Carbon Based Environmental
Pty Limited
ABN 74 102 920 285

Rocla Quarry Products
Calga Quarry

Environmental Monitoring

Dust Deposition Gauges, Surface and Ground Waters and Meteorological Station

March 2014

Colin Davies BSc MEIA CENVP
Environmental Scientist
Date: 30 April 2014

Executive Summary

Carbon Based Environmental is contracted by Rocla Quarry Products to conduct environmental monitoring at the Calga Sand Quarry.

The monitoring includes;

- Dust Deposition Gauges;
- Surface Waters;
- Groundwaters; and
- Meteorological Station.

This report was prepared by Carbon Based Environmental and includes the following;

- Dust Deposition results for March 2014;
- Surface Water quality results for March 2014;
- Groundwater depth and quality results for March 2014; and
- Meteorological report for March 2014.

The March 2014 dust deposition results for insoluble solids were generally low and free of major contamination this month. All sites, on a rolling annual average basis, are currently below the Air Quality Management Plan exceedance level of 3.7g/m^2.month. Results were found to be representative of dust levels as determined by the Australian Standard.

Surface water samples were collected on 4 April 2014 at sites A, B, D and F. Site C was inaccessible and unable to be sampled this month. The samples were collected and analysed for a monthly sampling event. Results show pH within the slightly acidic to neutral range, low Electrical Conductivity, low Total Dissolved Solids and low Total Suspended Solids. Oil and Grease was not detected at any site.

Groundwaters were sampled for normal monthly monitoring on 4 April 2014. Groundwater depth generally decreased across the sampled groundwater bores when compared to last month. Groundwater pH and EC were generally stable this month with the exception of CQ9, MW9 and CP6 which showed a decrease in pH.

The meteorological station data recovery for the month was approximately 100%. Recorded rainfall on site for March was 145.6 mm, which was higher than the Peats Ridge long-term average for March. A comparison is shown below:

Rocla Calga Quarry	145.6 mm
BOM Peats Ridge*	NA
BOM Gosford*	113.6 mm
BOM Peats Ridge Long term mean for March*	140.3 mm

NA = Not Available

*Data sourced from Bureau of Meteorology (BOM) website (www.bom.gov.au). No data was available from the BOM Peats Ridge station for February 2014

Note: Differences in the daily rainfall readings between BOM and the Rocla station may occur due to BOM stations reporting rainfall at 9am and the Rocla station recording rainfall at midnight.

Sampling Program

Rocla Calga Quarry conducts environmental monitoring in accordance to Development Consent, OEH (EPA) licence and Environmental Management Plans. Carbon Based Environmental are contracted to undertake dust deposition gauge, surface and groundwater and meteorological monitoring for the project. Carbon Based Environmental commenced monitoring from the April 2006 monitoring period.

Dust deposition gauges are operated to the Australian Standard AS3580.10.1 "Methods for Sampling and Analysis of Ambient Air Method 10.1 Determination of Particulates—Deposited Matter—Gravimetric Method". Sampling is undertaken every 30 +/- 2 days and each gauge is analysed for insoluble solids and ash residue. The results are reported as g/m^2.month.

Surface waters are sampled in accordance with Australian Standards AS5667.1 "Guidance on the Design of Sample Programs, Sampling Techniques and the Preservation and Handling of Samples", AS5667.6 "Water Quality Sampling—Guidance on sampling of rivers and streams" and AS5667.4 "Water Quality Sampling—Guidance on sampling from lakes, natural and man-made". Surface water monitoring sites include local streams and dams. Basic analysis including pH, Electrical Conductivity, Total Suspended Solids, Total Dissolved Solids and Total Oil and Grease is conducted monthly at Sites A and F (dams) and when Sites B, C and D are flowing. Additional samples are collected when daily rainfall exceeds 50mm.

Groundwaters are sampled in accordance with Australian Standards AS5667.1 "Guidance on the Design of Sample Programs, Sampling Techniques and the Preservation and Handling of Samples" and AS5667.11 "Water Quality Sampling—Guidance on sampling of ground waters". Groundwater monitoring sites are sampled at least bi-monthly for water quality and at least quarterly for water level. Groundwater monitoring loggers continuously record water levels in a selection of bores.

Meteorological monitoring is conducted at the quarry and displayed on the site computer with a real time display. Wind parameters are measured according to Australian Standard AS 2923 "Ambient Air— Guide for Measurement of Horizontal Wind for Air Quality Applications".

The weather stations have the following sensor configuration;
Air temperature

- Humidity
- Rainfall
- Atmospheric pressure
- Evaporation
- Solar radiation
- Wind speed
- Wind direction

Carbon Based Environmental continued to operate the monitoring equipment and utilise site collections at their existing locations.

The locations of monitoring points are provided in **Figure 1**.

Figure 1: Rocla Calga Quarry environmental monitoring locations

2.0 Monthly Results

2.1 Dust Deposition Gauges

Table 1 displays the results for March 2014 and the project 12 month rolling average. Results are in g/m^2.month.

Table 1: Dust Deposition results: 5 March 2014 – 4 April 2014 (30 days)

Site	Monthly Insoluble Solids g/m^2.month	Monthly Ash Residue g/m^2.month	Monthly Combustible Matter g/m^2.month	Monthly Ash Residue/ Insoluble Solids %	Rolling Annual Average Insoluble Solids g/m^2.month
CD1	0.7	0.6	0.1	86	1.3
CD2c	0.5	0.3	0.2	60	1.2
CD3	0.6	0.6	<0.1	100	2.2
CD4	0.5	0.2	0.3	40	0.6
CD5	0.5	0.2	0.3	40	0.5
CD6	0.7	0.3	0.4	43	0.7

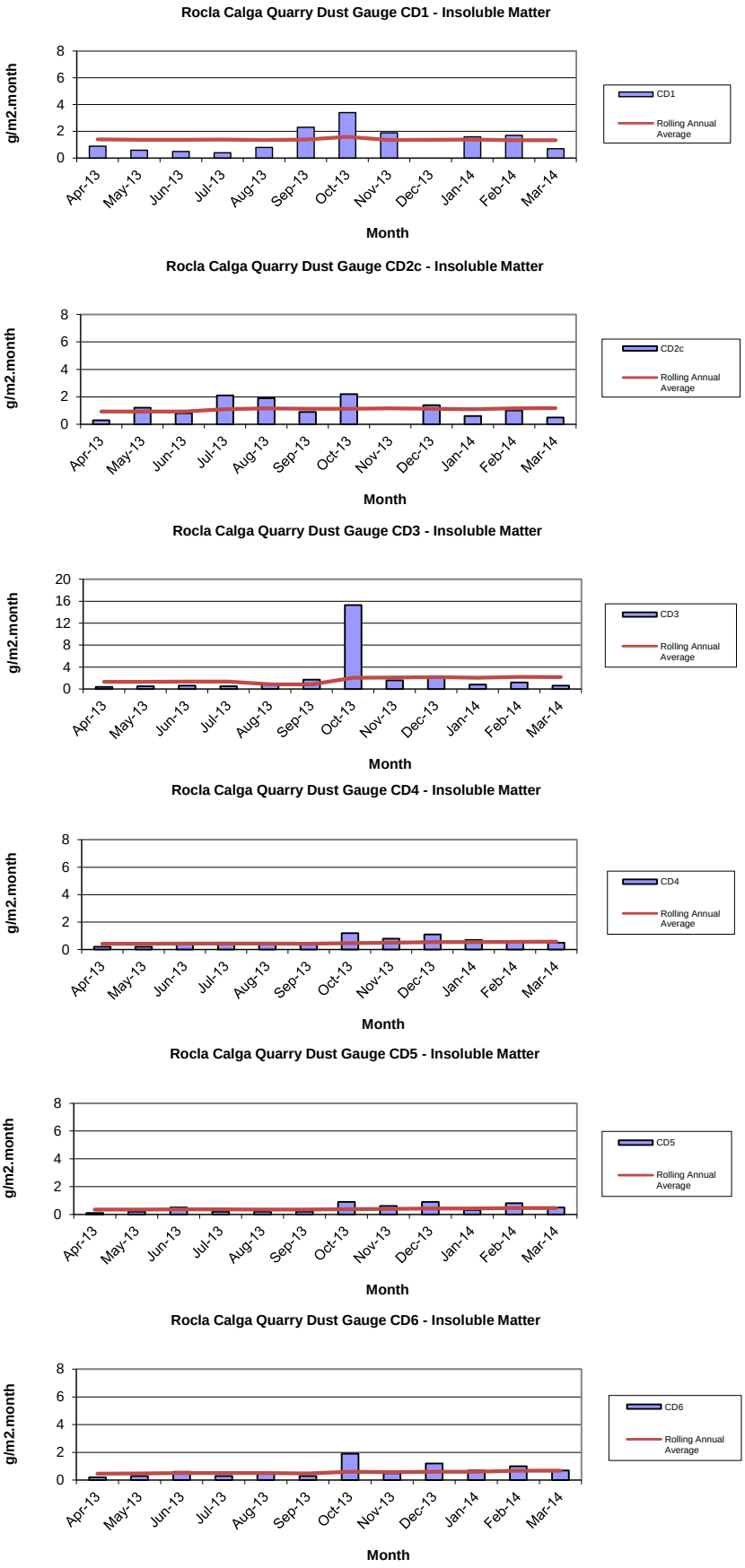
Insoluble Solids marked with an * indicate an excessively contaminated gauge. Contamination can include bird droppings, vegetation (such as plant matter, algae, pollen and seeds) and insects. Results in bold indicate insoluble solids levels above 3.7 g/m^2.month; the Development Consent's annual average amenity criteria at residential locations. The current rolling annual average is calculated from April 2013 to March 2014.

NA= Not Available.

CD1 was installed on the 1 May 2006. CD2a was discontinued at the start of August 2006 due to quarry operations "mining out" the site of the gauge. The replacement gauge, Site CD2b, was located in a position adjacent to the boundary between B. Kashouli and F. & J. Gazzana in conformance with the Air Quality Management Plan. CD4 was installed on 3 October 2006, to gauge air quality impacts to the south of the site operations, as were CD5 and CD6 which were installed on the 14 December 2006. CD2b was discontinued at the end of January 2010 due to contamination of the gauge by non-quarry related vehicle movements on a track adjacent to the gauge. The replacement gauge, CD2c, was located on a rehabilitated section of land between the extraction area and adjacent resident.

Dust deposition charts for all dust gauge sites appear in **Figure 2** below. The laboratory analysis is provided in **Appendix 1.**

Figure 2: Dust Deposition Charts



2.2 Surface Water Monitoring

Monthly surface water monitoring was conducted on the 4 April 2014 and results are listed in **Table 2**. The laboratory analysis sheets are provided in **Appendix 1.**

Table 2: Monthly surface water monitoring – March grab sample results

Site	Observed Flow Rate	Water Colour	Turbidity	pH	EC (µS/cm)	TDS (mg/L)	TSS (mg/L)	Oil and Grease (mg/L)
A	Dam	Clear	Clear	5.77	74	37	8	<5
B	Dam	Clear	Clear	6.86	94	70	<5	<5
C	No access							
D	Dam	Clear	Clear	5.53	81	58	<5	8
F	Dam	Clear	Clear	5.61	75	45	5	<5

Samples were collected at sites A, B, D and F. Site C was inaccessible and unable to be sampled this month. The samples were collected and analysed for a monthly sampling event. Results show pH within the slightly acidic to neutral range, low Electrical Conductivity, low Total Dissolved Solids and low Total Suspended Solids. Oil and Grease was detected at site D in March 2014.

2.3 Groundwater Monitoring

Groundwaters were sampled on 4 April 2014. Water quality tests for pH and electrical conductivity were conducted by Carbon Based Environmental Pty Limited. For water quality purposes, water was purged from the bore until constant pH (+/- 0.1 pH units) and Electrical Conductivity (+/- 5%) was obtained between samples. Data is displayed in **Table 3** and **Figures 3 to 6.**

Groundwater depth decreased at a majority of sites compared to last month, indicating water generally towards the surface. The exceptions being CQ6, CQ10, CP3, MW9 and CQ11S which showed a slight increase in depth.

pH at all sites is in the acidic to neutral range. pH levels remained steady across all sampled sites with the exception of CQ9, CP6 and MW9 which showed an decrease in pH. EC levels were generally similar when compared to the results obtained in February 2014.

Table 3: Groundwater Quality Data

Reference	Bore	Type	Depth to water TOC (m) April 06	Depth to water TOC (m) This report	pH This report	Electrical Conductivity (µS/cm) This report
CQ1	Voutos	* Monitor	20.59	Removed		
CQ3	Voutos	* Monitor	10.53	10.08	7.5	232
CQ4	Voutos	* Monitor	8.78	10.91	5.9	140
CQ5	Gazzana	DIP Only	8.69	7.30	5.1	187
CQ6	Gazzana	DIP Only	16.00	10.62	5.2	212
CQ7	Gazzana	* Monitor	6.89	6.00	5.2	118
CQ8	Gazzana	* Monitor	11.03	5.66	5.3	147
CQ9	Gazzana	DIP Only	10.10	8.53	5.5	131
CQ10	Voutos	* Monitor	NI	23.78	4.5	185
CQ11S	Gazzana	* Monitor	NI	11.67	5.1	171
CQ11D	Gazzana	* Monitor	NI	12.36	5.2	177
CQ12	Gazzana	* Monitor	NI	4.37	5.0	151
CQ13	Kashouli	* Monitor	NI	14.19	4.5	242
CP3	Gazzana	Domestic	10.40	9.63	5.4	165
CP4	Kashouli	Domestic	13.63	11.40	NM	NM
CP5	Kashouli	Domestic	16.61	8.92	4.9	246
CP6	Kashouli	Domestic	16.27	10.95	4.8	198
CP7	Kashouli	Production	8.56	2.46	5.7	136
CP8	Rozmanec	Domestic	22.17	11.62	5.2	154
MW7	Rocla Bore	* Monitor	15.76	15.43	4.6	124
MW8	Rocla Bore	* Monitor	9.82	7.87	4.7	96
MW9	Rocla Bore	* Monitor	22.44	22.61	4.8	106
MW10	Rocla Bore	* Monitor	15.41	NM	NM	NM
MW13	Rocla Bore	DIP Only	NI	NM	NM	NM
MW16	Rocla Bore	DIP Only	NI	NM	NM	NM

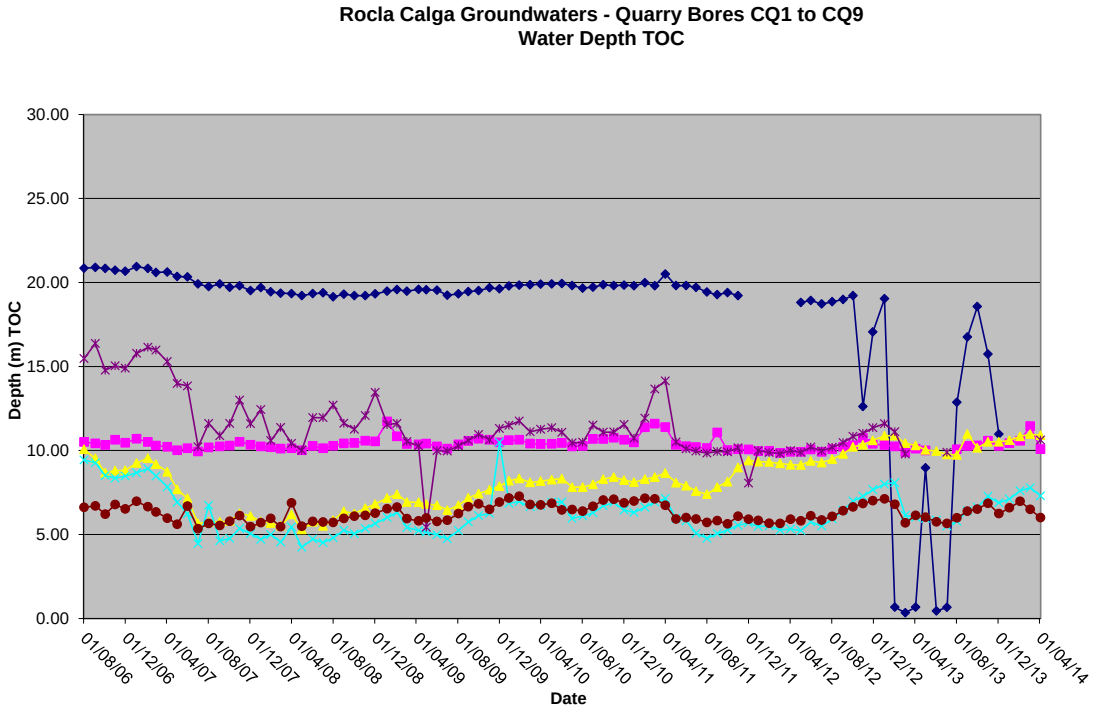
Notes:
TOC = Water level measured from top of bore case to water.
NM = Not Monitored – unable to sample water due to access restrictions.
NR = Not Required by resident.
* = Logger Installed.
NI = These bores were not installed in April 2006 but are now operational. April 2006 was the first set of measurements taken by Carbon Based Environmental Pty Limited.

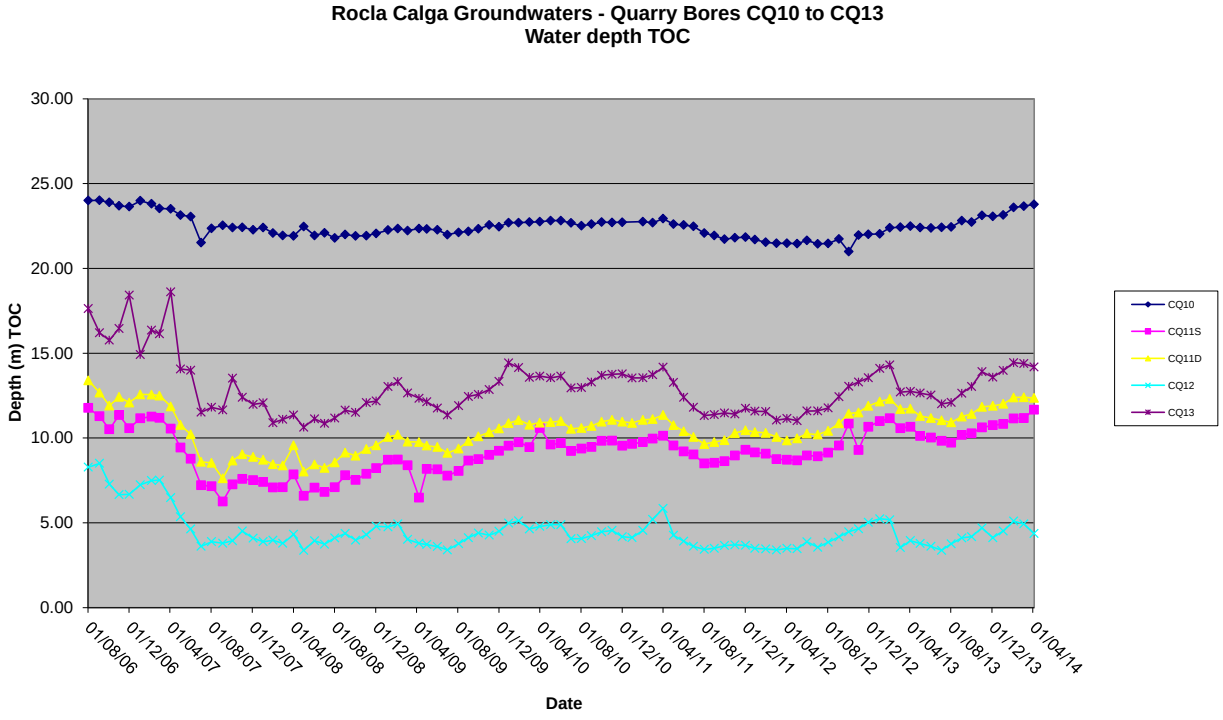
Shading is used to indicate the following trends in water depth (compared to the last reading):

	Increase to ground water depth (water moved away from surface)
	Decrease to ground water depth (water moved towards surface)
	Stable water depth (+/- 0.01m)

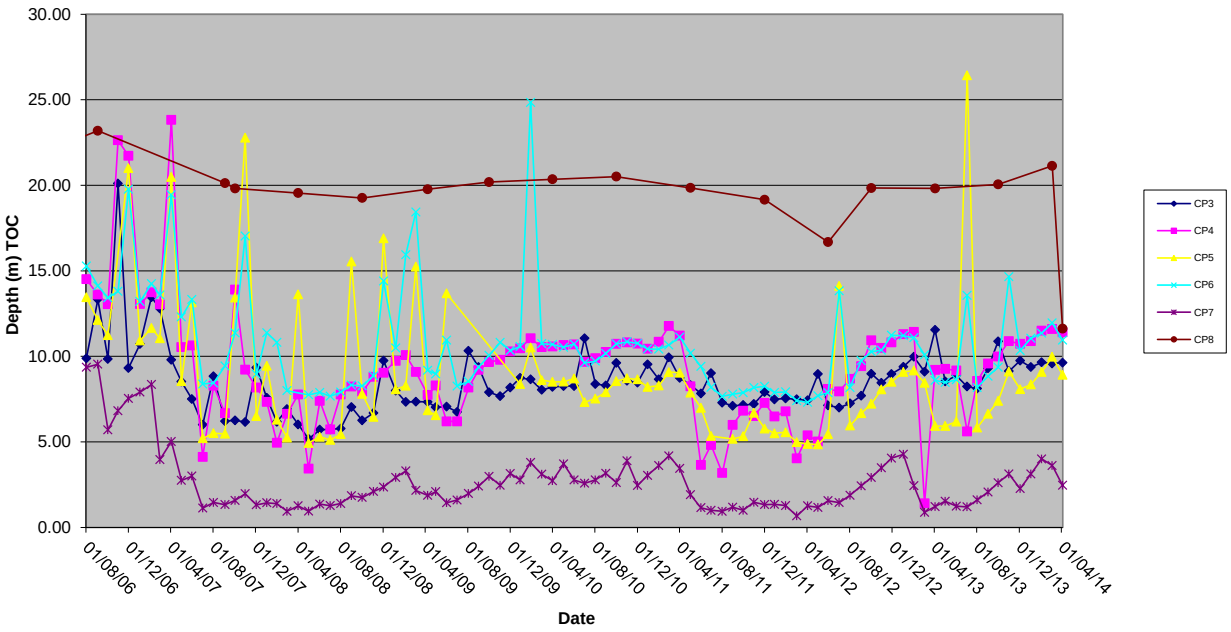
Available groundwater loggers were downloaded and will be forwarded to the Rocla Calga Quarry groundwater consultant.

Figures 3 to 6: Groundwater Depth Charts.

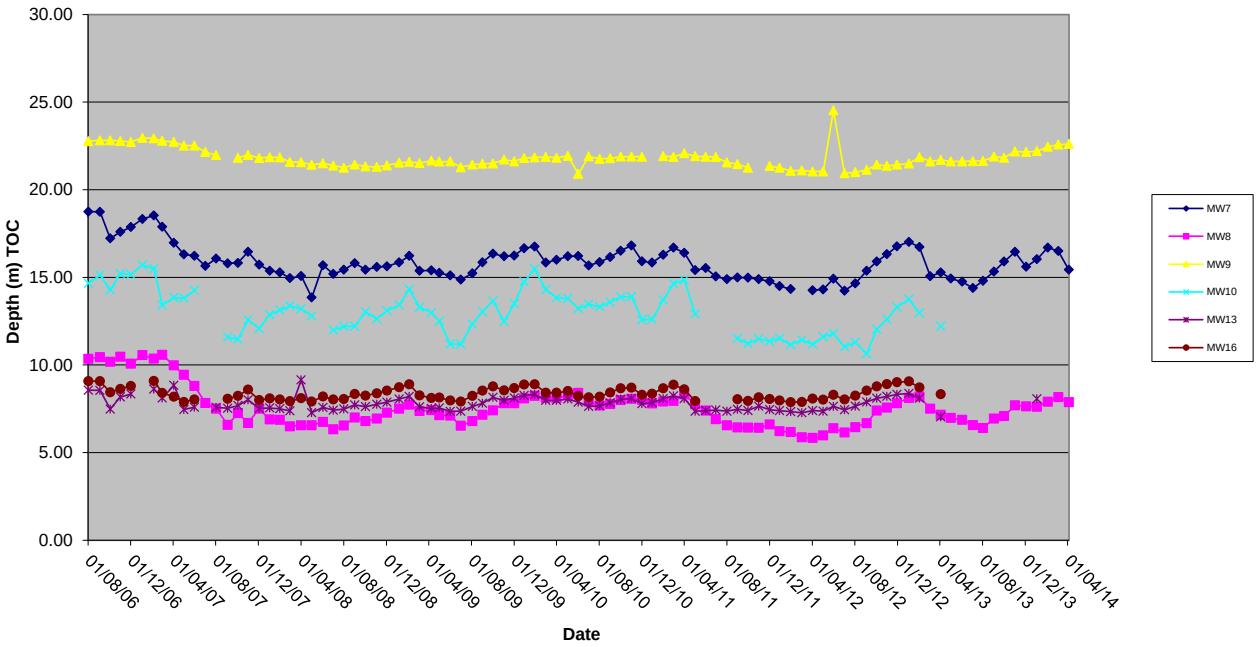




Rocla Calga Groundwaters - Quarry Bores CP3 to CP8
Water Depth TOC



Rocla Calga Groundwaters - Quarry Bores MW7 to MW16
Water Depth TOC



2.4 Meteorological Monitoring

The Rocla Calga Quarry weather station data recovery in March 2014 was approximately 100%. The weather station data follows and includes;

- Monthly data numerical summary;
- Weather charts of air temperature, humidity, heat index and wind chill, atmospheric pressure, solar radiation, evapotranspiration, rain, wind speed and data reception; and
- Wind rose (frequency distribution diagram of wind speed and direction).

Monthly weather statistics from the nearby Bureau of Meteorology (BOM) at Peats Ridge station are no longer available. However, the long term rainfall mean is available via a link on the Gosford BOM Daily Weather Observation page.

Data for March 2014 shows that rainfall recorded at the Rocla Calga Quarry was higher than the Gosford BOM and the Peats Ridge long term mean rainfall for March. The rainfall comparison is provided below:

Rocla Calga Quarry	145.8 mm
BOM Peats Ridge*	NA
BOM Gosford*	113.6mm
BOM Peats Ridge Long term mean for March*	140.3 mm

NA = Not Available
*Data sourced from Bureau of Meteorology (BOM) website (www.bom.gov.au).

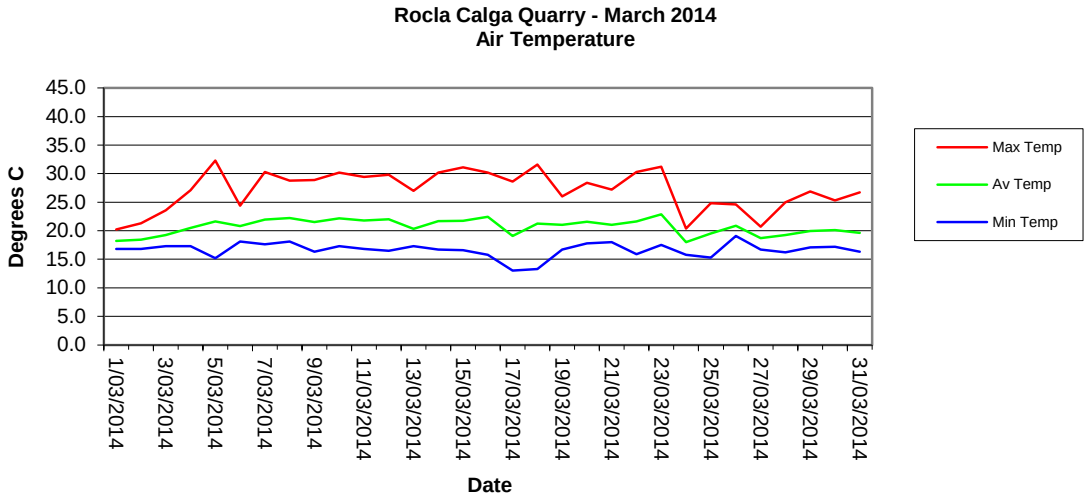
Results are displayed in the following table and figures.

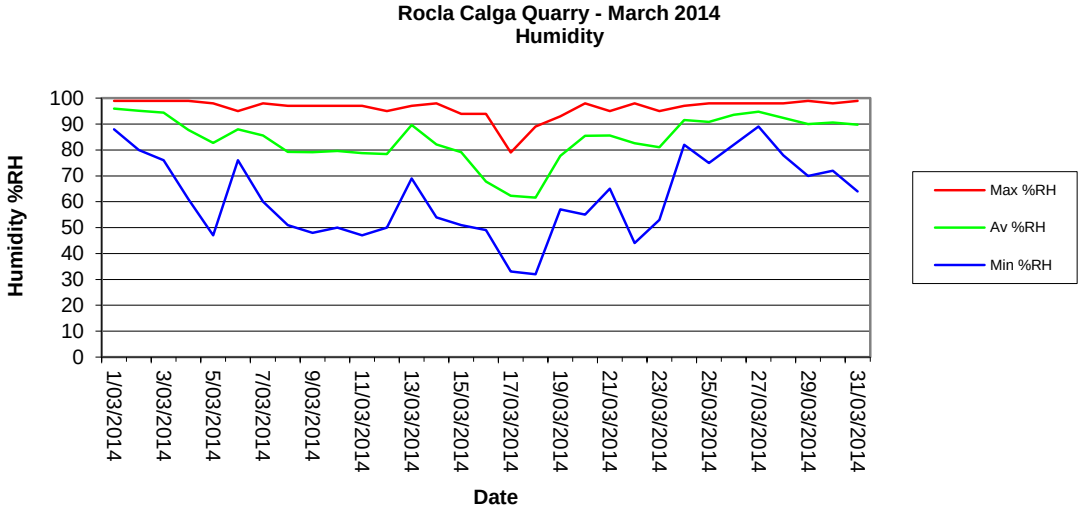
2.4.1 Monthly Meteorological Data Summary

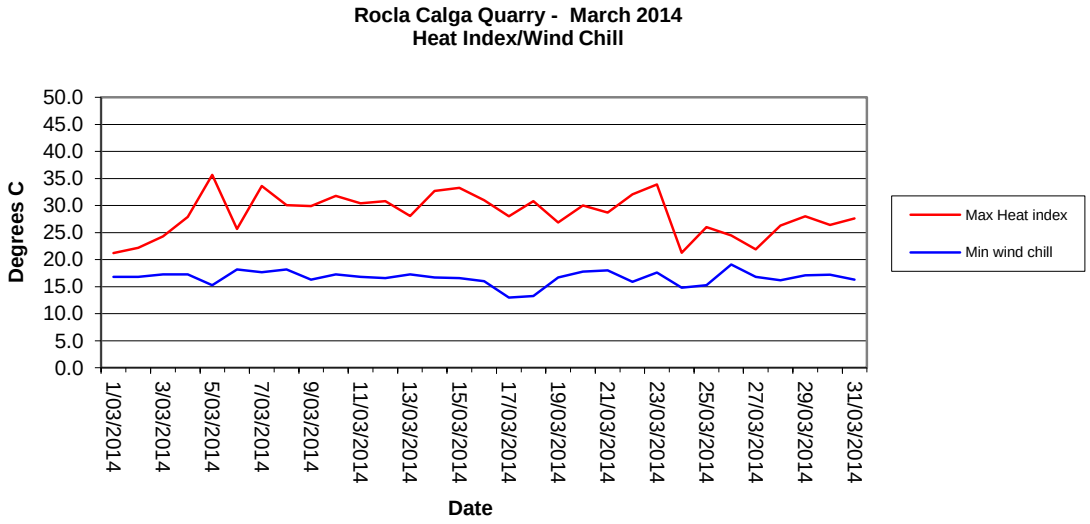
Summary **Mar-14** **Rocla - Calga**

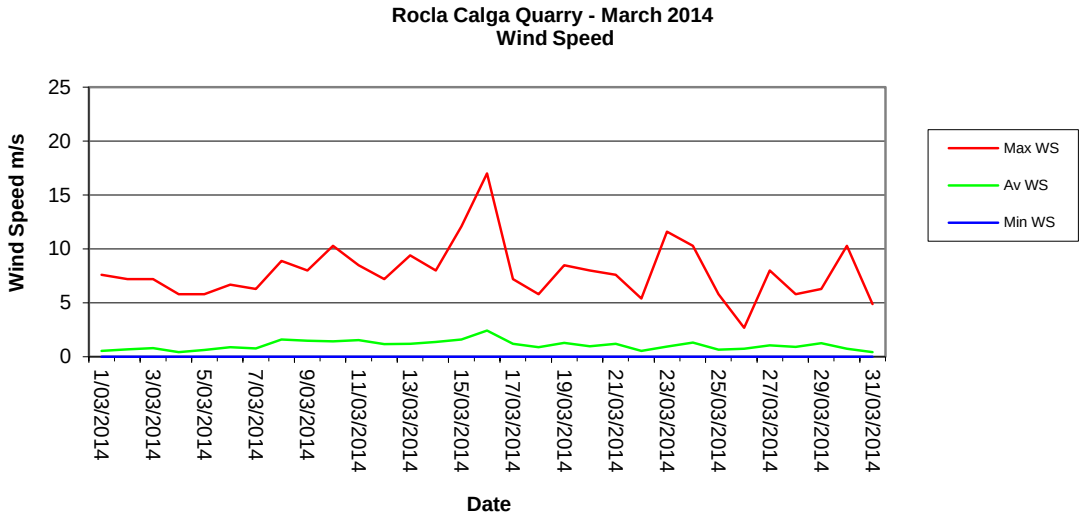
Date	Min Temp	Av Temp	Max Temp	Min %RH	Av %RH	Max %RH	RAIN mm	ET mm	Min WS	Av WS	Max WS	Min wind chill	Max Heat index	Min Atm P	Av Atm P	Max Atm P	Min Solar Rad	Av Solar Rad	Max Solar Rad	Min Data %	Av data %	Max Data %
1/03/2014	16.8	18.2	20.2	88	96	99	9.2	0.8	0	0.5	7.6	16.8	21.2	1017.7	1019.1	1021.2	0	57.9	257	42.4	81.3	100
2/03/2014	16.8	18.5	21.3	80	95	99	1.6	1.1	0	0.7	7.2	16.8	22.2	1017.4	1019.5	1021.8	0	78.2	370	38.3	79.9	100
3/03/2014	17.3	19.2	23.6	76	94	99	1.8	1.7	0	0.8	7.2	17.3	24.3	1021.4	1023.4	1025.3	0	112.7	717	77.8	95.3	100
4/03/2014	17.3	20.5	27.1	61	88	99	2.4	2.1	0	0.4	5.8	17.3	27.9	1020.3	1023.2	1025.4	0	129.6	778	80.1	96.1	100
5/03/2014	15.2	21.6	32.3	47	83	98	0.6	2.4	0	0.6	5.8	15.3	35.7	1012.6	1016.2	1019.9	0	146.4	923	64	96.1	100
6/03/2014	18.1	20.8	24.4	76	88	95	0.0	1.4	0	0.9	6.7	18.2	25.7	1013.8	1016.8	1018.6	0	80.9	389	81.6	97.4	100
7/03/2014	17.6	21.9	30.3	60	86	98	0.0	2.2	0	0.8	6.3	17.7	33.6	1016.8	1018.3	1019.7	0	114.6	857	83	97.3	100
8/03/2014	18.1	22.2	28.8	51	79	97	0.0	3.7	0	1.6	8.9	18.2	30.1	1018.6	1020.2	1021.8	0	189.9	896	81.9	97.1	100
9/03/2014	16.3	21.5	28.9	48	79	97	0.0	3.8	0	1.5	8	16.3	29.9	1018.6	1020.6	1022.6	0	204.6	860	93.6	97.2	100
10/03/2014	17.3	22.2	30.2	50	80	97	0.0	3.7	0	1.4	10.3	17.3	31.8	1019.6	1021.0	1022.3	0	194.4	895	79.5	97.4	100
11/03/2014	16.8	21.8	29.4	47	79	97	0.0	3.7	0	1.5	8.5	16.8	30.4	1018.5	1020.7	1022.9	0	195.9	888	84.5	98.7	100
12/03/2014	16.5	22.0	29.8	50	78	95	4.4	2.6	0	1.2	7.2	16.6	30.8	1014.1	1016.3	1018.4	0	138.1	684	72.5	96.4	100
13/03/2014	17.3	20.3	27.0	69	90	97	45.2	1.8	0	1.2	9.4	17.3	28.1	1016.1	1017.8	1020.0	0	111.3	664	48	93.0	100
14/03/2014	16.7	21.7	30.2	54	82	98	0.2	3.0	0	1.4	8	16.7	32.7	1012.8	1015.1	1017.4	0	166.1	909	83.3	96.3	100
15/03/2014	16.6	21.7	31.1	51	79	94	0.0	3.2	0	1.6	12.1	16.6	33.3	1005.8	1009.6	1013.3	0	170.3	935	98.8	100.0	100
16/03/2014	15.8	22.4	30.2	49	68	94	7.8	3.0	0	2.4	17	16.0	31.0	1001.6	1004.8	1012.0	0	110.3	658	80.1	95.9	100
17/03/2014	13.0	19.1	28.6	33	62	79	0.0	3.7	0	1.2	7.2	13.0	28.0	1012.5	1015.2	1018.1	0	188.3	862	82.5	97.1	100
18/03/2014	13.3	21.3	31.6	32	62	89	0.0	3.7	0	0.9	5.8	13.3	30.8	1017.6	1019.1	1020.5	0	180.4	835	93.6	99.5	100
19/03/2014	16.7	21.1	26.0	57	78	93	0.0	2.7	0	1.3	8.5	16.7	26.9	1019.5	1022.4	1024.9	0	139.5	671	97.1	99.9	100
20/03/2014	17.8	21.6	28.4	55	86	98	2.4	2.6	0	1.0	8	17.8	30.0	1022.2	1023.9	1026.2	0	149.2	761	68.7	97.3	100
21/03/2014	18.0	21.1	27.2	65	86	95	0.0	1.9	0	1.2	7.6	18.0	28.7	1017.0	1019.6	1022.1	0	106.7	673	93	99.1	100
22/03/2014	15.9	21.6	30.3	44	83	98	0.2	2.1	0	0.6	5.4	15.9	32.1	1013.0	1015.6	1017.5	0	120.2	668	77.5	98.8	100
23/03/2014	17.5	22.9	31.2	53	81	95	0.8	2.4	0	1.0	11.6	17.6	33.9	1010.9	1014.2	1016.9	0	121.6	713	90.4	98.0	100
24/03/2014	15.8	18.0	20.4	82	92	97	19.6	0.7	0	1.3	10.3	14.8	21.3	1012.4	1014.7	1016.5	0	37.4	498	82.7	94.0	100
25/03/2014	15.3	19.5	24.8	75	91	98	0.2	1.6	0	0.7	5.8	15.3	26.0	1016.0	1018.7	1021.3	0	102.7	591	80.4	92.5	100
26/03/2014	19.1	20.9	24.6	82	94	98	1.4	1.0	0	0.8	2.7	19.1	24.5	1019.2	1020.6	1022.0	0	62.2	439	79.5	97.4	100
27/03/2014	16.7	18.7	20.7	89	95	98	9.4	0.6	0	1.1	8	16.8	21.9	1017.6	1019.7	1021.8	0	37.0	223	85.4	97.5	100
28/03/2014	16.2	19.2	25.0	78	92	98	18.0	1.5	0	0.9	5.8	16.2	26.3	1011.4	1014.4	1018.2	0	91.3	482	51.5	88.6	100
29/03/2014	17.1	20.0	26.9	70	90	99	3.0	1.8	0	1.3	6.3	17.1	28.0	1011.4	1014.4	1018.0	0	105.8	682	44.2	84.2	100
30/03/2014	17.2	20.1	25.3	72	91	98	17.4	1.8	0	0.8	10.3	17.2	26.4	1016.8	1018.8	1021.2	0	108.7	608	67.5	93.4	100
31/03/2014	16.3	19.6	26.7	64	90	99	0.2	1.8	0	0.4	4.9	16.3	27.6	1017.7	1019.6	1021.6	0	110.1	762	53.8	86.5	100
Monthly	13	20.7	32.3	32	84	99	145.8	69.8	0	1.1	17	13.0	35.7	1001.6	1017.8	1026.2	0	124.6	935	38.3	94.8	100

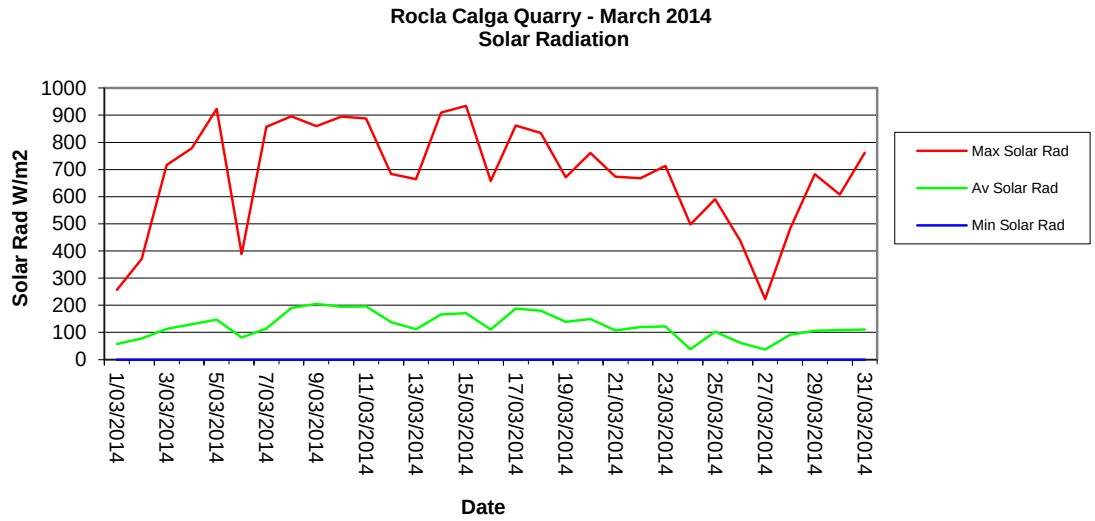
2.4.2 Monthly Weather Charts

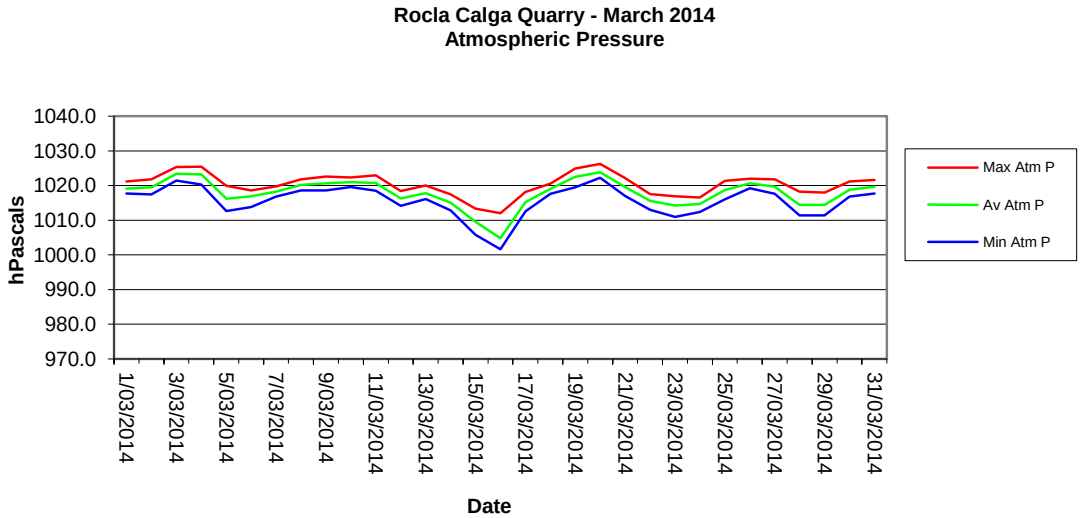




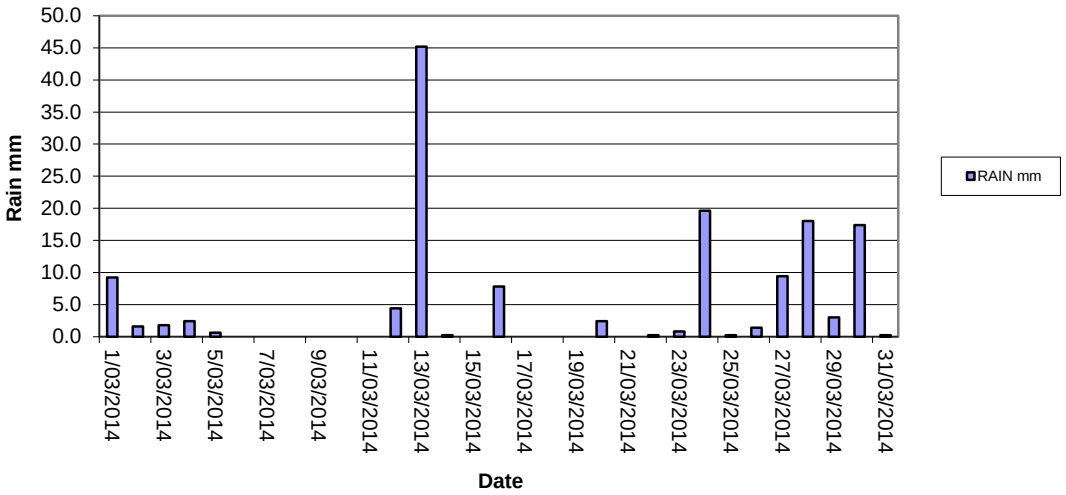



Rocla Calga Quarry - March 2014
Wind Speed
Wind Speed m/s
25
20
15
10
5
0
1/03/2014
3/03/2014
5/03/2014
7/03/2014
9/03/2014
11/03/2014
13/03/2014
15/03/2014
17/03/2014
19/03/2014
21/03/2014
23/03/2014
25/03/2014
27/03/2014
29/03/2014
31/03/2014
Date
Max WS
Av WS
Min WS

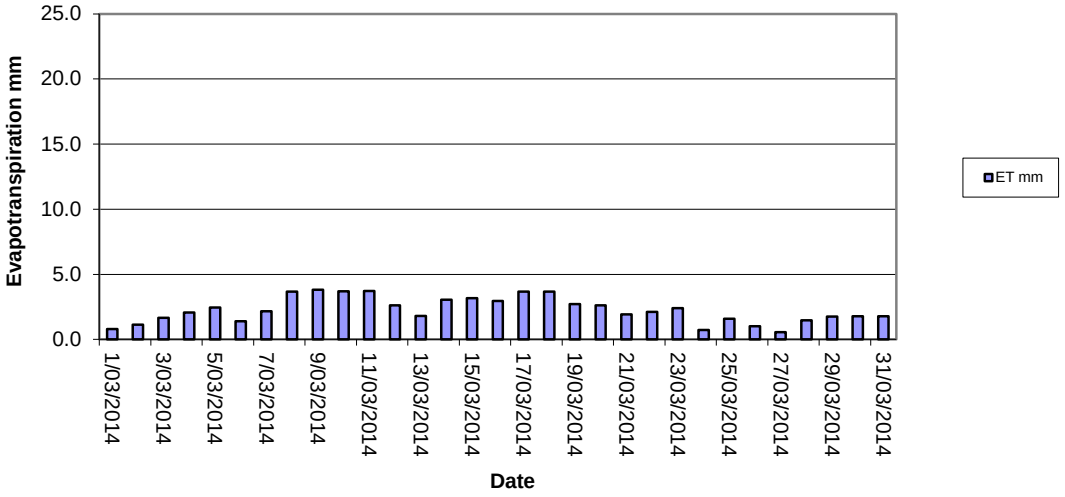

Rocla Calga Quarry - March 2014
Solar Radiation
Solar Rad W/m2
1000
900
800
700
600
500
400
300
200
100
0
1/03/2014
3/03/2014
5/03/2014
7/03/2014
9/03/2014
11/03/2014
13/03/2014
15/03/2014
17/03/2014
19/03/2014
21/03/2014
23/03/2014
25/03/2014
27/03/2014
29/03/2014
31/03/2014
Date
Max Solar Rad
Av Solar Rad
Min Solar Rad


Rocla Calga Quarry - March 2014
Atmospheric Pressure
hPascals
1040.0
1030.0
1020.0
1010.0
1000.0
990.0
980.0
970.0
1/03/2014
3/03/2014
5/03/2014
7/03/2014
9/03/2014
11/03/2014
13/03/2014
15/03/2014
17/03/2014
19/03/2014
21/03/2014
23/03/2014
25/03/2014
27/03/2014
29/03/2014
31/03/2014
Date
Max Atm P
Av Atm P
Min Atm P

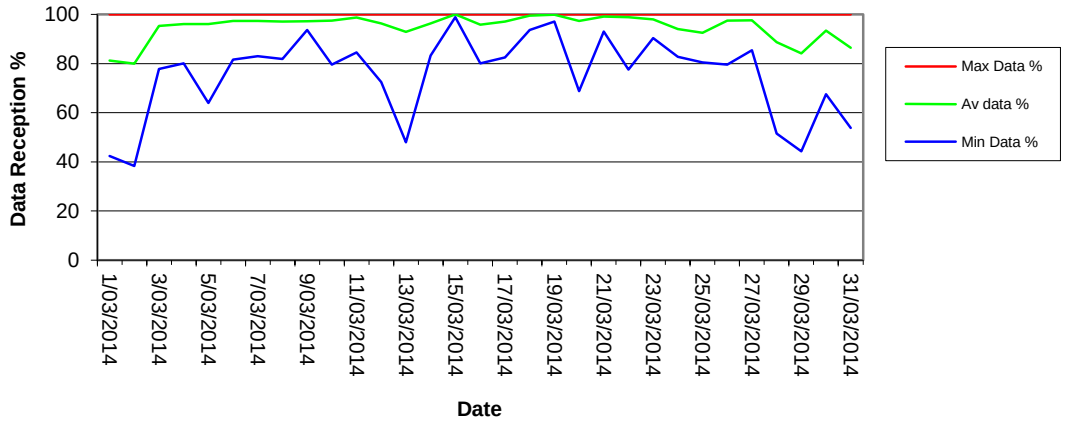
Rocla Calga Quarry - March 2014
Rainfall



Rocla Calga Quarry - March 2014
Evapotranspiration



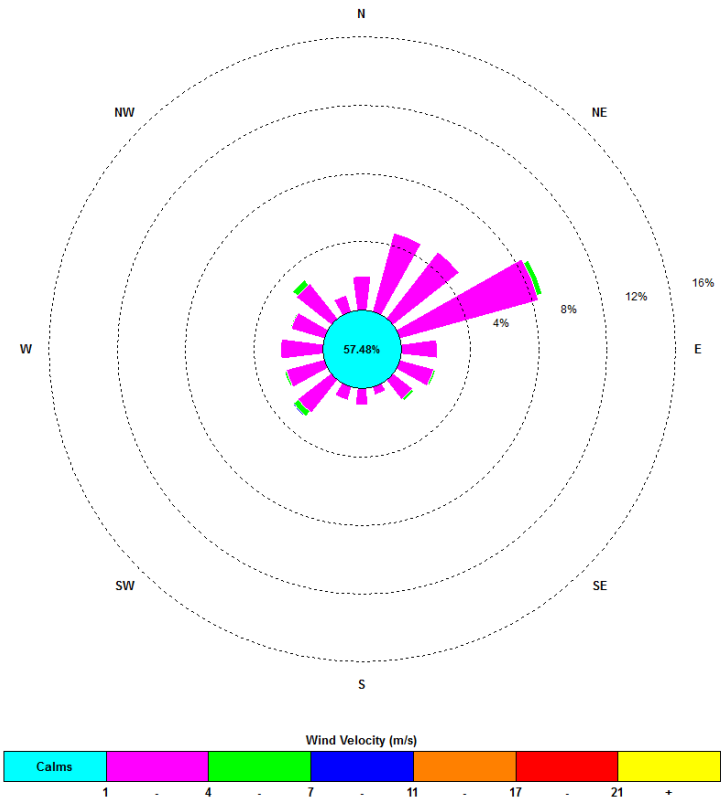
Rocla Calga Quarry - March 2014
Data Reception



2.4.3 Monthly Windrose Plot

Frequency plot of the average wind speed and average direction over each 15 minute sampling period. Wind is considered to be calm when less than a 15 minute average of 1m/s.

00:15, 01 March 2014 – 23:45, 31 March 2014



The predominant winds were from the NE, with most frequent, strongest winds from the ENE. The maximum wind speed was 17.0 m/s from the ENE.

Appendix 1

Laboratory Certificates

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: EN1401115	Page	: 1 of 4
Client	: CARBON BASED ENVIRONMENTAL	Laboratory	: Environmental Division Newcastle
Contact	: MR COLIN DAVIES (cbased)	Contact	: Peter Keyte
Address	: 47 BOOMERANG ST CESSNOCK NSW, AUSTRALIA 2325	Address	: 5/585 Maitland Road Mayfield West NSW Australia 2304
E-mail	: cbased@bigpond.com	E-mail	: peter.keyte@als.com.au
Telephone	: +61 49904443	Telephone	: 61-2-4968-9433
Facsimile	: +61 02 49904442	Facsimile	: +61-2-4968 0349
Project	: ROCLA CALGA DUSTS	QC Level	: NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Order number	: ----		
C-O-C number	: ----	Date Samples Received	: 04-APR-2014
Sampler	: CBE	Issue Date	: 14-APR-2014
Site	: ----		
		No. of samples received	: 6
Quote number	: ----	No. of samples analysed	: 6

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*
Dianne Blane	Laboratory Coordinator (2IC)	Newcastle - 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.

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

- **Analysis as per AS3580.10.1-2003. Samples passed through a 1mm sieve prior to analysis. NATA accreditation does not apply for results reported in g/m².mth as sampling data was provided by the client.**

Analytical Results

Sub-Matrix: DUST (Matrix: AIR)

Compound	CAS Number	LOR	Unit	Client sample ID	CD1 05/03/14 - 04/04/14	CD2c 05/03/14 - 04/04/14	CD3 05/03/14 - 04/04/14	CD4 05/03/14 - 04/04/14	CD5 05/03/14 - 04/04/14
				Client sampling date / time	[04-APR-2014]	[04-APR-2014]	[04-APR-2014]	[04-APR-2014]	[04-APR-2014]
					EN1401115-001	EN1401115-002	EN1401115-003	EN1401115-004	EN1401115-005
EA120: Ash Content									
Ash Content	----	0.1	g/m².month		0.6	0.3	0.6	0.2	0.2
Ash Content (mg)	----	1	mg		11	6	10	3	4
EA125: Combustible Matter									
Combustible Matter	----	0.1	g/m².month		0.1	0.2	<0.1	0.3	0.3
Combustible Matter (mg)	----	1	mg		2	2	<1	5	4
EA141: Total Insoluble Matter									
Total Insoluble Matter	----	0.1	g/m².month		0.7	0.5	0.6	0.5	0.5
Total Insoluble Matter (mg)	----	1	mg		13	8	10	8	8

Analytical Results

Sub-Matrix: DUST (Matrix: AIR)			Client sample ID	CD6 05/03/14 - 04/04/14	----	----	----	----
			Client sampling date / time	04-APR-2014 15:00	----	----	----	----
Compound	CAS Number	LOR	Unit	EN1401115-006	----	----	----	----
EA120: Ash Content								
Ash Content	----	0.1	g/m².month	0.3	----	----	----	----
Ash Content (mg)	----	1	mg	5	----	----	----	----
EA125: Combustible Matter								
Combustible Matter	----	0.1	g/m².month	0.4	----	----	----	----
Combustible Matter (mg)	----	1	mg	7	----	----	----	----
EA141: Total Insoluble Matter								
Total Insoluble Matter	----	0.1	g/m².month	0.7	----	----	----	----
Total Insoluble Matter (mg)	----	1	mg	12	----	----	----	----

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: ES1407465	Page	: 1 of 3
Client	: CARBON BASED ENVIRONMENTAL	Laboratory	: Environmental Division Sydney
Contact	: MR COLIN DAVIES (cbased)	Contact	: Client Services
Address	: 47 BOOMERANG ST CESSNOCK NSW, AUSTRALIA 2325	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: cbased@bigpond.com	E-mail	: sydney@alsglobal.com
Telephone	: +61 49904443	Telephone	: +61-2-8784 8555
Facsimile	: +61 02 49904442	Facsimile	: +61-2-8784 8500
Project	: ROCLA QUARRY	QC Level	: NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Order number	: ----		
C-O-C number	: ----	Date Samples Received	: 04-APR-2014
Sampler	: CBE	Issue Date	: 11-APR-2014
Site	: ----		
		No. of samples received	: 5
Quote number	: SY/428/12	No. of samples analysed	: 5

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

WORLD RECOGNISED ACCREDITATION

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
Ashesh Patel	Inorganic Chemist	Sydney Inorganics
Merrin Avery	Supervisor - Inorganic	Newcastle - 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.

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

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)

Compound	CAS Number	LOR	Unit	Client sample ID	A	B	D	F	CABBAGE TREE CREEK
				Client sampling date / time	[04-APR-2014]	[04-APR-2014]	[04-APR-2014]	[04-APR-2014]	[04-APR-2014]
					ES1407465-001	ES1407465-002	ES1407465-003	ES1407465-004	ES1407465-005
EA005: pH									
pH Value	----	0.01	pH Unit		5.77	6.86	5.53	5.61	5.58
EA010P: Conductivity by PC Titrator									
Electrical Conductivity @ 25°C	----	1	µS/cm		74	94	81	75	75
EA015: Total Dissolved Solids									
Total Dissolved Solids @180°C	----	10	mg/L		37	70	58	45	51
EA025: Suspended Solids									
Suspended Solids (SS)	----	5	mg/L		8	<5	<5	5	<5
EP020: Oil and Grease (O&G)									
Oil & Grease	----	5	mg/L		<5	<5	8	<5	<5