

CERTIFICATE OF ANALYSIS

Work Order : **EW1804197**
Client : **MERRY BEACH CARAVAN PARK**
Contact : Peter Young
Address : Merry Beach Rd
 Kioloa NSW 2539

Telephone : ----
Project : Merry Beach Monitoring
Order number : P0501061
C-O-C number : ----
Sampler : ----
Site : Merry Beach
Quote number : WO/010/16
No. of samples received : 10
No. of samples analysed : 9

Page : 1 of 5
Laboratory : Environmental Division NSW South Coast
Contact : Glenn Davies
Address : 1/19 Ralph Black Dr, North Wollongong 2500
 4/13 Geary Pl, North Nowra 2541
 Australia NSW Australia

Telephone : +61 2 4225 3125
Date Samples Received : 07-Nov-2018 11:23
Date Analysis Commenced : 06-Nov-2018
Issue Date : 04-Dec-2018 09:15



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. 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.

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
Ankit Joshi	Inorganic Chemist	Sydney Inorganics, Smithfield, NSW
Glenn Davies	Environmental Services Representative	Laboratory - Wollongong, NSW
Ivan Taylor	Analyst	Sydney Inorganics, Smithfield, NSW
Jessica Foster		Administration - Wollongong, NSW
Sarah Griffiths	Microbiologist	Sydney Microbiology, Smithfield, NSW
Tony DeSouza	Senior Microbiologist	Sydney Microbiology, Smithfield, NSW



General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by 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 Contact 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.

- Oil and Grease analysis was conducted by ALS Canberra under NATA accreditation number 992.
- EK061G: Poor spike recovery for TKN due to matrix interferences.
- MF = membrane filtration
- CFU = colony forming unit
- Microbiological Comment: In accordance with ALS work instruction QWI-MIC/04, membrane filtration result is reported an approximate (~) when the count of colonies on the filtered membrane is outside the range of 10 - 100cfu.
- Microbiological Comment: Membrane filtration results are reported as estimate (~) due to the presence of many non-target organism colonies that may have inhibited the growth of the target organisms on the filter membrane. It may be informative to record this fact.
- Field data supplied by ALS Wollongong.
- Field tests completed on day of sampling/receipt.
- Sampling completed by client
- MW023 is ALS's internal code and is equivalent to AS4276.9.
- MW006 is ALS's internal code and is equivalent to AS4276.7.
- O&G (W-TOG_LL) is conducted by ALS Canberra NATA accreditation no. 992, site no. 1524.
- Sodium Adsorption Ratio (where reported): Where results for Na, Ca or Mg are <LOR, a concentration at half the reported LOR is incorporated into the SAR calculation. This represents a conservative approach for Na relative to the assumption that <LOR = zero concentration and a conservative approach for Ca & Mg relative to the assumption that <LOR is equivalent to the LOR concentration.



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)		Client sample ID			884/Eff1	884/Eff2	884/SW2	884/SW3	884/GW4			
Client sampling date / time		06-Nov-2018 09:22			06-Nov-2018 09:36		06-Nov-2018 09:27		27-Nov-2018 08:40		06-Nov-2018 09:47	
Compound	CAS Number	LOR	Unit	EW1804197-001	EW1804197-002	EW1804197-004	EW1804197-005	EW1804197-006				
				Result	Result	Result	Result	Result				
EA005P: pH by PC Titrator												
pH Value	----	0.01	pH Unit	7.94	7.92	6.85	7.89	7.66				
EA010P: Conductivity by PC Titrator												
Electrical Conductivity @ 25°C	----	1	µS/cm	----	----	1890	2400	2590				
EA025: Suspended Solids												
Suspended Solids (SS)	----	5	mg/L	<5	10	----	----	----				
EK010FD - Chlorines												
Free Chlorine	----	0.01	mg/L	----	2.90	----	----	----				
EK055G: Ammonia as N by Discrete Analyser												
Ammonia as N	7664-41-7	0.01	mg/L	0.07	----	0.43	0.04	0.04				
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser												
Nitrite + Nitrate as N	----	0.01	mg/L	14.0	----	<0.01	<0.01	0.53				
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser												
Total Kjeldahl Nitrogen as N	----	0.1	mg/L	1.8	----	0.9	0.7	0.8				
EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser												
^ Total Nitrogen as N	----	0.1	mg/L	15.8	----	----	----	----				
EK067G: Total Phosphorus as P by Discrete Analyser												
Total Phosphorus as P	----	0.01	mg/L	6.98	----	0.16	0.43	3.26				
EP030: Biochemical Oxygen Demand (BOD)												
Biochemical Oxygen Demand	----	2	mg/L	<2	----	5	<2	<2				
MW006: Faecal Coliforms & E.coli by MF												
Faecal Coliforms	----	1	CFU/100mL	~1	----	~450	340	~2				
<i>Escherichia coli</i>	----	1	CFU/100mL	----	1	----	----	----				
MW023: Enterococci by Membrane Filtration												
Enterococci	----	1	CFU/100mL	----	----	120	15	~8				
Subcontracted Analysis												
Oil and Grease	----	1	mg/L	<1	----	----	----	----				



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)		Client sample ID		884/GW5	884/GW6	Spearwater	Influent	----
Client sampling date / time				06-Nov-2018 09:53	06-Nov-2018 09:58	06-Nov-2018 09:58	06-Nov-2018 09:15	----
Compound	CAS Number	LOR	Unit	EW1804197-007	EW1804197-008	EW1804197-009	EW1804197-010	-----
				Result	Result	Result	Result	----
EA005P: pH by PC Titrator								
pH Value	----	0.01	pH Unit	5.86	6.56	8.07	7.69	----
EA010P: Conductivity by PC Titrator								
Electrical Conductivity @ 25°C	----	1	µS/cm	1140	1980	3000	----	----
EA015: Total Dissolved Solids								
Total Dissolved Solids @180°C	----	1	mg/L	----	----	1250	----	----
EA065: Total Hardness as CaCO3								
Total Hardness as CaCO3	----	1	mg/L	----	----	50	----	----
ED037P: Alkalinity by PC Titrator								
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	----	----	<1	----	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	----	----	<1	----	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	----	----	451	----	----
Total Alkalinity as CaCO3	----	1	mg/L	----	----	451	----	----
ED040F: Dissolved Major Anions								
Silicon	7440-21-3	0.05	mg/L	----	----	6.61	----	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	----	----	18	----	----
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	1	mg/L	----	----	643	----	----
ED093F: Dissolved Major Cations								
Calcium	7440-70-2	1	mg/L	----	----	10	----	----
Magnesium	7439-95-4	1	mg/L	----	----	6	----	----
Sodium	7440-23-5	1	mg/L	----	----	567	----	----
Potassium	7440-09-7	1	mg/L	----	----	3	----	----
EG020T: Total Metals by ICP-MS								
Manganese	7439-96-5	0.001	mg/L	----	----	0.007	----	----
Iron	7439-89-6	0.05	mg/L	----	----	0.09	----	----
EK055G: Ammonia as N by Discrete Analyser								
Ammonia as N	7664-41-7	0.01	mg/L	0.30	0.03	----	----	----
EK058G: Nitrate as N by Discrete Analyser								
Nitrate as N	14797-55-8	0.01	mg/L	----	----	<0.01	----	----
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser								
Nitrite + Nitrate as N	----	0.01	mg/L	0.74	0.27	----	0.06	----
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser								



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	884/GW5	884/GW6	Spearwater	Influent	----
Client sampling date / time				06-Nov-2018 09:53	06-Nov-2018 09:58	06-Nov-2018 09:58	06-Nov-2018 09:15	----	
Compound	CAS Number	LOR	Unit	EW1804197-007	EW1804197-008	EW1804197-009	EW1804197-010	-----	
				Result	Result	Result	Result	----	
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser - Continued									
Total Kjeldahl Nitrogen as N	----	0.1	mg/L	0.4	0.6	----	11.0	----	
EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser									
^ Total Nitrogen as N	----	0.1	mg/L	----	----	----	11.1	----	
EK067G: Total Phosphorus as P by Discrete Analyser									
Total Phosphorus as P	----	0.01	mg/L	0.03	0.04	----	48.2	----	
EN055: Ionic Balance									
Total Anions	----	0.01	meq/L	----	----	27.5	----	----	
Total Cations	----	0.01	meq/L	----	----	25.7	----	----	
Ionic Balance	----	0.01	%	----	----	3.36	----	----	
EP030: Biochemical Oxygen Demand (BOD)									
Biochemical Oxygen Demand	----	2	mg/L	<2	<2	----	102	----	
MW006: Faecal Coliforms & E.coli by MF									
Faecal Coliforms	----	1	CFU/100mL	28	~3	<1	330000	----	
<i>Escherichia coli</i>	----	1	CFU/100mL	----	----	<1	330000	----	
MW023: Enterococci by Membrane Filtration									
Enterococci	----	1	CFU/100mL	~7	~1	<1	----	----	
Subcontracted Analysis									
Oil and Grease	----	1	mg/L	----	----	----	2	----	