

CERTIFICATE OF ANALYSIS

<p>Work Order : EW1201358</p> <p>Client : WOLLONGONG CITY COUNCIL</p> <p>Contact : MR WAYDE PETERSON</p> <p>Address : 41 BURELLI STREET WOLLONGONG NSW, AUSTRALIA 2500</p> <p>E-mail : wpeterson@wollongong.nsw.gov.au</p> <p>Telephone : +61 02 4227 7111</p> <p>Facsimile : +61 02 4227 7277</p> <p>Project : Helensburgh Groundwater Quarterly</p> <p>Order number : ----</p> <p>C-O-C number : ----</p> <p>Sampler : Glenn Davies</p> <p>Site : ----</p> <p>Quote number : WL/001/11 Helensburgh Groundwater Quarterly</p>	<p>Page : 1 of 4</p> <p>Laboratory : Environmental Division NSW South Coast</p> <p>Contact : Glenn Davies</p> <p>Address : 99 Kenny Street, Wollongong 2500 Unit 4 / 13 Geary Place, PO Box 3105, North Nowra 2541 AUSTRALIA</p> <p>E-mail : glenn.davies@alsglobal.com</p> <p>Telephone : 02 4225 3125</p> <p>Facsimile : 02 4225 3128</p> <p>QC Level : NEPM 1999 Schedule B(3) and ALS QCS3 requirement</p> <p>Date Samples Received : 09-MAY-2012</p> <p>Issue Date : 17-MAY-2012</p> <p>No. of samples received : 9</p> <p>No. of samples analysed : 9</p>
---	---

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results



NATA Accredited Laboratory 825

Accredited for compliance with
ISO/IEC 17025.

Signatories

This document has been electronically signed by the authorized signatories indicated below. Electronic signing has been carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	Position	Accreditation Category
Ankit Joshi	Inorganic Chemist	Sydney Inorganics
Celine Conceicao	Senior Spectroscopist	Sydney Inorganics
Evie.Sidarta	Inorganic Chemist	Sydney Inorganics
Glenn Davies	Environmental Services Representative	Laboratory - Wollongong
Hoa Nguyen	Inorganic Chemist	Sydney Inorganics
Sarah Millington	Senior Inorganic Chemist	Sydney Inorganics



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.

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

- TDS may bias high for sample ID (LGMB2) due to the presence of fine particulate matter, which may pass through the prescribed GF/C paper (confirmed by re-analysis).



Analytical Results

Sub-Matrix: WATER

Client sample ID
 Client sampling date / time

				BH 1	BH 2	BH 4	BH 5	BH 6
				09-MAY-2012 13:40	09-MAY-2012 14:50	09-MAY-2012 15:10	09-MAY-2012 15:35	09-MAY-2012 15:20
Compound	CAS Number	LOR	Unit	EW1201358-001	EW1201358-002	EW1201358-003	EW1201358-004	EW1201358-005
EA015: Total Dissolved Solids								
Total Dissolved Solids @180°C	GIS-210-010	1	mg/L	228	432	348	108	190
ED037P: Alkalinity by PC Titrator								
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	33	46	<1	<1	6
Total Alkalinity as CaCO3	----	1	mg/L	33	46	<1	<1	6
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	105	100	100	28	60
ED045G: Chloride Discrete analyser								
Chloride	16887-00-6	1	mg/L	51	165	139	42	47
ED093T: Total Major Cations								
Calcium	7440-70-2	1	mg/L	19	3	<1	4	2
Magnesium	7439-95-4	1	mg/L	14	2	6	5	4
Sodium	7440-23-5	1	mg/L	42	139	115	26	56
Potassium	7440-09-7	1	mg/L	1	14	1	3	7
EK055G: Ammonia as N by Discrete Analyser								
Ammonia as N	7664-41-7	0.01	mg/L	1.60	29.4	0.06	0.04	0.10
EN67 PK: Field Tests								
pH	----	0.1	pH Unit	5.8	5.0	4.1	4.6	5.0
Depth	----	0.01	m	3.15	2.18	2.21	5.02	2.88
EP005: Total Organic Carbon (TOC)								
Total Organic Carbon	----	1	mg/L	4	13	<1	<1	2



Analytical Results

Sub-Matrix: WATER

				Client sample ID	LGMB1	LGMB2	LGMB3	LGMB4	----
				Client sampling date / time	09-MAY-2012 13:30	09-MAY-2012 13:50	09-MAY-2012 14:15	09-MAY-2012 14:40	----
Compound	CAS Number	LOR	Unit		EW1201358-006	EW1201358-007	EW1201358-008	EW1201358-009	----
EA015: Total Dissolved Solids									
Total Dissolved Solids @180°C	GIS-210-010	1	mg/L		166	387	114	132	----
ED037P: Alkalinity by PC Titrator									
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		11	<1	10	7	----
Total Alkalinity as CaCO3	----	1	mg/L		11	<1	10	7	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		60	58	28	51	----
ED045G: Chloride Discrete analyser									
Chloride	16887-00-6	1	mg/L		16	39	37	13	----
ED093T: Total Major Cations									
Calcium	7440-70-2	1	mg/L		6	6	2	10	----
Magnesium	7439-95-4	1	mg/L		6	7	2	4	----
Sodium	7440-23-5	1	mg/L		26	32	27	10	----
Potassium	7440-09-7	1	mg/L		5	5	9	35	----
EK055G: Ammonia as N by Discrete Analyser									
Ammonia as N	7664-41-7	0.01	mg/L		0.03	0.03	1.52	0.20	----
EN67 PK: Field Tests									
pH	----	0.1	pH Unit		4.8	5.0	5.3	5.1	----
Depth	----	0.01	m		2.80	2.25	2.58	2.01	----
EP005: Total Organic Carbon (TOC)									
Total Organic Carbon	----	1	mg/L		<1	1	<1	4	----