

Environmental Division

CERTIFICATE OF ANALYSIS

<p>Work Order : EW1202341</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 : Whytes Gully Groundwater Quarterly</p> <p>Order number : 3001821</p> <p>C-O-C number : ----</p> <p>Sampler : Craig Wilson</p> <p>Site : ----</p> <p>Quote number : WL/001/11 Whytes Gully Groundwater Quarterly</p>	<p>Page : 1 of 5</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 : 23-AUG-2012</p> <p>Issue Date : 03-SEP-2012</p> <p>No. of samples received : 12</p> <p>No. of samples analysed : 12</p>	
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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.

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
Celine Conceicao	Senior Spectroscopist	Sydney Inorganics
Glenn Davies	Environmental Services Representative	Laboratory - Wollongong
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

- Sites BH1A, BH2A, BH3A & BH7A - Dry at time of sampling.
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Analytical Results

Sub-Matrix: WATER

Client sample ID
 Client sampling date / time

				BH1	BH1A	BH2A	BH3	BH3A
				23-AUG-2012 12:00	23-AUG-2012 10:55	23-AUG-2012 11:00	23-AUG-2012 11:20	23-AUG-2012 11:05
Compound	CAS Number	LOR	Unit	EW1202341-001	EW1202341-002	EW1202341-003	EW1202341-004	EW1202341-005
EA015: Total Dissolved Solids								
Total Dissolved Solids @180°C	GIS-210-010	1	mg/L	3440	----	----	2700	----
ED037P: Alkalinity by PC Titrator								
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	----	----	<1	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	----	----	<1	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	175	----	----	1060	----
Total Alkalinity as CaCO3	----	1	mg/L	175	----	----	1060	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	414	----	----	173	----
ED045G: Chloride Discrete analyser								
Chloride	16887-00-6	1	mg/L	1560	----	----	968	----
ED093T: Total Major Cations								
Calcium	7440-70-2	1	mg/L	95	----	----	138	----
Magnesium	7439-95-4	1	mg/L	138	----	----	163	----
Sodium	7440-23-5	1	mg/L	1060	----	----	716	----
Potassium	7440-09-7	1	mg/L	<1	----	----	<1	----
EK055G: Ammonia as N by Discrete Analyser								
Ammonia as N	7664-41-7	0.01	mg/L	0.12	----	----	0.06	----
EN67 PK: Field Tests								
pH	----	0.1	pH Unit	6.1	----	----	7.2	----
Electrical Conductivity (Non Compensated)	----	1	µS/cm	5610	----	----	4340	----
Depth	----	0.01	m	3.49	----	----	1.59	----
Field Observations	----	0.01	--	----	DRY	DRY	----	DRY
EP005: Total Organic Carbon (TOC)								
Total Organic Carbon	----	1	mg/L	<1	----	----	<1	----



Analytical Results

Sub-Matrix: WATER

				Client sample ID				
				BH4	BH4A	BH5	BH5A	BH6
				23-AUG-2012 11:45	23-AUG-2012 10:50	23-AUG-2012 11:30	23-AUG-2012 10:45	23-AUG-2012 10:15
				Client sampling date / time				
Compound	CAS Number	LOR	Unit	EW1202341-006	EW1202341-007	EW1202341-008	EW1202341-009	EW1202341-010
EA015: Total Dissolved Solids								
Total Dissolved Solids @180°C	GIS-210-010	1	mg/L	1030	804	3700	4440	2750
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	248	484	684	764	727
Total Alkalinity as CaCO3	----	1	mg/L	248	484	684	764	727
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	174	65	204	592	317
ED045G: Chloride Discrete analyser								
Chloride	16887-00-6	1	mg/L	408	214	1590	1830	1100
ED093T: Total Major Cations								
Calcium	7440-70-2	1	mg/L	31	56	111	161	119
Magnesium	7439-95-4	1	mg/L	30	35	157	251	126
Sodium	7440-23-5	1	mg/L	358	249	1130	1640	853
Potassium	7440-09-7	1	mg/L	<1	5	9	<1	<1
EK055G: Ammonia as N by Discrete Analyser								
Ammonia as N	7664-41-7	0.01	mg/L	0.08	1.48	1.30	0.02	0.06
EN67 PK: Field Tests								
pH	----	0.1	pH Unit	6.3	7.6	6.3	7.1	6.8
Electrical Conductivity (Non Compensated)	----	1	µS/cm	1880	1520	5870	7230	4710
Depth	----	0.01	m	1.75	2.14	6.21	2.50	1.42
EP005: Total Organic Carbon (TOC)								
Total Organic Carbon	----	1	mg/L	<1	4	30	<1	<1



Analytical Results

Sub-Matrix: WATER

				Client sample ID	BH6A	BH7A			
				Client sampling date / time	23-AUG-2012 10:35	23-AUG-2012 10:05	----	----	----
Compound	CAS Number	LOR	Unit	EW1202341-011	EW1202341-012				
EA015: Total Dissolved Solids									
Total Dissolved Solids @180°C	GIS-210-010	1	mg/L	5140	----	----	----	----	----
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	1000	----	----	----	----	----
Total Alkalinity as CaCO3	----	1	mg/L	1000	----	----	----	----	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	977	----	----	----	----	----
ED045G: Chloride Discrete analyser									
Chloride	16887-00-6	1	mg/L	1550	----	----	----	----	----
ED093T: Total Major Cations									
Calcium	7440-70-2	1	mg/L	232	----	----	----	----	----
Magnesium	7439-95-4	1	mg/L	319	----	----	----	----	----
Sodium	7440-23-5	1	mg/L	1280	----	----	----	----	----
Potassium	7440-09-7	1	mg/L	<1	----	----	----	----	----
EK055G: Ammonia as N by Discrete Analyser									
Ammonia as N	7664-41-7	0.01	mg/L	0.02	----	----	----	----	----
EN67 PK: Field Tests									
pH	----	0.1	pH Unit	7.0	----	----	----	----	----
Electrical Conductivity (Non Compensated)	----	1	µS/cm	7320	----	----	----	----	----
Depth	----	0.01	m	2.93	----	----	----	----	----
Field Observations	----	0.01	--	----	DRY	----	----	----	----
EP005: Total Organic Carbon (TOC)									
Total Organic Carbon	----	1	mg/L	<1	----	----	----	----	----