

## CERTIFICATE OF ANALYSIS

**Work Order** : **EW2004171**  
**Client** : **SHELLHARBOUR CITY COUNCIL**  
**Contact** : Joel Coulton  
**Address** : LAMERTON HOUSE, LAMERTON CRESCENT  
 SHELL HARBOUR CITY CENTRE NSW, AUSTRALIA 2529  
  
**Telephone** : ----  
**Project** : Dunmore Quarterly Groundwaters  
**Order number** : 130985  
**C-O-C number** : ----  
**Sampler** : Robert DaLio  
**Site** : DUNMORE LANDFILL TENDER  
**Quote number** : WO/030/19 TENDER GROUNDWATERS  
**No. of samples received** : 11  
**No. of samples analysed** : 11

**Page** : 1 of 8  
**Laboratory** : Environmental Division NSW South Coast  
**Contact** : Aneta Prosaroski  
**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** : 15-Sep-2020 16:35  
**Date Analysis Commenced** : 15-Sep-2020  
**Issue Date** : 22-Sep-2020 08:47



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

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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



## 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 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.

- **Analytical work for this work order will be conducted at ALS Sydney.**
- pH performed by ALS Wollongong via in-house method EA005FD and EN67 PK.
- Electrical conductivity performed by ALS Wollongong via in-house method EA010FD and EN67 PK.
- Sampling and groundwater depth measurements completed by ALS Wollongong via inhouse sampling method EN/67.11 Groundwater Sampling.
- Temperature performed by ALS Wollongong via in-house method EA016 and EN67 PK.
- 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	BHA	BH2	BH10	BH16	BH17R
Client sampling date / time				15-Sep-2020 07:50	15-Sep-2020 14:52	15-Sep-2020 09:30	15-Sep-2020 10:15	15-Sep-2020 08:12	
Compound	CAS Number	LOR	Unit	EW2004171-001	EW2004171-002	EW2004171-003	EW2004171-004	EW2004171-005	
				Result	Result	Result	Result	Result	
<b>EA005FD: Field pH</b>									
pH	----	0.1	pH Unit	6.8	7.0	7.1	6.6	6.8	
<b>EA010FD: Field Conductivity</b>									
Electrical Conductivity (Non Compensated)	----	1	µS/cm	1100	2600	2250	895	1960	
<b>EA116: Temperature</b>									
Temperature	----	0.1	°C	18.4	21.4	17.1	15.8	18.1	
<b>ED037P: Alkalinity by PC Titrator</b>									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	<1	<1	<1	
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	<1	<1	<1	
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	306	645	368	117	384	
Total Alkalinity as CaCO3	----	1	mg/L	306	645	368	117	384	
<b>ED041G: Sulfate (Turbidimetric) as SO4 2- by DA</b>									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	238	365	102	87	302	
<b>ED045G: Chloride by Discrete Analyser</b>									
Chloride	16887-00-6	1	mg/L	50	341	552	190	280	
<b>ED093F: Dissolved Major Cations</b>									
Calcium	7440-70-2	1	mg/L	137	181	26	66	190	
Potassium	7440-09-7	1	mg/L	10	36	2	14	54	
<b>EG020F: Dissolved Metals by ICP-MS</b>									
Manganese	7439-96-5	0.001	mg/L	0.061	0.803	0.070	0.213	0.196	
Iron	7439-89-6	0.05	mg/L	1.77	1.58	<0.05	0.16	11.4	
<b>EK040P: Fluoride by PC Titrator</b>									
Fluoride	16984-48-8	0.1	mg/L	<0.1	0.2	0.5	0.2	0.1	
<b>EK055G: Ammonia as N by Discrete Analyser</b>									
Ammonia as N	7664-41-7	0.01	mg/L	0.29	20.5	0.01	0.22	7.35	
<b>EK057G: Nitrite as N by Discrete Analyser</b>									
Nitrite as N	14797-65-0	0.01	mg/L	0.05	0.05	<0.01	<0.01	0.08	
<b>EK058G: Nitrate as N by Discrete Analyser</b>									
Nitrate as N	14797-55-8	0.01	mg/L	1.21	5.07	0.61	0.01	1.33	
<b>EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser</b>									
Nitrite + Nitrate as N	----	0.01	mg/L	1.26	5.12	0.61	0.01	1.41	
<b>EP005: Total Organic Carbon (TOC)</b>									
Total Organic Carbon	----	1	mg/L	26	40	6	12	23	



### Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	BHA	BH2	BH10	BH16	BH17R
Client sampling date / time					15-Sep-2020 07:50	15-Sep-2020 14:52	15-Sep-2020 09:30	15-Sep-2020 10:15	15-Sep-2020 08:12
Compound	CAS Number	LOR	Unit		EW2004171-001	EW2004171-002	EW2004171-003	EW2004171-004	EW2004171-005
					Result	Result	Result	Result	Result
<b>QWI-EN 67.11 Sampling of Groundwaters</b>									
Standing Water Level	----	0.01	m AHD		2.88	3.66	1.22	0.58	3.19



## Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	BH18	BH18R	BH20	BH20s	BH21
Client sampling date / time				15-Sep-2020 09:03	15-Sep-2020 10:00	15-Sep-2020 13:20	15-Sep-2020 13:30	15-Sep-2020 15:05	
Compound	CAS Number	LOR	Unit	EW2004171-006	EW2004171-007	EW2004171-008	EW2004171-009	EW2004171-010	
				Result	Result	Result	Result	Result	
<b>EA005FD: Field pH</b>									
pH	----	0.1	pH Unit	6.8	7.1	7.5	7.2	7.2	
<b>EA010FD: Field Conductivity</b>									
Electrical Conductivity (Non Compensated)	----	1	µS/cm	210	2870	1730	1070	2610	
<b>EA116: Temperature</b>									
Temperature	----	0.1	°C	18.8	17.6	20.0	17.6	21.0	
<b>ED037P: Alkalinity by PC Titrator</b>									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	<1	<1	<1	
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	<1	<1	<1	
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	90	847	368	329	554	
Total Alkalinity as CaCO3	----	1	mg/L	90	847	368	329	554	
<b>ED041G: Sulfate (Turbidimetric) as SO4 2- by DA</b>									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	192	132	138	254	
<b>ED045G: Chloride by Discrete Analyser</b>									
Chloride	16887-00-6	1	mg/L	9	479	299	53	438	
<b>ED093F: Dissolved Major Cations</b>									
Calcium	7440-70-2	1	mg/L	22	182	158	108	119	
Potassium	7440-09-7	1	mg/L	7	13	34	53	17	
<b>EG020F: Dissolved Metals by ICP-MS</b>									
Manganese	7439-96-5	0.001	mg/L	0.057	0.396	0.080	0.063	0.241	
Iron	7439-89-6	0.05	mg/L	0.59	0.21	1.89	<0.05	0.16	
<b>EK040P: Fluoride by PC Titrator</b>									
Fluoride	16984-48-8	0.1	mg/L	0.2	0.4	0.1	0.1	0.4	
<b>EK055G: Ammonia as N by Discrete Analyser</b>									
Ammonia as N	7664-41-7	0.01	mg/L	0.41	1.96	50.7	0.44	4.02	
<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	0.06	<0.01	
<b>EK058G: Nitrate as N by Discrete Analyser</b>									
Nitrate as N	14797-55-8	0.01	mg/L	0.01	0.05	<0.01	9.94	<0.01	
<b>EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser</b>									
Nitrite + Nitrate as N	----	0.01	mg/L	0.01	0.05	<0.01	10.0	<0.01	
<b>EP005: Total Organic Carbon (TOC)</b>									
Total Organic Carbon	----	1	mg/L	8	38	19	16	35	



### Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	BH18	BH18R	BH20	BH20s	BH21
Client sampling date / time					15-Sep-2020 09:03	15-Sep-2020 10:00	15-Sep-2020 13:20	15-Sep-2020 13:30	15-Sep-2020 15:05
Compound	CAS Number	LOR	Unit		EW2004171-006	EW2004171-007	EW2004171-008	EW2004171-009	EW2004171-010
					Result	Result	Result	Result	Result
<b>QWI-EN 67.11 Sampling of Groundwaters</b>									
Standing Water Level	----	0.01	m AHD		2.18	2.71	2.33	2.34	2.86



## Analytical Results

Sub-Matrix: WATER (Matrix: WATER)		Client sample ID			BH22	----	----	----	----
		Client sampling date / time			15-Sep-2020 15:15	----	----	----	----
Compound	CAS Number	LOR	Unit	EW2004171-011	-----	-----	-----	-----	-----
				Result	----	----	----	----	----
<b>EA005FD: Field pH</b>									
pH	----	0.1	pH Unit	7.3	----	----	----	----	----
<b>EA010FD: Field Conductivity</b>									
Electrical Conductivity (Non Compensated)	----	1	µS/cm	1740	----	----	----	----	----
<b>EA116: Temperature</b>									
Temperature	----	0.1	°C	18.1	----	----	----	----	----
<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	534	----	----	----	----	----
Total Alkalinity as CaCO3	----	1	mg/L	534	----	----	----	----	----
<b>ED041G: Sulfate (Turbidimetric) as SO4 2- by DA</b>									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	144	----	----	----	----	----
<b>ED045G: Chloride by Discrete Analyser</b>									
Chloride	16887-00-6	1	mg/L	238	----	----	----	----	----
<b>ED093F: Dissolved Major Cations</b>									
Calcium	7440-70-2	1	mg/L	103	----	----	----	----	----
Potassium	7440-09-7	1	mg/L	23	----	----	----	----	----
<b>EG020F: Dissolved Metals by ICP-MS</b>									
Manganese	7439-96-5	0.001	mg/L	0.099	----	----	----	----	----
Iron	7439-89-6	0.05	mg/L	0.95	----	----	----	----	----
<b>EK040P: Fluoride by PC Titrator</b>									
Fluoride	16984-48-8	0.1	mg/L	0.4	----	----	----	----	----
<b>EK055G: Ammonia as N by Discrete Analyser</b>									
Ammonia as N	7664-41-7	0.01	mg/L	0.98	----	----	----	----	----
<b>EK057G: Nitrite as N by Discrete Analyser</b>									
Nitrite as N	14797-65-0	0.01	mg/L	<0.01	----	----	----	----	----
<b>EK058G: Nitrate as N by Discrete Analyser</b>									
Nitrate as N	14797-55-8	0.01	mg/L	<0.01	----	----	----	----	----
<b>EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser</b>									
Nitrite + Nitrate as N	----	0.01	mg/L	<0.01	----	----	----	----	----
<b>EP005: Total Organic Carbon (TOC)</b>									
Total Organic Carbon	----	1	mg/L	21	----	----	----	----	----



**Analytical Results**

Sub-Matrix: <b>WATER</b> (Matrix: <b>WATER</b> )				Client sample ID	<b>BH22</b>	----	----	----	----
				Client sampling date / time	15-Sep-2020 15:15	----	----	----	----
Compound	CAS Number	LOR	Unit	<b>EW2004171-011</b>	-----	-----	-----	-----	-----
				Result	----	----	----	----	----
<b>QWI-EN 67.11 Sampling of Groundwaters</b>									
Standing Water Level	----	0.01	m AHD	<b>2.51</b>	----	----	----	----	----

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**Client** : **SHELLHARBOUR CITY COUNCIL**  
**Contact** : Joel Coulton  
**Address** : LAMERTON HOUSE, LAMERTON CRESCENT  
 SHELL HARBOUR CITY CENTRE NSW, AUSTRALIA 2529  
  
**Telephone** : ----  
**Project** : Dunmore Quarterly Leachate Tank EPL  
**Order number** : 130985  
**C-O-C number** : ----  
**Sampler** : Robert DaLio  
**Site** : DUNMORE LANDFILL TENDER  
**Quote number** : WO/030/19 TENDER LEACHATE  
**No. of samples received** : 1  
**No. of samples analysed** : 1

**Page** : 1 of 4  
**Laboratory** : Environmental Division NSW South Coast  
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<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
Ankit Joshi	Inorganic Chemist	Sydney Inorganics, Smithfield, NSW
Ivan Taylor	Analyst	Sydney Inorganics, Smithfield, NSW
Robert DaLio	Sampler	Laboratory - Wollongong, 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 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.

- **Analytical work for this work order will be conducted at ALS Sydney.**
- EK059G: LOR raised for NOx due to sample matrix.
- EK057G: LOR raised for Nitrite due to sample matrix.
- pH performed by ALS Wollongong via in-house method EA005FD and EN67 PK.
- Electrical conductivity performed by ALS Wollongong via in-house method EA010FD and EN67 PK.
- Dissolved oxygen (DO) performed by ALS Wollongong via in-house method EA025FD and EN67 PK.
- All field analysis performed by ALS Wollongong were completed at the time of sampling.
- Sampling completed by ALS Wollongong in accordance with in-house sampling method EN/67.10 Wastewaters
- 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

				Leachate Storage Tank LP1	----	----	----	----
Client sampling date / time				15-Sep-2020 08:30	----	----	----	----
Compound	CAS Number	LOR	Unit	EW2004172-001	-----	-----	-----	-----
				Result	----	----	----	----
<b>EA005FD: Field pH</b>								
pH	----	0.1	pH Unit	7.8	----	----	----	----
<b>EA010FD: Field Conductivity</b>								
Electrical Conductivity (Non Compensated)	----	1	µS/cm	12200	----	----	----	----
<b>EA116: Temperature</b>								
Temperature	----	0.1	°C	18.0	----	----	----	----
<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	4420	----	----	----	----
Total Alkalinity as CaCO3	----	1	mg/L	4420	----	----	----	----
<b>ED041G: Sulfate (Turbidimetric) as SO4 2- by DA</b>								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	252	----	----	----	----
<b>ED045G: Chloride by Discrete Analyser</b>								
Chloride	16887-00-6	1	mg/L	1560	----	----	----	----
<b>ED093F: Dissolved Major Cations</b>								
Calcium	7440-70-2	1	mg/L	174	----	----	----	----
Potassium	7440-09-7	1	mg/L	279	----	----	----	----
<b>EG020T: Total Metals by ICP-MS</b>								
Manganese	7439-96-5	0.001	mg/L	0.457	----	----	----	----
Iron	7439-89-6	0.05	mg/L	1.29	----	----	----	----
<b>EK040P: Fluoride by PC Titrator</b>								
Fluoride	16984-48-8	0.1	mg/L	0.5	----	----	----	----
<b>EK055G: Ammonia as N by Discrete Analyser</b>								
Ammonia as N	7664-41-7	0.01	mg/L	887	----	----	----	----
<b>EK057G: Nitrite as N by Discrete Analyser</b>								
Nitrite as N	14797-65-0	0.01	mg/L	<0.10	----	----	----	----
<b>EK058G: Nitrate as N by Discrete Analyser</b>								
Nitrate as N	14797-55-8	0.01	mg/L	<0.10	----	----	----	----
<b>EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser</b>								
Nitrite + Nitrate as N	----	0.01	mg/L	<0.10	----	----	----	----
<b>EP005: Total Organic Carbon (TOC)</b>								



**Analytical Results**

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	Leachate Storage Tank LP1	---	---	---	---
Client sampling date / time				15-Sep-2020 08:30	---	---	---	---	
Compound	CAS Number	LOR	Unit	EW2004172-001	-----	-----	-----	-----	
				Result	---	---	---	---	
<b>EP005: Total Organic Carbon (TOC) - Continued</b>									
Total Organic Carbon	---	1	mg/L	577	---	---	---	---	
<b>EP025FD: Field Dissolved Oxygen</b>									
Dissolved Oxygen	---	0.01	mg/L	0.06	---	---	---	---	
Dissolved Oxygen - % Saturation	---	0.1	% saturation	0.6	---	---	---	---	

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**Telephone** : ----  
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**Order number** : 130985  
**C-O-C number** : ----  
**Sampler** : Robert DaLio  
**Site** : DUNMORE LANDFILL TENDER  
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**No. of samples received** : 1  
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Ivan Taylor	Analyst	Sydney Inorganics, Smithfield, NSW
Robert DaLio	Sampler	Laboratory - Wollongong, NSW



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~ = Indicates an estimated value.

- **Analytical work for this work order will be conducted at ALS Sydney.**
- EK059G: LOR raised for NOx due to sample matrix.
- EK057G: LOR raised for Nitrite due to sample matrix.
- pH performed by ALS Wollongong via in-house method EA005FD and EN67 PK.
- Electrical conductivity performed by ALS Wollongong via in-house method EA010FD and EN67 PK.
- Dissolved oxygen (DO) performed by ALS Wollongong via in-house method EA025FD and EN67 PK.
- All field analysis performed by ALS Wollongong were completed at the time of sampling.
- Sampling completed by ALS Wollongong in accordance with in-house sampling method EN/67.10 Wastewaters
- 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			Leachate Sump	----	----	----	----
Client sampling date / time		15-Sep-2020 08:45			----	----	----	----	----
Compound	CAS Number	LOR	Unit	EW2004173-001	-----	-----	-----	-----	-----
				Result	----	----	----	----	----
<b>EA005FD: Field pH</b>									
pH	----	0.1	pH Unit	7.7	----	----	----	----	----
<b>EA010FD: Field Conductivity</b>									
Electrical Conductivity (Non Compensated)	----	1	µS/cm	11200	----	----	----	----	----
<b>EA116: Temperature</b>									
Temperature	----	0.1	°C	18.0	----	----	----	----	----
<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	3640	----	----	----	----	----
Total Alkalinity as CaCO3	----	1	mg/L	3640	----	----	----	----	----
<b>ED041G: Sulfate (Turbidimetric) as SO4 2- by DA</b>									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	250	----	----	----	----	----
<b>ED045G: Chloride by Discrete Analyser</b>									
Chloride	16887-00-6	1	mg/L	1430	----	----	----	----	----
<b>ED093F: Dissolved Major Cations</b>									
Calcium	7440-70-2	1	mg/L	178	----	----	----	----	----
Potassium	7440-09-7	1	mg/L	258	----	----	----	----	----
<b>EG020T: Total Metals by ICP-MS</b>									
Manganese	7439-96-5	0.001	mg/L	0.424	----	----	----	----	----
Iron	7439-89-6	0.05	mg/L	1.59	----	----	----	----	----
<b>EK040P: Fluoride by PC Titrator</b>									
Fluoride	16984-48-8	0.1	mg/L	0.5	----	----	----	----	----
<b>EK055G: Ammonia as N by Discrete Analyser</b>									
Ammonia as N	7664-41-7	0.01	mg/L	734	----	----	----	----	----
<b>EK057G: Nitrite as N by Discrete Analyser</b>									
Nitrite as N	14797-65-0	0.01	mg/L	<0.10	----	----	----	----	----
<b>EK058G: Nitrate as N by Discrete Analyser</b>									
Nitrate as N	14797-55-8	0.01	mg/L	<0.10	----	----	----	----	----
<b>EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser</b>									
Nitrite + Nitrate as N	----	0.01	mg/L	<0.10	----	----	----	----	----
<b>EP005: Total Organic Carbon (TOC)</b>									
Total Organic Carbon	----	1	mg/L	557	----	----	----	----	----



**Analytical Results**

Sub-Matrix: <b>WATER</b> (Matrix: <b>WATER</b> )				Client sample ID	Leachate Sump	----	----	----	----
Client sampling date / time				15-Sep-2020 08:45	----	----	----	----	
Compound	CAS Number	LOR	Unit	EW2004173-001	-----	-----	-----	-----	
				Result	----	----	----	----	
<b>EP025FD: Field Dissolved Oxygen</b>									
Dissolved Oxygen	----	0.01	mg/L	<b>0.13</b>	----	----	----	----	
Dissolved Oxygen - % Saturation	----	0.1	% saturation	<b>1.4</b>	----	----	----	----	

## CERTIFICATE OF ANALYSIS

**Work Order** : **EW2004174**  
**Client** : **SHELLHARBOUR CITY COUNCIL**  
**Contact** : Joel Coulton  
**Address** : LAMERTON HOUSE, LAMERTON CRESCENT  
 SHELL HARBOUR CITY CENTRE NSW, AUSTRALIA 2529  
  
**Telephone** : ----  
**Project** : Dunmore Quarterly Surface Water  
**Order number** : 130985  
**C-O-C number** : ----  
**Sampler** : Robert DaLio  
**Site** : DUNMORE LANDFILL TENDER  
**Quote number** : WO/030/19 TENDER SURFACE WATER  
**No. of samples received** : 3  
**No. of samples analysed** : 3

**Page** : 1 of 3  
**Laboratory** : Environmental Division NSW South Coast  
**Contact** : Aneta Prosaroski  
**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** : 15-Sep-2020 16:36  
**Date Analysis Commenced** : 15-Sep-2020  
**Issue Date** : 22-Sep-2020 15:05



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
Ivan Taylor	Analyst	Sydney Inorganics, Smithfield, NSW
Robert DaLio	Sampler	Laboratory - Wollongong, NSW



## General Comments

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- All field analysis performed by ALS Wollongong were completed at the time of sampling.
- Sampling completed by ALS Wollongong in accordance with in-house sampling method EN/67.4 Lakes and Reservoirs
- 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	SWP2	SWP4 - Sand Mine Dam	SWP5	----	----
Client sampling date / time				15-Sep-2020 14:30	15-Sep-2020 15:30	15-Sep-2020 12:10	----	----	
Compound	CAS Number	LOR	Unit	EW2004174-001	EW2004174-002	EW2004174-003	-----	-----	
				Result	Result	Result	----	----	
<b>EA005FD: Field pH</b>									
pH	----	0.1	pH Unit	7.7	8.0	----	----	----	
<b>EA025: Total Suspended Solids dried at 104 ± 2°C</b>									
Suspended Solids (SS)	----	5	mg/L	10	8	----	----	----	
<b>EA045: Turbidity</b>									
Turbidity	----	0.1	NTU	26.7	2.0	----	----	----	
<b>ED037P: Alkalinity by PC Titrator</b>									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	----	----	----	
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	6	----	----	----	
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	634	339	----	----	----	
Total Alkalinity as CaCO3	----	1	mg/L	634	345	----	----	----	
<b>ED041G: Sulfate (Turbidimetric) as SO4 2- by DA</b>									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	280	275	----	----	----	
<b>ED045G: Chloride by Discrete Analyser</b>									
Chloride	16887-00-6	1	mg/L	438	441	----	----	----	
<b>ED093F: Dissolved Major Cations</b>									
Calcium	7440-70-2	1	mg/L	143	54	----	----	----	
Magnesium	7439-95-4	1	mg/L	57	55	----	----	----	
Sodium	7440-23-5	1	mg/L	317	320	----	----	----	
Potassium	7440-09-7	1	mg/L	29	15	----	----	----	
<b>EG020F: Dissolved Metals by ICP-MS</b>									
Iron	7439-89-6	0.05	mg/L	0.20	<0.05	----	----	----	
<b>EG020T: Total Metals by ICP-MS</b>									
Iron	7439-89-6	0.05	mg/L	0.52	0.18	----	----	----	
<b>EN055: Ionic Balance</b>									
∅ Total Anions	----	0.01	meq/L	30.8	25.0	----	----	----	
∅ Total Cations	----	0.01	meq/L	26.4	21.5	----	----	----	
∅ Ionic Balance	----	0.01	%	7.86	7.59	----	----	----	
<b>EN67 PK: Field Tests</b>									
Field Observations	----	0.01	--	----	----	DRY	----	----	
<b>EP005: Total Organic Carbon (TOC)</b>									
Total Organic Carbon	----	1	mg/L	----	39	----	----	----	
<b>EP030: Biochemical Oxygen Demand (BOD)</b>									
Biochemical Oxygen Demand	----	2	mg/L	----	<2	----	----	----	