



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

April 2012

A handwritten signature in black ink, appearing to read 'Colin Davies', is positioned above a horizontal line.

Colin Davies BSc MEIA CEnvP
Environmental Scientist
22 May 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 April 2012;
- Surface Water quality results for April 2012;
- Groundwater depth and quality results for April 2012; and
- Meteorological report for April 2012.

The April 2012 dust deposition results for insoluble solids varied in comparison to those of March 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 May 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 were within the slightly acidic range. An additional high rainfall surface water sampling event was undertaken on 18 April 2012 at sites A, B, D and F.

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

The meteorological station data recovery for the month was approximately 100%. Recorded rainfall on site for April was 154.4mm, which was higher than that recorded at the BOM Peats Ridge Station and the Peats Ridge long-term average for April. Results are detailed below:

Rocla Calga Quarry	154.4 mm
BOM Peats Ridge*	133.0 mm
BOM Gosford*	227.2 mm
BOM Peats Ridge Long term mean for April*	127.0 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**.

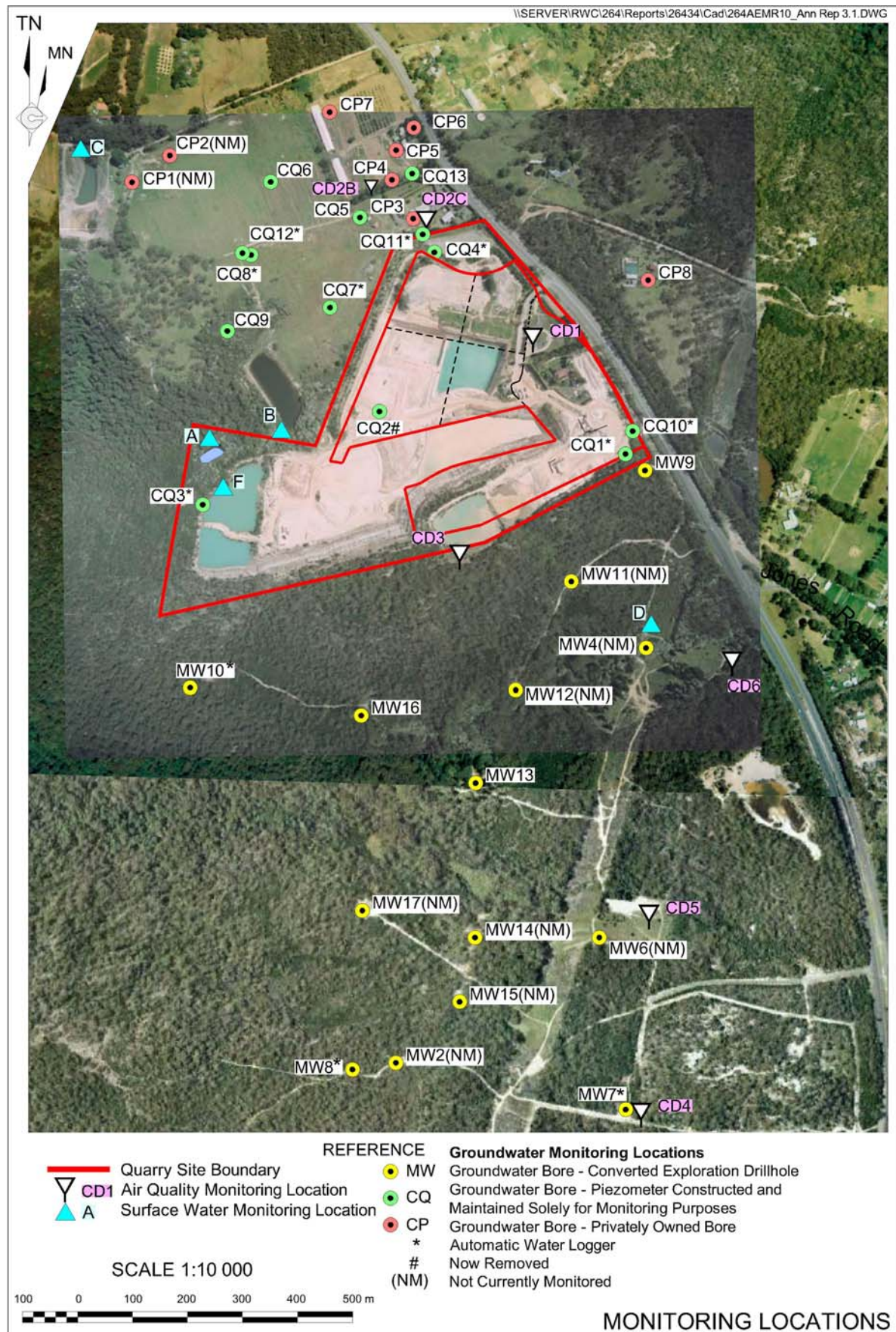


Figure 1: Rocla Calga Quarry environmental monitoring locations

2.0 Monthly Results

2.1 Dust Deposition Gauges

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

Table 1: Dust Deposition results: 2 April 2012 – 2 May 2012 (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	1.1	1.1	<0.1	100	1.8
CD2c	1.3	1.1	0.2	85	0.8
CD3	0.7	0.2	0.5	29	0.7
CD4	1.2	0.2	1.0	17	0.5
CD5	0.2	0.1	0.1	50	0.3
CD6	0.3	0.2	0.2	67	0.5

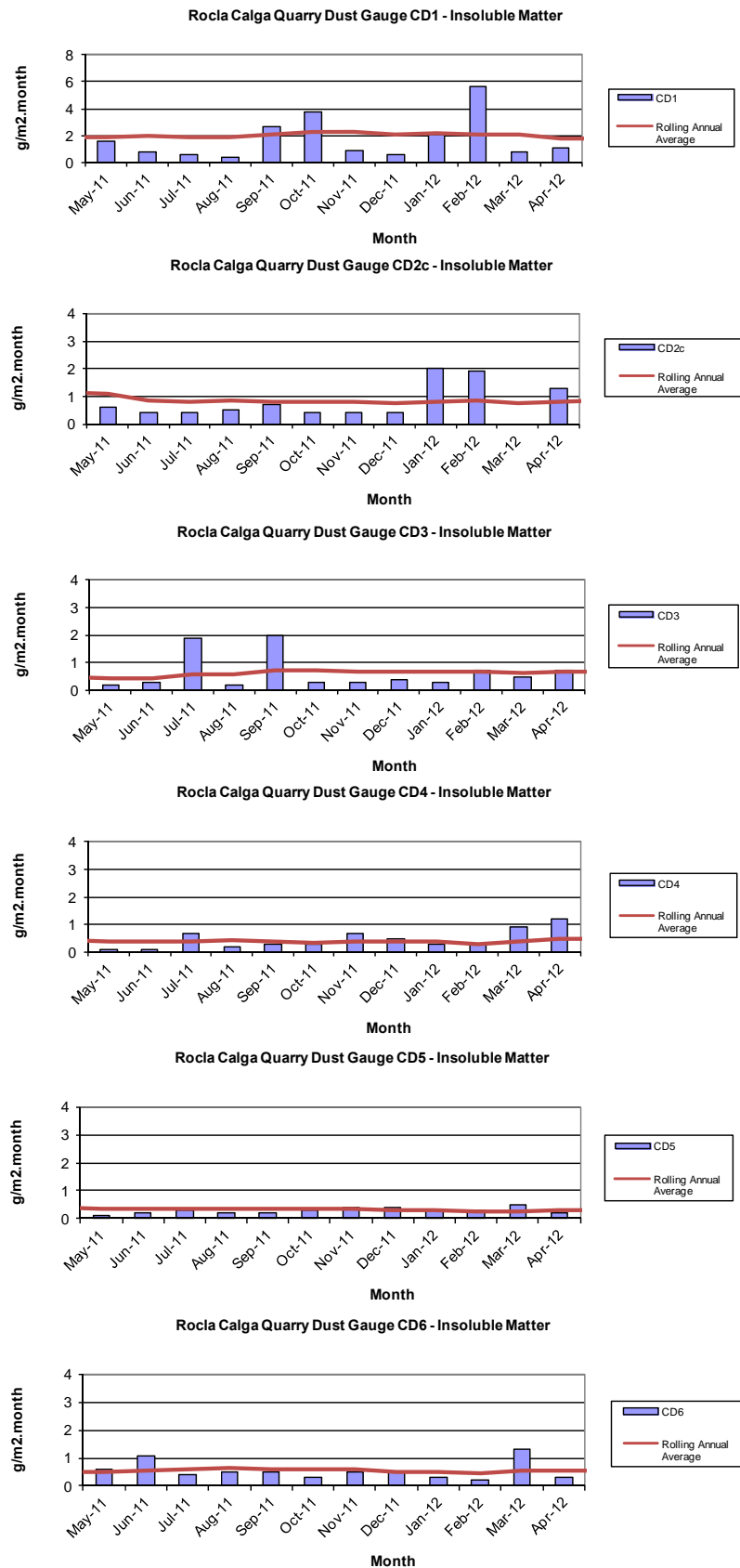
Insoluble Solids marked with an * indicate an excessively contaminated gauge. Contamination can include bird droppings, vegetation (such as plant matter, algae, pollen and seeds) and insects. Results in bold indicate insoluble solids levels above 3.7 g/m².month; the Development Consent's annual average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

2.2.1 Surface Waters

Monthly surface water monitoring was conducted on the 2 May 2012 and results are listed in **Table 2**. The laboratory analysis sheets are provided in **Appendix 1**.

Table 2: Monthly surface water monitoring – April 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	Still	N/A	N/A	6.19	51	32	6	<5
B	Still	N/A	N/A	6.66	70	46	<5	<5
C	No Access							
D	Still	N/A	N/A	5.96	85	59	18	<5
F	Still	N/A	N/A	6.16	58	38	10	<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.

An additional high rainfall surface water sampling event was undertaken on 18 April 2012 at sites A, B, D and F. Results are provided in **Appendix 1**.

2.2.2 Groundwaters

Groundwaters were sampled on 2 May 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 decreased across the sampled groundwater bores compared to last month indicating water moving towards the surface. Exceptions include CQ11D, CP3, CP6, MW7, MW8 and MW10 which all increased in water depth. Water depth at CQ3, CQ4 and MW9 remained stable.

Both pH and EC levels remained low and relatively stable compared to last month.

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	18.81	7.8	154
CQ3	Voutos	* Monitor	10.53	9.91	6.8	118
CQ4	Voutos	* Monitor	8.78	9.14	5.5	78
CQ5	Gazzana	DIP Only	8.69	5.23	5.1	129
CQ6	Gazzana	DIP Only	16.00	9.89	5.1	189
CQ7	Gazzana	* Monitor	6.89	5.81	5.3	90
CQ8	Gazzana	* Monitor	11.03	5.11	5.4	139
CQ9	Gazzana	DIP Only	10.10	8.64	5.2	104
CQ10	Voutos	* Monitor	NI	21.46	5.2	159
CQ11S	Gazzana	* Monitor	NI	8.68	5.0	155
CQ11D	Gazzana	* Monitor	NI	9.98	5.2	143
CQ12	Gazzana	* Monitor	NI	3.47	4.7	130
CQ13	Kashouli	* Monitor	NI	11.02	5.5	193
CP3	Gazzana	Domestic	10.40	8.97	5.1	144
CP4	Kashouli	Domestic	13.63	5.02	5.4	175
CP5	Kashouli	Domestic	16.61	4.85	4.7	244
CP6	Kashouli	Domestic	16.27	7.70	4.7	196
CP7	Kashouli	Production	8.56	1.17	5.7	225
CP8	Rozmanec	Domestic	22.17	NR	NR	NR
MW7	Rocla Bore	* Monitor	15.76	14.31	5.1	103
MW8	Rocla Bore	* Monitor	9.82	5.98	5.0	79
MW9	Rocla Bore	* Monitor	22.44	21.04	5.1	78
MW10	Rocla Bore	* Monitor	15.41	11.61	4.7	118
MW13	Rocla Bore	DIP Only	NI	7.36	4.8	97
MW16	Rocla Bore	DIP Only	NI	8.02	4.9	108

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.

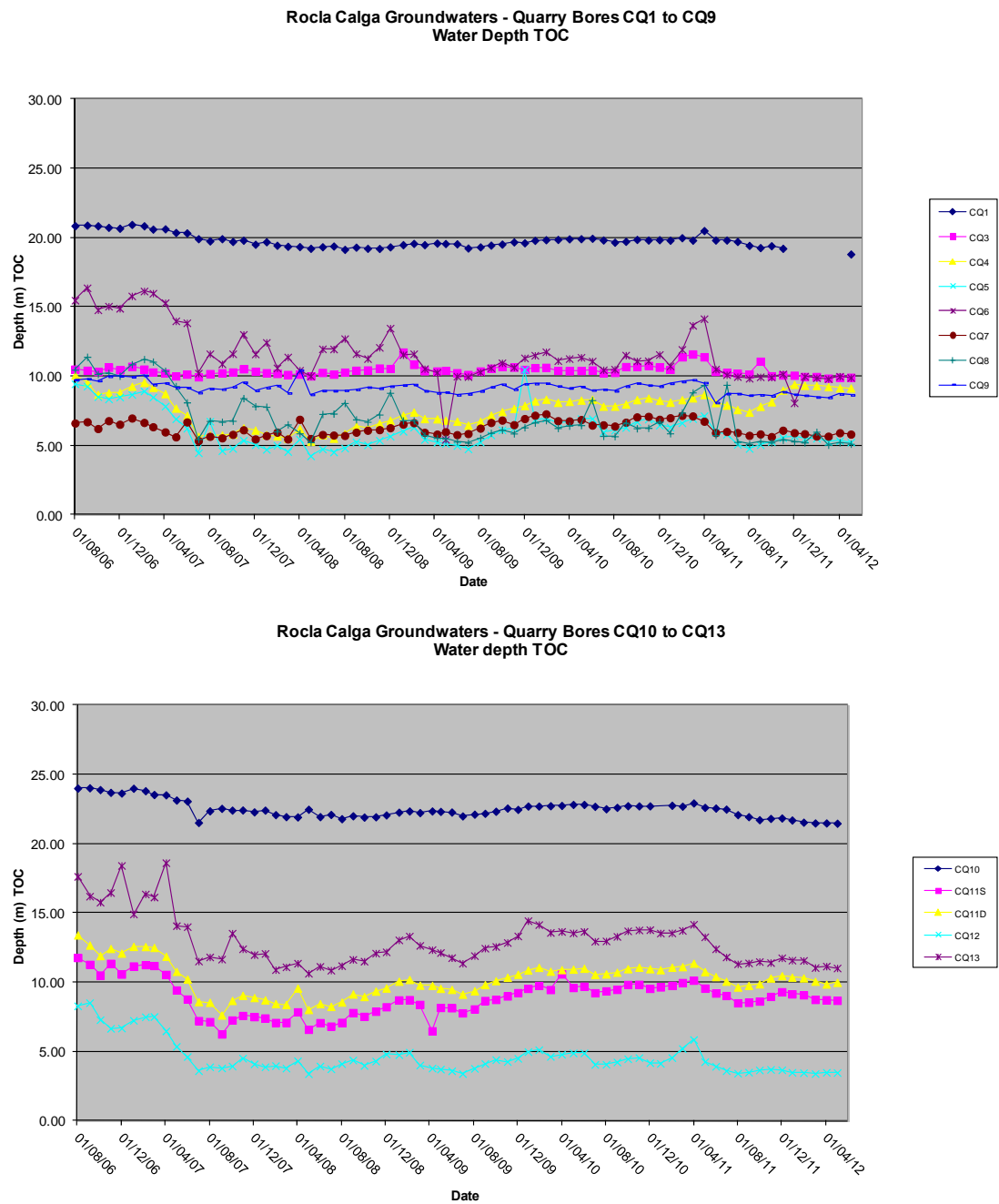
NI = These bores were not installed in April 2006 but are now operational. April 2006 was the first set of measurements taken by Carbon Based Environmental Pty Limited.

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

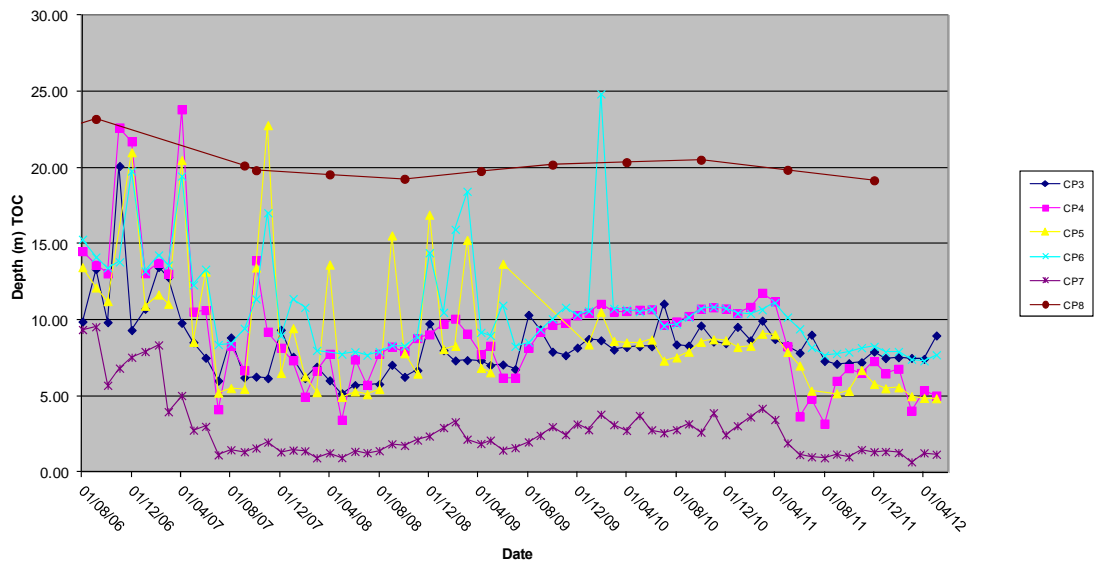
	Increase to ground water depth (water moved away from surface)
	Decrease to ground water depth (water moved towards surface)
	Stable water depth (+/- 0.01m)

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

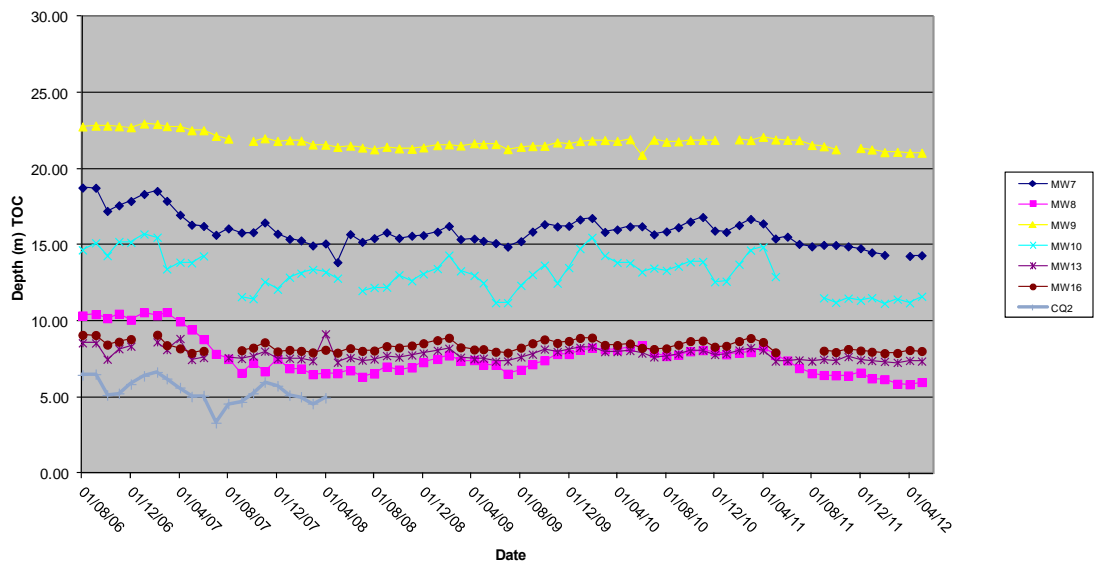
Figures 3 to 6: Groundwater Depth Charts.



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



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



2.3 Meteorological Monitoring

The Rocla Calga Quarry weather station data recovery in April 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 April 2012 shows that rainfall recorded at the Rocla Calga Quarry was higher than that recorded at nearby Peats Ridge BOM station and lower than the Gosford BOM station recorded rainfall. Recorded rainfall at Rocla Calga Quarry was higher than the Peats Ridge long term mean rainfall for April. The rainfall comparison is provided below:

Rocla Calga Quarry	154.4 mm
BOM Peats Ridge*	133.0 mm
BOM Gosford*	227.2 mm
BOM Peats Ridge Long term mean for April*	127.0 mm

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

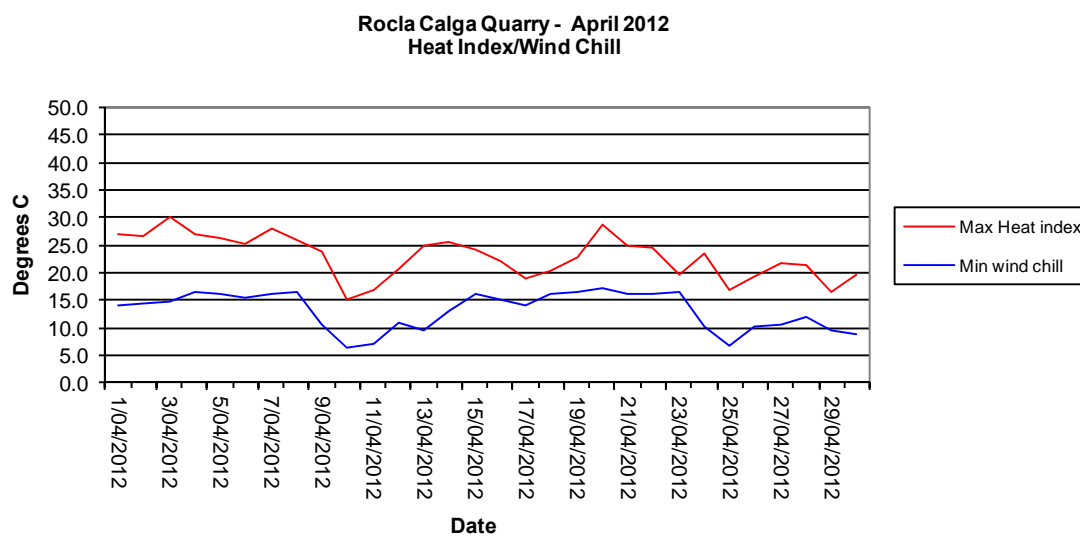
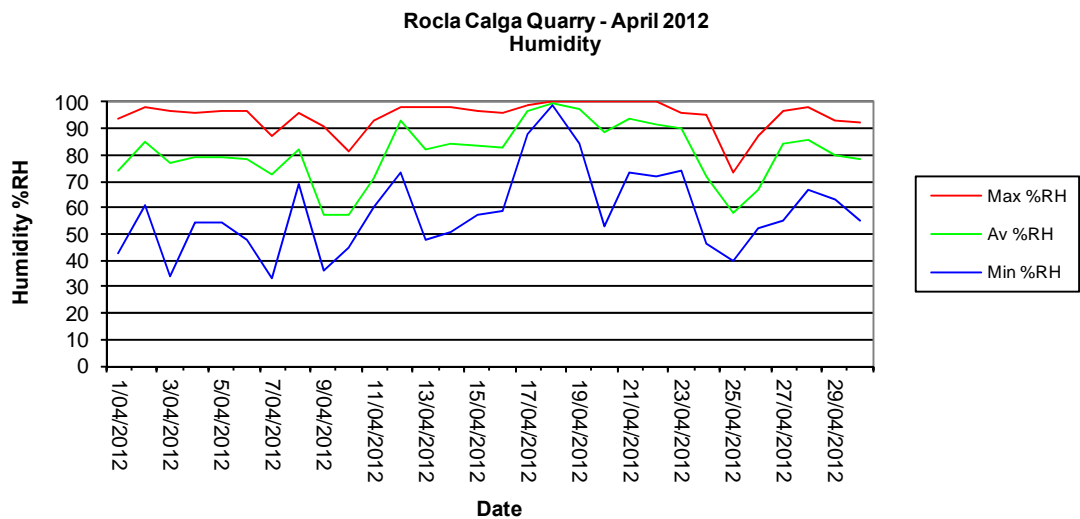
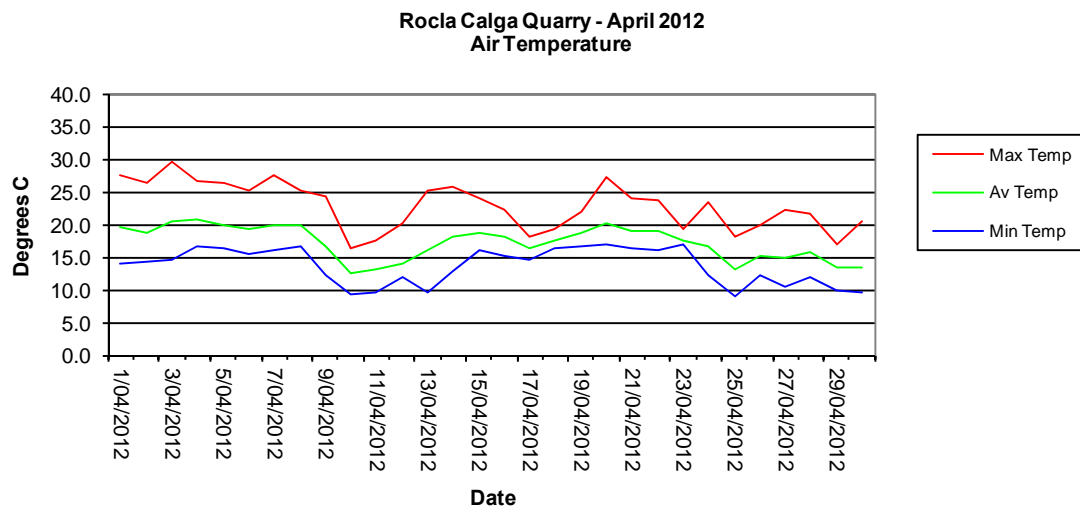
Results are displayed in the following table and figures.

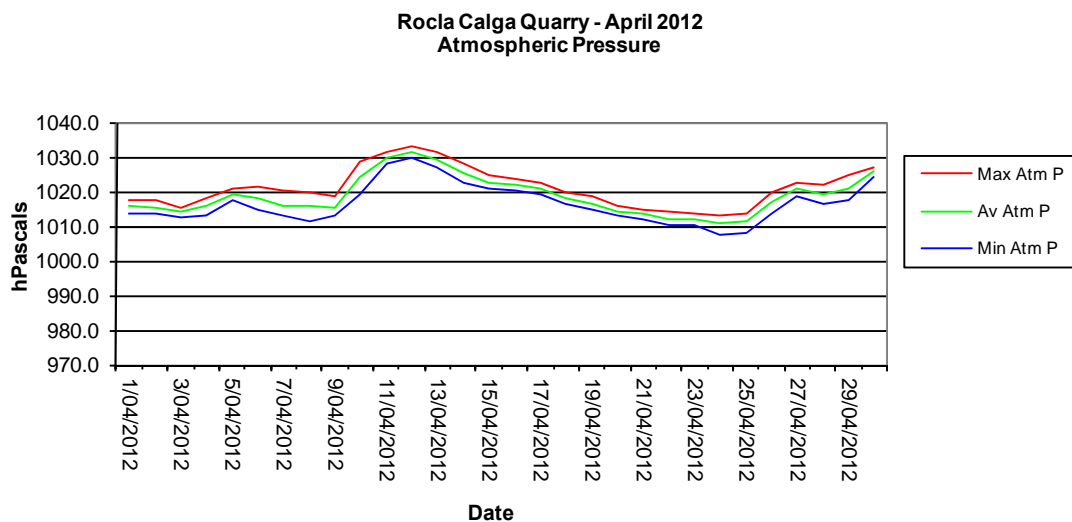
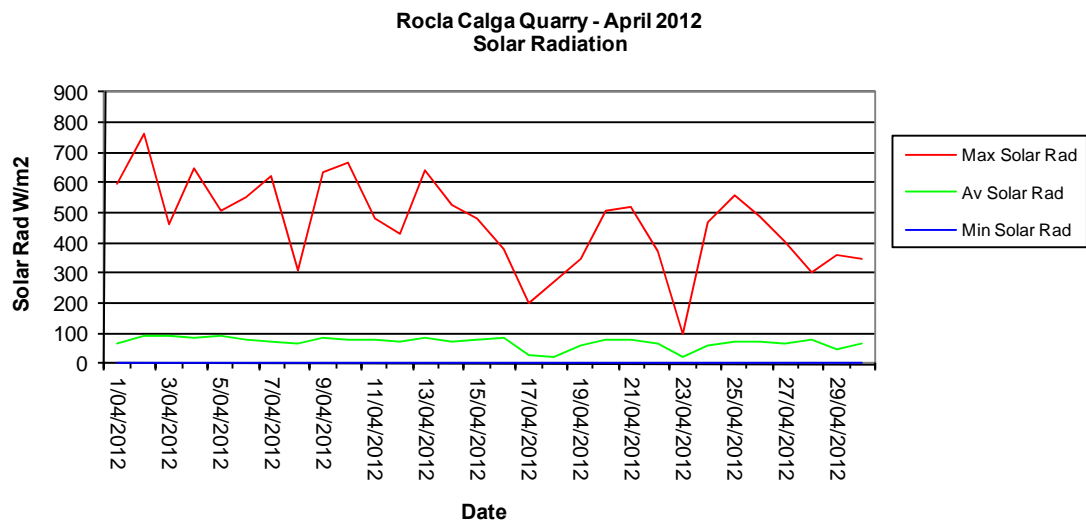
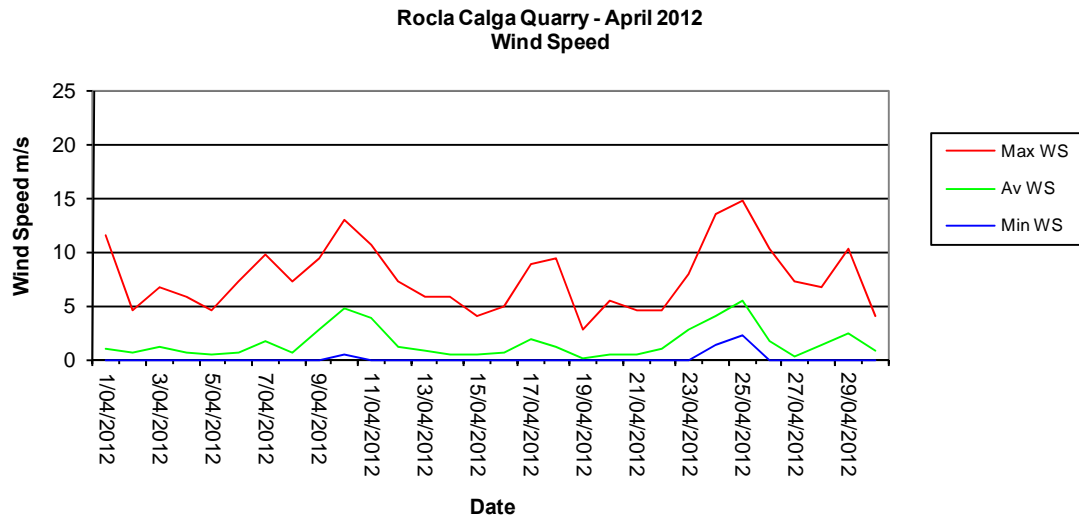
2.3.1 Monthly Meteorological Data Summary

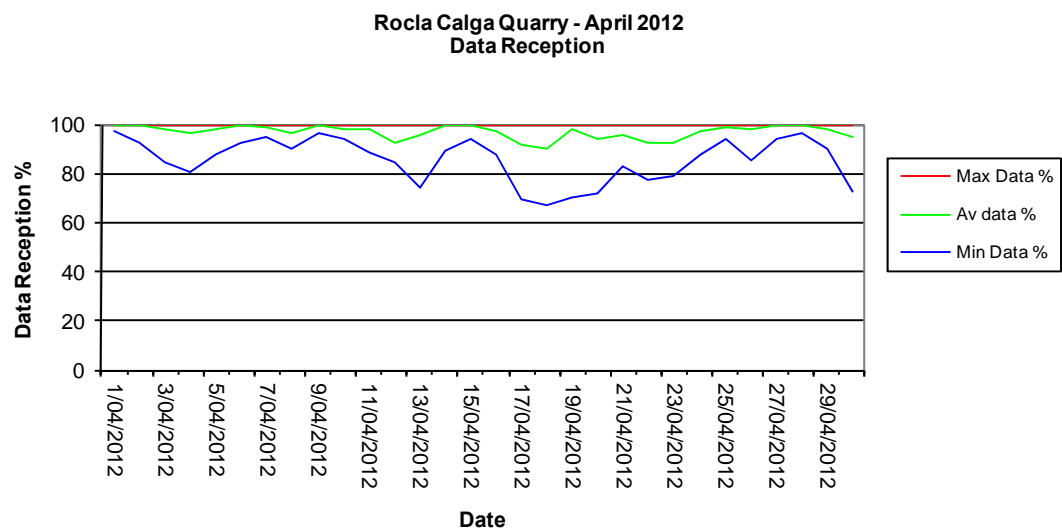
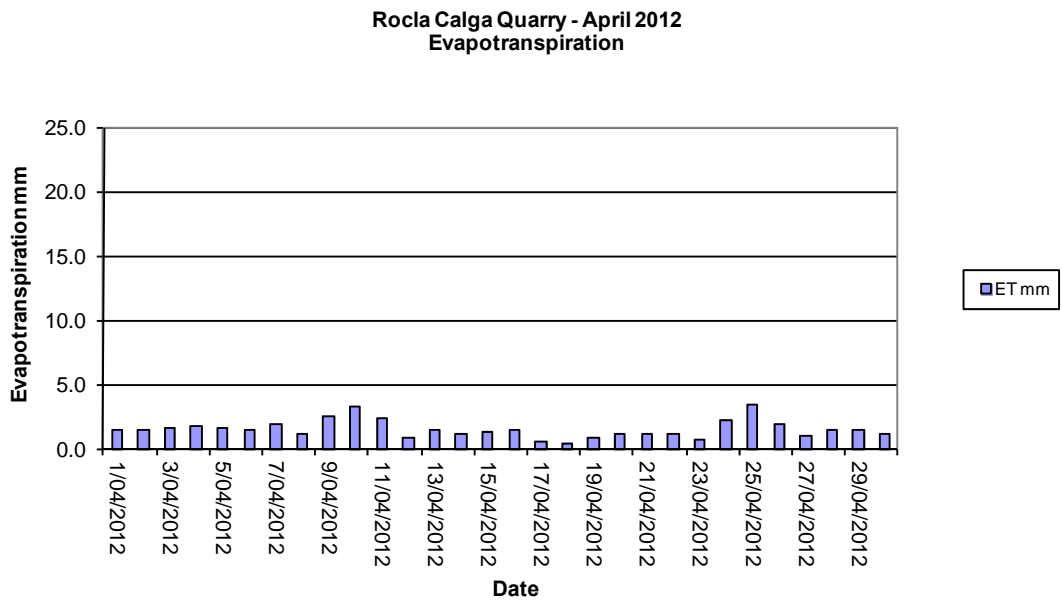
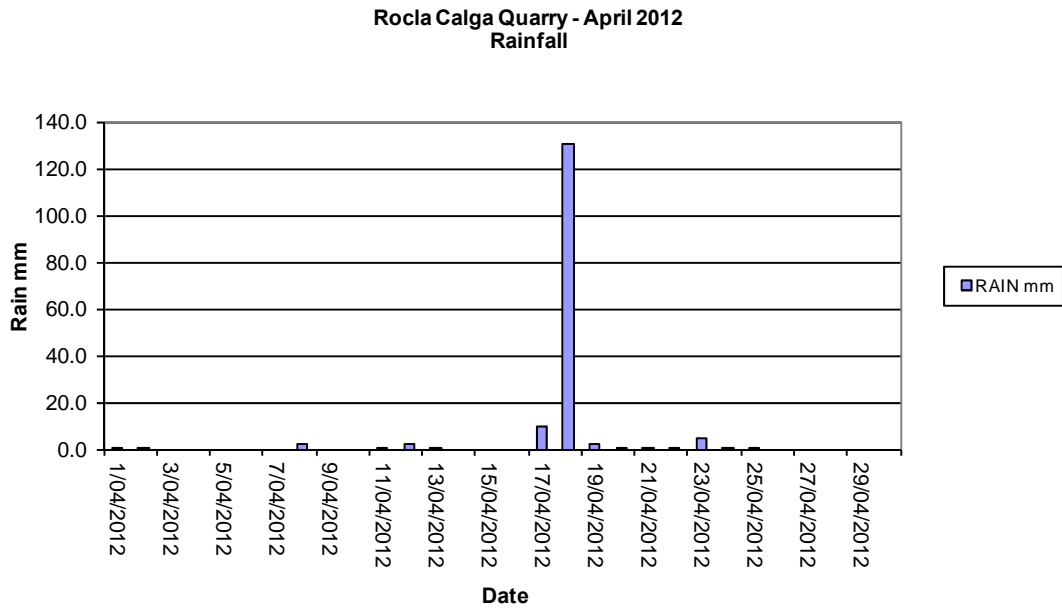
Summary Apr-12 Rocla - Calga

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 %
1/04/2012	14.1	19.7	27.5	43	74	94	0.2	1.4	0	0.9	11.6	14.1	27.2	1013.5	1016.1	1017.7	0	69.3	598	97.4	100.0	100
2/04/2012	14.3	18.8	26.3	61	85	98	0.2	1.5	0	0.7	4.5	14.3	26.6	1013.4	1015.2	1017.3	0	89.4	762	92.1	99.3	100
3/04/2012	14.7	20.5	29.7	34	77	97	0.0	1.7	0	1.1	6.7	14.7	30.3	1012.7	1014.1	1015.4	0	89.4	465	84.5	98.1	100
4/04/2012	16.6	20.8	26.7	54	79	96	0.0	1.7	0	0.7	5.8	16.6	27.0	1013.3	1015.8	1017.9	0	85.3	646	80.7	96.2	100
5/04/2012	16.3	20.0	26.3	54	79	97	0.0	1.6	0	0.4	4.5	16.3	26.4	1017.3	1019.1	1020.9	0	91.9	507	87.4	98.4	100
6/04/2012	15.4	19.3	25.3	48	79	97	0.0	1.5	0	0.6	7.2	15.5	25.3	1014.6	1018.1	1021.2	0	81.1	554	92.4	99.9	100
7/04/2012	16.2	19.8	27.7	33	73	87	0.0	1.9	0	1.8	9.8	16.1	28.2	1012.9	1015.8	1020.2	0	73.0	621	94.7	99.1	100
8/04/2012	16.6	19.9	25.1	69	82	96	2.4	1.2	0	0.6	7.2	16.4	26.0	1011.4	1015.6	1019.5	0	67.8	311	89.8	96.4	100
9/04/2012	12.2	16.8	24.5	36	57	91	0.0	2.5	0	2.8	9.4	10.8	23.9	1013.1	1015.0	1018.7	0	83.8	634	96.5	99.7	100
10/04/2012	9.3	12.6	16.5	45	57	81	0.0	3.2	0.4	4.8	13	6.4	15.3	1018.9	1024.3	1028.6	0	80.6	668	94.4	98.4	100
11/04/2012	9.6	13.2	17.5	60	71	93	0.8	2.3	0	3.9	10.7	7.1	16.8	1027.8	1029.8	1031.5	0	78.7	481	88.3	97.9	100
12/04/2012	12.1	14.2	20.3	73	93	98	2.4	0.9	0	1.1	7.2	10.9	20.6	1030.0	1031.2	1032.8	0	70.4	432	84.5	92.6	100
13/04/2012	9.7	16.2	25.3	48	82	98	0.2	1.5	0	0.9	5.8	9.7	25.1	1027.2	1029.4	1031.6	0	85.3	644	74.3	95.8	100
14/04/2012	13.0	18.2	25.8	51	84	98	0.0	1.2	0	0.5	5.8	13.1	25.8	1022.6	1025.1	1028.2	0	74.1	526	88.9	99.2	100
15/04/2012	16.2	18.8	24.0	57	83	97	0.0	1.2	0	0.4	4	16.3	24.1	1021.1	1022.7	1024.5	0	77.1	484	94.2	99.9	100
16/04/2012	15.2	18.1	22.3	59	83	96	0.0	1.4	0	0.6	4.9	15.2	22.3	1020.5	1022.0	1023.4	0	85.7	378	87.7	97.3	100
17/04/2012	14.8	16.3	18.3	88	97	99	9.6	0.5	0	1.9	8.9	14.2	18.9	1018.9	1020.6	1022.4	0	31.2	202	69.6	91.8	100
18/04/2012	16.3	17.5	19.4	99	100	100	130.4	0.3	0	1.1	9.4	16.3	20.3	1016.4	1018.2	1019.9	0	23.5	273	67	89.9	100
19/04/2012	16.6	18.8	21.9	84	97	100	2.0	0.9	0	0.1	2.7	16.6	22.8	1014.5	1016.3	1018.7	0	63.0	345	69.9	97.9	100
20/04/2012	17.1	20.4	27.4	53	88	100	0.2	1.2	0	0.5	5.4	17.1	28.7	1013.1	1014.3	1015.6	0	77.3	506	71.9	93.8	100
21/04/2012	16.3	18.9	24.0	73	94	100	0.2	1.1	0	0.5	4.5	16.3	24.8	1011.8	1013.5	1014.8	0	77.5	521	82.7	95.6	100
22/04/2012	16.0	19.1	23.9	72	91	100	0.4	1.1	0	1.0	4.5	16.1	24.7	1010.1	1012.2	1013.9	0	69.0	376	77.2	92.4	100
23/04/2012	16.9	17.7	19.4	74	90	96	5.0	0.7	0	2.7	8	16.6	19.7	1010.3	1011.7	1013.7	0	20.6	96	78.9	92.3	100
24/04/2012	12.2	16.9	23.6	46	72	95	0.2	2.2	1.3	3.9	13.4	10.4	23.5	1007.3	1010.8	1013.3	0	57.5	466	87.4	97.5	100
25/04/2012	9.2	13.2	18.2	40	58	73	0.2	3.5	2.2	5.4	14.8	6.7	16.8	1008.2	1011.1	1013.6	0	71.6	556	93.9	98.7	100
26/04/2012	12.2	15.4	20.0	52	67	87	0.0	1.9	0	1.7	10.3	10.4	19.3	1013.6	1017.0	1019.7	0	74.9	486	85.7	98.2	100
27/04/2012	10.4	14.9	22.3	55	84	97	0.0	1.0	0	0.3	7.2	10.5	21.8	1018.5	1020.6	1022.7	0	64.4	407	94.2	99.9	100
28/04/2012	12.1	15.9	21.7	67	86	98	0.0	1.5	0	1.3	6.7	12.1	21.4	1016.5	1019.2	1021.9	0	77.8	305	96.8	99.8	100
29/04/2012	10.1	13.6	17.1	63	80	93	0.0	1.4	0	2.3	10.3	9.7	16.5	1017.4	1021.0	1024.8	0	50.5	362	90.1	98.2	100
30/04/2012	9.8	13.6	20.4	55	78	92	0.0	1.2	0	0.7	4	9.0	19.8	1024.2	1025.6	1027.1	0	65.4	349	72.5	94.9	100
Monthly	9.2	17.3	29.7	33	81	100	154.4	45.3	0	1.5	14.8	6.4	30.3	1007.3	1018.7	1032.8	0	70.2	762	67	97.0	100

2.3.2 Monthly Weather Charts



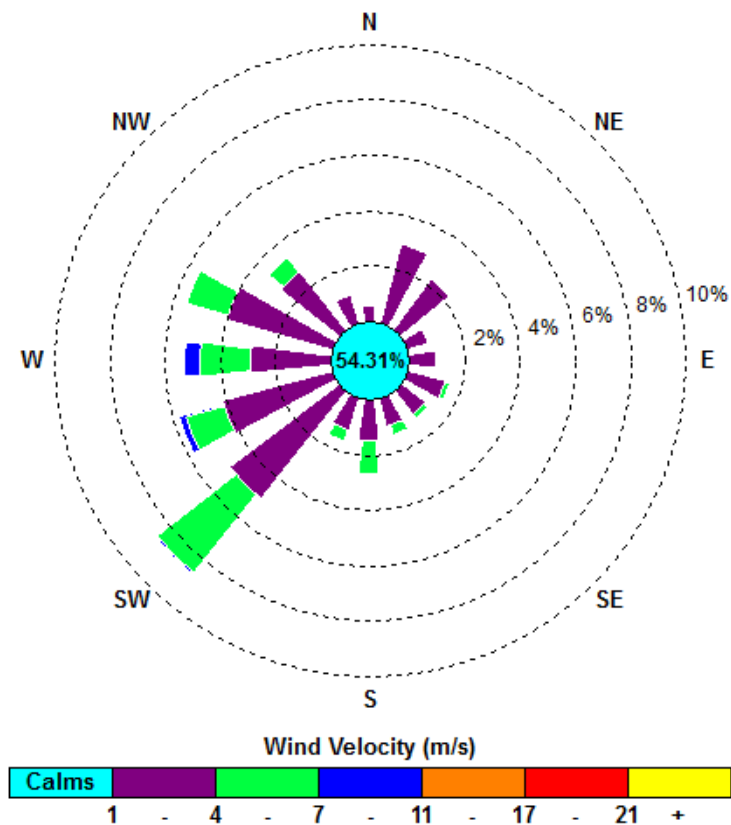




2.3.3 Monthly Windrose Plot

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 April 2012 – 00:00, 1 May 2012



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

Appendix 1

Laboratory Certificates

CERTIFICATE OF ANALYSIS

Work Order	: EN1201662	Page	: 1 of 4
Client	: CARBON BASED ENVIRONMENTAL	Laboratory	: Environmental Division Newcastle
Contact	: MS RENAE MIKKA	Contact	: Peter Keyte
Address	: 47 BOOMERANG ST CESSNOCK NSW, AUSTRALIA 2325	Address	: 5 Rosegum Road Warabrook NSW Australia 2304
E-mail	: cbased1@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	: ----		
C-O-C number	: ----	Date Samples Received	: 02-MAY-2012
Sampler	: CBE	Issue Date	: 11-MAY-2012
Site	: ----		
Quote number	: SY/269/10 V2	No. of samples received	: 6
		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 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.

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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.



Analytical Results

Sub-Matrix: DUST

Client sample ID

Client sampling date / time

				CD1 2/4/12 - 2/5/12	CD2C 2/4/12 - 2/5/12	CD3 2/4/12 - 2/5/12	CD4 2/4/12 - 2/5/12	CD5 2/4/12 - 2/5/12
				02-MAY-2012 15:00	02-MAY-2012 15:00	02-MAY-2012 15:00	02-MAY-2012 15:00	02-MAY-2012 15:00
Compound	CAS Number	LOR	Unit	EN1201662-001	EN1201662-002	EN1201662-003	EN1201662-004	EN1201662-005
EA120: Ash Content								
Ash Content	----	0.1	g/m ² .month	1.1	1.1	0.2	0.2	0.1
Ash Content (mg)	----	1	mg	20	19	4	3	2
EA125: Combustible Matter								
Combustible Matter	----	0.1	g/m ² .month	<0.1	0.2	0.5	1.0	0.1
Combustible Matter (mg)	----	1	mg	<1	4	8	19	1
EA141: Total Insoluble Matter								
Total Insoluble Matter	----	0.1	g/m ² .month	1.1	1.3	0.7	1.2	0.2
Total Insoluble Matter (mg)	----	1	mg	20	23	12	22	3

Page : 4 of 4
 Work Order : EN1201662
 Client : CARBON BASED ENVIRONMENTAL
 Project : ROCLA CALGA DUSTS



Analytical Results

Sub-Matrix: DUST

Client sample ID

CD6

2/4/12 - 2/5/12

02-MAY-2012 15:00

Client sampling date / time

EN1201662-006

Compound	CAS Number	LOR	Unit	EN1201662-006				
EA120: Ash Content								
Ash Content	----	0.1	g/m ² .month	0.2	----	----	----	----
Ash Content (mg)	----	1	mg	4	----	----	----	----
EA125: Combustible Matter								
Combustible Matter	----	0.1	g/m ² .month	0.1	----	----	----	----
Combustible Matter (mg)	----	1	mg	1	----	----	----	----
EA141: Total Insoluble Matter								
Total Insoluble Matter	----	0.1	g/m ² .month	0.3	----	----	----	----
Total Insoluble Matter (mg)	----	1	mg	5	----	----	----	----

CERTIFICATE OF ANALYSIS

Work Order	: ES1210626	Page	: 1 of 3
Client	: CARBON BASED ENVIRONMENTAL	Laboratory	: Environmental Division Sydney
Contact	: MS RENAE MIKKA	Contact	: Client Services
Address	: 47 BOOMERANG ST CESSNOCK NSW, AUSTRALIA 2325	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: cbased1@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-MAY-2012
Sampler	: CBE	Issue Date	: 10-MAY-2012
Site	: ----		
Quote number	: SY/269/10 V2	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
Ankit Joshi	Inorganic Chemist	Sydney Inorganics
Dianne Blane	Laboratory Supervisor	Newcastle
Hoa Nguyen	Inorganic Chemist	Sydney Inorganics

Page : 2 of 3
Work Order : ES1210626
Client : CARBON BASED ENVIRONMENTAL
Project : ROCLA QUARRY



General Comments

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- EA015: TDS for sample ID A has been confirmed by reanalysis.

Page : 3 of 3
 Work Order : ES1210626
 Client : CARBON BASED ENVIRONMENTAL
 Project : ROCLA QUARRY



Analytical Results

Sub-Matrix: WATER

Client sample ID

Client sampling date / time

				A	B	D	F	
				[02-MAY-2012]	[02-MAY-2012]	[02-MAY-2012]	[02-MAY-2012]	----
Compound	CAS Number	LOR	Unit	ES1210626-001	ES1210626-002	ES1210626-003	ES1210626-004	----
EA005: pH								
pH Value	----	0.01	pH Unit	6.19	6.66	5.96	6.16	----
EA010P: Conductivity by PC Titrator								
Electrical Conductivity @ 25°C	----	1	µS/cm	51	70	85	58	----
EA015: Total Dissolved Solids								
Total Dissolved Solids @180°C	GIS-210-010	10	mg/L	32	----	59	38	----
Total Dissolved Solids @180°C	GIS-210-010	10	mg/L	----	46	----	----	----
EA025: Suspended Solids								
Suspended Solids (SS)	----	5	mg/L	6	<5	18	10	----
EP020: Oil and Grease (O&G)								
Oil & Grease	----	5	mg/L	<5	<5	<5	<5	----

CERTIFICATE OF ANALYSIS

Work Order	: ES1210280	Page	: 1 of 3
Client	: CARBON BASED ENVIRONMENTAL	Laboratory	: Environmental Division Sydney
Contact	: MS RENAE MIKKA	Contact	: Client Services
Address	: 47 BOOMERANG ST CESSNOCK NSW, AUSTRALIA 2325	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: cbased1@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	: RAIN EVENT18 04 12	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Order number	: ----		
C-O-C number	: ----	Date Samples Received	: 30-APR-2012
Sampler	: CBE	Issue Date	: 08-MAY-2012
Site	: ----		
Quote number	: SY/269/10 V2	No. of samples received	: 5
		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 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
Hoa Nguyen	Inorganic Chemist	Sydney Inorganics
Sarah Millington	Senior Inorganic Chemist	Sydney Inorganics

Page : 2 of 3
Work Order : ES1210280
Client : CARBON BASED ENVIRONMENTAL
Project : RAIN EVENT18 04 12



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.

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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

- EA015: TDS by method EA-015 may bias high for various samples due to the presence of fine particulate matter, which may pass through the prescribed GF/C paper.

Page : 3 of 3
 Work Order : ES1210280
 Client : CARBON BASED ENVIRONMENTAL
 Project : RAIN EVENT18 04 12



Analytical Results

Sub-Matrix: WATER

Client sample ID

Client sampling date / time

				A	B	D	F	CABBAGE TREE CREEK
				18-APR-2012 19:30	18-APR-2012 19:30	18-APR-2012 19:30	18-APR-2012 19:30	18-APR-2012 19:30
Compound	CAS Number	LOR	Unit	ES1210280-001	ES1210280-002	ES1210280-004	ES1210280-005	ES1210280-006
EA005P: pH by PC Titrator								
pH Value	----	0.01	pH Unit	6.67	6.52	6.33	5.84	5.77
EA010P: Conductivity by PC Titrator								
Electrical Conductivity @ 25°C	----	1	µS/cm	66	55	36	49	53
EA015: Total Dissolved Solids								
Total Dissolved Solids @180°C	GIS-210-010	10	mg/L	42	46	42	36	26
EA025: Suspended Solids								
Suspended Solids (SS)	----	5	mg/L	16	19	60	9	34
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
April 2012 Daily Weather Observations



Date	Day	Temps		Rain mm	Evap mm	Sun hours	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		25.8	0												25.0	41	1	E	4	
2	Mo	13.4	24.1	0.4	4.0					19.2	88	4	SW	4		23.2	11	3	SE	4	
3	Tu	13.9	26.8	0	2.0					21.0	74	5	NW	9		26.2	49	2	N	4	
4	We	15.2	25.1	0	2.4					21.8	72	0	NE	4		22.4	72	1	ESE	9	
5	Th	15.1	24.2	0	3.8					21.6	70	2	ENE	4		22.5	68	1	NE	9	
6	Fr	14.0	24.2	0	3.0					20.4	73	3	NE	4		23.0	61	1	NE	4	
7	Sa	15.5	27.4	0	3.0					21.5	67	5	W	9		21.2	74	6	SE	9	
8	Su	15.4	23.6	0	3.8					18.8	84	8	SE	4		23.6	76	6	NE	4	
9	Mo	9.6	22.0	1.4	1.4					16.1	56	0	NW	4		21.1	42	0	N	4	
10	Tu	8.2	17.8	0	3.8					11.8	54	1	SW	4		16.0	48	3	SE	19	
11	We	8.7	17.9	0	4.0					13.1	62	3	SW	9		13.4	83	7	SSE	4	
12	Th	11.5	17.3	1.2	1.0					14.0	90	6	SW	4		16.2	94	5	SE	4	
13	Fr	10.3	22.1	3.2	1.0					16.6	87	0	SW	4		20.2	72	2	ENE	4	
14	Sa	12.0	24.8	0	0.8					19.2	80	4	N	4		22.4	71	7	E	4	
15	Su	15.0	22.6	0	2.2					18.4	90	7	NE	4		21.3	73	8	ESE	4	
16	Mo	14.5	21.2	0	1.4					17.2	80	7		Calm		20.4	69	6	SE	4	
17	Tu	14.0	17.7	4.0	1.4					15.5	94	8	SW	4		16.3	99	8	E	4	
18	We	14.9	20.1	72.8						17.2	98	8	E	9		17.2	98	8	E	4	
19	Th	16.0	22.3	35.0						18.5	92	7	NE	9		19.5	95	8	E	4	
20	Fr	16.3	25.9	2.8	2.4					19.2	92	1	NW	4		23.9	76	5	ESE	9	
21	Sa	14.5	23.1	0.2	2.0					18.7	98	2	E	4		23.0	71	4	S	9	
22	Su	14.6	23.1	0	1.4					17.1	99	8		Calm		21.6	83	8	NW	4	
23	Mo	16.6	19.2	2.2	1.6					17.1	95	8	WNW	4		17.1	92	8	N	9	
24	Tu	14.0	22.1	4.8	0.6					19.2	80	0	NNW	9		19.6	58	5	NW	4	
25	We	7.3	18.1	4.6	3.4					12.1	61	1	SW	19		16.4	46	0	SW	19	
26	Th	10.0	19.8	0	2.4					15.6	65	5	SW	9		18.7	54	4	S	4	
27	Fr	9.6	20.6	0	2.2					15.2	82	5	SSE	4		18.5	72	6	ENE	4	
28	Sa	11.3	19.6	0	1.4					14.7	86	8	E	4		19.0	67	7	NW	4	
29	Su	10.2	17.1	0	1.6					16.0	66	2	SW	4		15.6	67	5	S	9	
30	Mo	8.2	18.5	0.4	0.6					14.2	74	4	SW	4		16.5	65	6	E	9	
Statistics for April 2012																					
Mean		12.8	21.8		2.2					17.3	79	4		5		20.0	68	4		6	
Lowest		7.3	17.1		0.6					11.8	54	0		Calm		13.4	11	0	#	4	
Highest		16.6	27.4	72.8	4.0					21.8	99	8	SW	19		26.2	99	8	#	19	
Total				133.0	58.6																

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.

IDCJDW2110.201204 Prepared at 13:01 UTC on 21 May 2012

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Gosford, New South Wales
April 2012 Daily Weather Observations



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	11.2	27.2	0			SSE	17	18:16	20.6	97			Calm		26.1	40		ENE	7	
2	Mo	13.4	26.0	0.4			ESE	19	14:09	21.6	87		S	6		23.4	72		SE	9	
3	Tu	12.5	28.4	0			ENE	17	15:39	19.5	99			Calm		27.1	54		ENE	7	
4	We	14.5	25.9	0			NE	24	15:01	22.5	84		N	7		24.9	63		E	7	
5	Th	14.0	25.6	0			SSE	20	12:16	22.9	83			Calm		24.6	58		E	7	
6	Fr	12.5	25.7	0			NE	20	16:21	19.7	99		SSE	2		24.6	52		E	9	
7	Sa	13.6	28.9	0			S	39	13:40	22.3	94		N	6		22.3	78		SE	19	
8	Su	16.8	24.8	0			NNW	20	10:21	19.3	98			Calm		24.0	89		NE	7	
9	Mo	9.1	23.4	7.0			SSE	30	23:11	17.7	49		WNW	11		22.7	35		NW	9	
10	Tu	10.2	18.6	0			NW	44	15:22	14.6	49		SSE	7		17.0	48		SE	13	
11	We	11.5	19.8	0.2			SSE	39	15:28	14.6	62		SSE	6		18.7	59		SSE	9	
12	Th	12.1	19.2	3.8			W	20	04:16	16.6	95		SW	6		17.7	100			Calm	
13	Fr	7.9	24.0	3.6			SSE	17	15:06	17.4	99			Calm		22.9	60		ENE	7	
14	Sa	10.3	25.1	0			E	19	14:04	17.9	99			Calm		22.6	69		NNE	7	
15	Su	14.8	24.0	0			ESE	15	12:14	18.8	100			Calm		22.6	74			Calm	
16	Mo	15.6	22.7	0			SSE	22	14:54	19.2	98			Calm		22.4	73		SE	11	
17	Tu	15.8	19.8	5.6			ESE	24	14:46	18.0	99		N	7					SE	7	
18	We	16.1	19.9	92.8			E	24	14:28				SSE	4					E	6	
19	Th	15.8	24.5	103.6			ESE	19	12:48					Calm		21.3	99		E	2	
20	Fr	15.9	27.0	0.4			NE	19	14:34	21.8	95		N	11		24.4	72		E	7	
21	Sa	14.7	24.1	0			E	20	13:59					Calm		23.2	77		SSE	9	
22	Su	13.7	24.9	0.2			NNW	15	11:57					Calm		23.3	87		NE	2	
23	Mo	17.0	20.6	2.2			NNW	17	06:47					Calm		18.3	100		NNW	6	
24	Tu	13.5	24.8	4.4			W	30	15:17	20.5	88		NNE	6		21.9	47		WNW	9	
25	We	6.3	20.1	0.8			NW	33	13:47	14.3	53		ESE	9		19.4	35		WNW	11	
26	Th	13.0	21.7	0			SW	30	09:04	18.4	52		WNW	7		19.6	51		SE	9	
27	Fr	9.1	21.7	0			ESE	17	13:27	15.7	98			Calm		20.5	68		ESE	7	
28	Sa	11.0	21.1	0			NW	19	22:48					Calm		21.0	74		NNW	7	
29	Su	10.1	19.6	0.2			S	33	14:31	18.4	54		S	9		17.9	68		SE	13	
30	Mo	8.7	20.1	2.0			ESE	17	12:11	15.3	75		NW	6		18.7	69		SSE	2	
Statistics for April 2012																					
Mean		12.7	23.3							18.6	83			3		21.9	66			7	
Lowest		6.3	18.6							14.3	49			Calm		17.0	35			Calm	
Highest		17.0	28.9	103.6			NW	44		22.9	100		#	11		27.1	100		SE	19	
Total				227.2																	

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.

IDCJDW2048.201204 Prepared at 13:00 UTC on 21 May 2012

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