



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

July 2012

A handwritten signature in black ink, appearing to read 'Colin Davies'.

Colin Davies BSc MEIA CEnvP
Environmental Scientist
4 September 2012

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 July 2012;
- Surface Water quality results for July 2012;
- Groundwater depth and quality results for July 2012; and
- Meteorological report for July 2012.

The July 2012 dust deposition results for insoluble solids were generally similar to or lower than those of June 2012. All sites, on a rolling annual average basis, are currently below the Air Quality Management Plan exceedance level of 3.7g/m².month. Results were found to be representative of dust levels as determined by the Australian Standard.

Surface water samples were collected for the normal monthly sampling event on the 2 August 2012 at sites A, B, D and F. Site C was inaccessible and unable to be sampled. At the time of sample collection, there was no water discharge observed from the site. Results show generally good water quality with all sites sampled maintaining low Electrical Conductivity, Total Dissolved Solids and Total Suspended Solids. Oil and Grease was not detected at any of the sites. pH levels remained stable and within the slightly acidic range with the exception of F which increased in pH.

Groundwaters were sampled for normal monthly monitoring on 2 August 2012. Groundwater depths generally increased across the bores compared to last month. Groundwater pH and EC levels remained relatively stable.

The meteorological station data recovery for the month was approximately 100%. Recorded rainfall on site for July was 22.8 mm, which was lower than that recorded at the BOM Peats Ridge Station and the Peats Ridge long-term average for July. Results are detailed below:

Rocla Calga Quarry	22.8 mm
BOM Peats Ridge*	31.8 mm
BOM Gosford*	39.2 mm
BOM Peats Ridge Long term mean for July*	66.7 mm

*Data sourced from Bureau of Meteorology (BOM) website (www.bom.gov.au).

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.

1.0 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/m².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**.

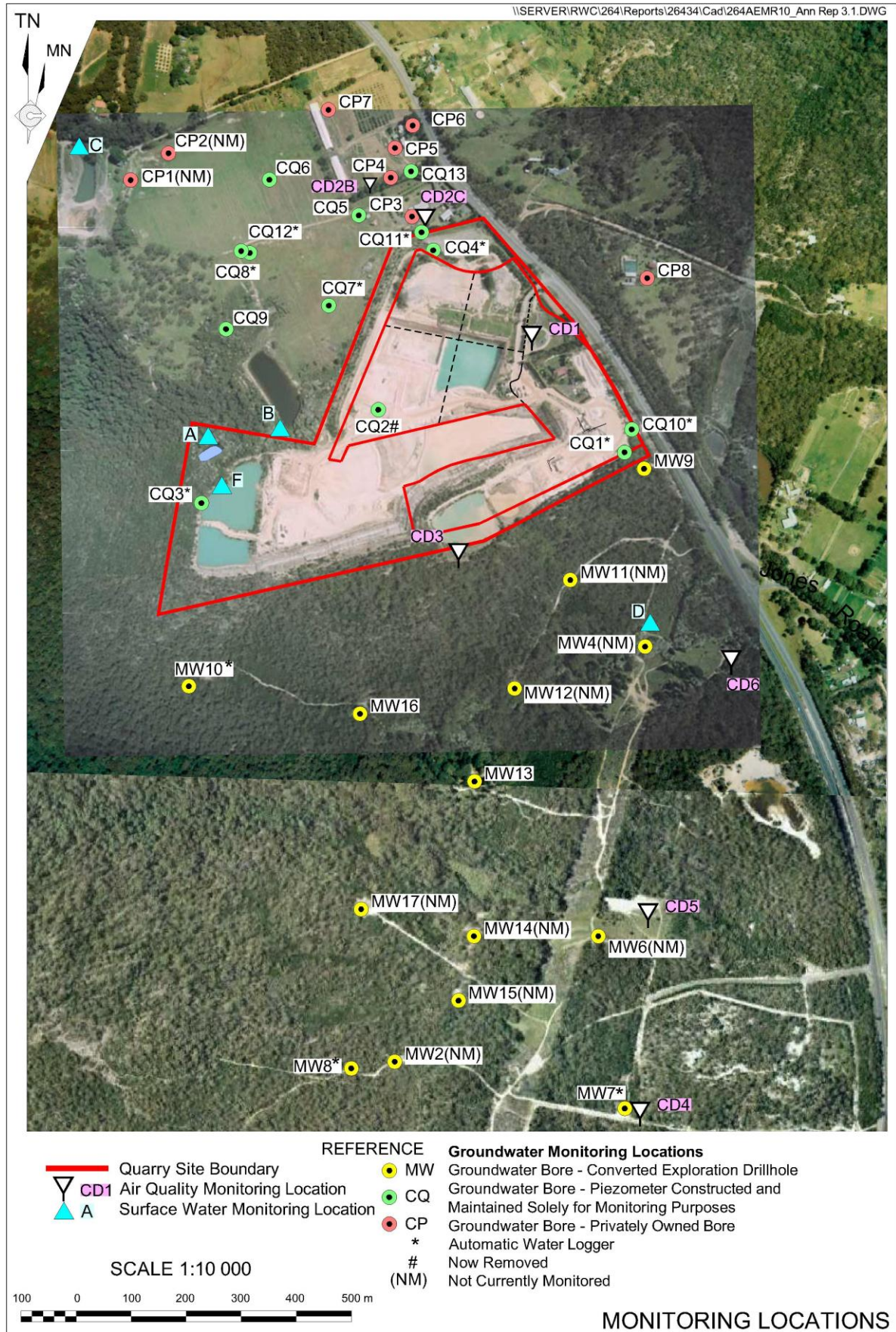


Figure 1: Rocla Calga Quarry environmental monitoring locations

2.0 Monthly Results

2.1 Dust Deposition Gauges

Table 1 displays the results for July 2012 and the project 12 month rolling average. Results are in g/m².month.

Table 1: Dust Deposition results: 2 July 2012 – 2 August 2012 (32 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	0.2	0.2	<0.1	100	1.6
CD2c	0.2	0.1	0.1	50	0.9
CD3	0.3	0.2	0.1	66	0.6
CD4	0.4	0.1	0.3	25	0.5
CD5	0.2	0.1	0.1	50	0.3
CD6	0.2	0.1	0.1	50	0.4

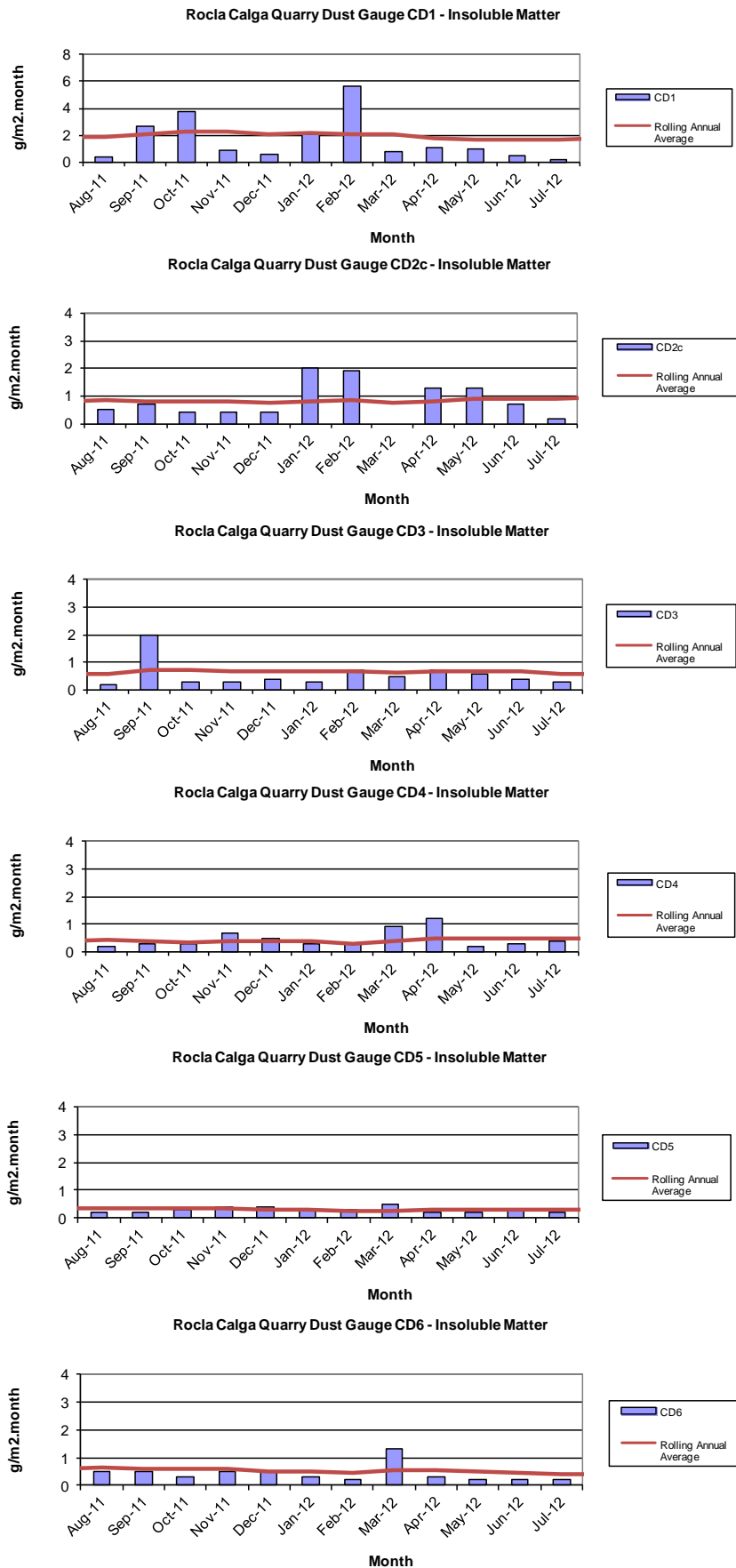
Insoluble Solids marked with an * indicate an excessively contaminated gauge. Contamination can include bird droppings, vegetation (such as plant matter, algae, pollen and seeds) and insects. Results in bold indicate insoluble solids levels above 3.7 g/m².month; the Development Consent's annual average amenity criteria at residential locations. The current rolling annual average is calculated from August 2011 to July 2012.

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 2 August 2012 and results are listed in **Table 2**. The laboratory analysis sheets are provided in **Appendix 1**.

Table 2: Monthly surface water monitoring – July 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	5.91	59	32	11	<5
B	Still	Clear	Clear	6.59	69	42	14	<5
C	No Access							
D	Still	Clear	Clear	5.74	97	48	15	<5
F	Dam	Clear	Clear	7.47	55	26	12	<5

At the time of sampling, there were no water discharges off site from any sampling location observed. 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 range, low Electrical Conductivity, low Total Dissolved Solids, low Total Suspended Solids and no detectable Oil and Grease.

2.3 Groundwater Monitoring

Groundwaters were sampled on 2 August 2012. 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 generally increased across the sampled groundwater bores compared to last month indicating water moving away from the surface. Exceptions were CP5 and CP6 which decreased in water depth.

pH levels were generally similar when compared to last month and in the acidic range. EC levels remained low and relatively stable compared to June with the exception of CQ1 which decreased.

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	18.85	10.5	262
CQ3	Voutos	* Monitor	10.53	10.07	6.3	117
CQ4	Voutos	* Monitor	8.78	9.48	4.6	81
CQ5	Gazzana	DIP Only	8.69	5.93	4.4	134
CQ6	Gazzana	DIP Only	16.00	10.19	4.3	202
CQ7	Gazzana	* Monitor	6.89	6.08	4.5	97
CQ8	Gazzana	* Monitor	11.03	5.40	4.4	148
CQ9	Gazzana	DIP Only	10.10	8.78	4.3	106
CQ10	Voutos	* Monitor	NI	21.47	4.1	169
CQ11S	Gazzana	* Monitor	NI	9.13	4.0	163
CQ11D	Gazzana	* Monitor	NI	10.42	4.5	150
CQ12	Gazzana	* Monitor	NI	3.85	4.2	136
CQ13	Kashouli	* Monitor	NI	11.77	5.0	203
CP3	Gazzana	Domestic	10.40	7.25	4.7	146
CP4	Kashouli	Domestic	13.63	8.68	5.2	174
CP5	Kashouli	Domestic	16.61	5.95	4.5	238
CP6	Kashouli	Domestic	16.27	8.18	4.2	198
CP7	Kashouli	Production	8.56	1.88	4.8	219
CP8	Rozmanec	Domestic	22.17	NR	NR	NR
MW7	Rocla Bore	* Monitor	15.76	14.66	4.1	109
MW8	Rocla Bore	* Monitor	9.82	6.45	4.1	81
MW9	Rocla Bore	* Monitor	22.44	21.00	4.2	85
MW10	Rocla Bore	* Monitor	15.41	11.29	3.9	122
MW13	Rocla Bore	DIP Only	NI	7.65	4.1	94
MW16	Rocla Bore	DIP Only	NI	8.25	4.0	111

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.

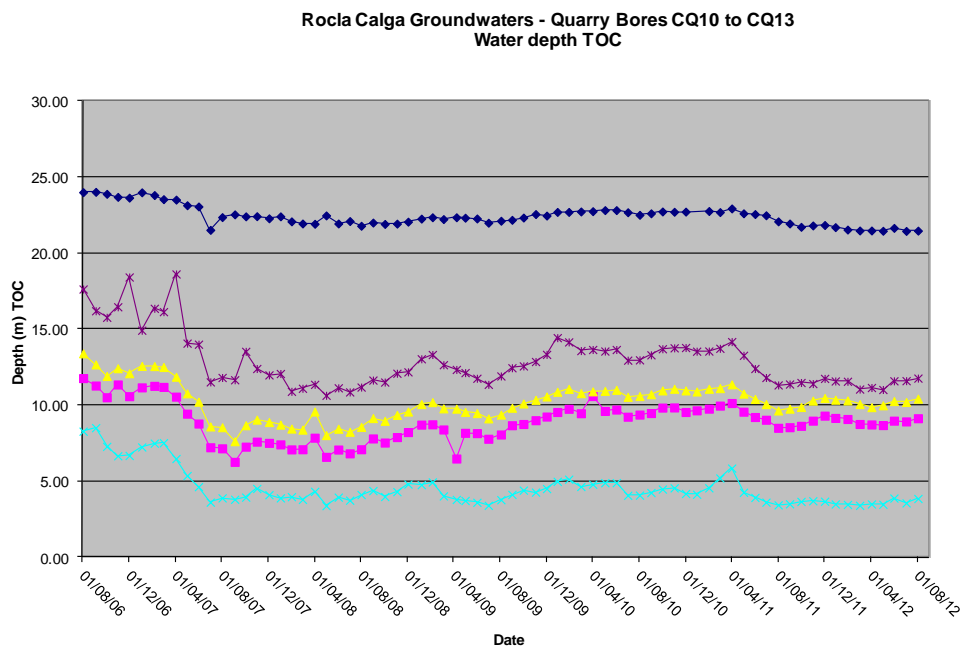
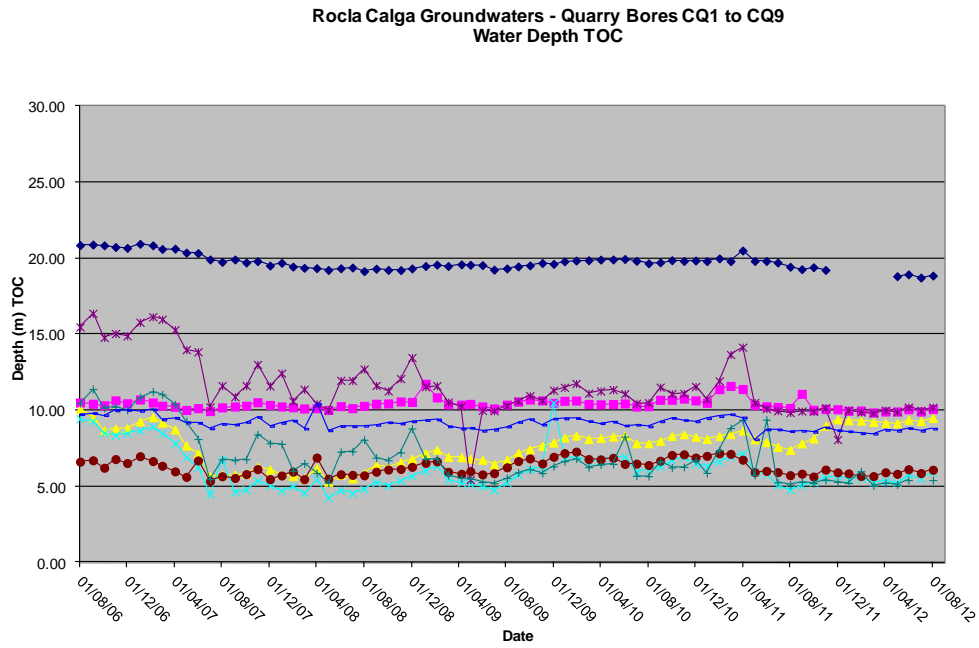
NI = These bores were not installed in April 2006 but are now operational. April 2006 was the first set of measurements taken by Carbon Based Environmental Pty Limited.

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

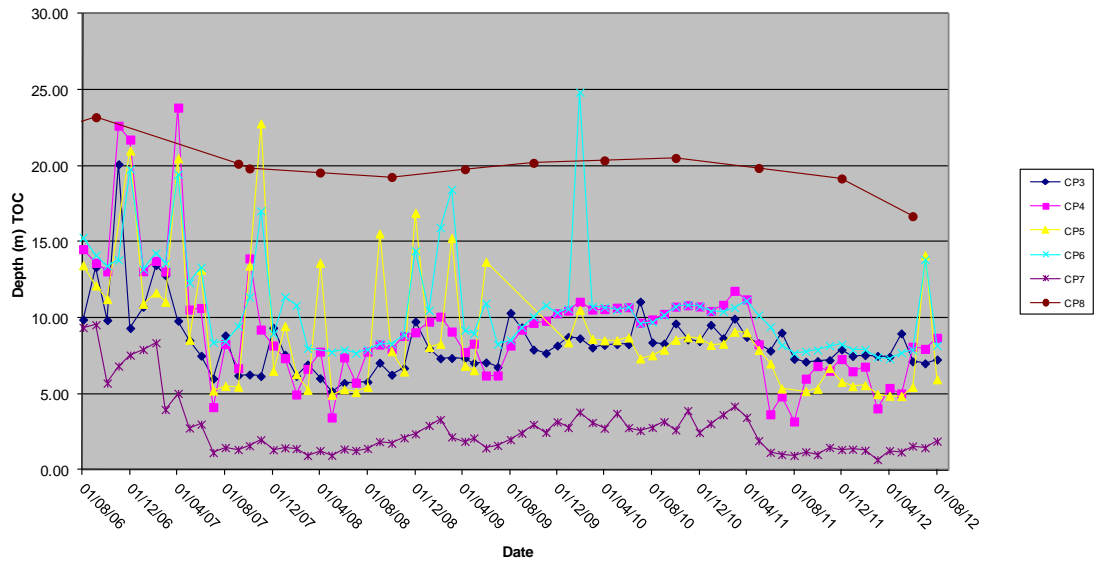
	Increase to ground water depth (water moved away from surface)
	Decrease to ground water depth (water moved towards surface)
	Stable water depth (+/- 0.01m)

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

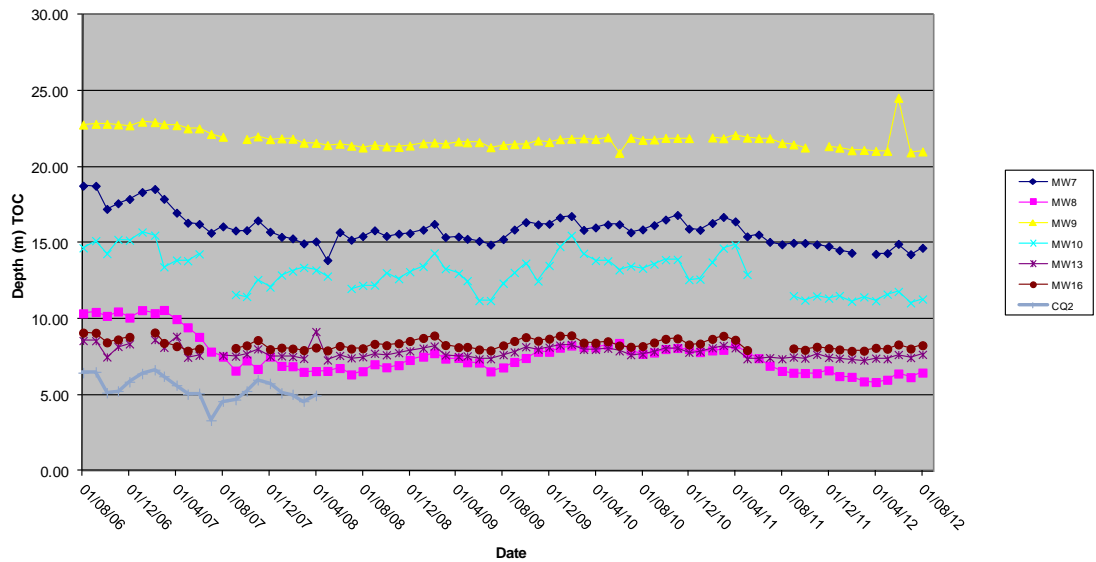
Figures 3 to 6: Groundwater Depth Charts.



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 July 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 two nearby Bureau of Meteorology (BOM) stations, Peats Ridge and Gosford are included in **Appendix 2** for comparison purposes.

Data for July 2012 shows that rainfall recorded at the Rocla Calga Quarry was lower than Peats Ridge BOM station and the Gosford BOM station recorded rainfall. Recorded rainfall at Rocla Calga Quarry was lower than the Peats Ridge long term mean rainfall for July. The rainfall comparison is provided below:

Rocla Calga Quarry	22.8 mm
BOM Peats Ridge*	31.8 mm
BOM Gosford*	39.2 mm
BOM Peats Ridge Long term mean for July*	66.7 mm

*Data sourced from Bureau of Meteorology (BOM) website (www.bom.gov.au).

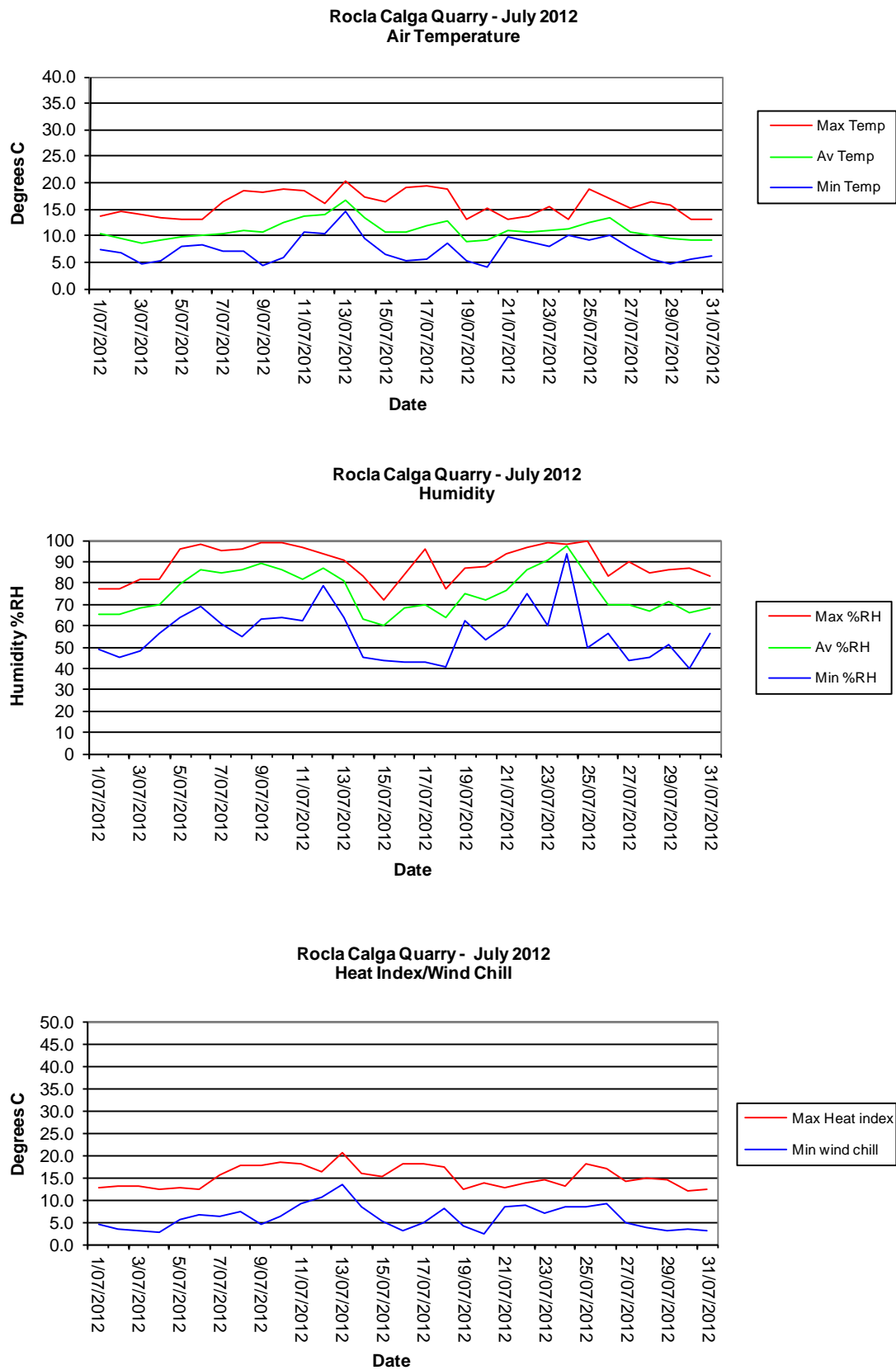
Results are displayed in the following table and figures.

2.4.1 Monthly Meteorological Data Summary

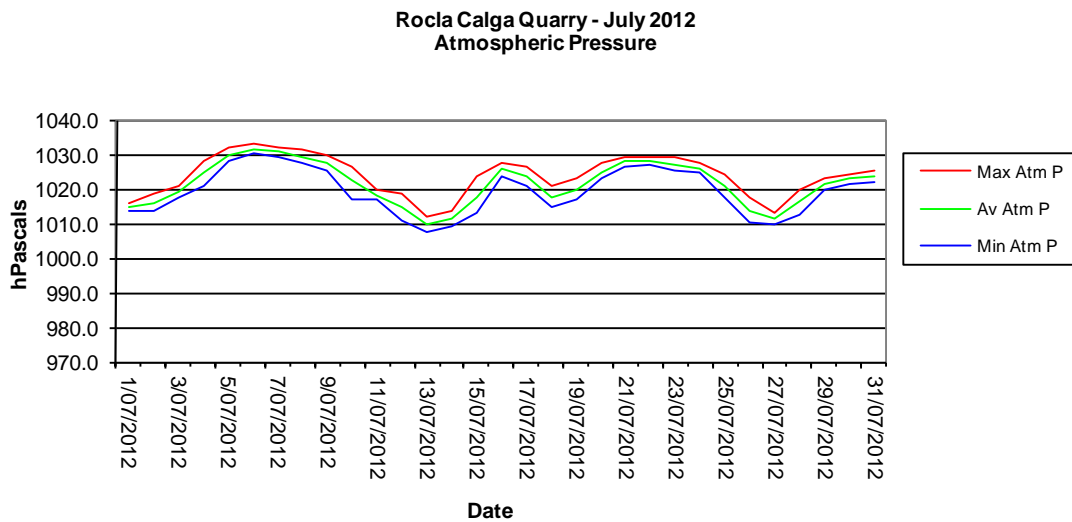
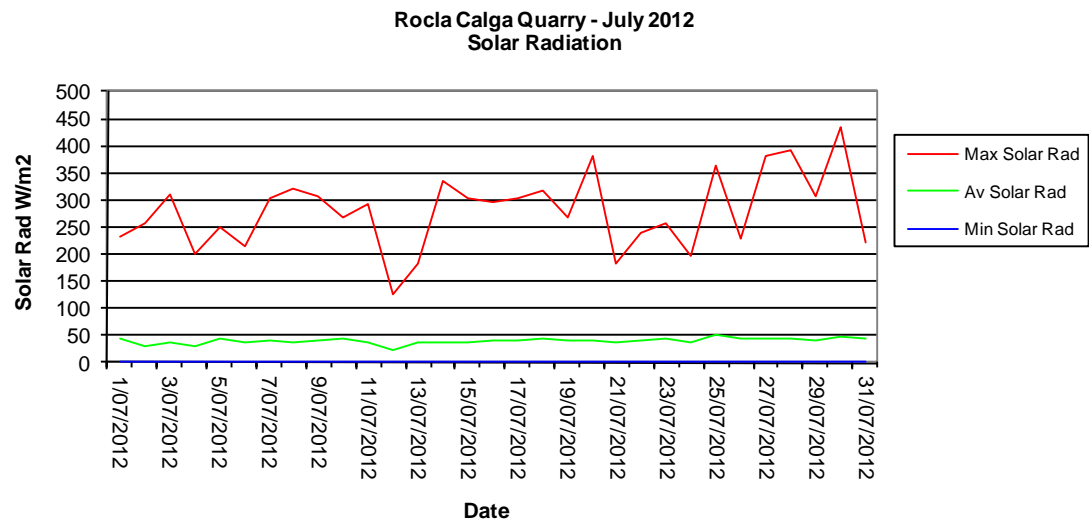
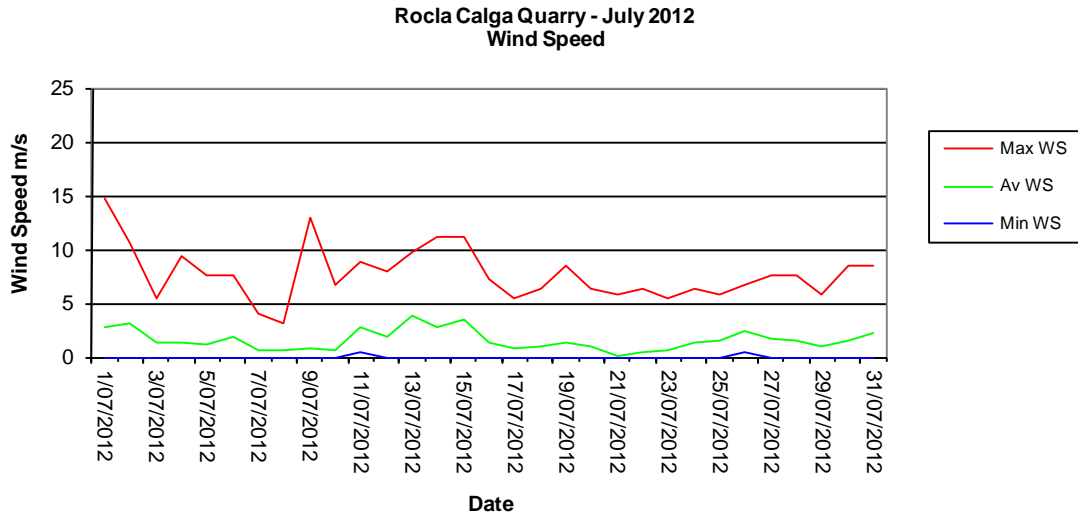
Summary Jul-12 Rocla - Calga

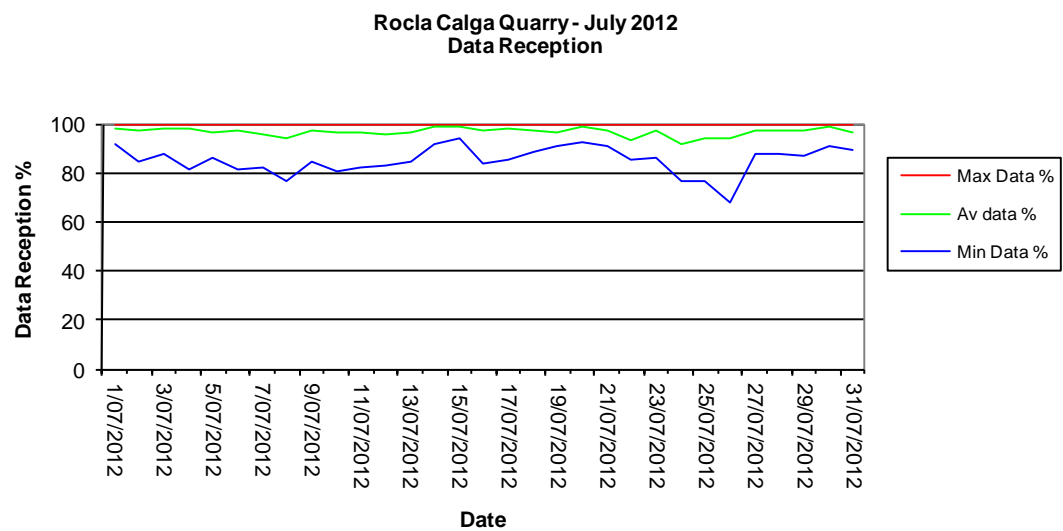
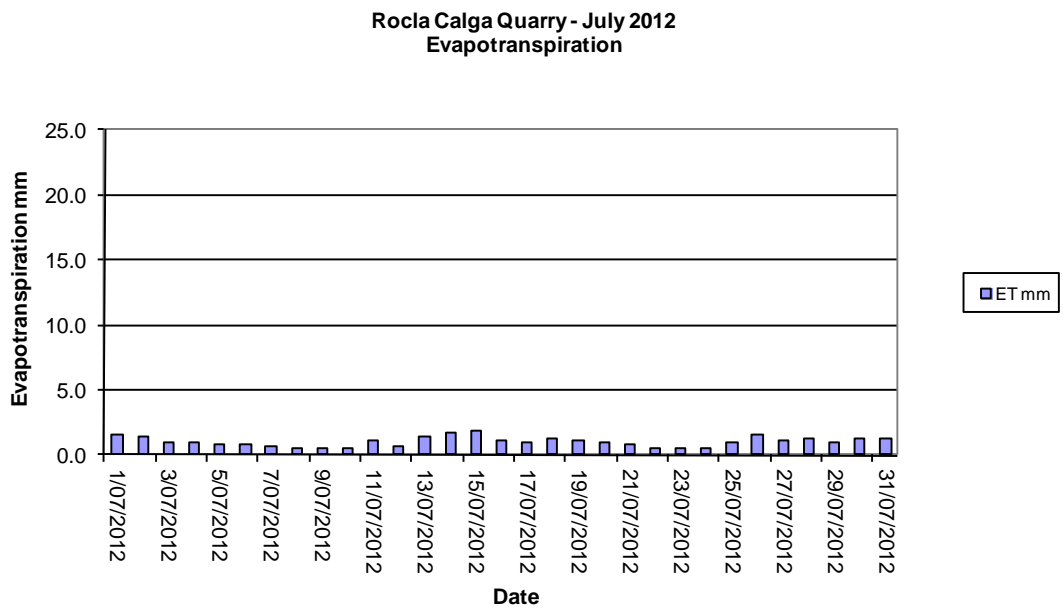
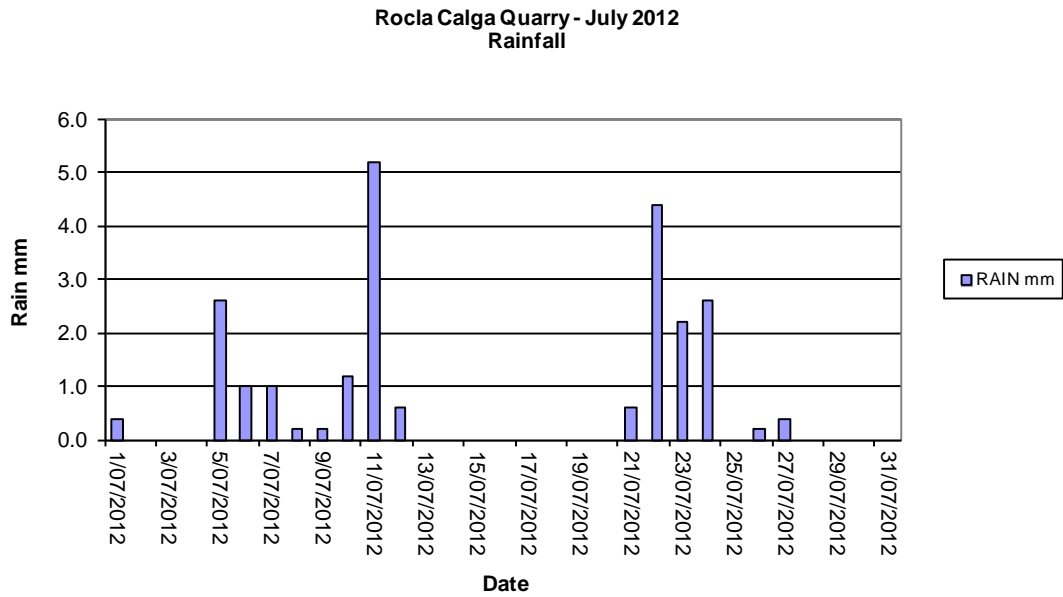
Date	Min Temp	Av Temp	Max Temp	Min %RH	Av %RH	Max %RH	RAIN mm	ET mm	Min WS	Av WS	Max WS	Min wind chill	Max Heat index	Min Atm P	Av Atm P	Max Atm P	Min Solar Rad	Av Solar Rad	Max Solar Rad	Min Data %	Av data %	Max Data %
1/07/2012	7.5	10.2	13.7	49	65	77	0.4	1.6	0	2.8	14.8	4.4	12.6	1013.4	1014.8	1016.1	0	43.9	231	91.5	97.8	100
2/07/2012	6.8	9.5	14.5	45	65	77	0.0	1.4	0	3.0	10.7	3.4	13.2	1013.8	1015.9	1018.8	0	30.9	256	84.2	96.9	100
3/07/2012	4.8	8.5	14.1	48	69	82	0.0	1.0	0	1.3	5.4	3.2	13.0	1017.4	1019.1	1021.0	0	36.2	310	87.7	98.0	100
4/07/2012	5.2	9.2	13.4	56	70	82	0.0	1.0	0	1.3	9.4	2.7	12.5	1021.0	1024.5	1028.0	0	31.0	200	81	98.0	100
5/07/2012	7.9	9.8	13.2	64	80	96	2.6	0.9	0	1.2	7.6	5.4	12.6	1027.8	1029.9	1032.1	0	44.4	249	86.5	96.8	100
6/07/2012	8.2	10.0	13.0	69	86	98	1.0	0.8	0	1.9	7.6	6.5	12.4	1030.5	1031.5	1033.1	0	38.2	214	81	97.1	100
7/07/2012	7.1	10.3	16.3	61	85	95	1.0	0.6	0	0.6	4	6.1	15.6	1029.4	1030.8	1032.2	0	41.7	302	82.2	95.8	100
8/07/2012	7.2	11.1	18.6	55	87	96	0.2	0.5	0	0.7	3.1	7.2	17.8	1027.3	1029.2	1031.2	0	38.3	322	76.9	94.0	100
9/07/2012	4.3	10.8	18.2	63	89	99	0.2	0.5	0	0.7	13	4.3	17.8	1025.5	1027.5	1029.8	0	39.3	307	84.2	97.4	100
10/07/2012	5.9	12.6	18.7	64	86	99	1.2	0.6	0	0.6	6.7	6.1	18.4	1017.2	1022.3	1026.4	0	45.8	268	80.4	96.0	100
11/07/2012	10.7	13.7	18.6	62	82	97	5.2	1.1	0.4	2.7	8.9	9.0	18.1	1017.0	1018.3	1019.6	0	37.8	292	82.2	96.6	100
12/07/2012	10.4	14.0	16.2	79	87	94	0.6	0.7	0	1.8	8	10.5	16.2	1010.8	1014.8	1018.4	0	24.7	125	83.3	95.9	100
13/07/2012	14.6	16.6	20.2	64	81	91	0.0	1.4	0	3.8	9.8	13.4	20.6	1007.3	1009.6	1011.7	0	36.4	183	84.2	96.1	100
14/07/2012	9.6	13.4	17.3	45	63	83	0.0	1.8	0	2.7	11.2	8.3	16.0	1009.3	1011.4	1013.8	0	38.2	336	91.5	98.7	100
15/07/2012	6.5	10.8	16.5	44	60	72	0.0	1.9	0	3.4	11.2	5.3	15.1	1013.0	1017.4	1023.8	0	38.8	303	93.9	98.9	100
16/07/2012	5.4	10.6	19.2	43	68	84	0.0	1.1	0	1.3	7.2	3.2	17.9	1023.6	1025.9	1027.5	0	40.2	297	83.6	97.6	100
17/07/2012	5.7	11.7	19.3	43	70	96	0.0	1.0	0	0.7	5.4	4.7	18.1	1020.6	1023.7	1026.6	0	41.4	302	85.7	97.8	100
18/07/2012	8.6	12.9	18.8	41	63	77	0.0	1.2	0	1.0	6.3	7.9	17.3	1014.5	1017.5	1021.0	0	45.8	318	88.6	97.5	100
19/07/2012	5.2	8.8	13.0	62	75	87	0.0	1.1	0	1.4	8.5	4.1	12.3	1016.7	1019.8	1023.3	0	40.9	267	91.2	96.2	100
20/07/2012	4.1	9.3	15.2	53	72	88	0.0	0.9	0	0.9	6.3	2.5	13.9	1023.1	1024.9	1027.4	0	41.0	381	92.4	98.5	100
21/07/2012	9.8	11.0	13.1	60	76	94	0.6	0.8	0	0.1	5.8	8.4	12.6	1026.6	1028.0	1029.4	0	36.1	182	90.6	97.0	100
22/07/2012	8.8	10.8	13.8	75	86	97	4.4	0.6	0	0.4	6.3	8.7	13.6	1026.7	1027.9	1029.0	0	40.5	238	85.7	93.5	100
23/07/2012	7.9	10.9	15.5	60	90	99	2.2	0.5	0	0.7	5.4	7.1	14.6	1025.4	1026.9	1028.9	0	43.7	256	86	97.2	100
24/07/2012	10.0	11.2	13.0	94	97	98	2.6	0.5	0	1.3	6.3	8.3	13.1	1024.5	1025.8	1027.4	0	36.2	196	76.3	91.9	100
25/07/2012	9.1	12.5	18.9	50	84	100	0.0	1.0	0	1.5	5.8	8.4	18.1	1017.7	1020.9	1024.3	0	49.7	362	76.6	93.8	100
26/07/2012	10.1	13.3	17.1	56	70	83	0.2	1.5	0.4	2.5	6.7	9.1	16.9	1010.3	1013.3	1017.4	0	44.7	230	67.8	94.0	100
27/07/2012	7.7	10.8	15.2	44	70	90	0.4	1.1	0	1.6	7.6	5.0	14.0	1009.5	1011.4	1012.9	0	42.8	382	87.4	97.4	100
28/07/2012	5.6	10.0	16.3	45	66	85	0.0	1.2	0	1.6	7.6	3.9	14.8	1012.6	1016.1	1019.8	0	46.1	391	88	97.6	100
29/07/2012	4.8	9.4	15.8	51	71	86	0.0	1.0	0	0.9	5.8	3.1	14.4	1019.5	1021.4	1022.9	0	39.4	307	87.1	96.9	100
30/07/2012	5.5	9.1	13.2	40	66	87	0.0	1.2	0	1.5	8.5	3.3	11.9	1021.5	1023.0	1024.2	0	46.1	435	90.6	98.7	100
31/07/2012	6.3	9.1	13.2	56	68	83	0.0	1.2	0	2.2	8.5	3.2	12.3	1022.2	1023.6	1025.4	0	44.2	222	88.9	96.1	100
Monthly	4.1	11.0	20.2	40	76	100	22.8	31.9	0	1.6	14.8	2.5	20.6	1007.3	1021.5	1033.1	0	40.1	435	67.8	96.6	100

2.4.2 Monthly Weather Charts



Rocla Calga Quarry Environmental Monitoring – July 2012

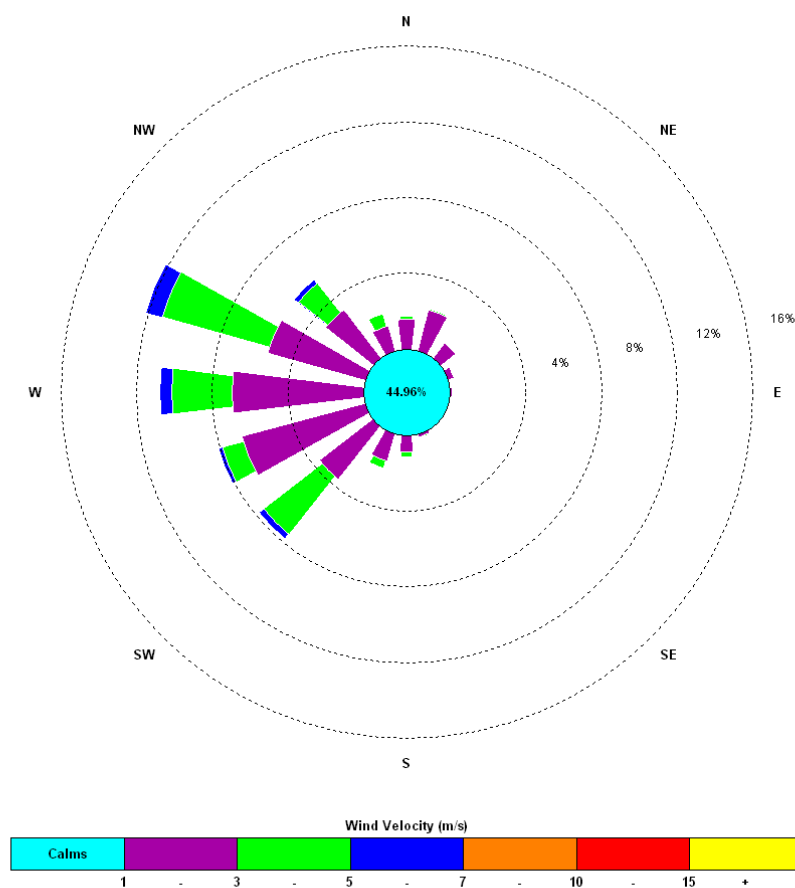




2.4.3 Monthly Windrose Plot

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, 1 July 2012 – 23:45, 31 July 2012



The predominant winds were from the W, with strongest winds from the WSW. The maximum wind speed was 14.8 m/s from the WSW.

Appendix 1

Laboratory Certificates

Environmental Division

CERTIFICATE OF ANALYSIS

Work Order	: EN1202868	Page	: 1 of 4
Client	: CARBON BASED ENVIRONMENTAL	Laboratory	: Environmental Division Newcastle
Contact	: MR COLIN DAVIES	Contact	: Peter Keyte
Address	: 47 BOOMERANG ST CESSNOCK NSW, AUSTRALIA 2325	Address	: 5 Rosegum Road Warabrook 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 1999 Schedule B(3) and ALS QCS3 requirement
Order number	: ----	Date Samples Received	: 02-AUG-2012
C-O-C number	: ----	Issue Date	: 08-AUG-2012
Sampler	: CARBON BASED ENVIRO	No. of samples received	: 6
Site	: ----	No. of samples analysed	: 6
Quote number	: ----		

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 Supervisor	Newcastle



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

- 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.

Page : 3 of 4
 Work Order : EN1202868
 Client : CARBON BASED ENVIRONMENTAL
 Project : ROCLA CALGA DUSTS



Analytical Results

Sub-Matrix: DUST (Matrix: AIR)

Client sample ID

				CD1 2/7/12 - 2/8/12	CD2C 2/7/12 - 2/8/12	CD3 2/7/12 - 2/8/12	CD4 2/7/12 - 2/8/12	CD5 2/7/12 - 2/8/12
Client sampling date / time				02-AUG-2012 15:00	02-AUG-2012 15:00	02-AUG-2012 15:00	02-AUG-2012 15:00	02-AUG-2012 15:00
Compound	CAS Number	LOR	Unit	EN1202868-001	EN1202868-002	EN1202868-003	EN1202868-004	EN1202868-005
EA120: Ash Content								
Ash Content	----	0.1	g/m ² .month	0.2	0.1	0.2	0.1	0.1
Ash Content (mg)	----	1	mg	3	2	3	1	1
EA125: Combustible Matter								
Combustible Matter	----	0.1	g/m ² .month	<0.1	0.1	0.1	0.3	0.1
Combustible Matter (mg)	----	1	mg	<1	1	2	7	3
EA141: Total Insoluble Matter								
Total Insoluble Matter	----	0.1	g/m ² .month	0.2	0.2	0.3	0.4	0.2
Total Insoluble Matter (mg)	----	1	mg	3	3	5	8	4

Page : 4 of 4
 Work Order : EN1202868
 Client : CARBON BASED ENVIRONMENTAL
 Project : ROCLA CALGA DUSTS



Analytical Results

Sub-Matrix: DUST (Matrix: AIR)

Client sample ID

				CD6	----	----	----	----
				2/7/12 - 2/8/12	----	----	----	----
				02-AUG-2012 15:00	----	----	----	----
Compound	CAS Number	LOR	Unit	EN1202868-006	----	----	----	----
EA120: Ash Content								
Ash Content	----	0.1	g/m ² .month	0.1	----	----	----	----
Ash Content (mg)	----	1	mg	2	----	----	----	----
EA125: Combustible Matter								
Combustible Matter	----	0.1	g/m ² .month	0.1	----	----	----	----
Combustible Matter (mg)	----	1	mg	2	----	----	----	----
EA141: Total Insoluble Matter								
Total Insoluble Matter	----	0.1	g/m ² .month	0.2	----	----	----	----
Total Insoluble Matter (mg)	----	1	mg	4	----	----	----	----

Environmental Division

CERTIFICATE OF ANALYSIS

Work Order	: ES1218805	Page	: 1 of 3
Client	: CARBON BASED ENVIRONMENTAL	Laboratory	: Environmental Division Sydney
Contact	: MR COLIN DAVIES	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 1999 Schedule B(3) and ALS QCS3 requirement
Order number	: ----		
C-O-C number	: ----	Date Samples Received	: 02-AUG-2012
Sampler	: CBE	Issue Date	: 07-AUG-2012
Site	: ----		
Quote number	: SY-273-12	No. of samples received	: 4
		No. of samples analysed	: 4

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 Supervisor	Newcastle
Hoa Nguyen	Inorganic Chemist	Sydney Inorganics
Sarah Millington	Senior Inorganic Chemist	Sydney Inorganics

Page : 2 of 3
Work Order : ES1218805
Client : CARBON BASED ENVIRONMENTAL
Project : ROCLA QUARRY



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

Page : 3 of 3
 Work Order : ES1218805
 Client : CARBON BASED ENVIRONMENTAL
 Project : ROCLA QUARRY



Analytical Results

Sub-Matrix: WATER

				Client sample ID				
				Client sampling date / time	A	B	D	F
					02-AUG-2012 10:30	02-AUG-2012 10:00	02-AUG-2012 12:05	02-AUG-2012 10:15
Compound	CAS Number	LOR	Unit		ES1218805-001	ES1218805-002	ES1218805-003	ES1218805-004
EA005: pH								
pH Value	----	0.01	pH Unit		5.91	6.59	5.74	7.47
EA010P: Conductivity by PC Titrator								
Electrical Conductivity @ 25°C	----	1	µS/cm		59	69	97	55
EA015: Total Dissolved Solids								
Total Dissolved Solids @180°C	GIS-210-010	10	mg/L		32	42	48	26
EA025: Suspended Solids								
Suspended Solids (SS)	----	5	mg/L		11	14	15	12
EP020: Oil and Grease (O&G)								
Oil & Grease	----	5	mg/L		<5	<5	<5	<5

Appendix 2

Additional Bureau of Meteorology Data from Peats Ridge and Gosford Monitoring Stations

Peats Ridge, New South Wales
July 2012 Daily Weather Observations



Australian Government
 Bureau of Meteorology

Date	Day	Temps		Rain	Evap	Sun	Max wind gust			9am						3pm					
		Min	Max				Dirn	Spd	Time	Temp	RH	Cld	Dirn	Spd	MSLP	Temp	RH	Cld	Dirn	Spd	MSLP
		°C	°C					km/h	local	°C	%	eighths		km/h	hPa	°C	%	eighths		km/h	hPa
1	Su	7.1	14.1	0	1.4					9.8	76	8	NW	4		12.6	47	1	SW	9	
2	Mo	5.6	14.5	0	1.2					9.9	68	1	W	9		14.0	44	5	SW	19	
3	Tu	4.0	13.1	0	0.8					8.0	69	0	NW	4		13.1	46	1	S	4	
4	We	4.2	13.8	0	0.6					9.0	61	1	SW	9		12.7	60	6	S	4	
5	Th	6.9	13.0	1.2	1.6					9.2	79	5	SW	4		12.3	64	5	S	9	
6	Fr	7.5	12.0	4.0	1.0					9.0	93	8	SW	9		11.6	76	5	S	9	
7	Sa	5.2	14.9	2.8	1.0					9.6	95	1	SW	4		13.0	72	4	NE	4	
8	Su	5.7	16.3	0	0.8					10.7	86	1	ENE	4		15.1	66	2	NE	4	
9	Mo	5.2	16.7	0	0.6					12.9	94	2	NE	4		15.2	67	3	SE	9	
10	Tu	6.6	17.8	0.2	1.8					13.0	79	6	N	9		16.3	69	7	E	4	
11	We	10.2	17.6	5.4	0.8					12.6	86	2	NW	9		17.3	63	4	W	4	
12	Th	9.3	16.6	0	1.2					13.1	94	8	W	4		15.4	86	8	N	4	
13	Fr	12.7	20.3	3.2	0.8					16.1	85	7	NW	9		18.9	74	7	NE	9	
14	Sa	7.7	17.2	0	1.4					13.6	71	2	NW	4		16.6	47	1	W	9	
15	Su	5.8	16.3	0	1.6					11.2	62	0	NW	9		15.7	50	2	NW	4	
16	Mo	4.9	18.5	0	2.0					11.8	63	0	W	4		16.6	52	0	E	9	
17	Tu	5.7	18.5	0	1.0					10.6	80	0	NW	4		17.4	55	0	NE	9	
18	We	7.8	18.6	0	1.2					11.9	73	7	W	4		18.1	42	3	W	4	
19	Th	3.3	12.9	0	1.6					9.2	69	4	SW	9		11.9	66	3	S	9	
20	Fr	4.0	14.2	0	1.6					8.4	69	0	SW	4		14.1	53	2	S	9	
21	Sa	7.7	13.4	1.2	1.0					10.3	94	8	SW	4		12.1	71	8	S	4	
22	Su	7.6	13.6	0.4	0.6					9.6	90	8	SW	4		13.0	77	5	S	9	
23	Mo	7.1	15.1	6.8	0.8					9.6	93	5	SW	4		14.9	62	3	S	4	
24	Tu	8.9	12.8	0.4	0.8					10.1	99	8	SW	4		12.4	95	8	SW	4	
25	We	7.7	17.3	2.2	0.6					9.8	97	3	NW	4							
26	Th	8.8	16.7	0	1.0					13.1	66	6	WNW	4		15.7	61	6	NW	4	
27	Fr	4.9	14.6	4.0	1.8					10.6	73	0	NW	9		14.5	52	3	SSW	9	
28	Sa	4.8	15.1	0	1.2					9.1	74	1	NW	4		14.6	48	4	SW	4	
29	Su	5.4	15.3	0	2.0					11.0	66	0	W	4		13.7	56	3	S	9	
30	Mo	4.3	12.8	0	1.2					8.9	66	1	SW	9		12.7	39	1	S	9	
31	Tu	5.1	13.1	0	1.8					8.6	67	4	SW	9		11.1	62	7	SW	9	
Statistics for July 2012																					
Mean		6.5	15.4		1.2					10.7	78	3		5		14.4	60	3		7	
Lowest		3.3	12.0		0.6					8.0	61	0	#	4		11.1	39	0	#	4	
Highest		12.7	20.3	6.8	2.0					16.1	99	8	#	9		18.9	95	8	SW	19	
Total				31.8	36.8																

Observations were drawn from Peats Ridge (Waratah Road) (station 061351)

The closest station with pressure observations is at Norah Head, about 32 km to the east. The closest station with sunshine observations is at Williamtown, about 82 km to the northeast.

IDCJDW2110.201207 Prepared at 13:01 UTC on 14 Aug 2012

Copyright © 2012 Bureau of Meteorology

Users of this product are deemed to have read the information and accepted the conditions described in the notes at <http://www.bom.gov.au/climate/dwo/IDCJDW0000.pdf>

Gosford, New South Wales
July 2012 Daily Weather Observations



Australian Government
Bureau of Meteorology

Date	Day	Temps		Rain	Evap	Sun	Max wind gust			9am						3pm					
		Min	Max				Dirn	Spd	Time	Temp	RH	Cld	Dirn	Spd	MSLP	Temp	RH	Cld	Dirn	Spd	MSLP
		°C	°C					km/h	local	°C	%	eighths		km/h	hPa	°C	%	eighths		km/h	hPa
1	Su	6.1	15.6	0			N	26	12:27	11.1	83		NNW	4		14.8	43		NW	9	
2	Mo	4.8	16.7	0			SSW	24	12:35	11.8	63		NNW	7		15.6	42		ENE	7	
3	Tu	5.4	15.7	0			S	24	11:54	10.2	61		NNW	11		15.4	44		E	6	
4	We	4.0	15.9	0			SE	28	11:15	11.4	55		NE	7		14.2	51		SSE	7	
5	Th	7.9	15.2	2.4			W	30	03:10	10.7	88		S	2		14.5	60		SSE	7	
6	Fr	8.2	14.8	10.8			ESE	26	13:23	10.3	99		SSW	6		14.2	72		ESE	7	
7	Sa	6.1	16.7	2.6			SSE	19	16:21	11.4	96		N	9		16.3	62		SW	6	
8	Su	6.2	17.9	0.2			SE	13	11:29	10.6	100			Calm		13.6	97			Calm	
9	Mo	2.9	18.3	0.2			NE	19	13:25					Calm		17.0	68		ENE	7	
10	Tu	6.2	19.5	0.2			N	24	11:48					Calm		17.7	81		ENE	4	
11	We	9.1	19.4	4.2			NNW	28	09:14	14.7	89		N	11		19.0	56		N	9	
12	Th	8.0	16.7	0			N	13	14:09					Calm						Calm	
13	Fr	11.3	21.3	0.8			WNW	50	12:58					Calm		19.9	93		NNE	9	
14	Sa	7.2	19.6	0.2			W	28	12:31	15.8	69		NNW	11		18.6	40		NW	11	
15	Su	2.9	18.4	0			NW	30	11:18	10.4	99		E	4		17.6	39		NW	7	
16	Mo	3.3	19.1	0			NNW	19	03:13	11.6	77		WNW	2		17.8	54			Calm	
17	Tu	2.4	20.4	0.2			NW	22	12:14					Calm		19.6	40		N	7	
18	We	4.5	20.6	0			NW	28	11:55	13.5	77		NNW	7		20.0	36		WNW	7	
19	Th	5.2	15.3	0			W	26	09:10	11.6	60		WNW	11		14.0	63		S	7	
20	Fr	4.7	16.4	0.2			SE	24	15:38	10.5	63		NNE	7		15.6	54		SE	9	
21	Sa	8.9	15.6	0.8			SSW	30	12:17	12.7	99		NNW	6		13.7	70		SSE	11	
22	Su	9.4	16.0	0.2			SSE	31	18:56	12.0	98		W	6		13.5	98		S	9	
23	Mo	8.3	17.2	10.0			SSE	26	12:39	10.9	100		NE	2		15.7	64		SSE	7	
24	Tu	7.6	14.7	1.8			NW	17	03:37	11.9	100		WNW	6		14.6	99		S	2	
25	We	4.9	19.3	1.8			NNW	24	11:25					Calm		19.1	53		NNE	7	
26	Th	5.9	18.9	0.2			NW	22	21:39					Calm		14.5	98			Calm	
27	Fr	7.8	17.2	2.0			W	22	11:19	12.7	66		NNW	11		16.5	46		NNW	2	
28	Sa	3.9	17.1	0			NNW	24	10:20	12.1	61		NW	11		16.5	42		SSE	7	
29	Su	5.1	16.4	0			SE	22	15:06	12.2	69		NNE	4		15.2	51		SSE	9	
30	Mo	5.3	15.4	0			ESE	31	13:32	11.2	53		WNW	11		15.1	37		SE	13	
31	Tu	6.3	14.6	0.4			SSW	35	12:04	10.6	63		NNW	7		14.2	56		SE	7	
Statistics for July 2012																					
Mean		6.1	17.3							11.7	78			5		16.1	60			6	
Lowest		2.4	14.6							10.2	53			Calm		13.5	36			Calm	
Highest		11.3	21.3	10.8			WNW	50		15.8	100		#	11		20.0	99		SE	13	
Total				39.2																	

Observations were drawn from Gosford (Narara Research Station) AWS (station 061087)

The closest station with pressure observations is at Norah Head about 27 km to the northeast. The closest station with cloud and evaporation data is at Peats Ridge about 15 km to the northwest. The closest station with sunshine observations is at Sydney Airport about 59 km to the south.

IDCJDW2048.201207 Prepared at 13:00 UTC on 14 Aug 2012

Copyright © 2012 Bureau of Meteorology

Users of this product are deemed to have read the information and accepted the conditions described in the notes at <http://www.bom.gov.au/climate/dwo/IDCJDW0000.pdf>