



## CERTIFICATE OF ANALYSIS

Work Order	: ES2432454	Page	: 1 of 9
Client	: Department of Climate Change, Energy, the Environment and Water	Laboratory	: Environmental Division Sydney
Contact	: [REDACTED]	Contact	: [REDACTED]
Address	: [REDACTED]	Address	: [REDACTED]
Telephone	: [REDACTED]	Telephone	: [REDACTED]
Project	: Darling Baaka River Health Program	Date Samples Received	: 03-Oct-2024 18:15
Order number	: [REDACTED]	Date Analysis Commenced	: 04-Oct-2024
C-O-C number	: [REDACTED]	Issue Date	: 10-Oct-2024 18:00
Sampler	: [REDACTED]		
Site	: [REDACTED]		
Quote number	: ES24DEPENWAT0001		
No. of samples received	: 32		
No. of samples analysed	: 32		



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

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Project : Darling Baaka 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: Poor spike recovery for Reactive Phosphorus due to matrix interferences.
- 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.
- EK262PA-CM/EK262PA-F-CM: It is recognised that Total Nitrogen is less than Dissolved Total Nitrogen for sample 12. However, the difference is confirmed from their respective bottles.
- EK267PA-F-CM/EK271A-CM: It has been noted that Reactive Phosphorus is greater than Dissolved Total Phosphorus on sample 5, however this difference is within the limits of experimental variation.



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	S1	S2	S3	S4	S5
Sampling date / time					09-Sep-2024 00:00	09-Aug-2024 00:00	09-Aug-2024 00:00	10-Sep-2024 00:00	10-Sep-2024 00:00
Compound	CAS Number	LOR	Unit	ES2432454-001	ES2432454-002	ES2432454-003	ES2432454-004	ES2432454-005	
				Result	Result	Result	Result	Result	
ED040F: Dissolved Major Anions									
Sulfate as SO4 2-	14808-79-8	1	mg/L	38	46	44	33	30	
Sulfur as S	63705-05-5	1	mg/L	13	16	14	11	10	
Silicon as SiO2	14464-46-1	0.1	mg/L	0.3	0.5	0.4	<0.1	0.5	
Silicon	7440-21-3	0.05	mg/L	0.13	0.24	0.18	<0.05	0.25	
EK255A: Ammonia									
Ammonia as N	7664-41-7	0.005	mg/L	<0.005	<0.005	0.010	<0.005	<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	<0.002	<0.002	<0.002	<0.002	<0.002	
EK259A: Nitrite and Nitrate (NOx)									
Nitrite + Nitrate as N	----	0.002	mg/L	<0.002	<0.002	<0.002	<0.002	<0.002	
EK261A: Total Kjeldahl Nitrogen									
Total Kjeldahl Nitrogen as N	----	0.01	mg/L	1.00	0.55	0.58	0.54	0.66	
EK262A: Total Nitrogen									
Dissolved Total Nitrogen as N	----	0.01	mg/L	0.46	0.43	0.45	0.53	0.43	
Total Nitrogen as N	----	0.01	mg/L	1.00	0.55	0.58	0.54	0.66	
EK267A: Total Phosphorus (Persulfate Digestion)									
Dissolved Total Phosphorus as P	----	0.005	mg/L	0.019	0.027	0.034	0.030	0.034	
Total Phosphorus as P	----	0.005	mg/L	0.070	0.078	0.072	0.064	0.099	
EK271A: Reactive Phosphorus									
Reactive Phosphorus as P	14265-44-2	0.001	mg/L	0.008	0.015	0.014	0.013	0.035	



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	S6	S7	S8	S9	S10
Sampling date / time					10-Sep-2024 00:00	10-Sep-2024 00:00	10-Sep-2024 00:00	11-Sep-2024 00:00	17-Sep-2024 00:00
Compound	CAS Number	LOR	Unit	ES2432454-006	ES2432454-007	ES2432454-008	ES2432454-009	ES2432454-010	
				Result	Result	Result	Result	Result	
ED040F: Dissolved Major Anions									
Sulfate as SO4 2-	14808-79-8	1	mg/L	28	13	12	9	14	
Sulfur as S	63705-05-5	1	mg/L	9	4	4	3	4	
Silicon as SiO2	14464-46-1	0.1	mg/L	1.1	6.2	15.9	11.2	13.4	
Silicon	7440-21-3	0.05	mg/L	0.53	2.87	7.44	5.25	6.24	
EK255A: Ammonia									
Ammonia as N	7664-41-7	0.005	mg/L	<0.005	<0.005	<0.005	<0.005	0.010	
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	<0.002	0.043	0.511	0.298	0.484	
EK259A: Nitrite and Nitrate (NOx)									
Nitrite + Nitrate as N	----	0.002	mg/L	0.002	0.043	0.511	0.298	0.484	
EK261A: Total Kjeldahl Nitrogen									
Total Kjeldahl Nitrogen as N	----	0.01	mg/L	0.72	0.76	1.03	0.99	0.92	
EK262A: Total Nitrogen									
Dissolved Total Nitrogen as N	----	0.01	mg/L	0.43	0.52	1.13	1.14	1.17	
Total Nitrogen as N	----	0.01	mg/L	0.72	0.80	1.54	1.29	1.40	
EK267A: Total Phosphorus (Persulfate Digestion)									
Dissolved Total Phosphorus as P	----	0.005	mg/L	0.049	0.123	0.174	0.193	0.167	
Total Phosphorus as P	----	0.005	mg/L	0.118	0.311	0.322	0.356	0.302	
EK271A: Reactive Phosphorus									
Reactive Phosphorus as P	14265-44-2	0.001	mg/L	0.041	0.083	0.119	0.074	0.115	



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	S11	S12	S13	S14	S17
Sampling date / time					11-Sep-2024 00:00	12-Sep-2024 00:00	12-Sep-2024 00:00	12-Sep-2024 00:00	23-Sep-2024 00:00
Compound	CAS Number	LOR	Unit	ES2432454-011	ES2432454-012	ES2432454-013	ES2432454-014	ES2432454-015	
				Result	Result	Result	Result	Result	
ED040F: Dissolved Major Anions									
Sulfate as SO4 2-	14808-79-8	1	mg/L	13	12	12	22	20	
Sulfur as S	63705-05-5	1	mg/L	4	4	4	7	7	
Silicon as SiO2	14464-46-1	0.1	mg/L	15.7	12.2	16.0	14.6	13.1	
Silicon	7440-21-3	0.05	mg/L	7.34	5.68	7.47	6.81	6.10	
EK255A: Ammonia									
Ammonia as N	7664-41-7	0.005	mg/L	<0.005	0.010	0.006	<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	0.692	0.826	0.801	0.236	0.118	
EK259A: Nitrite and Nitrate (NOx)									
Nitrite + Nitrate as N	----	0.002	mg/L	0.692	0.826	0.801	0.236	0.118	
EK261A: Total Kjeldahl Nitrogen									
Total Kjeldahl Nitrogen as N	----	0.01	mg/L	0.73	0.25	0.55	1.32	1.54	
EK262A: Total Nitrogen									
Dissolved Total Nitrogen as N	----	0.01	mg/L	1.29	1.30	1.29	1.33	1.13	
Total Nitrogen as N	----	0.01	mg/L	1.42	1.08	1.35	1.56	1.66	
EK267A: Total Phosphorus (Persulfate Digestion)									
Dissolved Total Phosphorus as P	----	0.005	mg/L	0.166	0.165	0.164	0.108	0.137	
Total Phosphorus as P	----	0.005	mg/L	0.367	0.273	0.355	0.295	0.342	
EK271A: Reactive Phosphorus									
Reactive Phosphorus as P	14265-44-2	0.001	mg/L	0.154	0.141	0.164	0.075	0.063	



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	S18	S19	S20	S21	S22
Sampling date / time					24-Sep-2024 00:00	24-Sep-2024 00:00	19-Sep-2024 00:00	24-Sep-2024 00:00	18-Sep-2024 00:00
Compound	CAS Number	LOR	Unit	ES2432454-016	ES2432454-017	ES2432454-018	ES2432454-019	ES2432454-020	
				Result	Result	Result	Result	Result	
ED040F: Dissolved Major Anions									
Sulfate as SO4 2-	14808-79-8	1	mg/L	18	20	14	18	19	
Sulfur as S	63705-05-5	1	mg/L	6	7	5	6	6	
Silicon as SiO2	14464-46-1	0.1	mg/L	11.1	14.1	12.6	16.4	15.3	
Silicon	7440-21-3	0.05	mg/L	5.20	6.58	5.88	7.64	7.12	
EK255A: Ammonia									
Ammonia as N	7664-41-7	0.005	mg/L	<0.005	<0.005	<0.005	<0.005	<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	0.193	0.203	0.697	0.728	0.556	
EK259A: Nitrite and Nitrate (NOx)									
Nitrite + Nitrate as N	----	0.002	mg/L	0.193	0.203	0.697	0.728	0.556	
EK261A: Total Kjeldahl Nitrogen									
Total Kjeldahl Nitrogen as N	----	0.01	mg/L	1.37	1.42	1.13	1.12	1.19	
EK262A: Total Nitrogen									
Dissolved Total Nitrogen as N	----	0.01	mg/L	1.06	1.33	1.35	1.32	1.41	
Total Nitrogen as N	----	0.01	mg/L	1.56	1.62	1.83	1.85	1.75	
EK267A: Total Phosphorus (Persulfate Digestion)									
Dissolved Total Phosphorus as P	----	0.005	mg/L	0.118	0.154	0.181	0.186	0.176	
Total Phosphorus as P	----	0.005	mg/L	0.183	0.193	0.428	0.410	0.400	
EK271A: Reactive Phosphorus									
Reactive Phosphorus as P	14265-44-2	0.001	mg/L	0.084	0.068	0.165	0.180	0.150	





Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	S23	S24	S25	S26	S27
Sampling date / time					18-Sep-2024 00:00	24-Sep-2024 00:00	18-Sep-2024 00:00	18-Sep-2024 00:00	23-Sep-2024 00:00
Compound	CAS Number	LOR	Unit	ES2432454-021	ES2432454-022	ES2432454-023	ES2432454-024	ES2432454-025	
				Result	Result	Result	Result	Result	
ED040F: Dissolved Major Anions									
Sulfate as SO4 2-	14808-79-8	1	mg/L	19	15	16	18	19	
Sulfur as S	63705-05-5	1	mg/L	6	5	6	6	6	
Silicon as SiO2	14464-46-1	0.1	mg/L	10.7	2.9	3.6	4.5	0.8	
Silicon	7440-21-3	0.05	mg/L	5.01	1.34	1.66	2.10	0.37	
EK255A: Ammonia									
Ammonia as N	7664-41-7	0.005	mg/L	0.005	0.614	0.006	0.016	<0.005	
EK257A: Nitrite									
Nitrite as N	14797-65-0	0.002	mg/L	<0.002	0.011	<0.002	0.002	<0.002	
EK258A: Nitrate									
Nitrate as N	14797-55-8	0.002	mg/L	0.003	0.231	0.004	0.008	<0.002	
EK259A: Nitrite and Nitrate (NOx)									
Nitrite + Nitrate as N	----	0.002	mg/L	0.003	0.242	0.004	0.010	<0.002	
EK261A: Total Kjeldahl Nitrogen									
Total Kjeldahl Nitrogen as N	----	0.01	mg/L	1.49	1.85	2.59	1.76	2.34	
EK262A: Total Nitrogen									
Dissolved Total Nitrogen as N	----	0.01	mg/L	0.71	1.87	1.44	1.52	1.38	
Total Nitrogen as N	----	0.01	mg/L	1.49	2.09	2.59	1.77	2.34	
EK267A: Total Phosphorus (Persulfate Digestion)									
Dissolved Total Phosphorus as P	----	0.005	mg/L	0.136	0.039	0.049	0.054	0.042	
Total Phosphorus as P	----	0.005	mg/L	0.263	0.122	0.285	0.228	0.351	
EK271A: Reactive Phosphorus									
Reactive Phosphorus as P	14265-44-2	0.001	mg/L	0.119	0.026	0.012	0.022	0.016	



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	S28	S29	S30	S31	B1
Sampling date / time				23-Sep-2024 00:00		08-Sep-2024 00:00	08-Sep-2024 00:00	08-Sep-2024 00:00	17-Sep-2024 00:00
Compound	CAS Number	LOR	Unit	ES2432454-026	ES2432454-027	ES2432454-028	ES2432454-029	ES2432454-030	
				Result	Result	Result	Result	Result	
ED040F: Dissolved Major Anions									
Sulfate as SO4 2-	14808-79-8	1	mg/L	19	19	23	12	14	
Sulfur as S	63705-05-5	1	mg/L	6	6	8	4	5	
Silicon as SiO2	14464-46-1	0.1	mg/L	6.8	4.8	4.4	0.4	15.5	
Silicon	7440-21-3	0.05	mg/L	3.15	2.24	2.05	0.17	7.22	
EK255A: Ammonia									
Ammonia as N	7664-41-7	0.005	mg/L	<0.005	0.008	0.006	0.006	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	<0.002	<0.002	<0.002	<0.002	0.579	
EK259A: Nitrite and Nitrate (NOx)									
Nitrite + Nitrate as N	----	0.002	mg/L	<0.002	<0.002	<0.002	<0.002	0.579	
EK261A: Total Kjeldahl Nitrogen									
Total Kjeldahl Nitrogen as N	----	0.01	mg/L	2.29	3.48	2.64	1.77	0.70	
EK262A: Total Nitrogen									
Dissolved Total Nitrogen as N	----	0.01	mg/L	1.18	1.40	1.66	1.45	1.11	
Total Nitrogen as N	----	0.01	mg/L	2.29	3.48	2.64	1.77	1.28	
EK267A: Total Phosphorus (Persulfate Digestion)									
Dissolved Total Phosphorus as P	----	0.005	mg/L	0.041	0.052	0.058	0.040	0.162	
Total Phosphorus as P	----	0.005	mg/L	0.306	0.390	0.582	0.188	0.324	
EK271A: Reactive Phosphorus									
Reactive Phosphorus as P	14265-44-2	0.001	mg/L	0.020	0.034	0.031	0.012	0.149	





Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	B2	B3	----	----	----
Sampling date / time				17-Sep-2024 00:00	17-Sep-2024 00:00	----	----	----	
Compound	CAS Number	LOR	Unit	ES2432454-031	ES2432454-032	-----	-----	-----	
				Result	Result	----	----	----	
ED040F: Dissolved Major Anions									
Sulfate as SO4 2-	14808-79-8	1	mg/L	10	21	----	----	----	
Sulfur as S	63705-05-5	1	mg/L	3	7	----	----	----	
Silicon as SiO2	14464-46-1	0.1	mg/L	11.1	12.3	----	----	----	
Silicon	7440-21-3	0.05	mg/L	5.19	5.76	----	----	----	
EK255A: Ammonia									
Ammonia as N	7664-41-7	0.005	mg/L	0.006	0.007	----	----	----	
EK257A: Nitrite									
Nitrite as N	14797-65-0	0.002	mg/L	<0.002	0.005	----	----	----	
EK258A: Nitrate									
Nitrate as N	14797-55-8	0.002	mg/L	0.688	0.245	----	----	----	
EK259A: Nitrite and Nitrate (NOx)									
Nitrite + Nitrate as N	----	0.002	mg/L	0.688	0.250	----	----	----	
EK261A: Total Kjeldahl Nitrogen									
Total Kjeldahl Nitrogen as N	----	0.01	mg/L	0.67	1.25	----	----	----	
EK262A: Total Nitrogen									
Dissolved Total Nitrogen as N	----	0.01	mg/L	1.34	1.40	----	----	----	
Total Nitrogen as N	----	0.01	mg/L	1.36	1.50	----	----	----	
EK267A: Total Phosphorus (Persulfate Digestion)									
Dissolved Total Phosphorus as P	----	0.005	mg/L	0.154	0.112	----	----	----	
Total Phosphorus as P	----	0.005	mg/L	0.398	0.207	----	----	----	
EK271A: Reactive Phosphorus									
Reactive Phosphorus as P	14265-44-2	0.001	mg/L	0.154	0.073	----	----	----	