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

September 2011

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19 October 2011

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 September 2011;
- Surface Water quality results for September 2011;
- Groundwater depth and quality results for September 2011; and
- Meteorological report for September 2011.

The September 2011 dust deposition results show generally similar to higher levels of insoluble solids compared to August 2011. All sites, on a year to date average basis, are currently below the Air Quality Management Plan exceedence 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 for the normal monthly sampling event on the 30 September 2011 at sites A, D and F. Site B was dry and there was no access to site C. 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, low Total Dissolved Solids, low Total Suspended Solids and no detectable Oil and Grease. pH levels remained stable and were within the slightly acidic range. An additional high rainfall surface water sampling event was undertaken on 26 September 2011 at sites A, B, D and F.

Groundwaters were sampled for normal monthly monitoring on 30 September 2011. Groundwater depth showed varying trends across monitoring bores this month. pH and EC remained relatively stable.

The meteorological station data recovery for the month was 100%. Recorded rainfall on site for September was 104.6 mm, which was lower than that recorded at the BOM Peats Ridge Station and higher than the Peats Ridge long-term average for September. Results are detailed below:

Rocla Calga Quarry	104.6 mm
BOM Peats Ridge*	133.0 mm
BOM Gosford*	178.8 mm
BOM Peats Ridge Long term mean for August*	75.1 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/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.

2.0 Monthly Results

2.1 Dust Deposition Gauges

Table 1 displays the results for September 2011 and the project average. Results are in g/m^2.month.

Table 1: Dust Deposition results: 31-August 2011 – 30-September 2011

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	2.7	2.2	0.5	81	2.1
CD2c	0.7	0.5	0.2	71	0.8
CD3	2.0	1.9	0.1	95	0.7
CD4	0.3	0.3	<0.1	100	0.4
CD5	0.2	0.1	0.1	50	0.3
CD6	0.5	0.3	0.2	60	0.6

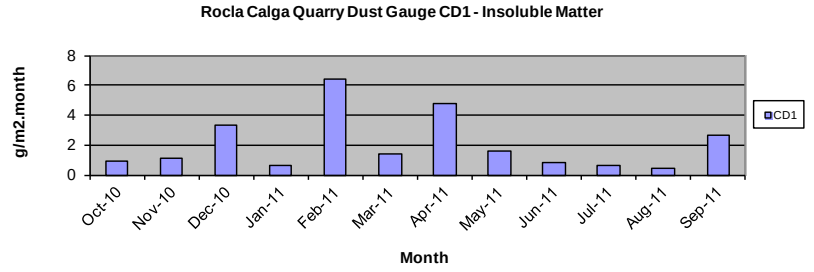
Insoluble Solids marked with an * indicate an excessively contaminated gauge. Contamination can include bird droppings, vegetation (such as plant matter, algae, pollen and seeds) and insects. Results in bold indicate insoluble solids levels above 3.7 g/m^2.month; the Development Consent's annual average amenity criteria at residential locations. The current rolling annual average is calculated from October 2010 to September 2011.

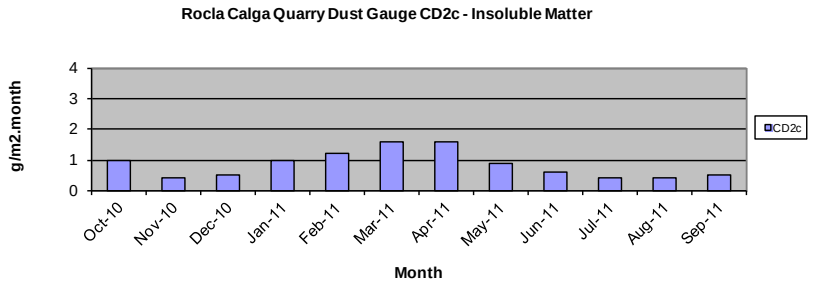
NA= Not Available.

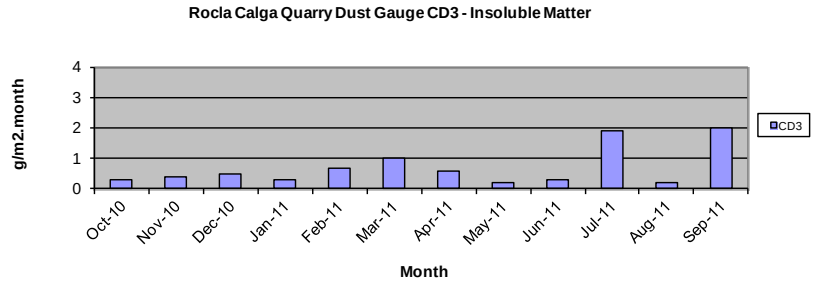
CD1 was installed on the 1 May 2006. CD2a was discontinued at the start of August 2006 due to quarry operations "mining out" the site of the gauge. The replacement gauge, Site CD2b, was located in a position adjacent to the boundary between B. Kashouli and F. & J. Gazzana in conformance with the Air 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.

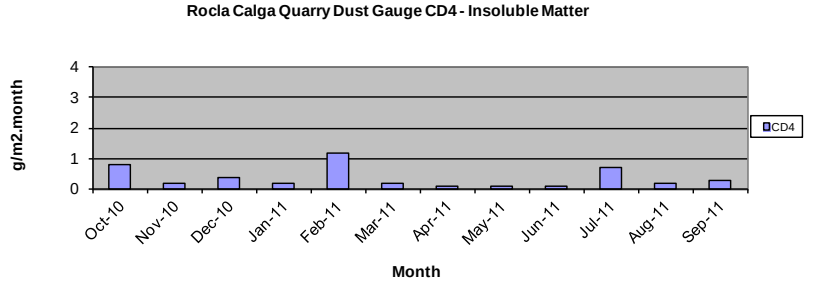
Dust deposition charts for all dust gauge sites appear in **Figure 1** below. The laboratory analysis is provided in **Appendix 1.**

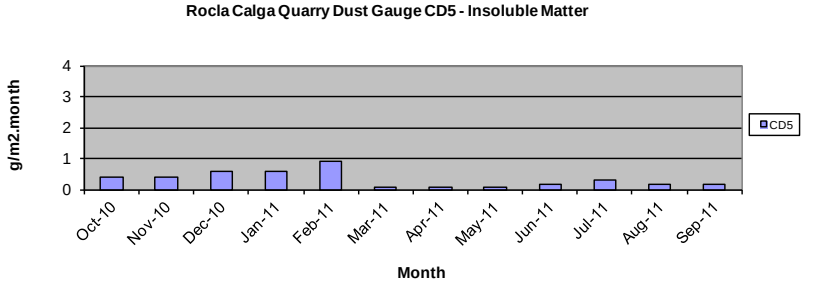
Figure 1: Dust Deposition Charts

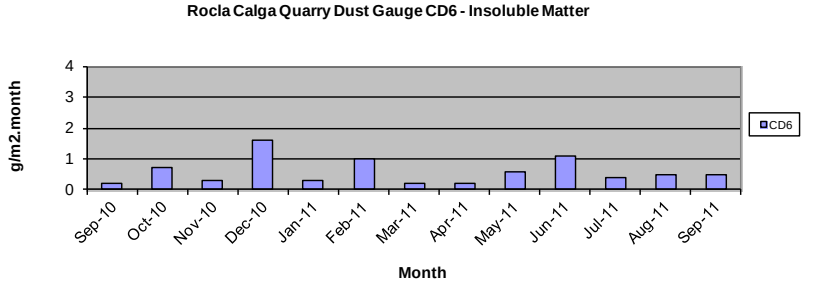












2.2 Water Monitoring

2.2.1 Surface Waters

Monthly surface water monitoring was conducted on the 30 September 2011 and results are listed in **Table 2**. The laboratory analysis sheets are provided in **Appendix 1.**

Table 2: Monthly surface water monitoring – September 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	Slow	Clear	Clear	5.15	76	46	6	<5
B	DRY							
C	NO ACCESS							
D	Slow	Clear	Clear	5.14	82	65	<5	<5
F	Dam	Clear	Clear	5.26	67	44	10	<5

At the time of sampling, there were no water discharges off site from any sampling location. Samples were collected at sites A, D and F. Site B was dry at the time of sampling and there was no access to site C. 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 26 September 2011 at sites A, B, D and F. Results are provided in **Appendix 1**.

2.2.2 Groundwaters

Groundwaters were sampled on 30 September 2011. 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 2 to 5.**

Groundwater depth showed varying trends across monitoring bores this month. pH and EC remained relatively stable compared to last month. Detailed biannual water quality monitoring is next due in October 2011.

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	19.40	4.5	120
CQ3	Voutos	* Monitor	10.53	10.02	5.8	100
CQ4	Voutos	* Monitor	8.78	8.14	4.8	80
CQ5	Gazzana	DIP Only	8.69	5.27	4.3	140
CQ6	Gazzana	DIP Only	16.00	9.92	4.3	160
CQ7	Gazzana	* Monitor	6.89	5.63	4.8	90
CQ8	Gazzana	* Monitor	11.03	5.20	4.3	140
CQ9	Gazzana	DIP Only	10.10	8.57	4.4	100
CQ10	Voutos	* Monitor	NI	21.72	4.9	160
CQ11S	Gazzana	* Monitor	NI	8.63	4.2	150
CQ11D	Gazzana	* Monitor	NI	9.87	4.4	140
CQ12	Gazzana	* Monitor	NI	3.66	4.2	130
CQ13	Kashouli	* Monitor	NI	11.48	5.1	190
CP3	Gazzana	Domestic	10.40	7.15	4.5	140
CP4	Kashouli	Domestic	13.63	6.82	4.9	200
CP5	Kashouli	Domestic	16.61	5.33	4.5	220
CP6	Kashouli	Domestic	16.27	7.88	4.3	200
CP7	Kashouli	Production	8.56	1.00	4.9	160
CP8	Rozmanec	Domestic	22.17	NR	NR	NR
MW7	Rocla Bore	* Monitor	15.76	14.98	4.0	110
MW8	Rocla Bore	* Monitor	9.82	6.42	4.5	80
MW9	Rocla Bore	* Monitor	22.44	21.26	4.1	80
MW10	Rocla Bore	* Monitor	15.41	11.22	3.4	120
MW13	Rocla Bore	DIP Only	NI	7.40	4.3	90
MW16	Rocla Bore	DIP Only	NI	7.95	4.4	100

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.

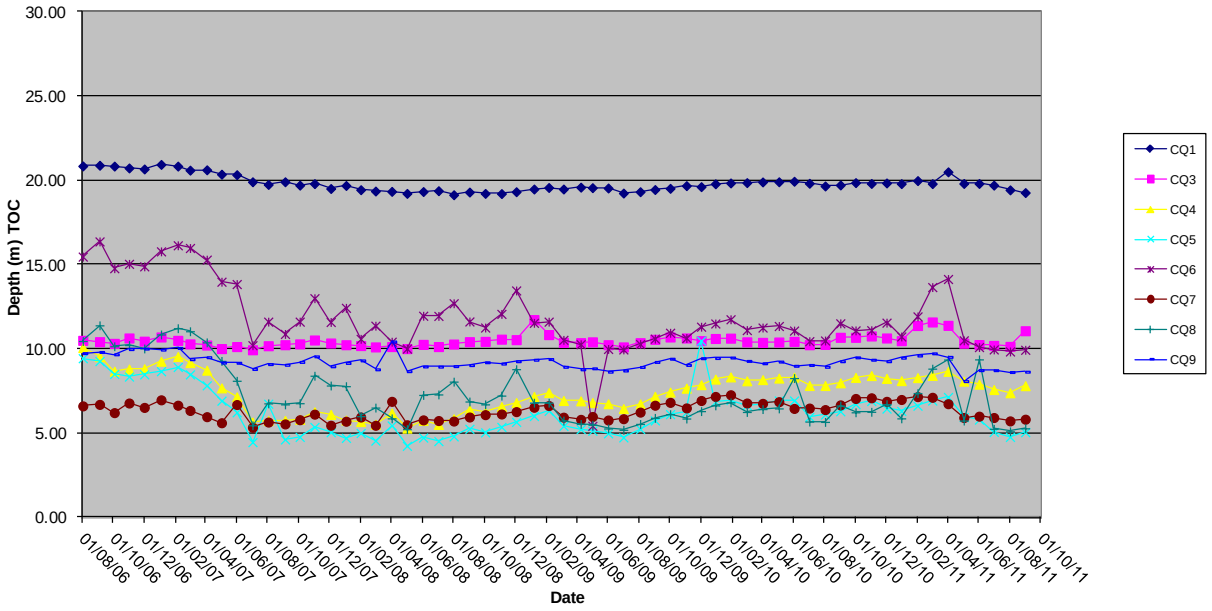
Shading is used to indicate the following trends in water depth (compared to the last reading):

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

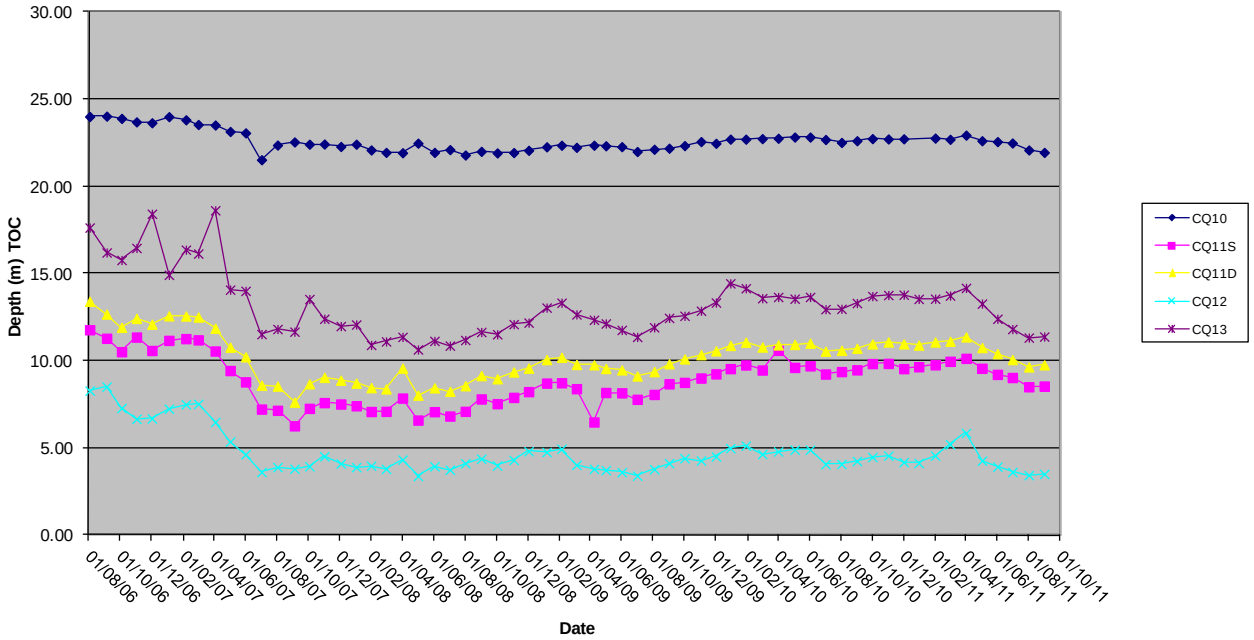
Available groundwater loggers were downloaded and will be forwarded to the Rocla Calga Quarry groundwater consultant.

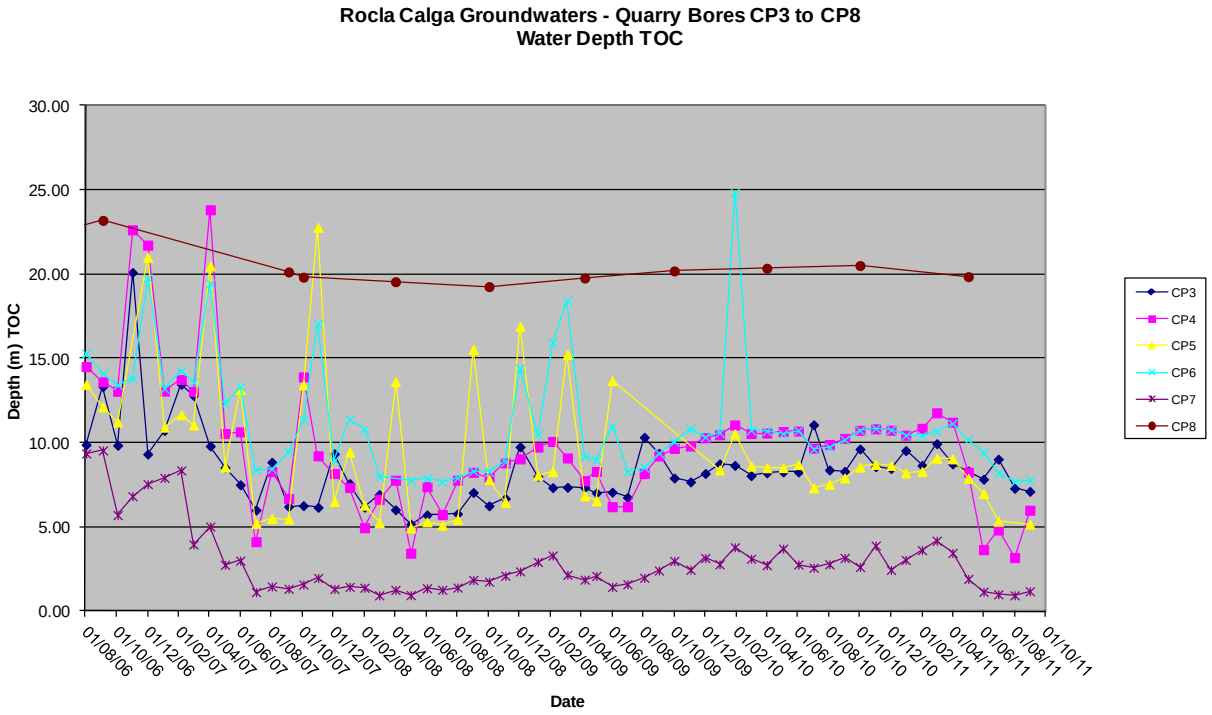
Figures 2 to 5: Groundwater Depth Charts.

Rocla Calga Groundwaters - Quarry Bores CQ1 to CQ9
Water Depth TOC



Rocla Calga Groundwaters - Quarry Bores CQ10 to CQ13
Water depth TOC




Rocla Calga Groundwaters - Quarry Bores CP3 to CP8
Water Depth TOC
Depth (m) TOC
30.00
25.00
20.00
15.00
10.00
5.00
0.00
01/08/06
01/10/06
01/12/06
01/02/07
01/04/07
01/06/07
01/08/07
01/10/07
01/12/07
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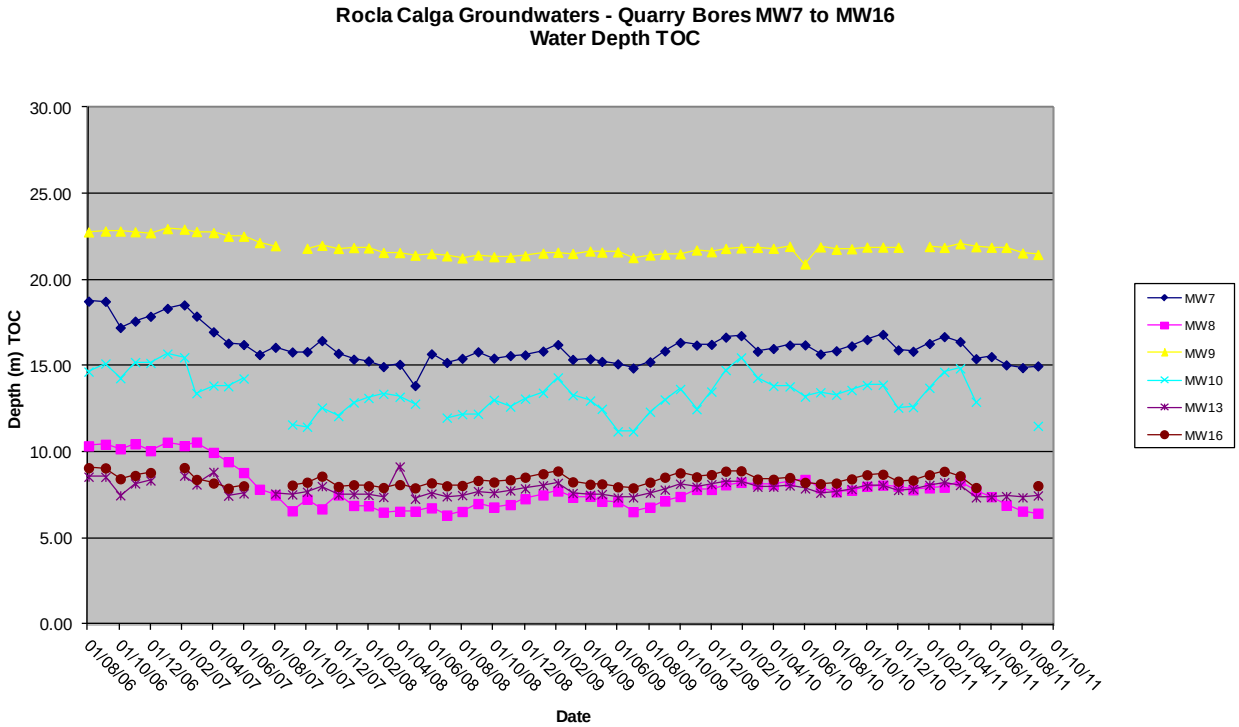
Date
CP3
CP4
CP5
CP6
CP7
CP8


Rocla Calga Groundwaters - Quarry Bores MW7 to MW16
Water Depth TOC
Depth (m) TOC
30.00
25.00
20.00
15.00
10.00
5.00
0.00
01/08/06
01/10/06
01/12/06
01/02/07
01/04/07
01/06/07
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01/10/10
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01/02/11
01/04/11
01/06/11
01/08/11
01/10/11
Date
MW7
MW8
MW9
MW10
MW13
MW16

2.3 Meteorological Monitoring

The Rocla Calga Quarry weather station data recovery in September 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 September 2011 shows rainfall recorded at the Rocla Calga Quarry was lower than that recorded at the nearby Peats Ridge BOM station and Gosford BOM station. Recorded rainfall at Rocla Calga Quarry was higher than the Peats Ridge long term mean rainfall for September. The rainfall comparison is provided below:

Rocla Calga Quarry	104.6 mm
BOM Peats Ridge*	133.0 mm
BOM Gosford*	178.8 mm
BOM Peats Ridge Long term mean for September*	75.1 mm

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

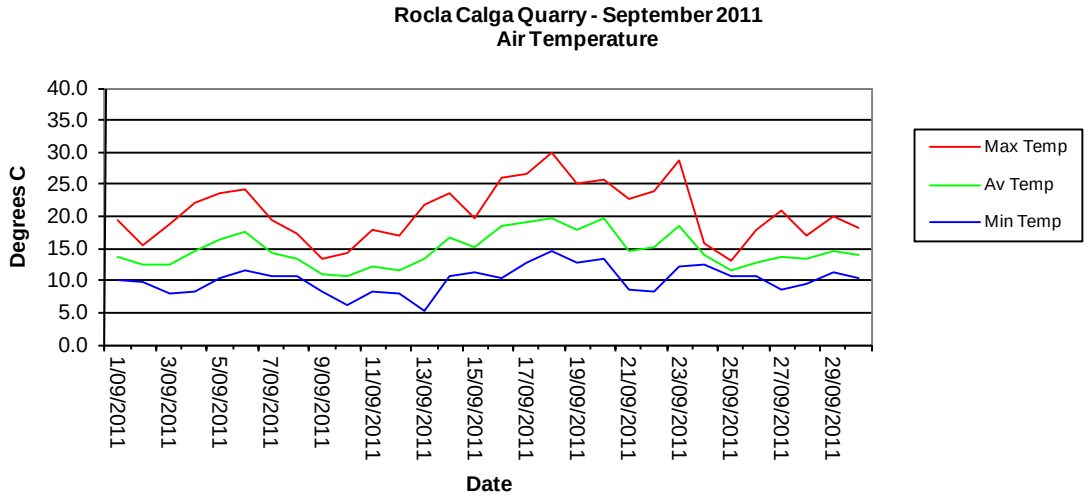
Results are displayed in the following table and figures.

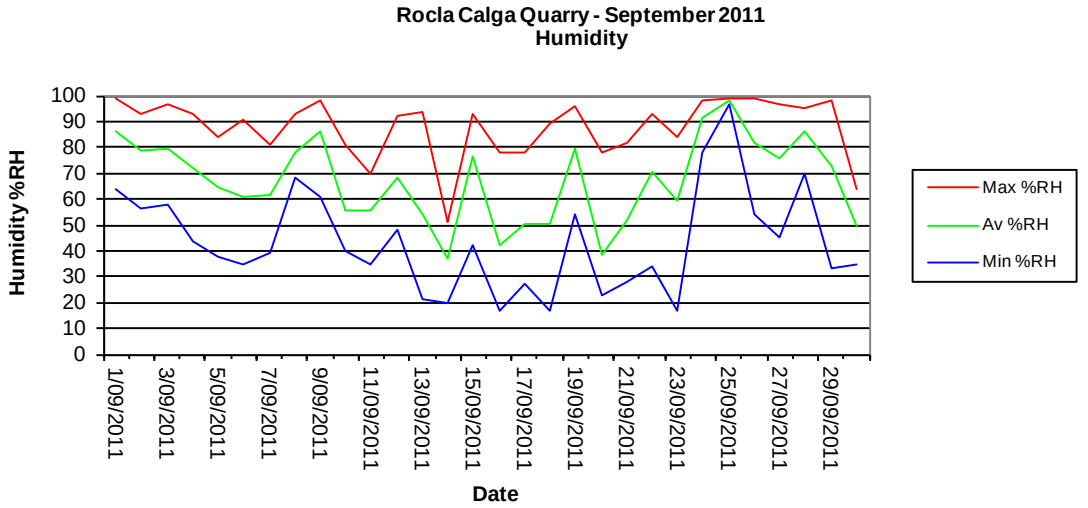
2.3.1 Monthly Meteorological Data Summary

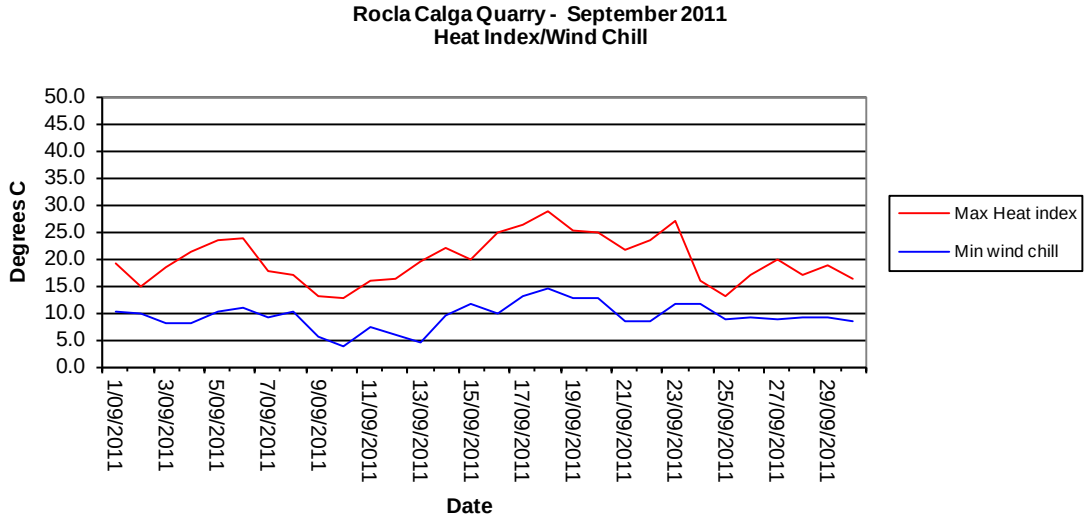
Summary **Sep-11** **Rocla - Calga**

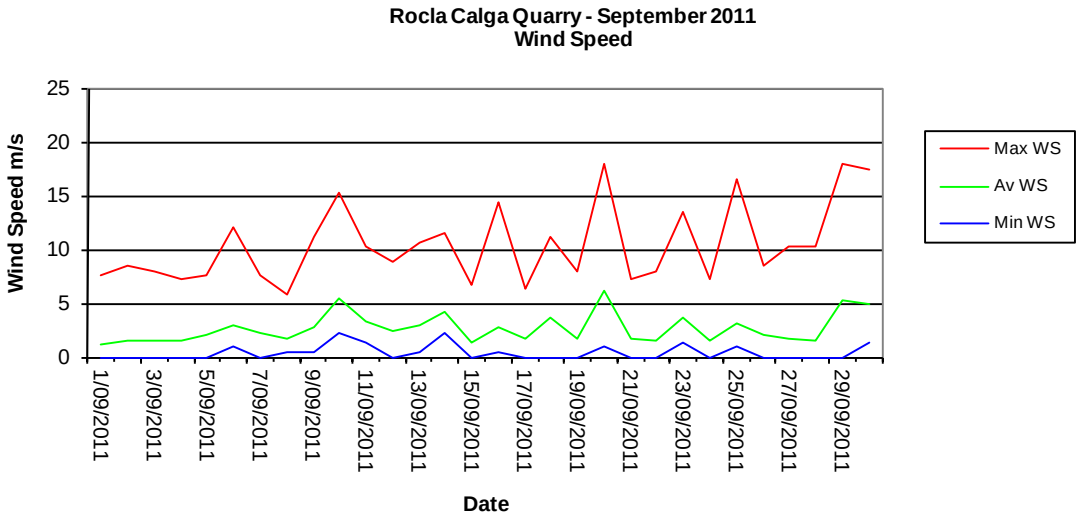
Date	Min Temp	Av Temp	Max Temp	Min %RH	Av %RH	Max %RH	RAIN mm	ET mm	Min WS	Av WS	Max WS	Min wind chill	Max Heat index	Min Atm P	Av Atm P	Max Atm P	Min Solar Rad	Av Solar Rad	Max Solar Rad	Min Data %	Av data %	Max Data %
1/09/2011	10.0	13.8	19.4	64	86	99	0.2	1.4	0	1.1	7.6	10.1	19.1	1021.2	1023.0	1026.0	0	79.3	754	75.4	98.2	100
2/09/2011	9.7	12.4	15.6	56	79	93	0.2	1.6	0	1.6	8.5	9.7	14.7	1025.8	1028.3	1030.6	0	78.3	463	91.5	98.6	100
3/09/2011	8.1	12.6	18.8	58	80	97	0.0	1.6	0	1.5	8	8.1	18.3	1026.5	1028.6	1030.4	0	78.3	629	85.7	97.8	100
4/09/2011	8.4	14.6	22.0	44	72	93	0.0	2.0	0	1.5	7.2	8.2	21.4	1022.8	1025.7	1028.1	0	90.4	718	93.9	99.5	100
5/09/2011	10.5	16.3	23.6	38	65	84	0.0	2.4	0	2.1	7.6	10.3	23.3	1021.7	1023.8	1025.9	0	94.6	677	76.3	97.5	100
6/09/2011	11.6	17.5	24.2	35	61	91	0.0	3.3	0.9	3.0	12.1	10.9	23.6	1013.8	1017.2	1021.6	0	98.5	715	85.1	97.9	100
7/09/2011	10.8	14.1	19.3	39	62	81	0.0	2.4	0	2.2	7.6	9.0	17.7	1014.8	1017.5	1020.3	0	93.2	693	85.1	98.3	100
8/09/2011	10.7	13.5	17.4	68	78	93	0.4	1.6	0.4	1.7	5.8	10.2	17.1	1013.3	1017.7	1020.8	0	78.2	707	84.5	97.4	100
9/09/2011	8.4	11.1	13.4	61	86	98	16.6	1.0	0.4	2.8	11.2	5.7	13.0	1005.3	1008.2	1012.9	0	54.1	611	90.6	98.8	100
10/09/2011	6.3	10.6	14.3	40	55	81	0.0	3.8	2.2	5.5	15.2	3.6	12.8	1008.3	1009.8	1011.7	0	111.8	788	90.1	98.5	100
11/09/2011	8.3	12.2	17.8	35	56	70	0.0	3.2	1.3	3.3	10.3	7.2	15.9	1010.2	1012.6	1016.9	0	110.2	935	91.8	98.5	100
12/09/2011	7.9	11.5	16.9	48	68	92	0.0	2.2	0	2.5	8.9	6.0	16.1	1017.0	1021.9	1025.5	0	100.1	723	93.3	98.3	100
13/09/2011	5.4	13.5	21.8	21	54	94	0.0	3.8	0.4	3.0	10.7	4.6	19.5	1019.0	1022.7	1026.0	0	131.1	779	82.7	97.0	100
14/09/2011	10.7	16.6	23.5	20	37	51	0.0	5.3	2.2	4.1	11.6	9.4	22.0	1016.7	1019.9	1022.5	0	138.5	791	90.1	98.6	100
15/09/2011	11.4	15.1	19.8	42	76	93	0.0	2.3	0	1.4	6.7	11.5	19.7	1016.6	1019.2	1021.7	0	122.9	680	89.2	98.3	100
16/09/2011	10.3	18.5	25.9	17	42	78	0.0	4.5	0.4	2.7	14.3	10.0	24.8	1011.1	1014.7	1018.0	0	125.0	765	77.8	97.7	100
17/09/2011	12.9	19.1	26.7	27	51	78	0.0	3.5	0	1.7	6.3	12.9	26.4	1011.7	1013.9	1016.7	0	141.2	798	84.8	98.9	100
18/09/2011	14.6	19.7	30.0	17	50	89	0.0	5.3	0	3.7	11.2	14.6	28.7	1010.9	1014.8	1021.2	0	152.9	771	98.8	99.9	100
19/09/2011	12.7	17.9	25.1	54	80	96	0.0	2.9	0	1.8	8	12.7	25.1	1009.5	1015.9	1020.9	0	149.2	760	90.1	99.3	100
20/09/2011	13.5	19.6	25.6	23	38	78	0.0	6.9	0.9	6.1	17.9	12.6	24.8	1002.8	1007.7	1016.3	0	128.4	752	87.1	99.4	100
21/09/2011	8.7	14.5	22.7	28	52	82	0.0	3.8	0	1.6	7.2	8.4	21.6	1016.2	1018.5	1021.6	0	187.5	823	91.5	99.1	100
22/09/2011	8.3	15.2	23.9	34	70	93	0.0	3.4	0	1.6	8	8.3	23.4	1017.1	1020.4	1024.0	0	189.9	817	91.8	98.5	100
23/09/2011	12.2	18.4	28.8	17	59	84	0.0	5.3	1.3	3.6	13.4	11.6	26.9	1013.0	1016.5	1020.9	0	198.4	824	95	99.6	100
24/09/2011	12.5	14.0	15.9	78	91	98	3.8	0.8	0	1.5	7.2	11.6	15.8	1016.2	1018.7	1021.2	0	50.1	241	92.7	99.1	100
25/09/2011	10.6	11.5	13.0	97	98	99	56.2	0.2	0.9	3.2	16.5	8.7	13.1	1013.1	1018.9	1022.8	0	18.4	143	96.8	99.2	100
26/09/2011	10.6	12.9	17.9	54	82	99	3.2	2.3	0	2.0	8.5	9.2	16.9	1020.9	1022.3	1024.0	0	140.2	823	84.2	97.6	100
27/09/2011	8.6	13.8	20.8	45	75	97	0.2	3.1	0	1.7	10.3	8.7	19.8	1016.9	1019.7	1022.9	0	174.0	841	79.5	95.6	100
28/09/2011	9.4	13.2	17.1	70	86	95	6.0	1.1	0	1.5	10.3	9.0	17.0	1005.6	1012.4	1017.0	0	57.3	383	94.7	99.0	100
29/09/2011	11.3	14.5	20.0	33	73	98	17.8	3.7	0	5.3	17.9	9.0	18.9	994.6	999.1	1005.5	0	141.4	969	82.7	97.3	100
30/09/2011	10.4	13.8	18.3	35	50	64	0.0	5.5	1.3	5.0	17.4	8.3	16.4	1000.1	1003.7	1006.8	0	227.3	876	91.2	97.5	100
Monthly	5.4	14.7	30	17	67	99	104.6	90.1	0	2.7	17.9	3.6	28.7	994.6	1017.1	1030.6	0	118.0	969	75.4	98.4	100

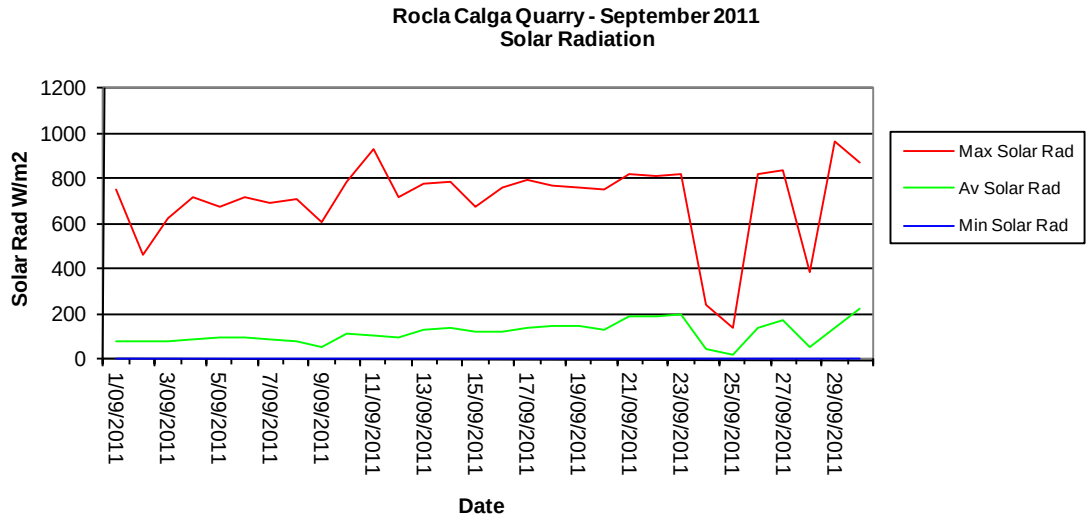
2.3.2 Monthly Weather Charts

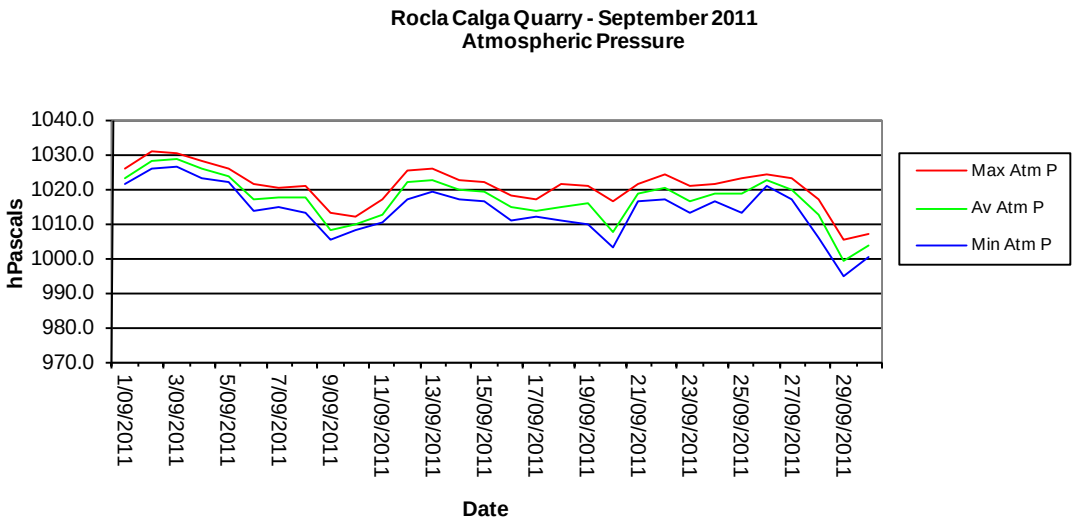


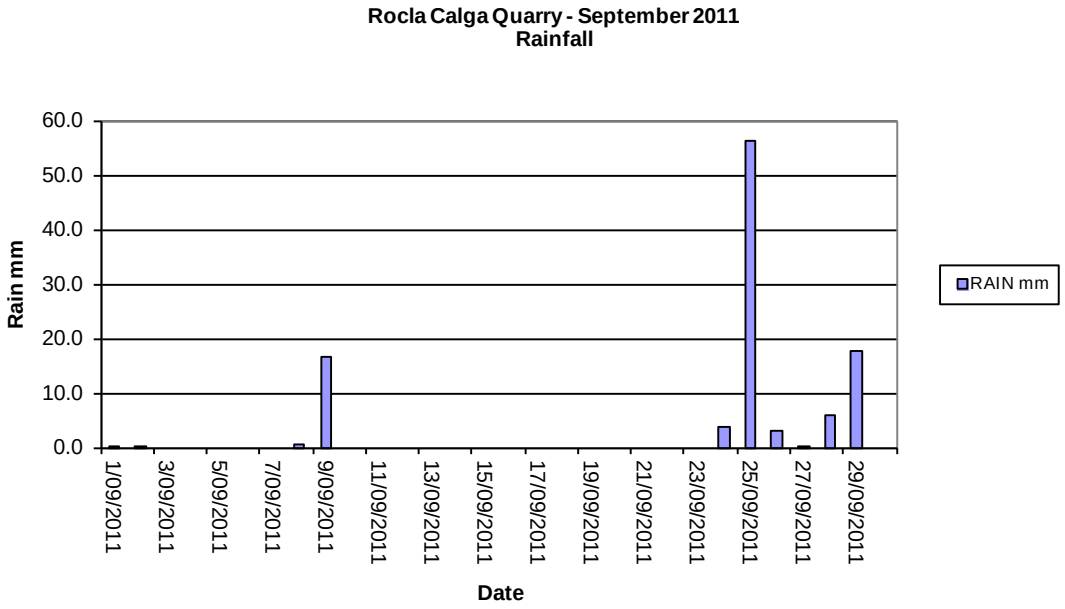


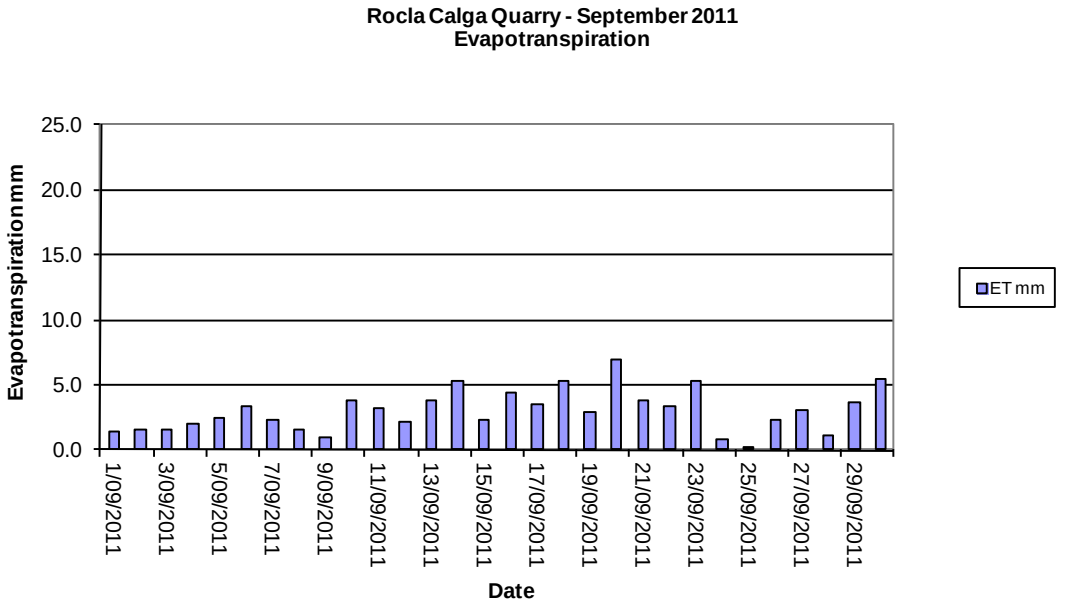


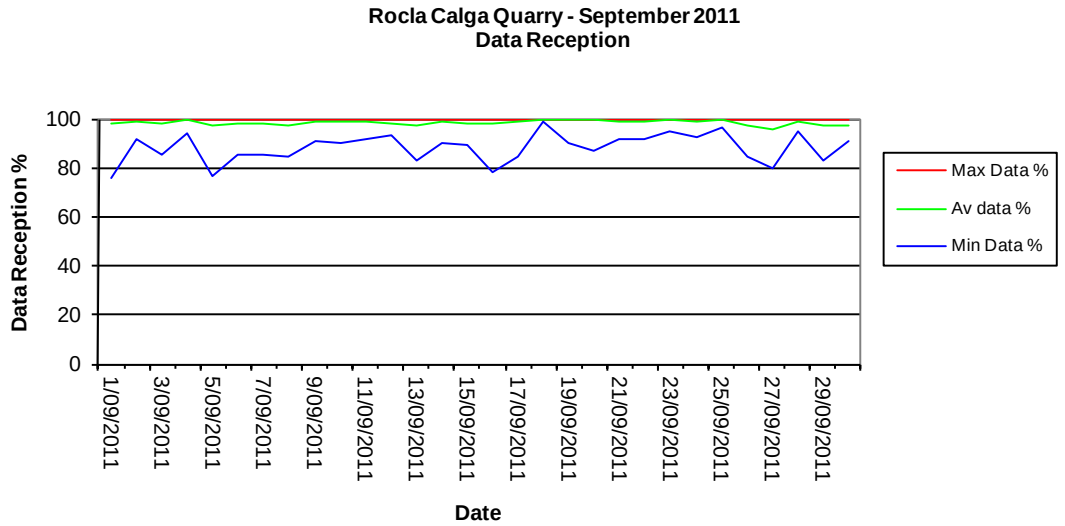

Rocla Calga Quarry - September 2011
Wind Speed
Wind Speed m/s
25
20
15
10
5
0
1/09/2011
3/09/2011
5/09/2011
7/09/2011
9/09/2011
11/09/2011
13/09/2011
15/09/2011
17/09/2011
19/09/2011
21/09/2011
23/09/2011
25/09/2011
27/09/2011
29/09/2011
Date
Max WS
Av WS
Min WS


Rocla Calga Quarry - September 2011
Solar Radiation
Solar Rad W/m2
1200
1000
800
600
400
200
0
1/09/2011
3/09/2011
5/09/2011
7/09/2011
9/09/2011
11/09/2011
13/09/2011
15/09/2011
17/09/2011
19/09/2011
21/09/2011
23/09/2011
25/09/2011
27/09/2011
29/09/2011
Date
Max Solar Rad
Av Solar Rad
Min Solar Rad


Rocla Calga Quarry - September 2011
Atmospheric Pressure
hPascals
1040.0
1030.0
1020.0
1010.0
1000.0
990.0
980.0
970.0
1/09/2011
3/09/2011
5/09/2011
7/09/2011
9/09/2011
11/09/2011
13/09/2011
15/09/2011
17/09/2011
19/09/2011
21/09/2011
23/09/2011
25/09/2011
27/09/2011
29/09/2011
Date
Max Atm P
Av Atm P
Min Atm P


Rocla Calga Quarry - September 2011
Rainfall
Rain mm
60.0
50.0
40.0
30.0
20.0
10.0
0.0
1/09/2011
3/09/2011
5/09/2011
7/09/2011
9/09/2011
11/09/2011
13/09/2011
15/09/2011
17/09/2011
19/09/2011
21/09/2011
23/09/2011
25/09/2011
27/09/2011
29/09/2011
Date
RAIN mm

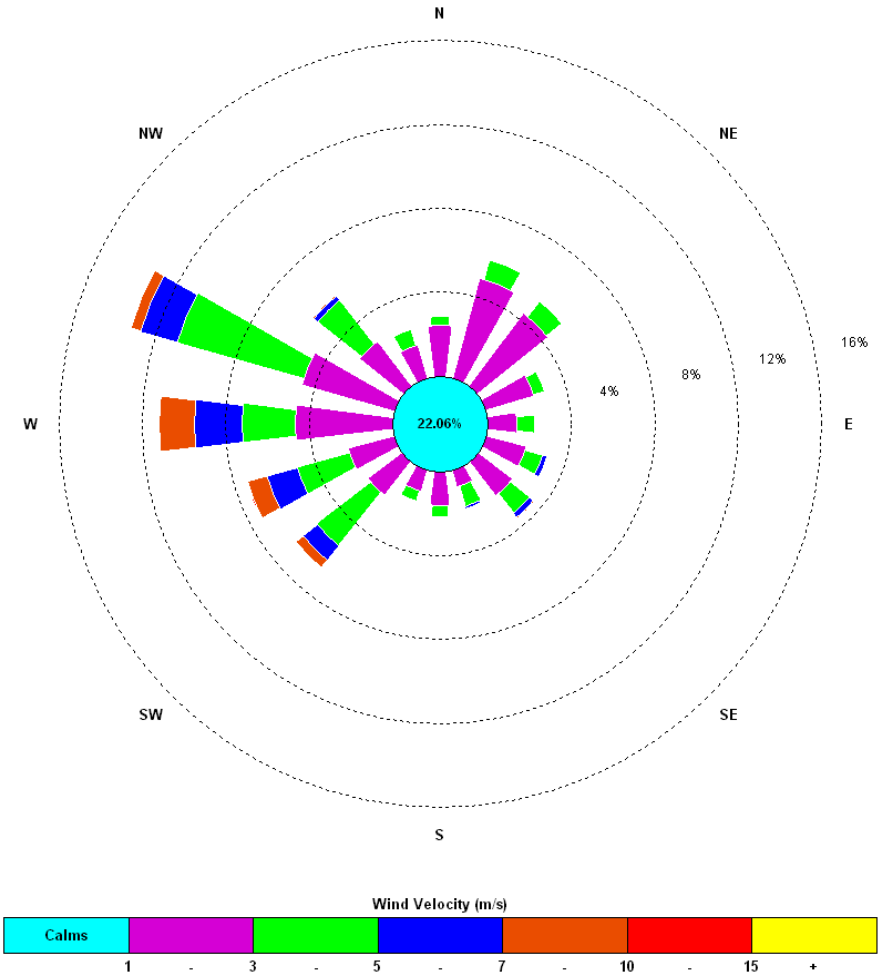

Rocla Calga Quarry - September 2011
Evapotranspiration
Evapotranspiration mm
25.0
20.0
15.0
10.0
5.0
0.0
1/09/2011
3/09/2011
5/09/2011
7/09/2011
9/09/2011
11/09/2011
13/09/2011
15/09/2011
17/09/2011
19/09/2011
21/09/2011
23/09/2011
25/09/2011
27/09/2011
29/09/2011
Date
ET mm


Rocla Calga Quarry - September 2011
Data Reception
Data Reception %
100
80
60
40
20
0
1/09/2011
3/09/2011
5/09/2011
7/09/2011
9/09/2011
11/09/2011
13/09/2011
15/09/2011
17/09/2011
19/09/2011
21/09/2011
23/09/2011
25/09/2011
27/09/2011
29/09/2011
Date
Max Data %
Av data %
Min Data %

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.

00:00, 1 September 2011 – 23:45, 30 September 2011



The predominant winds were from the WNW, with strongest winds from the W. The maximum wind speed was 17.9m/s from the WSW.

Appendix 1

Laboratory Certificates

Appendix 2

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

Peats Ridge, New South Wales
September 2011 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	mm	mm	hours		km/h	local	°C	%	eighths		km/h	hPa	°C	%	eighths		km/h	hPa
1	Th	8.2	18.8	0	0.8					15.0	86	4	S	9		16.7	75	5	ESE	9	
2	Fr	8.8	15.3	0	1.4					13.1	77	2	SW	19							
3	Sa	6.3	18.6	0	1.4					12.7	81	1	SW	4		16.1	68	1	E	9	
4	Su	6.8	22.0	0	1.6					15.6	73	1	NNE	4		20.0	56	2	E	4	
5	Mo	9.8	23.3	0	3.0					17.0	60	2	WNW	9		20.3	63	0	ESE	9	
6	Tu	10.7	23.2	0	3.0					19.2	49	2	N	19		18.0	69	0	N	4	
7	We	10.1	19.8	0	4.6					13.0	56	2	S	19		16.2	48	1	E	4	
8	Th	9.8	16.8	0	3.4					11.9	76	7	NW	4		15.9	76	6	ESE	9	
9	Fr	11.3	12.8	8.6	2.8					12.2	96	8	NW	4		11.6	67	5	WSW	4	
10	Sa	4.0	15.0	4.8	0.4					10.5	52	0	SW	19		13.8	44	7	W	4	
11	Su	6.3	18.3	0	3.8					12.9	59	0	NNW	4		16.0	40	5	NW	4	
12	Mo	6.7	16.5	0	3.2					11.7	60	4	SW	9		16.2	51	3	E	4	
13	Tu	5.6	21.4	0	2.6					12.6	57	0	W	4		20.7	17	1	NW	9	
14	We	7.8	24.0	0	3.6					15.9	43	1	NNW	9		22.5	26	0	W	19	
15	Th	10.9	20.6	0	4.6					15.6	83	4	SSW	4		17.5	72	2	E	9	
16	Fr	7.9	25.5	0	2.8					18.5	48	1	NNW	9		25.0	32	3	W	4	
17	Sa	9.5	26.6	0	1.2					19.2	50	0	SW	4		23.5	60	5	E	4	
18	Su	13.5		0	3.6					22.6	33	7	NE	4		20.2	59	0	S	9	
19	Mo		23.7	0												21.8	71	0	E	9	
20	Tu	15.3	26.3	0	6.2					23.6	33	2	NW	28		22.5	28	2	SW	37	
21	We	6.8	21.8	0	5.8					15.6	49	0	NW	4		19.5	47	0	NE	9	
22	Th	6.9	23.3	0	3.6					15.7	63	0	SW	4		22.2	55	0	NE	9	
23	Fr	11.2	29.7	0	3.8					21.1	46	0	NW	19		28.7	22	0	NW	9	
24	Sa	12.1	15.6	0.4	5.0					14.9	87	7	SE	4		15.0	96	8	SE	4	
25	Su	10.8	14.0	34.2	2.8					12.1	92	8	E	19		10.9	97	8	S	9	
26	Mo	10.1	17.9	58.4						14.0	82	5	S	9		16.1	50	4	SE	9	
27	Tu	7.3	18.8	0.6	2.4					14.9	72	3	NE	4		15.8	64	0	ENE	9	
28	We	7.8	17.6	0	3.4					14.9	72	8	NE	4		14.5	93	8	N	4	
29	Th	12.7	20.8	23.4	2.2					15.2	88	8	NW	9		14.4	59	8	W	15	
30	Fr	9.2	19.0	2.6	4.6					14.0	52	8	W	19		16.0	46	5	W	9	
Statistics for September 2011																					
	Mean	9.1	20.2		3.1					15.4	64	3		9		18.2	56	3		8	
	Lowest	4.0	12.8		0.4					10.5	33	0	#	4		10.9	17	0	#	4	
	Highest	15.3	29.7	58.4	6.2					23.6	96	8	NW	28		28.7	97	8	SW	37	
	Total			133.0	87.6																

Gosford, New South Wales
September 2011 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	mm	mm	hours		km/h	local	°C	%	eighths		km/h	hPa	°C	%	eighths		km/h	hPa
1	Th	8.2	20.3	0			ESE	22	13:38	17.2	85		S	9		17.7	71		SE	11	
2	Fr	9.5	17.6	0			S	28	14:19	15.9	67		SSE	9		16.7	52		SSE	11	
3	Sa	6.6	19.8	0.4			E	26	15:38	15.7	86		E	6		19.1	55		NE	7	
4	Su	5.6	21.7	0			NE	24	14:49	15.2	78		E	6		20.0	55		ENE	13	
5	Mo	7.1	25.1	0			NE	20	14:08	13.9	98			Calm		22.3	50		ENE	11	
6	Tu	8.1	25.3	0			N	30	13:48	17.8	88			Calm		25.0	33		NNE	9	
7	We	11.6	20.2	0			SSE	22	13:43	15.4	42		E	7		17.7	45		ESE	11	
8	Th	10.7	18.8	0			SE	19	15:19	14.8	71		NW	6		17.8	70		SE	2	
9	Fr	12.5	15.3	8.8			SSE	28	14:20	13.7	100			Calm		14.2	52		SW	9	
10	Sa	5.1	17.0	7.4			S	37	11:55	12.4	43		NW	9		16.7	33		NW	7	
11	Su	6.2	20.2	0			WSW	28	13:06	15.1	47		WNW	9		18.4	35		WNW	9	
12	Mo	8.5	17.8	0			NW	22	06:59	13.4	53		S	9		16.9	49		SW	2	
13	Tu	2.7	23.4	0			N	26	14:44	14.5	50		N	9		22.7	19		NNW	9	
14	We	3.7	25.6	0			N	31	11:00	18.7	34		NNW	11		25.2	20		N	7	
15	Th	10.0	20.7	0			SE	24	11:38	19.0	69		NE	4		19.6	66		E	9	
16	Fr	6.7	26.4	0			N	22	12:32	20.7	38		NW	6		22.8	48		NNE	9	
17	Sa	7.3	25.4	0			ESE	17	14:22	19.7	56		ESE	7		23.7	61		NE	7	
18	Su	8.8	31.9	0			WSW	48	13:01	25.3	25		N	9		20.1	73		SE	19	
19	Mo	11.3	22.9	0			N	28	11:10	18.8	78		ENE	4		22.1	72		E	11	
20	Tu	11.1	28.3	0			NNW	52	10:38	22.9	55		ENE	4		23.9	30		NW	9	
21	We	4.9	22.7	0			SSE	22	11:59	17.3	39		NW	9		20.4	43		E	11	
22	Th	6.0	24.1	0			N	26	14:48	18.0	53		NNE	6		21.4	54		NNE	7	
23	Fr	7.2	30.6	0			SSE	46	17:15	24.0	33		NNW	13		30.0	19		NNW	13	
24	Sa	13.9	17.3	0			W	24	21:59	17.3	77		SSE	7		15.7	99		S	4	
25	Su	12.7	18.6	57.8			ESE	37	03:04	13.2	99		SE	9		12.4	100		SSE	7	
26	Mo	12.0	19.8	77.2			S	30	11:23	18.5	53		SE	11		18.4	51		SE	9	
27	Tu	7.9	19.7	0.2			NE	31	14:20	17.3	58		ENE	6		18.3	49		NE	11	
28	We	7.2	18.7	0.2			N	17	18:59	16.2	73		ENE	6		15.8	98		NE	2	
29	Th	14.2	22.2	25.6			NNW	54	14:44	16.7	98		N	4		17.7	44		N	7	
30	Fr	6.5	20.7	1.2			NW	46	14:57	16.0	48		NNW	9		20.0	29		NNW	9	
Statistics for September 2011																					
Mean		8.5	21.9							17.2	63			6		19.8	52			8	
Lowest		2.7	15.3							12.4	25			Calm		12.4	19		#	2	
Highest		14.2	31.9	77.2			NNW	54		25.3	100		NNW	13		30.0	100		SE	19	
Total				178.8																	