

## CERTIFICATE OF ANALYSIS

**Work Order** : **EW1902261**  
**Client** : **KIAMA COUNCIL**  
**Contact** : **MR PAUL CZULOWSKI**  
**Address** : **11 MANNING STREET**  
**KIAMA NSW, AUSTRALIA 2533**

**Telephone** : **+61 02 4232 0444**  
**Project** : **Gerroa Landfill**  
**Order number** : **126590**  
**C-O-C number** : **----**  
**Sampler** : **Robert DaLio**  
**Site** : **Gerroa Landfill**  
**Quote number** : **WO/016/18**  
**No. of samples received** : **17**  
**No. of samples analysed** : **17**

**Page** : 1 of 6  
**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** : 02 42253125  
**Date Samples Received** : 28-May-2019 15:20  
**Date Analysis Commenced** : 28-May-2019  
**Issue Date** : 03-Jun-2019 13:30



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



## 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.

- EK067G: LOR raised for Total P on sample No 14 & 17 due to sample matrix.
- EK059G-EK058G: LOR raised for NOx-Nitrate on sample 12 due to sample matrix.
- Sampling and sample data supplied by ALS Wollongong.
- Sampling completed as per FWI-EN001 Groundwater Sampling.
- Field tests completed on day of sampling/receipt.



## Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	MW1D	MW1S	MW3	MW4	MW5
Client sampling date / time				28-May-2019 10:45	28-May-2019 10:40	28-May-2019 10:10	28-May-2019 09:10	28-May-2019 11:50	
Compound	CAS Number	LOR	Unit	EW1902261-001	EW1902261-002	EW1902261-003	EW1902261-004	EW1902261-005	
				Result	Result	Result	Result	Result	
<b>EA005FD: Field pH</b>									
pH	----	0.1	pH Unit	7.4	----	7.9	7.2	8.1	
<b>EA010FD: Field Conductivity</b>									
Electrical Conductivity (Non Compensated)	----	1	µS/cm	1500	----	467	810	538	
<b>EA015: Total Dissolved Solids dried at 180 ± 5 °C</b>									
Total Dissolved Solids @180°C	----	10	mg/L	639	----	244	394	282	
<b>ED037P: Alkalinity by PC Titrator</b>									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	----	<1	<1	<1	
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	----	<1	<1	<1	
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	384	----	78	<1	132	
Total Alkalinity as CaCO3	----	1	mg/L	384	----	78	<1	132	
<b>EK055G: Ammonia as N by Discrete Analyser</b>									
Ammonia as N	7664-41-7	0.01	mg/L	15.5	----	0.34	0.05	0.03	
<b>EK057G: Nitrite as N by Discrete Analyser</b>									
Nitrite as N	14797-65-0	0.01	mg/L	<0.01	----	<0.01	<0.01	<0.01	
<b>EK058G: Nitrate as N by Discrete Analyser</b>									
Nitrate as N	14797-55-8	0.01	mg/L	<0.01	----	0.01	0.01	<0.01	
<b>EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser</b>									
Nitrite + Nitrate as N	----	0.01	mg/L	<0.01	----	0.01	0.01	<0.01	
<b>EK061G: Total Kjeldahl Nitrogen By Discrete Analyser</b>									
Total Kjeldahl Nitrogen as N	----	0.1	mg/L	17.2	----	0.8	1.2	0.6	
<b>EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser</b>									
^ Total Nitrogen as N	----	0.1	mg/L	17.2	----	0.8	1.2	0.6	
<b>EK067G: Total Phosphorus as P by Discrete Analyser</b>									
Total Phosphorus as P	----	0.01	mg/L	0.30	----	0.22	1.44	0.26	
<b>EN67 PK: Field Tests</b>									
Field Observations	----	0.01	--	----	DRY	----	----	----	
<b>EP025FD: Field Dissolved Oxygen</b>									
Dissolved Oxygen	----	0.01	mg/L	3.36	----	3.48	3.44	4.49	
<b>FWI-EN/001: Groundwater Sampling - Depth</b>									
Depth	----	0.01	m	3.94	----	3.41	4.84	4.08	



## Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	MW6D	MW6S	MW7D	MW7S	MW9
Client sampling date / time				28-May-2019 09:35	28-May-2019 09:33	28-May-2019 10:00	28-May-2019 09:45	28-May-2019 11:10	
Compound	CAS Number	LOR	Unit	EW1902261-006	EW1902261-007	EW1902261-008	EW1902261-009	EW1902261-010	
				Result	Result	Result	Result	Result	
<b>EA005FD: Field pH</b>									
pH	----	0.1	pH Unit	7.4	----	7.6	8.1	6.4	
<b>EA010FD: Field Conductivity</b>									
Electrical Conductivity (Non Compensated)	----	1	µS/cm	1130	----	714	714	24900	
<b>EA015: Total Dissolved Solids dried at 180 ± 5 °C</b>									
Total Dissolved Solids @180°C	----	10	mg/L	580	----	334	340	14700	
<b>ED037P: Alkalinity by PC Titrator</b>									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	----	<1	<1	<1	
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	----	<1	<1	<1	
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	411	----	286	161	68	
Total Alkalinity as CaCO3	----	1	mg/L	411	----	286	161	68	
<b>EK055G: Ammonia as N by Discrete Analyser</b>									
Ammonia as N	7664-41-7	0.01	mg/L	8.74	----	2.36	0.45	0.34	
<b>EK057G: Nitrite as N by Discrete Analyser</b>									
Nitrite as N	14797-65-0	0.01	mg/L	<0.01	----	<0.01	<0.01	<0.01	
<b>EK058G: Nitrate as N by Discrete Analyser</b>									
Nitrate as N	14797-55-8	0.01	mg/L	<0.01	----	<0.01	<0.01	0.02	
<b>EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser</b>									
Nitrite + Nitrate as N	----	0.01	mg/L	<0.01	----	<0.01	<0.01	0.02	
<b>EK061G: Total Kjeldahl Nitrogen By Discrete Analyser</b>									
Total Kjeldahl Nitrogen as N	----	0.1	mg/L	10.2	----	3.0	1.0	1.6	
<b>EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser</b>									
^ Total Nitrogen as N	----	0.1	mg/L	10.2	----	3.0	1.0	1.6	
<b>EK067G: Total Phosphorus as P by Discrete Analyser</b>									
Total Phosphorus as P	----	0.01	mg/L	3.54	----	1.20	0.50	0.13	
<b>EN67 PK: Field Tests</b>									
Field Observations	----	0.01	--	----	DRY	----	----	----	
<b>EP025FD: Field Dissolved Oxygen</b>									
Dissolved Oxygen	----	0.01	mg/L	3.15	----	3.78	4.33	4.60	
<b>FWI-EN/001: Groundwater Sampling - Depth</b>									
Depth	----	0.01	m	5.11	----	4.88	4.72	1.56	



## Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	MW10	MW11	ML-1	ML-2	ML-3
Client sampling date / time				28-May-2019 11:30	28-May-2019 12:10	28-May-2019 00:00	28-May-2019 12:30	28-May-2019 00:00	
Compound	CAS Number	LOR	Unit	EW1902261-011	EW1902261-012	EW1902261-013	EW1902261-014	EW1902261-015	
				Result	Result	Result	Result	Result	
<b>EA005FD: Field pH</b>									
pH	----	0.1	pH Unit	5.3	6.6	----	7.3	----	
<b>EA010FD: Field Conductivity</b>									
Electrical Conductivity (Non Compensated)	----	1	µS/cm	34000	11500	----	43600	----	
<b>EA015: Total Dissolved Solids dried at 180 ± 5 °C</b>									
Total Dissolved Solids @180°C	----	10	mg/L	23600	6690	----	27800	----	
<b>ED037P: Alkalinity by PC Titrator</b>									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	----	<1	----	
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	----	<1	----	
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	4	129	----	106	----	
Total Alkalinity as CaCO3	----	1	mg/L	4	129	----	106	----	
<b>EK055G: Ammonia as N by Discrete Analyser</b>									
Ammonia as N	7664-41-7	0.01	mg/L	0.23	2.20	----	0.26	----	
<b>EK057G: Nitrite as N by Discrete Analyser</b>									
Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	----	0.04	----	
<b>EK058G: Nitrate as N by Discrete Analyser</b>									
Nitrate as N	14797-55-8	0.01	mg/L	0.07	<0.10	----	0.06	----	
<b>EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser</b>									
Nitrite + Nitrate as N	----	0.01	mg/L	0.07	<0.10	----	0.10	----	
<b>EK061G: Total Kjeldahl Nitrogen By Discrete Analyser</b>									
Total Kjeldahl Nitrogen as N	----	0.1	mg/L	10.9	7.1	----	0.5	----	
<b>EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser</b>									
^ Total Nitrogen as N	----	0.1	mg/L	11.0	7.1	----	0.6	----	
<b>EK067G: Total Phosphorus as P by Discrete Analyser</b>									
Total Phosphorus as P	----	0.01	mg/L	1.18	0.35	----	<0.05	----	
<b>EN67 PK: Field Tests</b>									
Field Observations	----	0.01	--	----	----	NO ACCESS	----	NO ACCESS	
<b>EP025FD: Field Dissolved Oxygen</b>									
Dissolved Oxygen	----	0.01	mg/L	6.97	4.74	----	6.76	----	
<b>FWI-EN/001: Groundwater Sampling - Depth</b>									
Depth	----	0.01	m	1.89	2.20	----	----	----	



## Analytical Results

Sub-Matrix: WATER (Matrix: WATER)		Client sample ID			ML-4	ML-5	----	----	----
		Client sampling date / time			28-May-2019 00:00	28-May-2019 11:05	----	----	----
Compound	CAS Number	LOR	Unit	EW1902261-016	EW1902261-017	-----	-----	-----	
				Result	Result	----	----	----	
<b>EA005FD: Field pH</b>									
pH	----	0.1	pH Unit	----	6.9	----	----	----	
<b>EA010FD: Field Conductivity</b>									
Electrical Conductivity (Non Compensated)	----	1	µS/cm	----	36900	----	----	----	
<b>EA015: Total Dissolved Solids dried at 180 ± 5 °C</b>									
Total Dissolved Solids @180°C	----	10	mg/L	----	25500	----	----	----	
<b>ED037P: Alkalinity by PC Titrator</b>									
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	----	118	----	----	----	
Total Alkalinity as CaCO3	----	1	mg/L	----	118	----	----	----	
<b>EK055G: Ammonia as N by Discrete Analyser</b>									
Ammonia as N	7664-41-7	0.01	mg/L	----	0.75	----	----	----	
<b>EK057G: Nitrite as N by Discrete Analyser</b>									
Nitrite as N	14797-65-0	0.01	mg/L	----	0.08	----	----	----	
<b>EK058G: Nitrate as N by Discrete Analyser</b>									
Nitrate as N	14797-55-8	0.01	mg/L	----	0.12	----	----	----	
<b>EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser</b>									
Nitrite + Nitrate as N	----	0.01	mg/L	----	0.20	----	----	----	
<b>EK061G: Total Kjeldahl Nitrogen By Discrete Analyser</b>									
Total Kjeldahl Nitrogen as N	----	0.1	mg/L	----	0.9	----	----	----	
<b>EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser</b>									
^ Total Nitrogen as N	----	0.1	mg/L	----	1.1	----	----	----	
<b>EK067G: Total Phosphorus as P by Discrete Analyser</b>									
Total Phosphorus as P	----	0.01	mg/L	----	<0.05	----	----	----	
<b>EN67 PK: Field Tests</b>									
Field Observations	----	0.01	--	NO ACCESS	----	----	----	----	
<b>EP025FD: Field Dissolved Oxygen</b>									
Dissolved Oxygen	----	0.01	mg/L	----	5.57	----	----	----	