-2024	----	----	----	03-Jun-2024	28-May-2024	✗
EA010P: Conductivity by PC Titrator							
Clear Plastic Bottle - Natural (EA010-P) QA052024	28-May-2024	----	----	----	03-Jun-2024	25-Jun-2024	✓
Clear Plastic Bottle - Natural (EA010-P) LP, WL, Sed-2, Sed-1, SW1	28-May-2024	----	----	----	28-May-2024	25-Jun-2024	✓
EA025: Total Suspended Solids dried at 104 ± 2°C							
Clear Plastic Bottle - Natural (EA025H) LP, WL, Sed-2, Sed-1, SW1, QA052024	28-May-2024	----	----	----	30-May-2024	04-Jun-2024	✓
EG020F: Dissolved Metals by ICP-MS							
Clear Plastic Bottle - Nitric Acid; Filtered (EG020A-F) Sed-2, Sed-1, SW1, QA052024	28-May-2024	----	----	----	30-May-2024	24-Nov-2024	✓
EG050G LL-F: Dissolved Hexavalent Chromium by Discrete Analyser - Low Level							
Clear Plastic Bottle - NaOH Filtered (EG050G LL-F) Sed-2, Sed-1, SW1, QA052024	28-May-2024	----	----	----	31-May-2024	25-Jun-2024	✓
EK055G: Ammonia as N by Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK055G) GW1, GW3, LP, WL, Sed-2, Sed-1, SW1, QA052024	28-May-2024	----	----	----	31-May-2024	25-Jun-2024	✓
EK057G: Nitrite as N by Discrete Analyser							
Clear Plastic Bottle - Natural (EK057G) GW1, GW3, LP, WL, Sed-2, Sed-1, SW1, QA052024	28-May-2024	----	----	----	29-May-2024	30-May-2024	✓
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK059G) GW1, GW3, LP, WL, Sed-2, Sed-1, SW1, QA052024	28-May-2024	----	----	----	31-May-2024	25-Jun-2024	✓



Matrix: **WATER** Evaluation: ✖ = Holding time breach ; ✔ = Within holding time.

Method	Sample Date	Extraction / Preparation			Analysis			
Container / Client Sample ID(s)		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation	
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser								
Clear Plastic Bottle - Sulfuric Acid (EK061G) LP, Sed-2, SW1,	WL, Sed-1, QA052024	28-May-2024	31-May-2024	25-Jun-2024	✓	31-May-2024	25-Jun-2024	✓
EK067G: Total Phosphorus as P by Discrete Analyser								
Clear Plastic Bottle - Sulfuric Acid (EK067G) GW1, LP, Sed-2, SW1,	GW3, WL, Sed-1, QA052024	28-May-2024	31-May-2024	25-Jun-2024	✓	31-May-2024	25-Jun-2024	✓
EP080/071: Total Petroleum Hydrocarbons								
Amber Glass Bottle - Unpreserved (EP071) GW1, Sed-2, SW1	GW3, Sed-1,	28-May-2024	29-May-2024	04-Jun-2024	✓	30-May-2024	08-Jul-2024	✓
Amber Glass Bottle - Unpreserved (EP071) QA052024		28-May-2024	30-May-2024	04-Jun-2024	✓	30-May-2024	09-Jul-2024	✓
Amber VOC Vial - Sulfuric Acid (EP080) GW1, Sed-2, SW1	GW3, Sed-1,	28-May-2024	29-May-2024	11-Jun-2024	✓	29-May-2024	11-Jun-2024	✓
Amber VOC Vial - Sulfuric Acid (EP080) QA052024		28-May-2024	30-May-2024	11-Jun-2024	✓	30-May-2024	11-Jun-2024	✓
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions								
Amber Glass Bottle - Unpreserved (EP071) GW1, Sed-2, SW1	GW3, Sed-1,	28-May-2024	29-May-2024	04-Jun-2024	✓	30-May-2024	08-Jul-2024	✓
Amber Glass Bottle - Unpreserved (EP071) QA052024		28-May-2024	30-May-2024	04-Jun-2024	✓	30-May-2024	09-Jul-2024	✓
Amber VOC Vial - Sulfuric Acid (EP080) GW1, Sed-2, SW1	GW3, Sed-1,	28-May-2024	29-May-2024	11-Jun-2024	✓	29-May-2024	11-Jun-2024	✓
Amber VOC Vial - Sulfuric Acid (EP080) QA052024		28-May-2024	30-May-2024	11-Jun-2024	✓	30-May-2024	11-Jun-2024	✓

Evaluation: ✖ = Holding time breach ; ✔ = Within holding time.

Method		Sample Date	Extraction / Preparation			Analysis		
Container / Client Sample ID(s)			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP080: BTEXN								
Amber VOC Vial - Sulfuric Acid (EP080)	GW3, Sed-1, SW1	28-May-2024	29-May-2024	11-Jun-2024	✓	29-May-2024	11-Jun-2024	✓
Amber VOC Vial - Sulfuric Acid (EP080)	QA052024	28-May-2024	30-May-2024	11-Jun-2024	✓	30-May-2024	11-Jun-2024	✓
EP132B: Polynuclear Aromatic Hydrocarbons								
Amber Glass Bottle - Unpreserved (EP132)	GW3	28-May-2024	29-May-2024	04-Jun-2024	✓	31-May-2024	08-Jul-2024	✓



Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **WATER**

Evaluation: ✖ = Quality Control frequency not within specification ; ✔ = Quality Control frequency within specification.

Quality Control Sample Type	Method	Count		Rate (%)			Quality Control Specification
		QC	Regular	Actual	Expected	Evaluation	
Laboratory Duplicates (DUP)							
Ammonia as N by Discrete analyser	EK055G	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Conductivity by Auto Titrator	EA010-P	5	32	15.63	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Hexavalent Chromium by DA - Low Level	EG050G LL-F	1	4	25.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite A	EG020A-F	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite as N by Discrete Analyser	EK057G	2	12	16.67	10.00	✓	NEPM 2013 B3 & ALS QC Standard
pH	EA005	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
pH by Auto Titrator	EA005-P	2	19	10.53	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Semivolatile Compounds by GCMS(SIM - Ultra-trace)	EP132	1	2	50.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Suspended Solids (High Level)	EA025H	4	35	11.43	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Kjeldahl Nitrogen as N By Discrete Analyser	EK061G	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Phosphorus as P By Discrete Analyser	EK067G	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	21	4.76	10.00	✗	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	4	40	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Ammonia as N by Discrete analyser	EK055G	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Conductivity by Auto Titrator	EA010-P	5	32	15.63	8.33	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Hexavalent Chromium by DA - Low Level	EG050G LL-F	1	4	25.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite as N by Discrete Analyser	EK057G	1	12	8.33	5.00	✓	NEPM 2013 B3 & ALS QC Standard
pH	EA005	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
pH by Auto Titrator	EA005-P	2	19	10.53	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Semivolatile Compounds by GCMS(SIM - Ultra-trace)	EP132	1	2	50.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Suspended Solids (High Level)	EA025H	5	35	14.29	12.50	✓	NEPM 2013 B3 & ALS QC Standard
Total Kjeldahl Nitrogen as N By Discrete Analyser	EK061G	3	20	15.00	15.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Phosphorus as P By Discrete Analyser	EK067G	3	20	15.00	15.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	2	21	9.52	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	2	40	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Ammonia as N by Discrete analyser	EK055G	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Conductivity by Auto Titrator	EA010-P	3	32	9.38	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Hexavalent Chromium by DA - Low Level	EG050G LL-F	1	4	25.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite as N by Discrete Analyser	EK057G	1	12	8.33	5.00	✓	NEPM 2013 B3 & ALS QC Standard



Matrix: **WATER**

Evaluation: ✖ = Quality Control frequency not within specification ; ✔ = Quality Control frequency within specification .

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	Method	QC	Regular	Actual	Expected	Evaluation	
Method Blanks (MB) - Continued							
Semivolatile Compounds by GCMS(SIM - Ultra-trace)	EP132	1	2	50.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Suspended Solids (High Level)	EA025H	2	35	5.71	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Kjeldahl Nitrogen as N By Discrete Analyser	EK061G	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Phosphorus as P By Discrete Analyser	EK067G	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	2	21	9.52	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	2	40	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Ammonia as N by Discrete analyser	EK055G	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Hexavalent Chromium by DA - Low Level	EG050G LL-F	1	4	25.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite as N by Discrete Analyser	EK057G	1	12	8.33	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Semivolatile Compounds by GCMS(SIM - Ultra-trace)	EP132	1	2	50.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Kjeldahl Nitrogen as N By Discrete Analyser	EK061G	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Phosphorus as P By Discrete Analyser	EK067G	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	21	4.76	5.00	✗	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	2	40	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard



Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
pH	EA005	WATER	In house: Referenced to APHA 4500 H+ B. pH of water samples is determined by ISE either manually or by automated pH meter. This method is compliant with NEPM Schedule B(3)
pH by Auto Titrator	EA005-P	WATER	In house: Referenced to APHA 4500 H+ B. This procedure determines pH of water samples by automated ISE. This method is compliant with NEPM Schedule B(3)
Conductivity by Auto Titrator	EA010-P	WATER	In house: Referenced to APHA 2510 B. This procedure determines conductivity by automated ISE. This method is compliant with NEPM Schedule B(3)
Suspended Solids (High Level)	EA025H	WATER	In house: Referenced to APHA 2540D. A gravimetric procedure employed to determine the amount of 'non-filterable' residue in a aqueous sample. The prescribed GFC (1.2um) filter is rinsed with deionised water, oven dried and weighed prior to analysis. A well-mixed sample is filtered through a glass fibre filter (1.2um). The residue on the filter paper is dried at 104+/-2C . This method is compliant with NEPM Schedule B(3)
Dissolved Metals by ICP-MS - Suite A	EG020A-F	WATER	In house: Referenced to APHA 3125; USEPA SW846 - 6020, ALS QWI-EN/EG020. Samples are 0.45µm filtered prior to analysis. The ICPMS technique utilizes a highly efficient argon plasma to ionize selected elements. Ions are then passed into a high vacuum mass spectrometer, which separates the analytes based on their distinct mass to charge ratios prior to their measurement by a discrete dynode ion detector.
Dissolved Hexavalent Chromium by DA - Low Level	EG050G LL-F	WATER	In house: Referenced to APHA 3500 Cr-A & B. Samples are 0.45µm filtered prior to analysis. Hexavalent chromium is determined directly on water sample by Discrete Analyser as received by pH adjustment and colour development using dephenylcarbazide. Each run of samples is measured against a five-point calibration curve. This method is compliant with NEPM Schedule B(3).
Ammonia as N by Discrete analyser	EK055G	WATER	In house: Referenced to APHA 4500-NH3 G. Ammonia is determined by direct colorimetry by Discrete Analyser. This method is compliant with NEPM Schedule B(3)
Nitrite as N by Discrete Analyser	EK057G	WATER	In house: Referenced to APHA 4500-NO2- B. Nitrite is determined by direct colourimetry by Discrete Analyser. This method is compliant with NEPM Schedule B(3)
Nitrate as N by Discrete Analyser	EK058G	WATER	In house: Referenced to APHA 4500-NO3- F. Nitrate is reduced to nitrite by way of a chemical reduction followed by quantification by Discrete Analyser. Nitrite is determined seperately by direct colourimetry and result for Nitrate calculated as the difference between the two results. This method is compliant with NEPM Schedule B(3)
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	WATER	In house: Referenced to APHA 4500-NO3- F. Combined oxidised Nitrogen (NO2+NO3) is determined by Chemical Reduction and direct colourimetry by Discrete Analyser. This method is compliant with NEPM Schedule B(3)
Total Kjeldahl Nitrogen as N By Discrete Analyser	EK061G	WATER	In house: Referenced to APHA 4500-Norg D (In house). An aliquot of sample is digested using a high temperature Kjeldahl digestion to convert nitrogenous compounds to ammonia. Ammonia is determined colorimetrically by discrete analyser. This method is compliant with NEPM Schedule B(3)
Total Nitrogen as N (TKN + Nox) By Discrete Analyser	EK062G	WATER	In house: Referenced to APHA 4500-Norg / 4500-NO3-. This method is compliant with NEPM Schedule B(3)
Total Phosphorus as P By Discrete Analyser	EK067G	WATER	In house: Referenced to APHA 4500-P H, Jirka et al, Zhang et al. This procedure involves sulphuric acid digestion of a sample aliquot to break phosphorus down to orthophosphate. The orthophosphate reacts with ammonium molybdate and antimony potassium tartrate to form a complex which is then reduced and its concentration measured at 880nm using discrete analyser. This method is compliant with NEPM Schedule B(3)



<i>Analytical Methods</i>	<i>Method</i>	<i>Matrix</i>	<i>Method Descriptions</i>
TRH - Semivolatile Fraction	EP071	WATER	In house: Referenced to USEPA SW 846 - 8015 The sample extract is analysed by Capillary GC/FID and quantification is by comparison against an established 5 point calibration curve of n-Alkane standards. This method is compliant with the QC requirements of NEPM Schedule B(3)
TRH Volatiles/BTEX	EP080	WATER	In house: Referenced to USEPA SW 846 - 8260 Water samples are directly purged prior to analysis by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. Alternatively, a sample is equilibrated in a headspace vial and a portion of the headspace determined by GCMS analysis. This method is compliant with the QC requirements of NEPM Schedule B(3)
Semivolatile Compounds by GCMS(SIM - Ultra-trace)	EP132	WATER	In house: Referenced to USEPA 3640 (GPC Cleanup), 8270 GCMS Capillary column, SIM mode. This method is compliant with NEPM Schedule B(3)
<i>Preparation Methods</i>	<i>Method</i>	<i>Matrix</i>	<i>Method Descriptions</i>
TKN/TP Digestion	EK061/EK067	WATER	In house: Referenced to APHA 4500 Norg - D; APHA 4500 P - H. This method is compliant with NEPM Schedule B(3)
Separatory Funnel Extraction of Liquids	ORG14	WATER	In house: Referenced to USEPA SW 846 - 3510 100 mL to 1L of sample is transferred to a separatory funnel and serially extracted three times using DCM for each extract. The resultant extracts are combined, dehydrated and concentrated for analysis. This method is compliant with NEPM Schedule B(3) . ALS default excludes sediment which may be resident in the container.
Sep. Funnel Extraction /Acetylation of Phenolic Compounds	ORG14-AC	WATER	In house: Referenced to USEPA 3510 (Extraction) / In-house (Acetylation): A 1L sample is extracted into dichloromethane and concentrated to 1 mL with exchange into cyclohexane. Phenolic compounds are reacted with acetic anhydride to yield phenyl acetates suitable for ultra-trace analysis. This method is compliant with NEPM Schedule B(3) . ALS default excludes sediment which may be resident in the container.
Volatiles Water Preparation	ORG16-W	WATER	A 5 mL aliquot or 5 mL of a diluted sample is added to a 40 mL VOC vial for purging.



CHAIN OF CUSTODY

ALS Laboratory: please tick →

□ Sydney: 277 Woodpark Rd, Smithfield NSW 2176
Ph: 02 8784 8656 E: samples.sydney@alsenviro.com
□ Newcastle: 5 Rosegum Rd, Warabrook NSW 2304
Ph: 02 4968 9433 E: samples.newcastle@alsenviro.com

□ Brisbane: 32 Shand St, Stafford QLD 4053
Ph: 07 3243 7222 E: samples.brisbane@alsenviro.com
□ Townsville: 14-16 Desma Ct, Bohle QLD 4818
Ph: 07 4796 0600 E: townsville.environmental@alsenviro.com

□ Melbourne: 2-4 Westall Rd, Springvale VIC 3171
Ph: 03 8549 0600 E: samples.melbourne@alsenviro.com
□ Adelaide: 2-1 Burma Rd, Pooraka SA 5005
Ph: 08 8359 0890 E: adelaide@alsenviro.com

□ Perth: 10 Hoj Way, Malaga WA 6090
Ph: 08 9209 7655 E: samples.perth@alsenviro.com
□ Launceston: 27 Wellington St, Launceston TAS 7250
Ph: 03 6331 2158 E: launceston@alsenviro.com

CLIENT: RCA Australia		TURNAROUND REQUIREMENTS: ☐ Standard TAT (List due date):		FOR LABORATORY USE ONLY (Circle)	
OFFICE: 92 Hill Street, Carrington		(Standard TAT may be longer for some tests e.g., Ultra Trace Organics)		Custody Seal Intact? Yes ☒ No ☐ N/A ☐	
RCA Ref No: 13589a		ALS QUOTE NO.: SY_496_21		Free ice / frozen ice bricks present upon receipt? Yes ☒ No ☐ N/A ☐	
PROJECT MANAGER: Fiona Brooker		CONTACT PH: 0408 687 529		Random Sample Temperature on Receipt: 36 °C	
SAMPLER: AH		SAMPLER MOBILE: 0410230644		Other comment:	
COC Emailed to ALS? (NO)		EDD FORMAT (or default):		RECEIVED BY: JN 28.5.24	
Email Reports to: administrator@rca.com.au + enviro@rca.com.au		RELINQUISHED BY: Anh Hoang		DATE/TIME: 14:15	
Email Invoice to: as above		DATE/TIME: 28.5.24 14:15		DATE/TIME: 1700	
		RECEIVED BY: ENK		DATE/TIME: 28.5	
		RELINQUISHED BY: C.C		DATE/TIME: 28/5 19:27	

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

ALS USE ONLY	SAMPLE DETAILS MATRIX: Solid(S) Water(W)			CONTAINER INFORMATION		ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).								Additional Information
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (refer to codes below)	TOTAL BOTTLES	EK055G, EK058G, EK067G (Ammonia as N, Nitrate as N, Total Phosphorous as P)	W4 - TRH / BTEX	EP132B - Ultra Trace PAH	EA005P (pH), EA010P (EC), EA025H (suspended solids), NT-08 (TN, NO2, NO3, NH3 & TP)	EA005P (pH), EA010P (EC), EA025H (suspended solids), TPH (TRH C6-C40), NT-08 (TN, NO2, NO3, NH3 & TP)	EG020F Dissolved (Aluminium, Arsenic, Boron, Cadmium, Chromium, Cobalt, Copper, Lead, Nickel, Selenium, Zinc)	EG050LL (Low Level Dissolved Cr6)	Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.	
1	GW1	28.5.24-12:00	W	Unpreserved + Purple Plastic 2x amber glass + 2x purple amber vials	6	x	x	x					Environmental Division Sydney Work Order Reference ES2417412	
2	GW3	28.5.24-10:30	W	Unpreserved + Purple Plastic 2x amber glass + 2x purple amber vials	6	x	x	x						
3	LP	28.5.24-10:45	W	Unpreserved + Purple Plastic	2				x					
4	WL	28.5.24-9:50	W	Unpreserved + Purple Plastic	2				x					
5	Sed-2		W	Unpreserved + Purple + (filtered) Red + Blue Plastic Amber glass + 2x purple amber vials	7					x	x	x		
	SW2		W	Unpreserved + Purple + (filtered) Red + Blue Plastic Amber glass + 2x purple amber vials	7					x	x	x	no samples	
6	Sed-1	28.5.24-12:55	W	Unpreserved + Purple + (filtered) Red + Blue Plastic Amber glass + 2x purple amber vials	7					x	x	x		
7	SW1	28.5.24-13:35	W	Unpreserved + Purple + (filtered) Red + Blue Plastic Amber glass + 2x purple amber vials	7					x	x	x	E-MAILED	
8	QA 052024	28.5.24	W		7									
					44 (44)	2	2	2	2	3	3	3	PH @ WN LAB OF ORIGIN: NEWCASTLE	



SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **ES2417412**

Client : **ROBERT CARR & ASSOCIATES P/L**
Contact : **MS FIONA BROOKER**
Address : **92 HILL STREET**
CARRINGTON NSW 2294

E-mail : **fionab@rca.com.au**
Telephone : **+61 02 4902 9200**
Facsimile : **+61 02 4902 9299**

Project : **13589a**
Order number : **----**
C-O-C number : **----**
Site : **----**
Sampler : **AH**

Laboratory : **Environmental Division Sydney**
Contact : **Danae Hambly**
Address : **277-289 Woodpark Road Smithfield**
NSW Australia 2164

E-mail : **danae.hambly@alsglobal.com**
Telephone : **+61-2-8784 8555**
Facsimile : **+61-2-8784 8500**

Page : **1 of 3**
Quote number : **EN2023ROBCAR0002 (EN/222)**
QC Level : **NEPM 2013 B3 & ALS QC Standard**

Dates

Date Samples Received : **28-May-2024 14:19**
Client Requested Due : **04-Jun-2024**
Date

Issue Date : **28-May-2024**
Scheduled Reporting Date : **04-Jun-2024**

Delivery Details

Mode of Delivery : **Undefined**
No. of coolers/boxes : **1**
Receipt Detail :

Security Seal : **Not Available**
Temperature : **3.6°C**
No. of samples received / analysed : **8 / 7**

General Comments

- This report contains the following information:
 - Sample Container(s)/Preservation Non-Compliances
 - Summary of Sample(s) and Requested Analysis
 - Proactive Holding Time Report
 - Requested Deliverables
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- **Sample(s) requiring volatile organic compound analysis received in airtight containers (ZHE).**
- **pH analysis will be conducted by ALS Newcastle-Water**
- Please direct any queries you have regarding this work order to the above ALS laboratory contact.
- Analytical work for this work order will be conducted at ALS Sydney.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months ± 1 week) from receipt of samples.
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.



Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- No sample container / preservation non-compliance exists.

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.

If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **WATER**

Laboratory sample ID Sampling date / time Sample ID

Laboratory sample ID	Sampling date / time	Sample ID	WATER - EA005; pH	WATER - EK055G Ammonia as N By Discrete Analyser	WATER - EK058G Nitrate as N by Discrete Analyser	WATER - EK067G Total Phosphorus as P By Discrete Analyser	WATER - EP132B(PAH) Ultra Trace Polynuclear Aromatic Compounds	WATER - NT-08 Total Nitrogen + NO2 + NO3 + NH3 + Total P	WATER - W-04 TRH/BTEXN
ES2417412-001	28-May-2024 12:00	GW1		✓	✓	✓	✓		✓
ES2417412-002	28-May-2024 10:30	GW3		✓	✓	✓	✓		✓
ES2417412-003	28-May-2024 10:45	LP	✓					✓	
ES2417412-004	28-May-2024 09:50	WL	✓					✓	
ES2417412-005	28-May-2024 00:00	Sed-2	✓					✓	
ES2417412-006	28-May-2024 12:55	Sed-1	✓					✓	
ES2417412-007	28-May-2024 13:35	SW1	✓					✓	

Matrix: **WATER**

Laboratory sample ID Sampling date / time Sample ID

Laboratory sample ID	Sampling date / time	Sample ID	(On Hold) WATER No analysis requested	WATER - EA010P Electrical Conductivity (Auto Titrator)	WATER - EA025H Suspended Solids - Standard Level	WATER - EG020F Dissolved Metals by ICP/MS	WATER - EG050G LL-F Dissolved Hexavalent Chromium - Low Level	WATER - TPH TRH (C6-C40)	WATER - W-01 7 Metals
ES2417412-003	28-May-2024 10:45	LP		✓	✓				
ES2417412-004	28-May-2024 09:50	WL		✓	✓				
ES2417412-005	28-May-2024 00:00	Sed-2		✓	✓	✓	✓	✓	✓
ES2417412-006	28-May-2024 12:55	Sed-1		✓	✓	✓	✓	✓	✓
ES2417412-007	28-May-2024 13:35	SW1		✓	✓	✓	✓	✓	✓
ES2417412-008	28-May-2024 00:00	QA052024	✓						

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.



Requested Deliverables

ADMINISTRATOR

- *AU Certificate of Analysis - NATA (COA)	Email	administrator@rca.com.au
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	administrator@rca.com.au
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	administrator@rca.com.au
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	administrator@rca.com.au
- A4 - AU Tax Invoice (INV)	Email	administrator@rca.com.au
- Chain of Custody (CoC) (COC)	Email	administrator@rca.com.au
- EDI Format - ENMRG (ENMRG)	Email	administrator@rca.com.au
- EDI Format - ESDAT (ESDAT)	Email	administrator@rca.com.au
- EDI Format - XTab (XTAB)	Email	administrator@rca.com.au

ALL INVOICES

- A4 - AU Tax Invoice (INV)	Email	administrator@rca.com.au
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ENVIRO

- *AU Certificate of Analysis - NATA (COA)	Email	enviro@rca.com.au
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	enviro@rca.com.au
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	enviro@rca.com.au
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	enviro@rca.com.au
- A4 - AU Tax Invoice (INV)	Email	enviro@rca.com.au
- Chain of Custody (CoC) (COC)	Email	enviro@rca.com.au
- EDI Format - ENMRG (ENMRG)	Email	enviro@rca.com.au
- EDI Format - ESDAT (ESDAT)	Email	enviro@rca.com.au
- EDI Format - XTab (XTAB)	Email	enviro@rca.com.au

FIONA BROOKER

- *AU Certificate of Analysis - NATA (COA)	Email	fionab@rca.com.au
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	fionab@rca.com.au
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	fionab@rca.com.au
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	fionab@rca.com.au
- Chain of Custody (CoC) (COC)	Email	fionab@rca.com.au
- EDI Format - ENMRG (ENMRG)	Email	fionab@rca.com.au
- EDI Format - ESDAT (ESDAT)	Email	fionab@rca.com.au
- EDI Format - XTab (XTAB)	Email	fionab@rca.com.au

Inter-Laboratory Testing

Analysis conducted by ALS Newcastle - Water, NATA accreditation no. 825, site no. 1656 (Chemistry) 9854 (Biology).

(WATER) EA005: pH