



CERTIFICATE OF ANALYSIS

Work Order	: ES2407572	Page	: 1 of 11
Client	: Department of Climate Change, Energy, the Environment and Water	Laboratory	: Environmental Division Sydney
Contact	: [REDACTED]	Contact	: Customer Services ES
Address	: [REDACTED]	Address	: [REDACTED]
Telephone	: [REDACTED]	Telephone	: [REDACTED]
Project	: Darling Baake River Health Program	Date Samples Received	: 07-Mar-2024 15:05
Order number	: [REDACTED]	Date Analysis Commenced	: 08-Mar-2024
C-O-C number	: [REDACTED]	Issue Date	: 14-Mar-2024 18:35
Sampler	: [REDACTED]		
Site	: [REDACTED]		
Quote number	: ES24DEPENWAT0001		
No. of samples received	: 41		
No. of samples analysed	: 41		



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

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
[REDACTED]	Senior Chemist - Inorganics	Sydney Inorganics, Smithfield, NSW
[REDACTED]	Inorganics Coordinator	Sydney Inorganics, Smithfield, NSW

right solutions. right partner.

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Client : Department of Climate Change, Energy, the Environment and Water
Project : Darling Baake River Health Program



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.

- EK271A-CM: Samples for Ultra-Trace Reactive Phosphorus by FIA should be frozen upon sampling. If not, low-level results (below 0.01 mg/L) may bias low.
- EK267PA-CM/EK267PA-F-CM: It is recognised that Total Phosphorus is less than Dissolved Total Phosphorus for various samples. However, the difference is confirmed from their respective bottles.
- EK262PA-CM/EK262PA-F-CM: It is recognised that Total Nitrogen is less than Dissolved Total Nitrogen for samples 24 & 31. However, the difference is confirmed from their respective bottles.
- EK267PA-CM/EK271A-CM: It has been noted that Reactive Phosphorus is greater than Total Phosphorus on sample 17, however this difference is confirmed from their respective bottles.
- EK239A-CM/EK262PA-CM: It has been noted that NOx is greater than Total Nitrogen on sample 31, however this difference confirmed from their respective bottles.
- EK255A-CM/EK261PA-CM: It has been noted that Ammonia is greater than TKN for samples 24 & 31, however this difference is confirmed from their respective bottles.
- EK267PA-CM: Insufficient sample has been provided for Total Phosphorus on sample 38. Where applicable LOR values have been adjusted accordingly.



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	MFK-Z-E 1-20240219	MFK-BW-E 1-20240219	MFK-Z-E 2-20240219	MFK-BW-E 2-20240219	MFK-Z-E 3-20240219
Sampling date / time					19-Feb-2024 00:00	19-Feb-2024 00:00	19-Feb-2024 00:00	19-Feb-2024 00:00	19-Feb-2024 00:00
Compound	CAS Number	LOR	Unit	ES2407572-001	ES2407572-002	ES2407572-003	ES2407572-004	ES2407572-005	
				Result	Result	Result	Result	Result	
ED040F: Dissolved Major Anions									
Silicon	7440-21-3	0.05	mg/L	4.25	4.00	3.97	3.96	3.89	
EK255A: Ammonia									
Ammonia as N	7664-41-7	0.005	mg/L	<0.005	<0.005	<0.005	0.012	0.013	
EK257A: Nitrite									
Nitrite as N	14797-65-0	0.002	mg/L	<0.002	<0.002	<0.002	<0.002	<0.002	
EK258A: Nitrate									
Nitrate as N	14797-55-8	0.002	mg/L	0.003	0.004	0.003	<0.002	0.004	
EK259A: Nitrite and Nitrate (NOx)									
Nitrite + Nitrate as N	----	0.002	mg/L	0.003	0.004	0.003	<0.002	0.004	
EK261A: Total Kjeldahl Nitrogen									
Total Kjeldahl Nitrogen as N	----	0.01	mg/L	1.55	1.44	1.59	1.46	1.34	
EK262A: Total Nitrogen									
Dissolved Total Nitrogen as N	----	0.01	mg/L	0.91	0.88	0.84	0.82	0.88	
Total Nitrogen as N	----	0.01	mg/L	1.55	1.44	1.59	1.46	1.34	
EK267A: Total Phosphorus (Persulfate Digestion)									
Dissolved Total Phosphorus as P	----	0.005	mg/L	0.101	0.120	0.064	0.069	0.068	
Total Phosphorus as P	----	0.005	mg/L	0.168	0.199	0.185	0.179	0.125	
EK271A: Reactive Phosphorus									
Reactive Phosphorus as P	14265-44-2	0.001	mg/L	0.017	0.024	0.014	0.016	0.018	



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	MFK-Z-BW 3-20240219	MFK-Z-E 4-20240219	MFK-Z-BW-E 4-20240219	MFK-Z-E 5-20240219	MFK-Z-BW-E 5-20240219
Sampling date / time					19-Feb-2024 00:00	19-Feb-2024 00:00	19-Feb-2024 00:00	19-Feb-2024 00:00	19-Feb-2024 00:00
Compound	CAS Number	LOR	Unit	ES2407572-006	ES2407572-007	ES2407572-008	ES2407572-009	ES2407572-010	
				Result	Result	Result	Result	Result	
ED040F: Dissolved Major Anions									
Silicon	7440-21-3	0.05	mg/L	4.12	4.05	3.95	4.32	4.22	
EK255A: Ammonia									
Ammonia as N	7664-41-7	0.005	mg/L	0.092	0.007	0.037	0.005	0.031	
EK257A: Nitrite									
Nitrite as N	14797-65-0	0.002	mg/L	<0.002	<0.002	<0.002	<0.002	<0.002	
EK258A: Nitrate									
Nitrate as N	14797-55-8	0.002	mg/L	0.006	0.003	0.003	0.003	0.004	
EK259A: Nitrite and Nitrate (NOx)									
Nitrite + Nitrate as N	----	0.002	mg/L	0.006	0.003	0.003	0.003	0.004	
EK261A: Total Kjeldahl Nitrogen									
Total Kjeldahl Nitrogen as N	----	0.01	mg/L	1.21	1.68	1.23	1.38	1.42	
EK262A: Total Nitrogen									
Dissolved Total Nitrogen as N	----	0.01	mg/L	0.96	0.92	0.92	0.94	1.00	
Total Nitrogen as N	----	0.01	mg/L	1.22	1.68	1.23	1.38	1.42	
EK267A: Total Phosphorus (Persulfate Digestion)									
Dissolved Total Phosphorus as P	----	0.005	mg/L	0.085	0.060	0.066	0.057	0.106	
Total Phosphorus as P	----	0.005	mg/L	0.113	0.135	0.112	0.076	0.136	
EK271A: Reactive Phosphorus									
Reactive Phosphorus as P	14265-44-2	0.001	mg/L	0.022	0.013	0.023	0.014	0.016	



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	MFK-Z-B 1-20240219	MFK-Z-B 2-20240219	MFK-Z-B 3-20240219	MFK-Z-WILCANNIA BUOY-20240219	MFK-BW-WILCANNIA BUOY-20240219
Sampling date / time					19-Feb-2024 00:00	19-Feb-2024 00:00	19-Feb-2024 00:00	19-Feb-2024 00:00	19-Feb-2024 00:00
Compound	CAS Number	LOR	Unit	ES2407572-011	ES2407572-012	ES2407572-013	ES2407572-014	ES2407572-015	
				Result	Result	Result	Result	Result	
ED040F: Dissolved Major Anions									
Silicon	7440-21-3	0.05	mg/L	1.09	3.85	6.08	4.79	4.85	
EK255A: Ammonia									
Ammonia as N	7664-41-7	0.005	mg/L	0.007	0.018	0.216	<0.005	0.048	
EK257A: Nitrite									
Nitrite as N	14797-65-0	0.002	mg/L	<0.002	<0.002	<0.002	0.013	<0.002	
EK258A: Nitrate									
Nitrate as N	14797-55-8	0.002	mg/L	<0.002	0.005	0.003	0.003	<0.002	
EK259A: Nitrite and Nitrate (NOx)									
Nitrite + Nitrate as N	----	0.002	mg/L	<0.002	0.005	0.003	0.016	<0.002	
EK261A: Total Kjeldahl Nitrogen									
Total Kjeldahl Nitrogen as N	----	0.01	mg/L	2.82	1.16	3.02	0.89	0.83	
EK262A: Total Nitrogen									
Dissolved Total Nitrogen as N	----	0.01	mg/L	1.04	0.84	1.46	0.44	0.80	
Total Nitrogen as N	----	0.01	mg/L	2.82	1.17	3.02	0.91	0.83	
EK267A: Total Phosphorus (Persulfate Digestion)									
Dissolved Total Phosphorus as P	----	0.005	mg/L	0.042	0.062	0.064	0.217	0.103	
Total Phosphorus as P	----	0.005	mg/L	0.124	0.078	0.295	0.329	0.357	
EK271A: Reactive Phosphorus									
Reactive Phosphorus as P	14265-44-2	0.001	mg/L	0.002	0.014	0.024	0.185	0.018	



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	MFK-Z-WETHERELL BUOY-20240219	MFK-BW-WETHERELL BUOY-20240219	E 6	E 6.5	E 7
				Sampling date / time	19-Feb-2024 00:00	19-Feb-2024 00:00	27-Feb-2024 00:00	27-Feb-2024 00:00	26-Feb-2024 00:00
Compound	CAS Number	LOR	Unit	ES2407572-016	ES2407572-017	ES2407572-018	ES2407572-019	ES2407572-020	
				Result	Result	Result	Result	Result	
ED040F: Dissolved Major Anions									
Silicon	7440-21-3	0.05	mg/L	1.74	3.31	2.44	3.13	3.73	
EK255A: Ammonia									
Ammonia as N	7664-41-7	0.005	mg/L	<0.005	0.062	0.006	0.005	0.006	
EK257A: Nitrite									
Nitrite as N	14797-65-0	0.002	mg/L	<0.002	0.020	<0.002	<0.002	<0.002	
EK258A: Nitrate									
Nitrate as N	14797-55-8	0.002	mg/L	<0.002	0.013	0.003	0.010	0.008	
EK259A: Nitrite and Nitrate (NOx)									
Nitrite + Nitrate as N	----	0.002	mg/L	<0.002	0.033	0.003	0.010	0.008	
EK261A: Total Kjeldahl Nitrogen									
Total Kjeldahl Nitrogen as N	----	0.01	mg/L	0.95	1.37	2.47	1.30	1.39	
EK262A: Total Nitrogen									
Dissolved Total Nitrogen as N	----	0.01	mg/L	0.64	0.53	1.01	0.80	0.84	
Total Nitrogen as N	----	0.01	mg/L	0.95	1.40	2.47	1.31	1.40	
EK267A: Total Phosphorus (Persulfate Digestion)									
Dissolved Total Phosphorus as P	----	0.005	mg/L	0.100	0.221	0.029	0.039	0.043	
Total Phosphorus as P	----	0.005	mg/L	0.094	0.145	0.230	0.235	0.177	
EK271A: Reactive Phosphorus									
Reactive Phosphorus as P	14265-44-2	0.001	mg/L	0.008	0.167	0.013	0.022	0.012	



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	E 8 Repeat 01	E 8 Repeat 02	E 8 Repeat 03	E 8-BLANK	E 9
Sampling date / time					27-Feb-2024 00:00	27-Feb-2024 00:00	27-Feb-2024 00:00	27-Feb-2024 00:00	28-Feb-2024 00:00
Compound	CAS Number	LOR	Unit	ES2407572-021	ES2407572-022	ES2407572-023	ES2407572-024	ES2407572-025	
				Result	Result	Result	Result	Result	
ED040F: Dissolved Major Anions									
Silicon	7440-21-3	0.05	mg/L	4.20	4.13	4.14	<0.05	4.10	
EK255A: Ammonia									
Ammonia as N	7664-41-7	0.005	mg/L	0.060	0.060	0.062	0.045	0.043	
EK257A: Nitrite									
Nitrite as N	14797-65-0	0.002	mg/L	0.004	0.003	0.004	<0.002	0.004	
EK258A: Nitrate									
Nitrate as N	14797-55-8	0.002	mg/L	0.014	0.018	0.015	0.020	0.027	
EK259A: Nitrite and Nitrate (NOx)									
Nitrite + Nitrate as N	----	0.002	mg/L	0.018	0.021	0.019	0.020	0.031	
EK261A: Total Kjeldahl Nitrogen									
Total Kjeldahl Nitrogen as N	----	0.01	mg/L	1.60	1.56	1.52	0.03	1.52	
EK262A: Total Nitrogen									
Dissolved Total Nitrogen as N	----	0.01	mg/L	0.98	0.96	0.95	0.09	0.97	
Total Nitrogen as N	----	0.01	mg/L	1.62	1.58	1.54	0.05	1.55	
EK267A: Total Phosphorus (Persulfate Digestion)									
Dissolved Total Phosphorus as P	----	0.005	mg/L	0.086	0.091	0.074	0.010	0.093	
Total Phosphorus as P	----	0.005	mg/L	0.150	0.159	0.149	<0.005	0.147	
EK271A: Reactive Phosphorus									
Reactive Phosphorus as P	14265-44-2	0.001	mg/L	0.033	0.036	0.036	<0.001	0.036	



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	E 10	E 11	E-12 Repeat 01	E-12 Repeat 02	E-12 Repeat 03
Sampling date / time				28-Feb-2024 00:00	26-Feb-2024 00:00	27-Feb-2024 00:00	27-Feb-2024 00:00	27-Feb-2024 00:00	27-Feb-2024 00:00
Compound	CAS Number	LOR	Unit	ES2407572-026	ES2407572-027	ES2407572-028	ES2407572-029	ES2407572-030	ES2407572-030
				Result	Result	Result	Result	Result	Result
ED040F: Dissolved Major Anions									
Silicon	7440-21-3	0.05	mg/L	3.72	3.59	3.59	3.58	3.60	
EK255A: Ammonia									
Ammonia as N	7664-41-7	0.005	mg/L	<0.005	<0.005	<0.005	0.005	0.006	
EK257A: Nitrite									
Nitrite as N	14797-65-0	0.002	mg/L	<0.002	<0.002	<0.002	<0.002	<0.002	
EK258A: Nitrate									
Nitrate as N	14797-55-8	0.002	mg/L	0.009	0.006	<0.002	<0.002	<0.002	
EK259A: Nitrite and Nitrate (NOx)									
Nitrite + Nitrate as N	----	0.002	mg/L	0.009	0.006	<0.002	<0.002	<0.002	
EK261A: Total Kjeldahl Nitrogen									
Total Kjeldahl Nitrogen as N	----	0.01	mg/L	1.36	1.27	1.54	1.53	1.50	
EK262A: Total Nitrogen									
Dissolved Total Nitrogen as N	----	0.01	mg/L	0.89	0.89	0.90	0.90	0.92	
Total Nitrogen as N	----	0.01	mg/L	1.37	1.28	1.54	1.53	1.50	
EK267A: Total Phosphorus (Persulfate Digestion)									
Dissolved Total Phosphorus as P	----	0.005	mg/L	0.067	0.062	0.063	0.057	0.058	
Total Phosphorus as P	----	0.005	mg/L	0.113	0.135	0.164	0.183	0.173	
EK271A: Reactive Phosphorus									
Reactive Phosphorus as P	14265-44-2	0.001	mg/L	0.030	0.024	0.025	0.030	0.028	



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	E 12-BLANK	E 13	E 14	E 15	B 1- Repeat 01
Sampling date / time				27-Feb-2024 00:00		26-Feb-2024 00:00	26-Feb-2024 00:00	26-Feb-2024 00:00	27-Feb-2024 00:00
Compound	CAS Number	LOR	Unit	ES2407572-031	ES2407572-032	ES2407572-033	ES2407572-034	ES2407572-035	
				Result	Result	Result	Result	Result	
ED040F: Dissolved Major Anions									
Silicon	7440-21-3	0.05	mg/L	<0.05	2.80	3.25	3.43	1.07	
EK255A: Ammonia									
Ammonia as N	7664-41-7	0.005	mg/L	0.050	<0.005	0.006	0.007	<0.005	
EK257A: Nitrite									
Nitrite as N	14797-65-0	0.002	mg/L	<0.002	<0.002	<0.002	<0.002	<0.002	
EK258A: Nitrate									
Nitrate as N	14797-55-8	0.002	mg/L	0.128	<0.002	0.003	0.002	0.008	
EK259A: Nitrite and Nitrate (NOx)									
Nitrite + Nitrate as N	----	0.002	mg/L	0.128	<0.002	0.003	0.002	0.008	
EK261A: Total Kjeldahl Nitrogen									
Total Kjeldahl Nitrogen as N	----	0.01	mg/L	<0.01	1.32	1.48	1.41	1.63	
EK262A: Total Nitrogen									
Dissolved Total Nitrogen as N	----	0.01	mg/L	0.18	0.87	0.87	0.90	0.90	
Total Nitrogen as N	----	0.01	mg/L	0.05	1.32	1.48	1.41	1.64	
EK267A: Total Phosphorus (Persulfate Digestion)									
Dissolved Total Phosphorus as P	----	0.005	mg/L	<0.005	0.062	0.062	0.095	0.042	
Total Phosphorus as P	----	0.005	mg/L	<0.005	0.131	0.138	0.175	0.141	
EK271A: Reactive Phosphorus									
Reactive Phosphorus as P	14265-44-2	0.001	mg/L	<0.001	0.021	0.018	0.039	0.020	



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	B 1- Repeat 02	B 1- Repeat 03	B 1-Blank	B 2	B 3
Sampling date / time				27-Feb-2024 00:00	27-Feb-2024 00:00	27-Feb-2024 00:00	27-Feb-2024 00:00	27-Feb-2024 00:00	
Compound	CAS Number	LOR	Unit	ES2407572-036	ES2407572-037	ES2407572-038	ES2407572-039	ES2407572-040	
				Result	Result	Result	Result	Result	
ED040F: Dissolved Major Anions									
Silicon	7440-21-3	0.05	mg/L	1.08	1.08	<0.05	3.93	6.80	
EK255A: Ammonia									
Ammonia as N	7664-41-7	0.005	mg/L	<0.005	0.006	0.052	0.022	0.168	
EK257A: Nitrite									
Nitrite as N	14797-65-0	0.002	mg/L	<0.002	<0.002	<0.002	<0.002	0.002	
EK258A: Nitrate									
Nitrate as N	14797-55-8	0.002	mg/L	0.003	0.011	0.008	0.008	0.023	
EK259A: Nitrite and Nitrate (NOx)									
Nitrite + Nitrate as N	----	0.002	mg/L	0.003	0.011	0.008	0.008	0.025	
EK261A: Total Kjeldahl Nitrogen									
Total Kjeldahl Nitrogen as N	----	0.01	mg/L	1.56	1.62	0.09	1.23	2.96	
EK262A: Total Nitrogen									
Dissolved Total Nitrogen as N	----	0.01	mg/L	0.90	0.92	0.10	0.85	1.48	
Total Nitrogen as N	----	0.01	mg/L	1.56	1.63	0.10	1.24	2.98	
EK267A: Total Phosphorus (Persulfate Digestion)									
Dissolved Total Phosphorus as P	----	0.005	mg/L	0.041	0.045	<0.005	0.048	0.050	
Total Phosphorus as P	----	0.005	mg/L	0.121	0.122	<0.010	0.072	0.237	
EK271A: Reactive Phosphorus									
Reactive Phosphorus as P	14265-44-2	0.001	mg/L	0.019	0.018	<0.001	0.019	0.020	



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)			Sample ID	B 4	----	----	----	----
Sampling date / time				27-Feb-2024 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit	ES2407572-041	-----	-----	-----	-----
				Result	----	----	----	----
ED040F: Dissolved Major Anions								
Silicon	7440-21-3	0.05	mg/L	3.00	----	----	----	----
EK255A: Ammonia								
Ammonia as N	7664-41-7	0.005	mg/L	0.008	----	----	----	----
EK257A: Nitrite								
Nitrite as N	14797-65-0	0.002	mg/L	<0.002	----	----	----	----
EK258A: Nitrate								
Nitrate as N	14797-55-8	0.002	mg/L	0.006	----	----	----	----
EK259A: Nitrite and Nitrate (NOx)								
Nitrite + Nitrate as N	----	0.002	mg/L	0.006	----	----	----	----
EK261A: Total Kjeldahl Nitrogen								
Total Kjeldahl Nitrogen as N	----	0.01	mg/L	0.95	----	----	----	----
EK262A: Total Nitrogen								
Dissolved Total Nitrogen as N	----	0.01	mg/L	0.74	----	----	----	----
Total Nitrogen as N	----	0.01	mg/L	0.96	----	----	----	----
EK267A: Total Phosphorus (Persulfate Digestion)								
Dissolved Total Phosphorus as P	----	0.005	mg/L	0.047	----	----	----	----
Total Phosphorus as P	----	0.005	mg/L	0.069	----	----	----	----
EK271A: Reactive Phosphorus								
Reactive Phosphorus as P	14265-44-2	0.001	mg/L	0.017	----	----	----	----