Appendix 2

Monthly Dust and Meteorological Reports

This appendix is presented on the CD included on the inside front cover this report

(No. of pages including blank pages = 254)

DONALDSON MONITORING

DUST AND METEOROLOGICAL DATA
NOVEMBER 2009 REPORT

Donaldson Coal

Job No: **3003**

February 2010

PROJECT TITLE:	**DUST AND METEOROLOGICAL DATA NOVEMBER 2009 REPORT**
JOB NUMBER:	**3003**
PREPARED FOR:	Phil Brown **DONALDSON COAL**
PREPARED BY:	Philip Henschke
QA PROCEDURES CHECKED BY:	Ronan Kellaghan
APPROVED FOR RELEASE BY:	Aleks Todoroski
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VERSION	DATE	PREPARED BY	REVIEWED BY
V1	03/02/2010	Philip Henschke	Ronan Kellaghan

Queensland Environment Pty Ltd trading as
PAEHolmes ABN 86 127 101 642

SYDNEY:
Suite 2B, 14 Glen Street
Eastwood NSW 2122
Ph: +61 2 9874 8644
Fax: +61 2 9874 8904

BRISBANE:
Level 1, La Melba, 59 Melbourne Street South Brisbane Qld 4101
PO Box 3306 South Brisbane Qld 4101
Ph: +61 7 3004 6400
Fax: +61 7 3844 5858

Email: info@paeholmes.com

Website: www.paeholmes.com

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1 INTRODUCTION

As part of their Air Quality Management Plan Donaldson Coal operate a dust monitoring network in the vicinity of the mining lease and a meteorological station on site. This report has been prepared in order to bring together the various data collected throughout the network during November 2009 and to summarise the information.

The dust network includes continuous monitoring, high volume air sampling and dust deposition monitoring. The continuous monitoring network consists of two DustTrak monitors measuring PM_{10} at two sites and an additional DustTrak monitor which is used for one week each quarter to measure $PM_{2.5}$.

There are two locations which use high volume air samplers to determine concentrations of PM_{10} and TSP. These operate on a six-day cycle in line with similar measurements made by the NSW Department of Environment, Climate Change and Water (DECCW) at other locations throughout the state.

In addition to concentration measurements, monthly levels of dust deposition are also measured using twelve gauges placed at various locations in the area of the mine. The locations of each of these monitors and gauges are shown in Figure 1.

Table 1 lists the monitors used and pollutants measured at these locations.

Table 1: Summary of monitoring locations and instruments

Monitoring Location	Instruments Used	Pollutant Monitored
Beresfield	HVAS	PM_{10}
Blackhill	HVAS	PM_{10}
	HVAS	TSP
	DustTrak	PM_{10}
	DustTrak (1 week per quarter)	$PM_{2.5}$
Weakleys Drive	DustTrak	PM_{10}
DG1 – DG12	Deposition Gauges	Dust Deposition

The meteorological station is situated at the site of the office buildings and measures the following parameters:

- wind speed
- wind direction
- temperature
- solar radiation
- rainfall

The data are downloaded at various intervals by Donaldson and then forwarded to PAEHolmes for processing.

2 HIGH VOLUME AIR SAMPLING

High Volume Air Sampling (HVAS) was carried out at Beresfield and Blackhill by Metford Laboratories. PM_{10} is measured at both sites while TSP is only measured at Blackhill. The data collected during November 2009 are summarised in **Table 2**. A graph consisting of all the data collected to date is shown in Figure 2.

Table 2: HVAS data from Beresfield and Blackhill for November 2009

Date	Beresfield PM_{10} ($\mu g/m^3$)	Blackhill PM_{10} ($\mu g/m^3$)	Blackhill TSP ($\mu g/m^3$)
2/11/2009	29	39	60
8/11/2009	5	5	12
14/11/2009	10	10	22
20/11/2009	39	33	67
26/11/2009	18	17	46
Annual average	**19**	**16**	**34**

These measurements will include all background sources relevant to that location, including contributions from the Donaldson mining operations.

On the days that the instruments were monitoring, the highest 24-hour average PM_{10} concentration recorded in November 2009 was 39 $\mu g/m^3$. This value was measured on two different occasions, on the 2nd at the Blackhill site and on the 20th at the Beresfield site. The measured PM_{10} concentration did not exceed the 50 $\mu g/m^3$ 24-hour DECCW goal for November 2009.

TSP measurements from the Blackhill site show that concentrations were below the NHMRC 90 $\mu g/m^3$ annual average TSP goal. It should be noted that the NHMRC goal refers to an annual average and not a 24-hour average as measured by the high volume air sampler. The annual average TSP concentration for the 12 months to November 2009 was 34 $\mu g/m^3$.

Figure 2 shows a seasonal trend in PM_{10} concentrations, peaking during the warmer months and decreasing during autumn and winter. This is a common trend and is seen consistently in the Hunter Valley.

The annual average PM_{10} concentrations for Beresfield and Blackhill were 19 $\mu g/m^3$ and 16 $\mu g/m^3$ respectively for the 12 months to November 2009. These values are below the DECCW's annual average PM_{10} air quality criterion of 30 $\mu g/m^3$.

3 CONTINUOUS MONITORING

3.1 DustTrak Monitoring at Blackhill

Figure 3 shows a time series of the PM_{10} data collected from the DustTrak monitor at the Blackhill site. During the month of November, the DustTrak monitor located at the Blackhill site experienced a power failure. The DustTrak monitoring for the Blackhill site is available from the 9th to the 20th of November 2009.

Of the available data, the measured 24-hour average PM_{10} concentrations were below the DECCW goal of 50 $\mu g/m^3$. The maximum 24-hour average PM_{10} concentration was recorded on the 20th of November at 21.5 $\mu g/m^3$.

3.2 DustTrak Monitoring at Weakleys Drive

A time series of the PM_{10} data collected from the Weakleys Drive site is shown in Figure 4. The DustTrak monitoring for the Weakleys Drive site is available from the 1st to the 30th of November 2009.

The available data show that 24-hour average PM_{10} concentrations were above the DECCW goal of 50 $\mu g/m^3$ on one occasion with a maximum 24-hour average PM_{10} concentration of 76.4 $\mu g/m^3$, recorded on the 29th of November. During this day it should be noted that a small dust storm occurred, leading to the high readings shown.

3.3 DustTrak $PM_{2.5}$ Monitoring at BlackHill

No $PM_{2.5}$ monitoring was scheduled for November 2009.

4 DUST DEPOSITION MONITORING

Dust deposition monitoring is carried out each month via a network consisting of twelve (12) gauges. The results for November 2009 are shown in **Table 3**, in conjunction with results for the previous eleven months in order to provide an annual average for that period. A table showing the complete data set from July 2000 in provided in **Appendix A**.

Table 3: Dust deposition monitoring for the 12-month period to November 2009

Month	Monthly dust deposition rate (g/m^2/month)											
	DG1	**DG2**	**DG3**	**DG4**	**DG5A**	**DG6**	**DG7**	**DG8**	**DG9**	**DG10**	**DG11**	**DG12**
Dec-08	0.4 #	0.4 #	0.6 #	0.5 #	0.3 #	1.1 #	0.6 #	15+	0.9 #	0.7 #	1.2 #	-
Jan-09	1.1 #	3.0 #	1.6 #	0.8 #	0.9 #	1.4 #	0.7 #	1.5 #	0.9 #	0.9 #	5.0 +	-
Feb-09	0.4 #	4.4 #	1.5 #	1.1 #	0.9	1.6 #	0.8	1.2	1.4	2.5 #	1.2	-
Mar-09	2.8 #	5.8 #	2.7 #	2.4 #	1.9 #	2.1 #	2.5 #	2.4 #	2.3 #	5.7 #	2.7 #	-
Apr-09	2.0 #	0.8 #	0.8 #	0.6 #	0.6 #	3.2 #	1.1 #	1.1 #	1.0 #	0.6	0.9 #	-
May-09	0.6 #	1.6 #	0.8 #	2.4	0.9 #	5.6 +	1.4 #	1.1	1.3	0.7 #	1.5 #	-
Jun-09	0.4	1.3 #	0.8	0.5	0.5	3.3 #	0.9	0.6 #	1.0	3.4 #	0.7	-
Jul-09	0.2	1.0 #	0.6	0.4	0.3	3.8 #	0.5	0.6	0.6	0.3	0.6	-
Aug-09	0.8#	3.6#	0.8#	1.2#	1.0#	1.8#	0.8#	1.8	1.3#	0.8#	1.0	-
Sep-09	1.0	1.8#	1.8	8.3#	1	1.8	0.9#	1.8#	1.7#	0.7	1.4#	-
Oct-09	4.3	9#	5.2#	11.3#	3.2	3.8#	2.4#	6.8#	3#	2.2	3.2#	5.7#
Nov-09	0.8#	1.7#	1.4#	1.3#	0.7#	2.1#	1.3#	8.0#	*	1.0#	*	2.3#
Annual Average	**1.0**	**2.3**	**1.2**	**1.8**	**0.8**	**2.5**	**1.0**	**2.0**	**1.2**	**1.6**	**1.2**	**-**

*Data supplied by Metford Laboratories. # Insects/bird droppings reported. +Invalid (excess bird droppings). * No recording, funnel damaged.*

The highest dust deposition measurement recorded in November 2009 was 8 g/m^2/month at DG8; the accompanying laboratory report showed the sample was contaminated with insects.

Readings considered invalid have been removed when calculating the annual average. The annual average deposition rates for the gauges in the network were low and significantly below the amount goal of 4 g/m^2/month, indicating nuisance dust in the vicinity of the mine is not an issue.

5 METEOROLOGICAL MONITORING

Monthly plots of the wind speed, temperature, solar radiation, and rainfall data collected in November 2009 are shown in Figure 6 and a windrose plot is shown in Figure 7

The graphs shown in Figure 6 indicate that the instruments were recording appropriately. Data maxima and minima all appeared to be sensible for this site during November. Total rainfall for the month was 51.4 mm.

A windrose (see Figure 7) created from the available 30-minute average wind data shows that winds were predominantly from the east-southeast. The site recorded calms (wind speed less than or equal to 0.5 m/s) for approximately 36.1% of the time. The relatively large fraction of clam winds may arise from the generally forested area and the specific location of the weather station.

APPENDIX A

ALL DUST DEPOSITION DATA

Dust deposition (g/m²/month)												
Month	D1	D2	D3	D4	D5A	D6	D7	D8	D9	D10	D11	D12
May-00	0.4	0.4	-	0.7	0.9	0.6	3.6	1.6	0.5	1.8	-	-
Jun-00	0.7	0.5	0.5	0.7	0.8	0.4	3.8	3.2	0.5	0.7	-	-
Jul-00	0.4	0.4	0.5	0.7	0.8	0.5	0.8	1.5	0.4	0.4	-	-
Aug-00	0.9	0.6	1.0	1.2	1.1	1.0	3.4	0.7	0.7	0.6	-	-
Sep-00	0.8	0.9	1.1	0.9	1.3	1.0	2.2	1.0	1.0	0.8	-	-
Oct-00	0.4	0.6	1.1	0.9	0.9	0.8	5.3	0.9	0.6	0.5	-	-
Nov-00	5.2	0.7	1.4	0.8	1.0	0.4	24.1	9.4	1.1	0.6	-	-
Dec-00	2.8	1.4	1.9	1.3	1.1	0.8	2.1	2.5	0.9	0.9	-	-
Jan-01	0.7	1.7	1.4	1.8	0.7	1.3	1.1	2.4	1.1	0.6	-	-
Feb-01	0.9	3.1	2.0	0.5	0.9	0.7	0.7	6.7	1.3	0.5	1.0	-
Mar-01	0.8	2.1	1.3	0.6	0.7	0.6	0.6	5.5	0.6	0.6	1.5	-
Apr-01	0.8	0.7	1.3	0.5	0.7	0.4	0.3	5.1	0.7	0.6	0.8	-
May-01	0.2	0.2	0.4	0.4	0.3	0.3	0.6	1.8	0.6	0.8	0.9	-
Jun-01	0.5	0.4	0.5	1.0	1.0	0.4	0.4	8.8	0.7	0.6	0.6	-
Jul-01	0.5	0.3	1.8	0.5	0.8	-	16.3	4.9	0.9	0.7	0.7	-
Aug-01	0.4	0.4	0.8	0.8	1.0	1.7	1.0	-	1.0	1.8	1.1	-
Sep-01	0.7	1.0	1.7	1.1	1.7	0.7	-	6.0	1.1	1.3	1.7	-
Oct-01	1.1	0.6	4.6	0.9	0.7	0.9	1.2	1.9	0.9	0.6	1.7	-
Nov-01	0.9	1.0	1.1	1.1	0.8	1.1	6.0	5.5	1.3	1.9	2.3	-
Dec-01	4.9	0.9	4.2	0.9	1.3	1.9	1.2	3.1	1.2	9.7	1.8	-
Jan-02	0.8	1.0	1.5	1.3	1.1	1.4	1.3	1.5	1.1	0.9	1.5	-
Feb-02	1.1	1.1	0.9	0.3	0.4	0.5	3.1	5.1	0.5	0.5	0.9	-
Mar-02	1.7	2.1	1.6	0.7	0.7	0.8	1.0	18	1.0	0.9	1.7	-
Apr-02	1.0	0.4	1.0	0.8	0.8	0.6	0.9	10.1	0.5	0.7	1.0	-
May-02	0.6	0.6	6.0	0.7	0.4	1.2	0.9	3.1	0.7	0.2	1.0	-
Jun-02	1.4	0.4	1.7	0.6	0.5	0.8	0.6	2.1	0.6	0.5	1.0	-
Jul-02	0.7	0.7	-	0.8	0.8	0.7	1.2	-	1.1	0.5	1.0	-
Aug-02	1.3	0.8	1.4	1.2	1.1	1.2	1.5	-	1.5	0.9	1.6	-
Sep-02	0.5	1.2	1.1	0.8	0.5	0.7	5.1	9.3	1.6	0.6	1.0	-
Oct-02	2.2	1.4	5.2	1.5	1.5	1.4	1.4	3.4	-	1.5	3.1	-
Nov-02	2.8	1.8	3.7	1.6	0.1	1.8	2.1	3.5	2.1	2	1.9	-
Dec-02	2.0	-	2.5	1.5	3.0	1.5	1.8	4.1	1.6	1.2	1.9	-
Jan-03	2.1	1.5	2.7	1.5	1.0	1.9	2.2	2.5	1.1	1.0	1.6	-
Feb-03	1.4	1.1	2.6	1.1	0.9	1.2	1.7	5.9	1.2	1.0	1.5	-
Mar-03	0.8	0.5	1.2	1.2	0.6	2.1	1.5	3.4	-	3.6	9.5	-
Apr-03	0.5	1.0	0.6	1.0	0.7	0.5	1.1	8.0	-	2.0	1.0	-
May-03	0.5	0.4	0.6	0.2	0.2	0.6	1.3	1.6	0.5	0.8	1.2	-
Jun-03	0.5	0.6	0.8	0.8	0.4	0.6	0.8	0.7	0.9	0.7	0.7	-
Jul-03	0.3	0.4	0.4	0.6	0.4	0.5	0.7	0.5	0.5	0.5	0.7	-
Aug-03	0.8	0.2	0.7	1.1	0.5	1.3	1.8	2.1	1.3	0.7	0.9	-
Sep-03	0.6	0.7	1.1	0.7	0.8	1.7	1.4	1.3	2.5	0.9	1.3	-
Oct-03	-	0.9	1.4	0.9	0.7	1.9	1.0	1.4	0.6	0.8	1.3	-
Nov-03	2.6	0.8	1.0	1.1	0.4	1.3	1.5	1.5	-	0.8	1.3	-
Dec-03	1.0	1.0	1.4	1.3	1.1	1.5	1.6	2.0	1.8	0.9	1.4	-
Jan-04	8.5	1.5	2.1	1.5	1.3	2.6	1.4	2.2	1.7	1.5	1.7	-
Feb-04	1.2	1.0	1.7	1.4	0.7	3.1	1.6	2.2	-	1.5	2.3	-
Mar-04	0.4	0.6	6.6	1.2	0.7	1.9	1.1	12.1	4.8	1.5	1.1	-

Apr-04	0.6	1.0	0.8	0.8	0.6	1.9	0.8	1.4	0.9	1.2	1.1	-
May-04	0.2	0.9	2.2	0.9	0.8	0.7	0.9	1.4	1.2	0.9	1.5	-
Jun-04	0.4	0.6	0.7	0.9	0.6	1.4	1.0	0.9	1.0	1.0	0.8	-
Jul-04	0.4	0.6	5.3#	0.6	0.5	2.9	1.0	1.1	0.9	0.6	1.2	-
Aug-04	0.5	0.5	0.5	1.3	0.7	1.1	1.1	1.4	-	1.0	1.0	-
Sep-04	0.6	0.6	0.8	2.2	1.0	1.0	0.9	4.4	0.9	16.7	1.1	-
Oct-04	0.7	0.9	1.2	0.9	0.8	1.4	1.0	10.5	1.0	1.0	0.8	-
Nov-04	0.8	0.7	1.3	1.9	0.7	0.9	1.0	3.0	1.1	1.1	1.6	-
Dec-04	2.0	1.4	3.6	1.5	1.3	2.2	3.2	7.9	1.8	5.5	2.5	-
Jan-05	1.2	1.0	3.7	1.6	1.4	4.0	2.3	2.7	2.6	2.5	2.8	-
Feb-05	1.2	1.2	1.8	1.6	1.3	2.0	1.7	-	2.3	1.5	2.3	-
Mar-05	1.3	0.9	1.4	0.9	0.9	3.0	1.2	7.7	-	0.8	1.3	-
Apr-05	1.1	0.7	0.9	0.8	0.7	0.9	1.4	3.3	1.1	0.8	0.9	-
May-05	0.7	8.6	1.1	0.8	0.7	0.8	0.9	4.4	1.2	0.8	1.1	-
Jun-05	1.3	0.8	1.3	1.3	0.8	1.2	1.2	1.3	1.5	2.5	0.9	-
Jul-05	1.0	0.5	0.5	0.7	0.4	1.6	0.7	1.2	0.8	4.3	1.1	-
Aug-05	0.6	0.6	0.8	1.0	0.8	0.9	0.7	1.0	0.9	1.0	0.9	-
Sep-05	0.6	0.7	0.8	0.7	0.7	1.2	1.3	1.3	1.0	0.9	1.1	-
Oct-05	0.8	0.9	1.3	0.9	0.8	1.4	1.2	1.9	1.3	1.1	1.3	-
Nov-05	-	2.3	2.3	2.0	1.7	1.2	2.0	3.2	1.6	1.4	2.2	-
Dec-05	1.9	3.2	2.3	3.3	2.6	3.4	2.3	-	1.3	2.1	3.9	-
Jan-06	1.0	2.1	1.7	1.0	23.	3.5	-	2.7	1.1	-	1.5	-
Feb-06	2.2	1.0	0.9	1.2	1.1	1.7	1.1	2.9	-	2.3	1.8	-
Mar-06	0.7	0.6	2.3	0.7	0.6	0.9	1.0	1.4	0.7	0.8	1.5	-
Apr-06	0.6	0.7	1.1	0.8	0.6	1.1	0.8	1.0	1.0	1.8	1.5	-
May-06	1.0	3.1	1.0	-	1.1	1.4	1.1	4.1	-	7.0	1.5	-
Jun-06	0.4	0.3	0.7	0.5	0.4	0.6	0.7	0.8	0.6	0.9	0.9	-
Jul-06	0.3	0.3	1	1.3	0.4	0.7	0.7	2.7	-	0.6	0.6	-
Aug-06	0.9	0.6	0.8	0.7	0.7	0.8	0.7	1.7	-	3.7	0.9	-
Sep-06	1.6	0.7	1.1	1.7	0.7	1	0.9	1.3	1.2	0.8	1.6	-
Oct-06	2	1.4	1.6	1.8	0.9	1.8	1.2	1.8	1.5	1.8	1.9	-
Nov-06	4.3	2.2	3	2.3	2.3	5.3	2.4	3.3	2.3	2.3	2.9	-
Dec-06	1.2	3.4	1.9	2.3	2.3		2.1	2.1		4.9	3.9	-
Jan-07	2	0.9	1.5	0.7	0.7	1.7	1.1		1.2	1.7	0.9	-
Feb-07	1.7	0.9	1.6	0.7	0.6	1	1.8	1.7	1.1	1.2	1.7	-
Mar-07	1.3	0.9	1.7	0.8	1.2	0.6	2.2	1.7	1	0.9	1.7	-
Apr-07	0.5	0.7	0.9	0.6	4.8	1.2	0.5	2.7	0.5	0.8	0.9	-
May-07	0.8	0.5	0.6	1.2	0.6	0.6	0.7	1.9	0.5	0.7	0.8	-
Jun-07	0.6	0.5	0.7	1.1	0.1	0.5	0.1	0.5	0.1	0.4	0.3	-
Jul-07	0.5	0.4	0.6	2.1	0.5	0.8	0.6	0.6	0.4	0.5	0.7	-
Aug-07	1.5	0.4	0.7	1	0.7	0.7	0.5	1	0.6	0.6	0.7	-
Sep-07	1.3	0.5	1.8	1	0.7	0.9	0.9	1.3	1	0.7	1.6	-
Oct-07	4.2	0.9	1.1	1.4	1.1	1.7	1.8	1.7	1.6	1.4	2.2	-
Nov-07	0.8	0.8	1.1	0.9	1.1	1.1	1.1	1.7	0.6	0.8	1.5	-
Dec-07	1.3	0.8	3	0.7	0.5	0.8	0.5	1.1	0.3	0.8	0.6	-
Jan-08	2.6	0.8	3.7	0.5	0.5	0.5	0.4	2.2	0.8	0.3	0.8	-
Feb-08	0.4	0.1	14	0.1	0.1	0.3	0.1	0.3	0.2	0.2	0.3	-
Mar-08	4.5	0.6	9.2+	0.6	2.9	2.1	0.6	1.5	0.5	1	0.9	-
April-08	0.4#	0.4#	0.8#	0.4#	0.4#	0.8#	1.1#	1.7#	1.2	1.1#	1.1#	-

May-08	1.1	2.4#	0.9	1.4	0.9	0.9	0.7	2.7	1#	1.1	1.3#	-
June-08	0.2	0.4#	0.1	0.5	0.1#	0.1	0.3	0.5#	0.1	0.8	0.2	-
July-08	0.4	0.7#	1.3#	0.6	0.8#	0.9	0.8	1	0.7	0.5	1.1	-
Aug-08	1	0.5	0.7	0.6	0.5	1.9	0.8	1	1	0.9	1.4	-
Sep-08	0.6	1	1.3	0.7	0.6	0.9	0.6	0.9	0.9	0.9	1.8	-
Oct-08	1	0.5	1	1.3	1.3	1.2	1	1.4	0.8	1.6	1.8	-
Nov-08	0.8	1.4	2.7	2.5	0.9	1.2	0.8	2.4	1.1	1	1.7	-
Dec-08	0.4	0.4	0.6	0.5	0.3	1.1	0.6	15	0.9	0.7	1.2	-
Jan-09	1.1	3#	1.6	0.8	0.9	1.4	0.7	1.5	0.9	0.9	5+	-
Feb-09	0.4	4.4	1.5	1.1	0.9	1.6	0.8	1.2	1.4	2.5	1.2	-
Mar-09	2.8	5.8	2.7	2.4	1.9	2.1	2.5	2.4	2.3	5.7	2.7	-
Apr-09	2	0.8	0.8	0.6	0.6	3.2	1.1	1.1	1	0.6	0.9	-
May-09	0.6	1.6	0.8	2.4	0.9	5.6 +	1.4	1.1	1.3	0.7	1.5	-
Jun-09	0.4	1.3	0.8	0.5	0.5	3.3	0.9	0.6	1	3.4	0.7	-
Jul-09	0.2	1.0	0.6	0.4	0.3	3.8	0.5	0.6	0.6	0.3	0.6	-
Aug-09	0.8	3.6	0.8	1.2	1.0	1.8	0.8	1.8	1.3	0.8	1.0	-
Sep-09	1.0	1.8#	1.8	8.3 +	1	1.8	0.9#	1.8#	1.7#	0.7	1.4#	-
Oct-09+	4.3	9#	5.2#	11.3#	3.2	3.8#	2.4#	6.8#	3.0#	2.2	3.2#	5.7#
Nov-09	0.8#	1.7#	1.4#	1.3#	0.7#	2.1#	1.3#	8.0#	*	1.0#	*	2.3

 # - sample contaminated

+ - sample invalid

**Broken funnel*

[Note: Samples for October 2009 have been considered invalid, due to a widespread dust storm experienced on 23rd September 2009.]

FIGURES

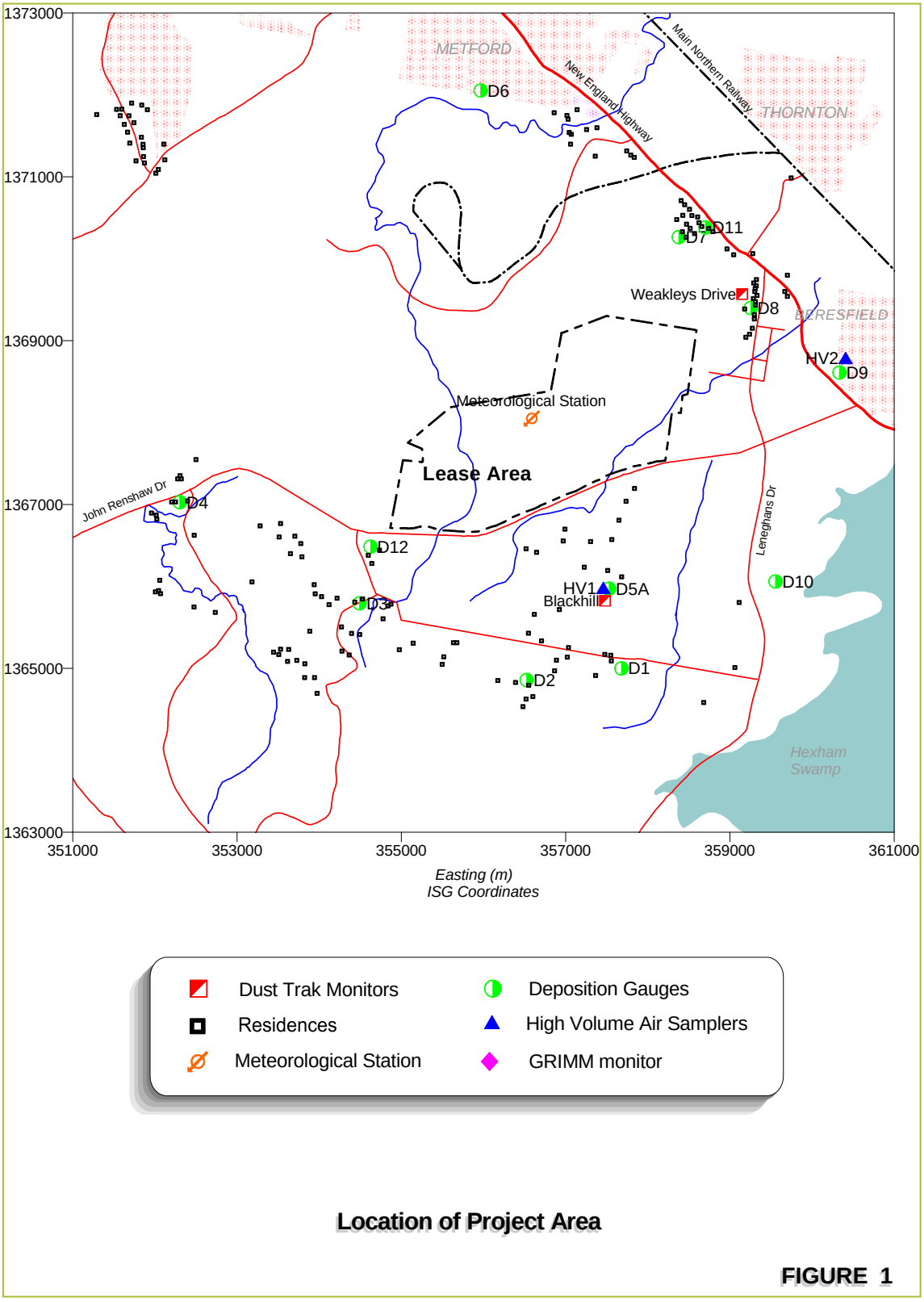

Figure 1: Project Location

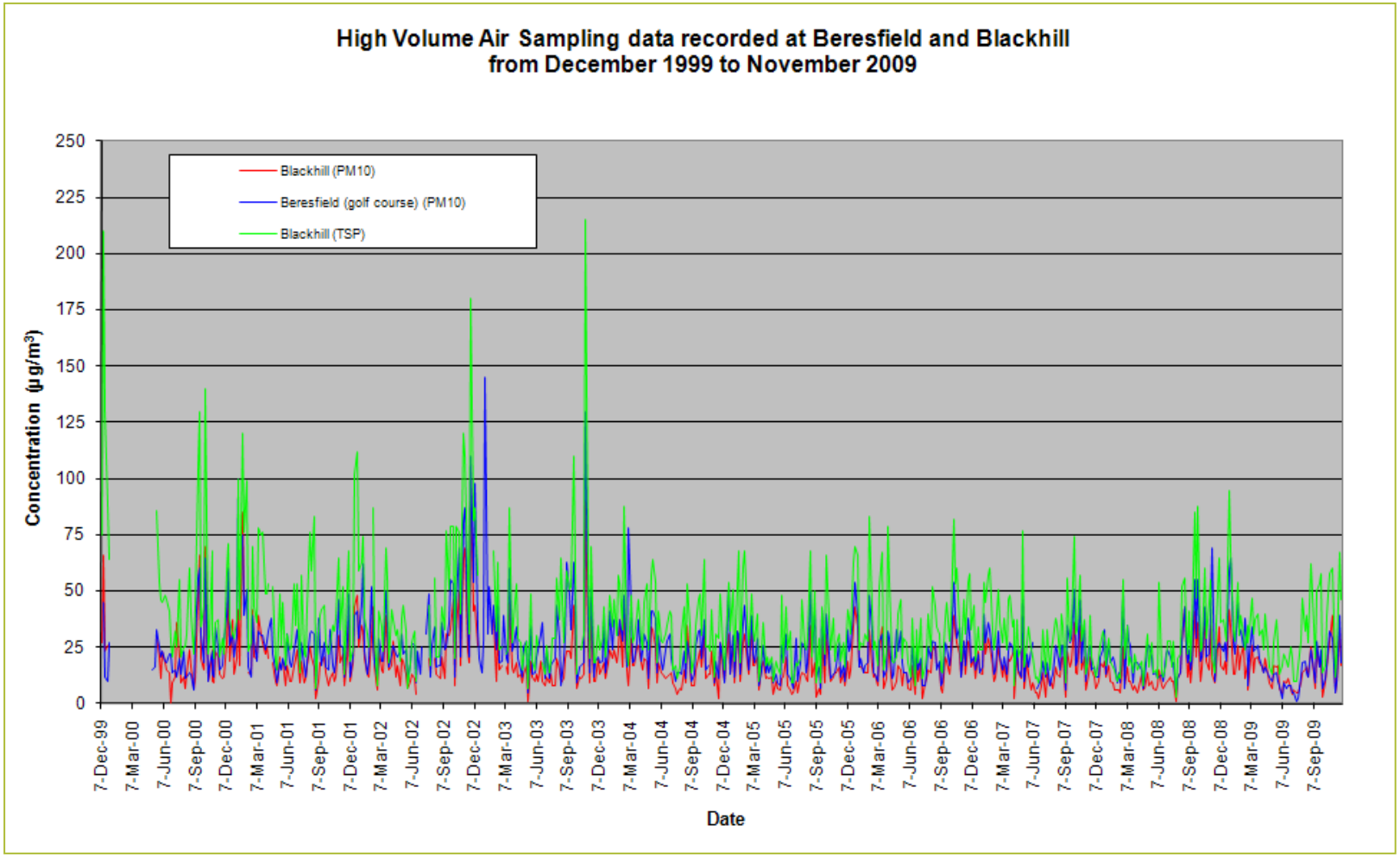

Figure 2: High Volume Air Sampling data

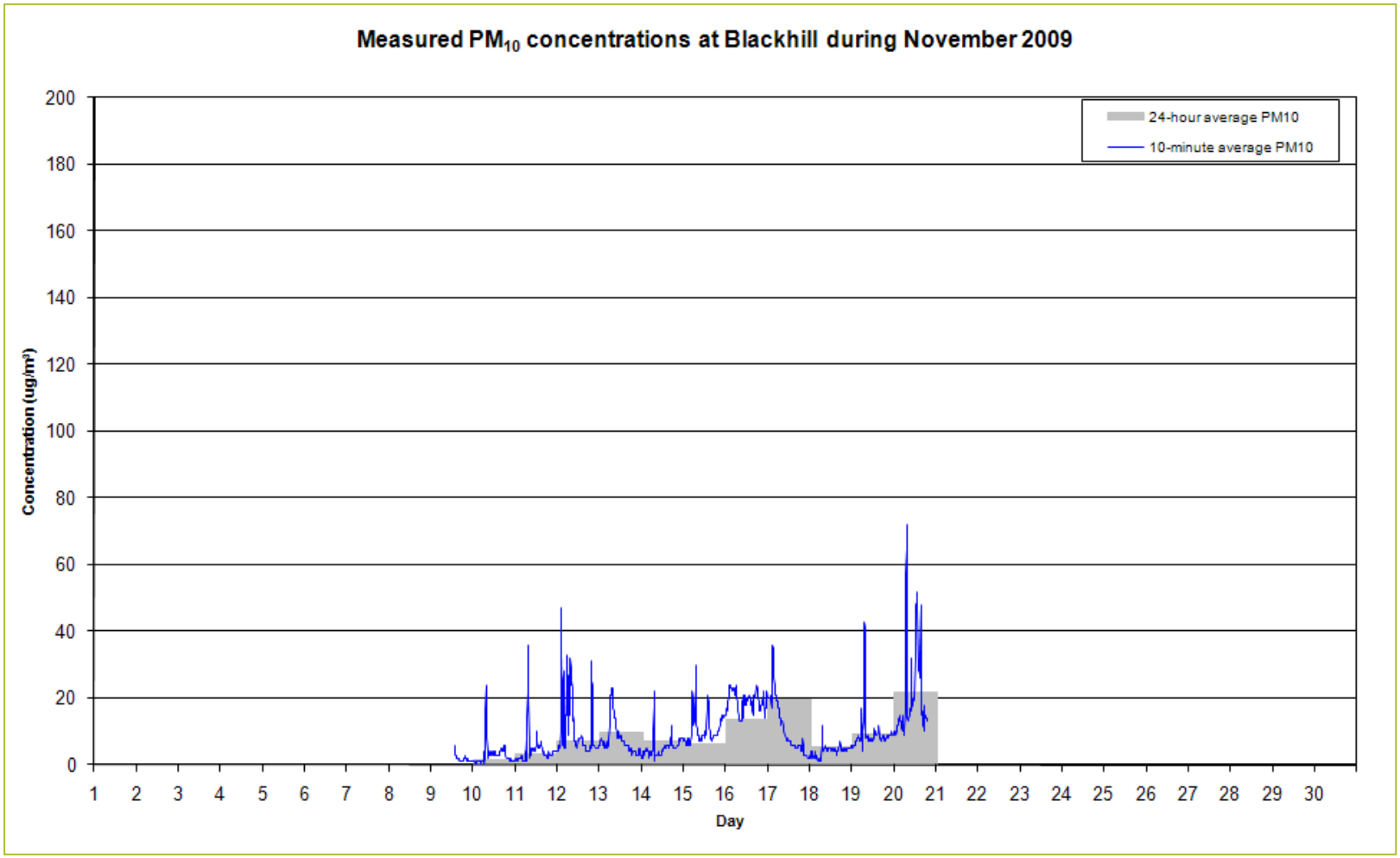

Figure 3: DustTrak sampling data, Blackhill site

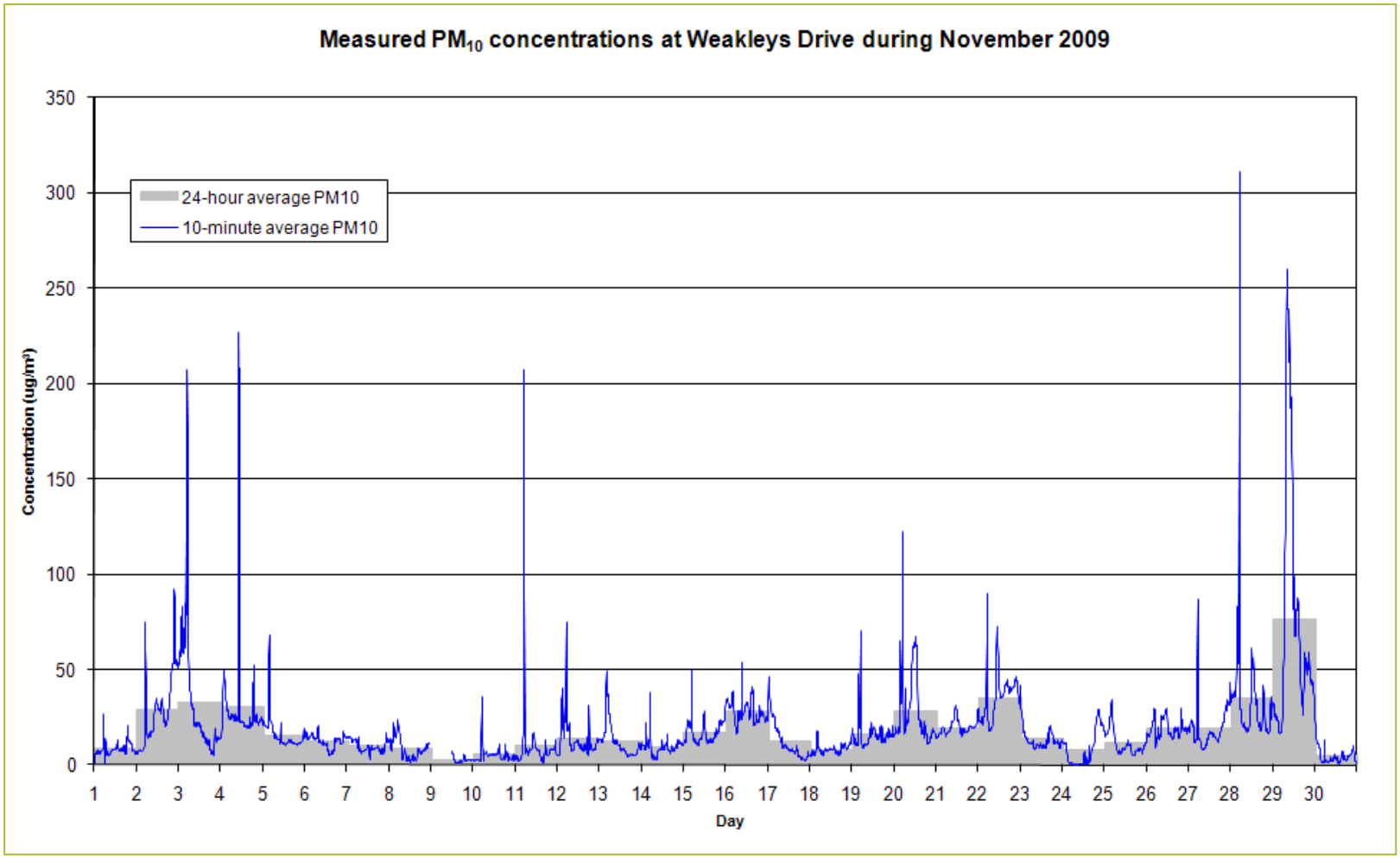

Figure 4: DustTrak sampling data, Weakleys Drive site

No $PM_{2.5}$ monitoring was scheduled for November 2009

Figure 5: DustTrak $PM_{2.5}$ monitoring data

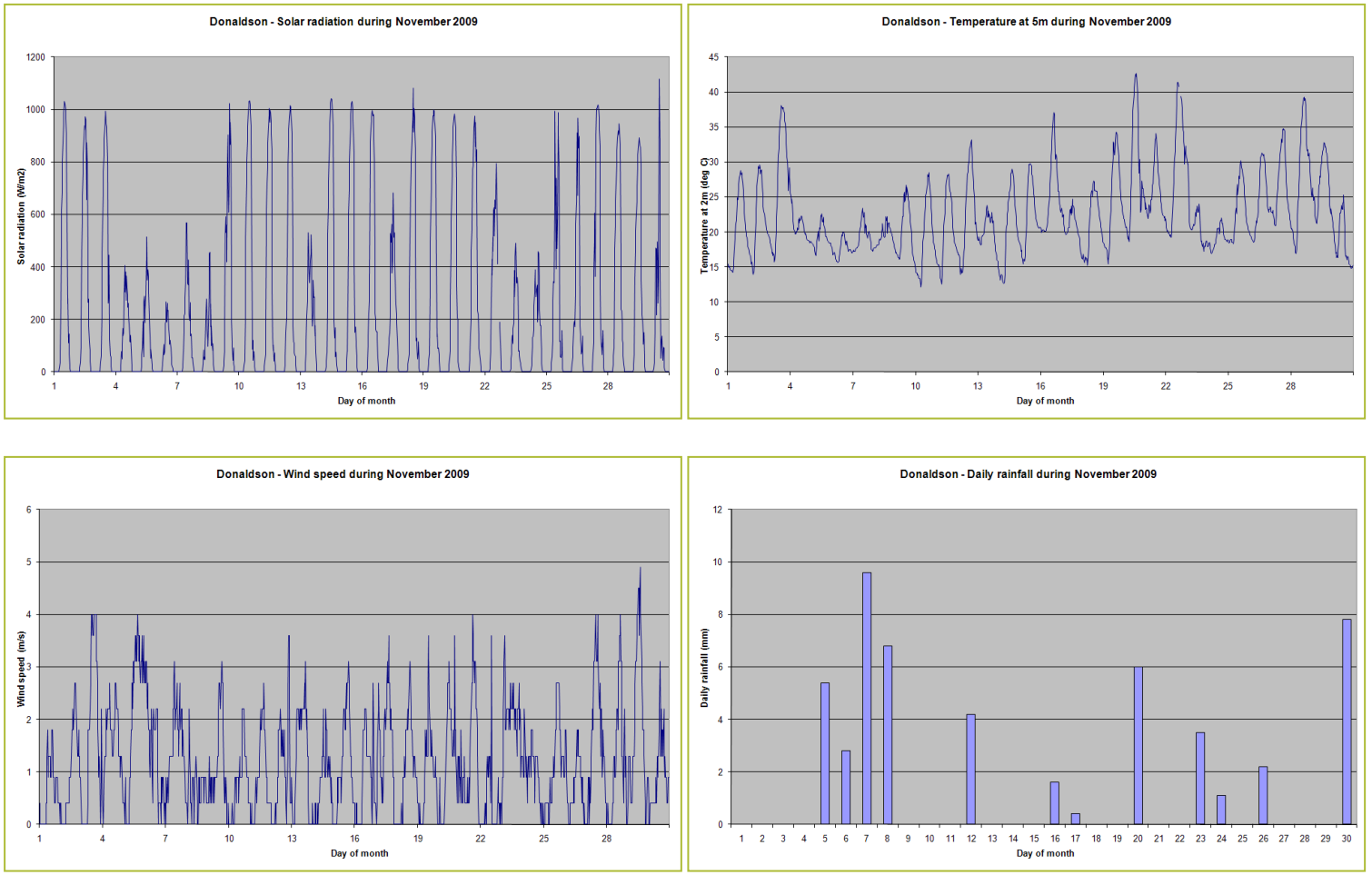

Figure 6: Meteorological conditions

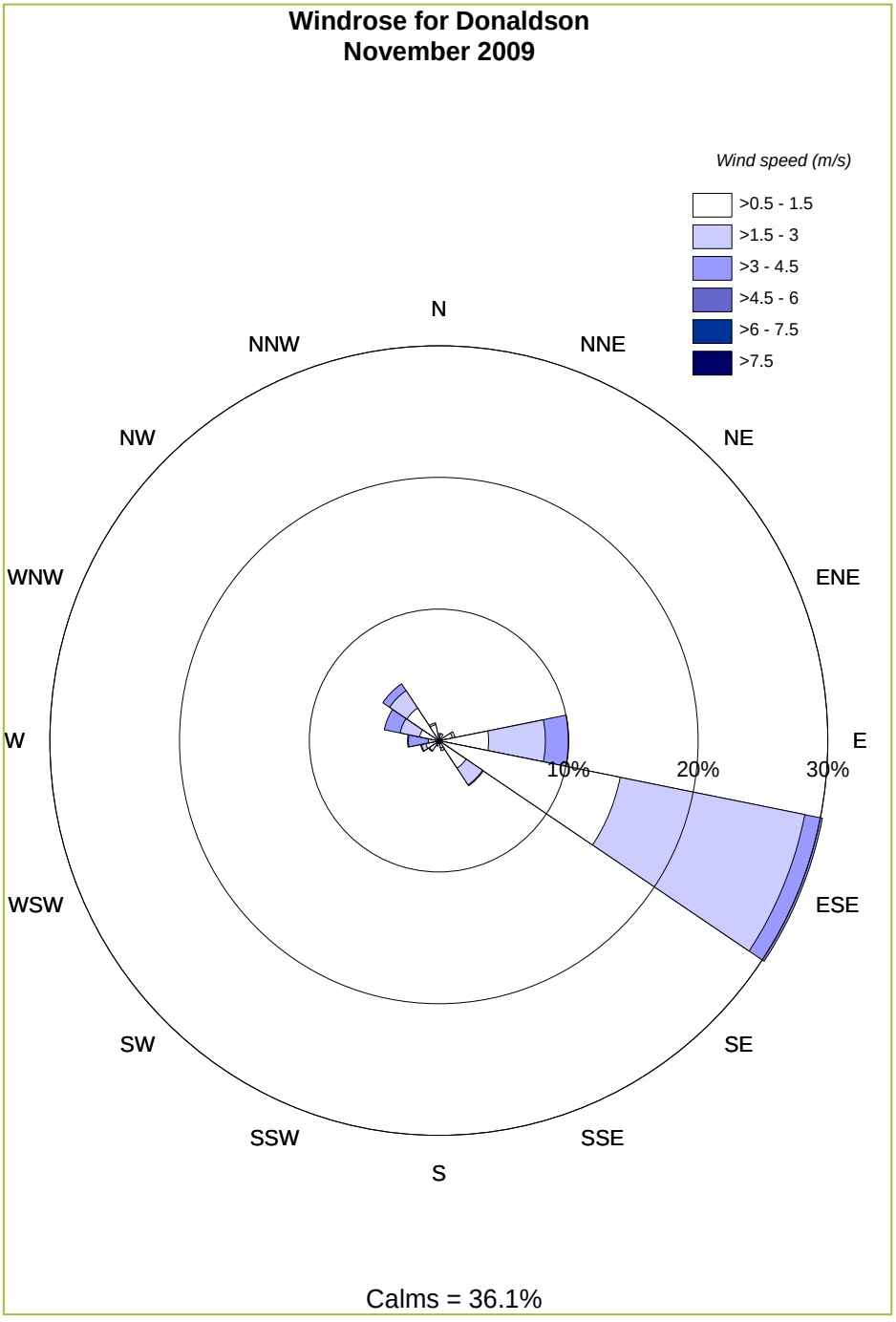

Figure 7: Windrose

DONALDSON MONITORING

DUST AND METEOROLOGICAL DATA
DECEMBER 2009 REPORT

Donaldson Coal

Job No: **3003**

February 2010

PROJECT TITLE:	**DUST AND METEOROLOGICAL DATA DECEMBER 2009 REPORT**
JOB NUMBER:	**3003**
PREPARED FOR:	Phil Brown **DONALDSON COAL**
PREPARED BY:	Philip Henschke
QA PROCEDURES CHECKED BY:	Ronan Kellaghan
APPROVED FOR RELEASE BY:	Aleks Todoroski
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VERSION	DATE	PREPARED BY	REVIEWED BY
V1	03/02/2010	Philip Henschke	Ronan Kellaghan

Queensland Environment Pty Ltd trading as
PAEHolmes ABN 86 127 101 642

SYDNEY:
Suite 2B, 14 Glen Street
Eastwood NSW 2122
Ph: +61 2 9874 8644
Fax: +61 2 9874 8904

BRISBANE:
Level 1, La Melba, 59 Melbourne Street South Brisbane Qld 4101
PO Box 3306 South Brisbane Qld 4101
Ph: +61 7 3004 6400
Fax: +61 7 3844 5858

Email: info@paeholmes.com

Website: www.paeholmes.com

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1 INTRODUCTION

As part of their Air Quality Management Plan Donaldson Coal operate a dust monitoring network in the vicinity of the mining lease and a meteorological station on site. This report has been prepared in order to bring together the various data collected throughout the network during December 2009 and to summarise the information.

The dust network includes continuous monitoring, high volume air sampling and dust deposition monitoring. The continuous monitoring network consists of two DustTrak monitors measuring PM_{10} at two sites and an additional DustTrak monitor which is used for one week each quarter to measure $PM_{2.5}$.

There are two locations which use high volume air samplers to determine concentrations of PM_{10} and TSP. These operate on a six-day cycle in line with similar measurements made by the NSW Department of Environment, Climate Change and Water (DECCW) at other locations throughout the state.

In addition to concentration measurements, monthly levels of dust deposition are also measured using twelve gauges placed at various locations in the area of the mine. The locations of each of these monitors and gauges are shown in Figure 1.

lists the monitors used and pollutants measured at these locations.

Table 1: Summary of monitoring locations and instruments

Monitoring Location	Instruments Used	Pollutant Monitored
Beresfield	HVAS	PM_{10}
Blackhill	HVAS	PM_{10}
	HVAS	TSP
	DustTrak	PM_{10}
	DustTrak (1 week per quarter)	$PM_{2.5}$
Weakleys Drive	DustTrak	PM_{10}
DG1 – DG12	Deposition Gauges	Dust Deposition

The meteorological station is situated at the site of the office buildings and measures the following parameters:

- wind speed
- wind direction
- temperature
- solar radiation
- rainfall

The data are downloaded at various intervals by Donaldson and then forwarded to PAEHolmes for processing.

2 HIGH VOLUME AIR SAMPLING

High Volume Air Sampling (HVAS) was carried out at Beresfield and Blackhill by Metford Laboratories. PM_{10} is measured at both sites while TSP is only measured at Blackhill. The data collected during December 2009 are summarised in **Table 2**. A graph consisting of all the data collected to date is shown in Figure 2.

Table 2: HVAS data from Beresfield and Blackhill for December 2009

Date	Beresfield PM_{10} ($\mu g/m^3$)	Blackhill PM_{10} ($\mu g/m^3$)	Blackhill TSP ($\mu g/m^3$)
2/12/2009	5	5	11
8/12/2009	40	36	62
14/12/2009	14	12	34
20/12/2009	16	18	36
26/12/2009	11	10	15
Annual average	**19**	**16**	**33**

These measurements will include all background sources relevant to that location, including contributions from the Donaldson mining operations.

On the days that the instruments were monitoring, the highest 24-hour average PM_{10} concentration recorded in December 2009 was 40 $\mu g/m^3$. This value was measured on the 8th at the Beresfield site. On this occasion the measured PM_{10} concentration did not exceed the 50 $\mu g/m^3$ 24-hour DECCW goal.

TSP measurements from the Blackhill site show that concentrations were below the NHMRC 90 $\mu g/m^3$ annual average TSP goal. It should be noted that the NHMRC goal refers to an annual average and not a 24-hour average as measured by the high volume air sampler. The annual average TSP concentration for the 12 months to December 2009 was 33 $\mu g/m^3$.

Figure 2 shows a seasonal trend in PM_{10} concentrations, peaking during the warmer months and decreasing during autumn and winter. This is a common trend and is seen consistently in the Hunter Valley.

The annual average PM_{10} concentrations for Beresfield and Blackhill were 19 $\mu g/m^3$ and 16 $\mu g/m^3$ respectively for the 12 months to December 2009. These values are below the DECCW's annual average PM_{10} air quality criterion of 30 $\mu g/m^3$.

3 CONTINUOUS MONITORING

3.1 DustTrak Monitoring at Blackhill

Figure 3 shows a time series of the PM_{10} data collected from the DustTrak monitor at the Blackhill site. During the month of December, the DustTrak monitor located at the Blackhill site experienced a power failure. The DustTrak monitoring for the Blackhill site is available from the 2nd to the 31st of December 2009.

Of the available data, the measured 24-hour average PM_{10} concentrations were below the DECCW goal of 50 $\mu g/m^3$. The maximum 24-hour average PM_{10} concentration was recorded on the 8th of December at 21.5 $\mu g/m^3$.

3.2 DustTrak Monitoring at Weakleys Drive

A time series of the PM_{10} data collected from the Weakleys Drive site is shown in Figure 4. During the month of December, the DustTrak monitor located at the Weakleys Drive site experienced a power failure. Due to this no data was recorded for the month of December 2009.

3.3 DustTrak $PM_{2.5}$ Monitoring at BlackHill

DustTrak $PM_{2.5}$ monitoring was carried out between 5th and 12th of December 2009 and the data are presented in Figure 5. The measurements show that there were no occurrences above the 24-hour average DECCW advisory standard of 25 $\mu g/m^3$ during this period.

The 10-minute logged data for both PM_{10} and $PM_{2.5}$ show reasonable correlation, with peaks and troughs following the same trends. However, the average $PM_{2.5}$ fraction in the PM_{10} size range was calculated from the measurements as 0.65.

4 DUST DEPOSITION MONITORING

Dust deposition monitoring is carried out each month via a network consisting of twelve (12) gauges. The results for December 2009 are shown in **Table 3Error! Reference source not found.**, in conjunction with results for the previous eleven months in order to provide an annual average for that period. A table showing the complete data set from July 2000 in provided in **Appendix A**.

Table 3: Dust deposition monitoring for the 12-month period to December 2009

Month	Monthly dust deposition rate (g/m^2/month)											
	DG1	**DG2**	**DG3**	**DG4**	**DG5A**	**DG6**	**DG7**	**DG8**	**DG9**	**DG10**	**DG11**	**DG12**
Jan-09	1.1 #	3.0 #	1.6 #	0.8 #	0.9 #	1.4 #	0.7 #	1.5 #	0.9 #	0.9 #	5.0 +	-
Feb-09	0.4 #	4.4 #	1.5 #	1.1 #	0.9	1.6 #	0.8	1.2	1.4	2.5 #	1.2	-
Mar-09	2.8 #	5.8 #	2.7 #	2.4 #	1.9 #	2.1 #	2.5 #	2.4 #	2.3 #	5.7 #	2.7 #	-
Apr-09	2.0 #	0.8 #	0.8 #	0.6 #	0.6 #	3.2 #	1.1 #	1.1 #	1.0 #	0.6	0.9 #	-
May-09	0.6 #	1.6 #	0.8 #	2.4	0.9 #	5.6 +	1.4 #	1.1	1.3	0.7 #	1.5 #	-
Jun-09	0.4	1.3 #	0.8	0.5	0.5	3.3 #	0.9	0.6 #	1.0	3.4 #	0.7	-
Jul-09	0.2	1.0 #	0.6	0.4	0.3	3.8 #	0.5	0.6	0.6	0.3	0.6	-
Aug-09	0.8#	3.6#	0.8#	1.2#	1.0#	1.8#	0.8#	1.8	1.3#	0.8#	1.0	-
Sep-09	1.0	1.8#	1.8	8.3#	1	1.8	0.9#	1.8#	1.7#	0.7	1.4#	-
Oct-09	4.3	9#	5.2#	11.3#	3.2	3.8#	2.4#	6.8#	3#	2.2	3.2#	5.7#
Nov-09	0.8#	1.7#	1.4#	1.3#	0.7#	2.1#	1.3#	8.0#	*	1.0#	*	2.3#
Dec-09	1.4#	4.0#	1.6#	2.4#	1.7#	1.8	1.6	2.6#	1.7#	1.7#	2.2#	1.7
Annual Average	**1.0**	**2.6**	**1.3**	**1.9**	**0.9**	**2.6**	**1.1**	**2.1**	**1.3**	**1.7**	**1.4**	**-**

*Data supplied by Metford Laboratories. # Insects/bird droppings reported. +Invalid (excess bird droppings). * No recording, funnel damaged.*

The highest dust deposition measurement recorded in December 2009 was 4 g/m^2/month at DG2; the accompanying laboratory report showed the sample was contaminated with insects and leaf matter/vegetation.

Readings considered invalid have been removed when calculating the annual average. The annual average deposition rates for the gauges in the network were low and significantly below the amount goal of 4 g/m^2/month, indicating nuisance dust in the vicinity of the mine is not an issue.

5 METEOROLOGICAL MONITORING

Monthly plots of the wind speed, temperature, solar radiation, and rainfall data collected in December 2009 are shown in Figure 6 and a windrose plot is shown in Figure 7

The graphs shown in Figure 6 indicate that the instruments were recording appropriately. Data maxima and minima all appeared to be sensible for this site during December. Total rainfall for the month was 62 mm.

A windrose (see Figure 7) created from the available 30-minute average wind data shows that winds were predominantly from the east-southeast. The site recorded calms (wind speed less than or equal to 0.5 m/s) for approximately 36% of the time. The relatively large fraction of clam winds may arise from the generally forested area and the specific location of the weather station.

APPENDIX A

Estimation of Emissions

Dust deposition (g/m²/month)												
Month	D1	D2	D3	D4	D5A	D6	D7	D8	D9	D10	D11	D12
May-00	0.4	0.4	-	0.7	0.9	0.6	3.6	1.6	0.5	1.8	-	-
Jun-00	0.7	0.5	0.5	0.7	0.8	0.4	3.8	3.2	0.5	0.7	-	-
Jul-00	0.4	0.4	0.5	0.7	0.8	0.5	0.8	1.5	0.4	0.4	-	-
Aug-00	0.9	0.6	1.0	1.2	1.1	1.0	3.4	0.7	0.7	0.6	-	-
Sep-00	0.8	0.9	1.1	0.9	1.3	1.0	2.2	1.0	1.0	0.8	-	-
Oct-00	0.4	0.6	1.1	0.9	0.9	0.8	5.3	0.9	0.6	0.5	-	-
Nov-00	5.2	0.7	1.4	0.8	1.0	0.4	24.1	9.4	1.1	0.6	-	-
Dec-00	2.8	1.4	1.9	1.3	1.1	0.8	2.1	2.5	0.9	0.9	-	-
Jan-01	0.7	1.7	1.4	1.8	0.7	1.3	1.1	2.4	1.1	0.6	-	-
Feb-01	0.9	3.1	2.0	0.5	0.9	0.7	0.7	6.7	1.3	0.5	1.0	-
Mar-01	0.8	2.1	1.3	0.6	0.7	0.6	0.6	5.5	0.6	0.6	1.5	-
Apr-01	0.8	0.7	1.3	0.5	0.7	0.4	0.3	5.1	0.7	0.6	0.8	-
May-01	0.2	0.2	0.4	0.4	0.3	0.3	0.6	1.8	0.6	0.8	0.9	-
Jun-01	0.5	0.4	0.5	1.0	1.0	0.4	0.4	8.8	0.7	0.6	0.6	-
Jul-01	0.5	0.3	1.8	0.5	0.8	-	16.3	4.9	0.9	0.7	0.7	-
Aug-01	0.4	0.4	0.8	0.8	1.0	1.7	1.0	-	1.0	1.8	1.1	-
Sep-01	0.7	1.0	1.7	1.1	1.7	0.7	-	6.0	1.1	1.3	1.7	-
Oct-01	1.1	0.6	4.6	0.9	0.7	0.9	1.2	1.9	0.9	0.6	1.7	-
Nov-01	0.9	1.0	1.1	1.1	0.8	1.1	6.0	5.5	1.3	1.9	2.3	-
Dec-01	4.9	0.9	4.2	0.9	1.3	1.9	1.2	3.1	1.2	9.7	1.8	-
Jan-02	0.8	1.0	1.5	1.3	1.1	1.4	1.3	1.5	1.1	0.9	1.5	-
Feb-02	1.1	1.1	0.9	0.3	0.4	0.5	3.1	5.1	0.5	0.5	0.9	-
Mar-02	1.7	2.1	1.6	0.7	0.7	0.8	1.0	18	1.0	0.9	1.7	-
Apr-02	1.0	0.4	1.0	0.8	0.8	0.6	0.9	10.1	0.5	0.7	1.0	-
May-02	0.6	0.6	6.0	0.7	0.4	1.2	0.9	3.1	0.7	0.2	1.0	-
Jun-02	1.4	0.4	1.7	0.6	0.5	0.8	0.6	2.1	0.6	0.5	1.0	-
Jul-02	0.7	0.7	-	0.8	0.8	0.7	1.2	-	1.1	0.5	1.0	-
Aug-02	1.3	0.8	1.4	1.2	1.1	1.2	1.5	-	1.5	0.9	1.6	-
Sep-02	0.5	1.2	1.1	0.8	0.5	0.7	5.1	9.3	1.6	0.6	1.0	-
Oct-02	2.2	1.4	5.2	1.5	1.5	1.4	1.4	3.4	-	1.5	3.1	-
Nov-02	2.8	1.8	3.7	1.6	0.1	1.8	2.1	3.5	2.1	2	1.9	-
Dec-02	2.0	-	2.5	1.5	3.0	1.5	1.8	4.1	1.6	1.2	1.9	-
Jan-03	2.1	1.5	2.7	1.5	1.0	1.9	2.2	2.5	1.1	1.0	1.6	-
Feb-03	1.4	1.1	2.6	1.1	0.9	1.2	1.7	5.9	1.2	1.0	1.5	-
Mar-03	0.8	0.5	1.2	1.2	0.6	2.1	1.5	3.4	-	3.6	9.5	-
Apr-03	0.5	1.0	0.6	1.0	0.7	0.5	1.1	8.0	-	2.0	1.0	-
May-03	0.5	0.4	0.6	0.2	0.2	0.6	1.3	1.6	0.5	0.8	1.2	-
Jun-03	0.5	0.6	0.8	0.8	0.4	0.6	0.8	0.7	0.9	0.7	0.7	-
Jul-03	0.3	0.4	0.4	0.6	0.4	0.5	0.7	0.5	0.5	0.5	0.7	-
Aug-03	0.8	0.2	0.7	1.1	0.5	1.3	1.8	2.1	1.3	0.7	0.9	-
Sep-03	0.6	0.7	1.1	0.7	0.8	1.7	1.4	1.3	2.5	0.9	1.3	-
Oct-03	-	0.9	1.4	0.9	0.7	1.9	1.0	1.4	0.6	0.8	1.3	-
Nov-03	2.6	0.8	1.0	1.1	0.4	1.3	1.5	1.5	-	0.8	1.3	-
Dec-03	1.0	1.0	1.4	1.3	1.1	1.5	1.6	2.0	1.8	0.9	1.4	-
Jan-04	8.5	1.5	2.1	1.5	1.3	2.6	1.4	2.2	1.7	1.5	1.7	-
Feb-04	1.2	1.0	1.7	1.4	0.7	3.1	1.6	2.2	-	1.5	2.3	-

Mar-04	0.4	0.6	6.6	1.2	0.7	1.9	1.1	12.1	4.8	1.5	1.1	-
Apr-04	0.6	1.0	0.8	0.8	0.6	1.9	0.8	1.4	0.9	1.2	1.1	-
May-04	0.2	0.9	2.2	0.9	0.8	0.7	0.9	1.4	1.2	0.9	1.5	-
Jun-04	0.4	0.6	0.7	0.9	0.6	1.4	1.0	0.9	1.0	1.0	0.8	-
Jul-04	0.4	0.6	5.3#	0.6	0.5	2.9	1.0	1.1	0.9	0.6	1.2	-
Aug-04	0.5	0.5	0.5	1.3	0.7	1.1	1.1	1.4	-	1.0	1.0	-
Sep-04	0.6	0.6	0.8	2.2	1.0	1.0	0.9	4.4	0.9	16.7	1.1	-
Oct-04	0.7	0.9	1.2	0.9	0.8	1.4	1.0	10.5	1.0	1.0	0.8	-
Nov-04	0.8	0.7	1.3	1.9	0.7	0.9	1.0	3.0	1.1	1.1	1.6	-
Dec-04	2.0	1.4	3.6	1.5	1.3	2.2	3.2	7.9	1.8	5.5	2.5	-
Jan-05	1.2	1.0	3.7	1.6	1.4	4.0	2.3	2.7	2.6	2.5	2.8	-
Feb-05	1.2	1.2	1.8	1.6	1.3	2.0	1.7	-	2.3	1.5	2.3	-
Mar-05	1.3	0.9	1.4	0.9	0.9	3.0	1.2	7.7	-	0.8	1.3	-
Apr-05	1.1	0.7	0.9	0.8	0.7	0.9	1.4	3.3	1.1	0.8	0.9	-
May-05	0.7	8.6	1.1	0.8	0.7	0.8	0.9	4.4	1.2	0.8	1.1	-
Jun-05	1.3	0.8	1.3	1.3	0.8	1.2	1.2	1.3	1.5	2.5	0.9	-
Jul-05	1.0	0.5	0.5	0.7	0.4	1.6	0.7	1.2	0.8	4.3	1.1	-
Aug-05	0.6	0.6	0.8	1.0	0.8	0.9	0.7	1.0	0.9	1.0	0.9	-
Sep-05	0.6	0.7	0.8	0.7	0.7	1.2	1.3	1.3	1.0	0.9	1.1	-
Oct-05	0.8	0.9	1.3	0.9	0.8	1.4	1.2	1.9	1.3	1.1	1.3	-
Nov-05	-	2.3	2.3	2.0	1.7	1.2	2.0	3.2	1.6	1.4	2.2	-
Dec-05	1.9	3.2	2.3	3.3	2.6	3.4	2.3	-	1.3	2.1	3.9	-
Jan-06	1.0	2.1	1.7	1.0	23.	3.5	-	2.7	1.1	-	1.5	-
Feb-06	2.2	1.0	0.9	1.2	1.1	1.7	1.1	2.9	-	2.3	1.8	-
Mar-06	0.7	0.6	2.3	0.7	0.6	0.9	1.0	1.4	0.7	0.8	1.5	-
Apr-06	0.6	0.7	1.1	0.8	0.6	1.1	0.8	1.0	1.0	1.8	1.5	-
May-06	1.0	3.1	1.0	-	1.1	1.4	1.1	4.1	-	7.0	1.5	-
Jun-06	0.4	0.3	0.7	0.5	0.4	0.6	0.7	0.8	0.6	0.9	0.9	-
Jul-06	0.3	0.3	1	1.3	0.4	0.7	0.7	2.7	-	0.6	0.6	-
Aug-06	0.9	0.6	0.8	0.7	0.7	0.8	0.7	1.7	-	3.7	0.9	-
Sep-06	1.6	0.7	1.1	1.7	0.7	1	0.9	1.3	1.2	0.8	1.6	-
Oct-06	2	1.4	1.6	1.8	0.9	1.8	1.2	1.8	1.5	1.8	1.9	-
Nov-06	4.3	2.2	3	2.3	2.3	5.3	2.4	3.3	2.3	2.3	2.9	-
Dec-06	1.2	3.4	1.9	2.3	2.3		2.1	2.1		4.9	3.9	-
Jan-07	2	0.9	1.5	0.7	0.7	1.7	1.1		1.2	1.7	0.9	-
Feb-07	1.7	0.9	1.6	0.7	0.6	1	1.8	1.7	1.1	1.2	1.7	-
Mar-07	1.3	0.9	1.7	0.8	1.2	0.6	2.2	1.7	1	0.9	1.7	-
Apr-07	0.5	0.7	0.9	0.6	4.8	1.2	0.5	2.7	0.5	0.8	0.9	-
May-07	0.8	0.5	0.6	1.2	0.6	0.6	0.7	1.9	0.5	0.7	0.8	-
Jun-07	0.6	0.5	0.7	1.1	0.1	0.5	0.1	0.5	0.1	0.4	0.3	-
Jul-07	0.5	0.4	0.6	2.1	0.5	0.8	0.6	0.6	0.4	0.5	0.7	-
Aug-07	1.5	0.4	0.7	1	0.7	0.7	0.5	1	0.6	0.6	0.7	-
Sep-07	1.3	0.5	1.8	1	0.7	0.9	0.9	1.3	1	0.7	1.6	-
Oct-07	4.2	0.9	1.1	1.4	1.1	1.7	1.8	1.7	1.6	1.4	2.2	-
Nov-07	0.8	0.8	1.1	0.9	1.1	1.1	1.1	1.7	0.6	0.8	1.5	-
Dec-07	1.3	0.8	3	0.7	0.5	0.8	0.5	1.1	0.3	0.8	0.6	-
Jan-08	2.6	0.8	3.7	0.5	0.5	0.5	0.4	2.2	0.8	0.3	0.8	-

Feb-08	0.4	0.1	14	0.1	0.1	0.3	0.1	0.3	0.2	0.2	0.3	-
Mar-08	4.5	0.6	9.2+	0.6	2.9	2.1	0.6	1.5	0.5	1	0.9	-
April-08	0.4#	0.4#	0.8#	0.4#	0.4#	0.8#	1.1#	1.7#	1.2	1.1#	1.1#	-
May-08	1.1	2.4#	0.9	1.4	0.9	0.9	0.7	2.7	1#	1.1	1.3#	-
June-08	0.2	0.4#	0.1	0.5	0.1#	0.1	0.3	0.5#	0.1	0.8	0.2	-
July-08	0.4	0.7#	1.3#	0.6	0.8#	0.9	0.8	1	0.7	0.5	1.1	-
Aug-08	1	0.5	0.7	0.6	0.5	1.9	0.8	1	1	0.9	1.4	-
Sep-08	0.6	1	1.3	0.7	0.6	0.9	0.6	0.9	0.9	0.9	1.8	-
Oct-08	1	0.5	1	1.3	1.3	1.2	1	1.4	0.8	1.6	1.8	-
Nov-08	0.8	1.4	2.7	2.5	0.9	1.2	0.8	2.4	1.1	1	1.7	-
Dec-08	0.4	0.4	0.6	0.5	0.3	1.1	0.6	15	0.9	0.7	1.2	-
Jan-09	1.1	3#	1.6	0.8	0.9	1.4	0.7	1.5	0.9	0.9	5+	-
Feb-09	0.4	4.4	1.5	1.1	0.9	1.6	0.8	1.2	1.4	2.5	1.2	-
Mar-09	2.8	5.8	2.7	2.4	1.9	2.1	2.5	2.4	2.3	5.7	2.7	-
Apr-09	2	0.8	0.8	0.6	0.6	3.2	1.1	1.1	1	0.6	0.9	-
May-09	0.6	1.6	0.8	2.4	0.9	5.6 +	1.4	1.1	1.3	0.7	1.5	-
Jun-09	0.4	1.3	0.8	0.5	0.5	3.3	0.9	0.6	1	3.4	0.7	-
Jul-09	0.2	1.0	0.6	0.4	0.3	3.8	0.5	0.6	0.6	0.3	0.6	-
Aug-09	0.8	3.6	0.8	1.2	1.0	1.8	0.8	1.8	1.3	0.8	1.0	-
Sep-09	1.0	1.8#	1.8	8.3 +	1	1.8	0.9#	1.8#	1.7#	0.7	1.4#	-
Oct-09+	4.3	9#	5.2#	11.3#	3.2	3.8#	2.4#	6.8#	3.0#	2.2	3.2#	5.7#
Nov-09	0.8#	1.7#	1.4#	1.3#	0.7#	2.1#	1.3#	8.0#	*	1.0#	*	2.3
Dec-09	1.4#	4.0#	1.6#	2.4#	1.7#	1.8	1.6	2.6#	1.7#	1.7#	2.2#	1.7

 # - sample contaminated

+ - sample invalid

**Broken funnel*

[Note: Samples for October 2009 have been considered invalid, due to a widespread dust storm experienced on 23rd September 2009.]

APPENDIX B

Figures

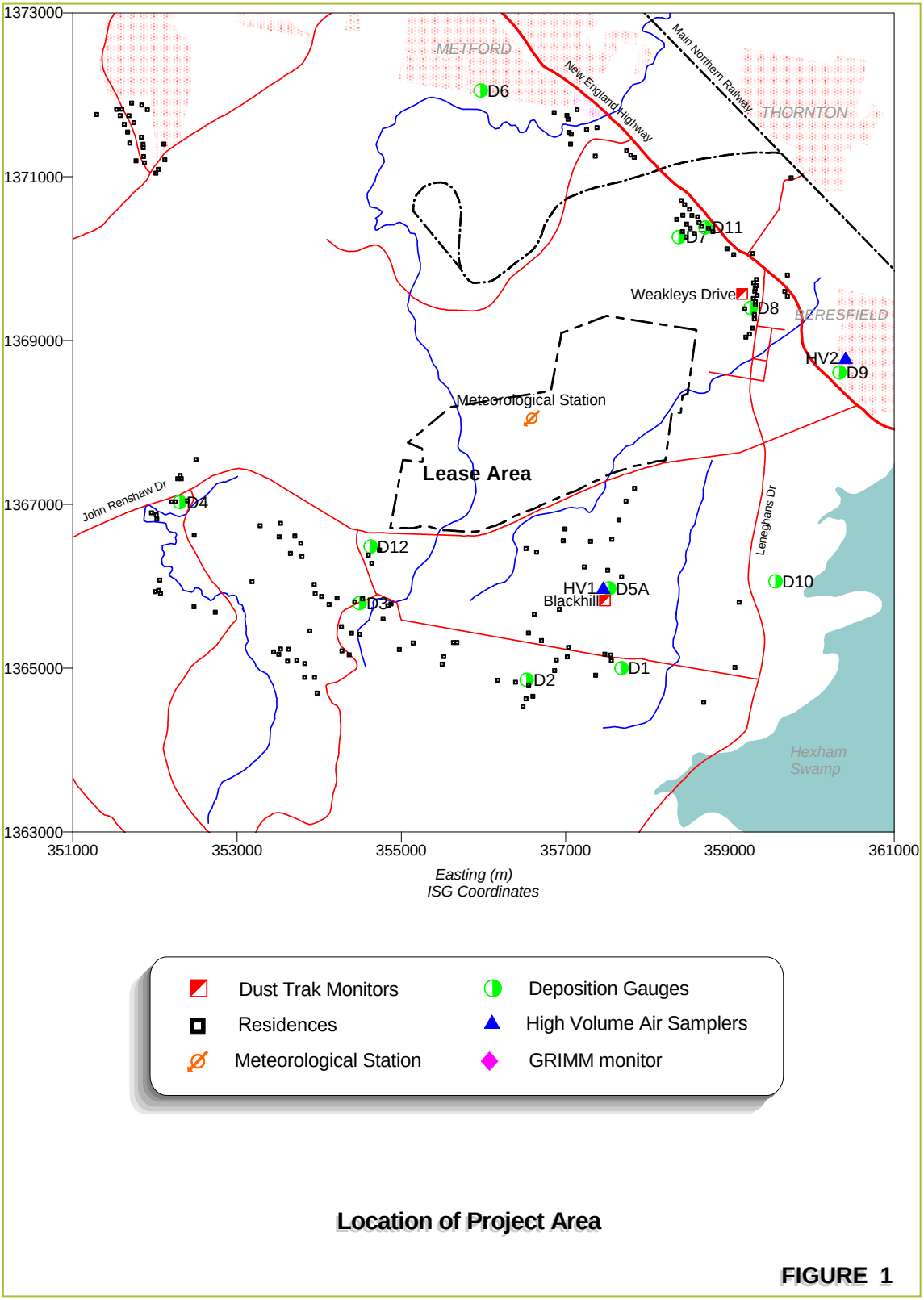

Figure 1: Project Location

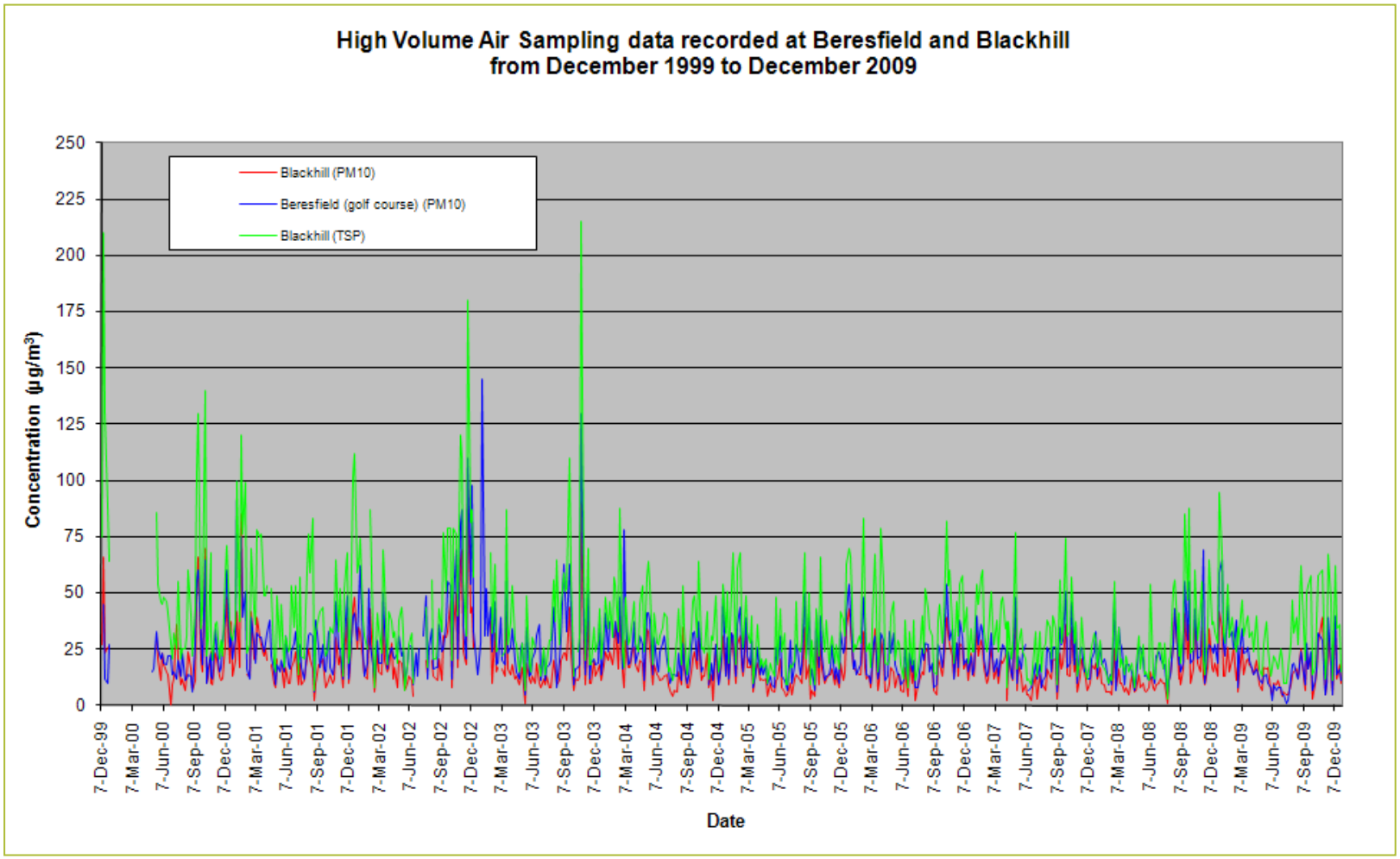

Figure 2: High Volume Air Sampling data

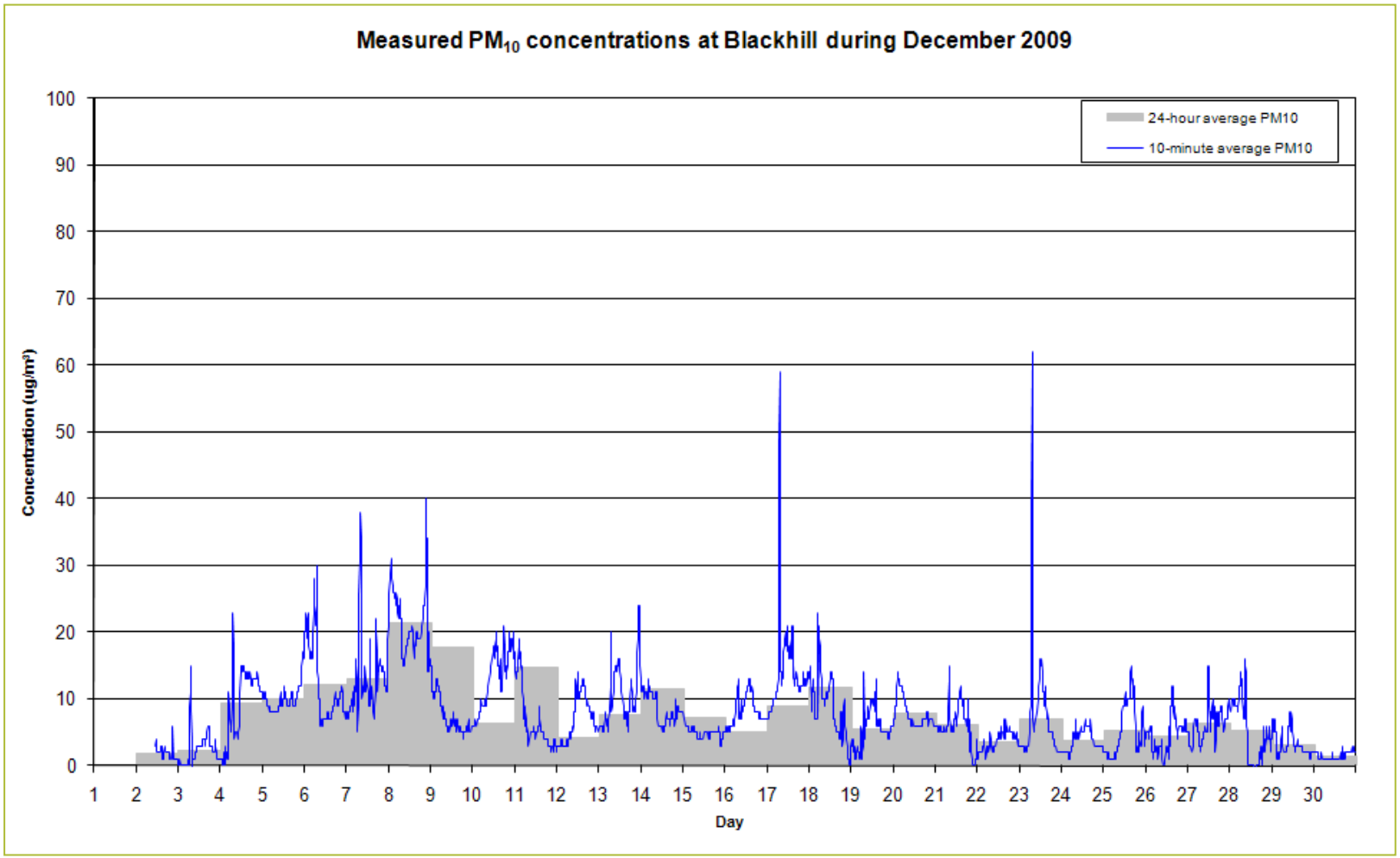

Figure 3: DustTrak sampling data, Blackhill site

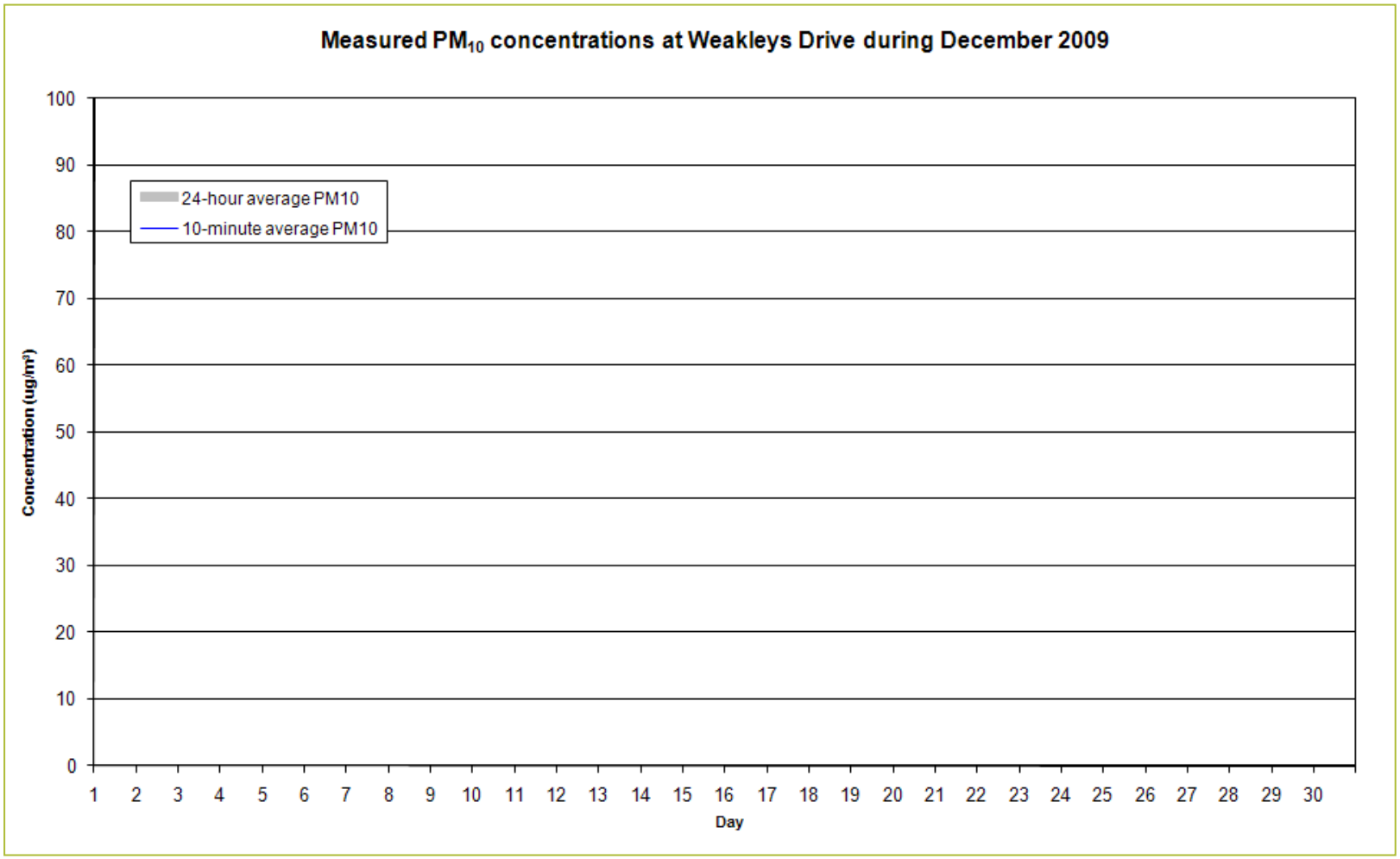

Figure 4: DustTrak sampling data, Weakleys Drive site

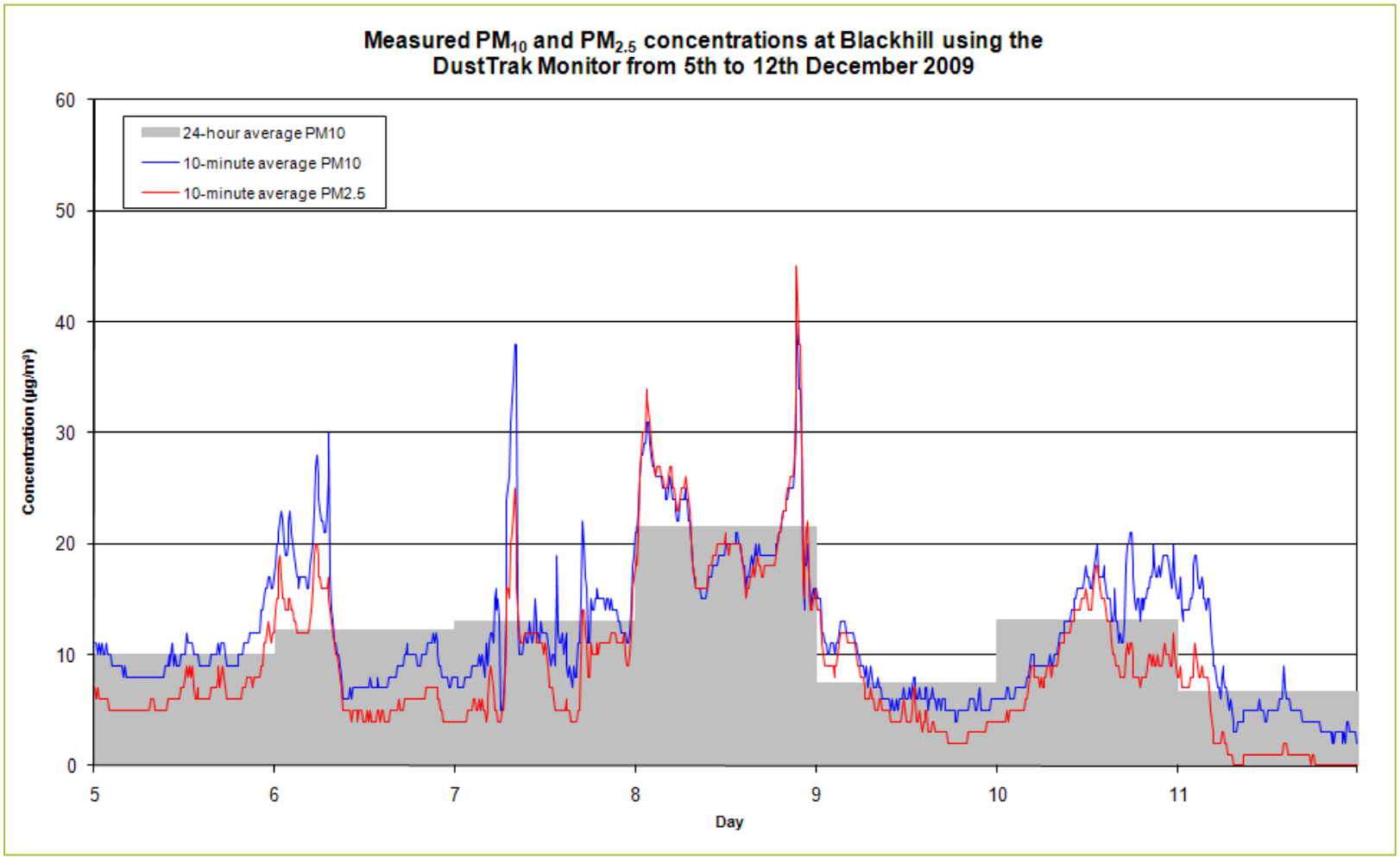

Figure 5: DustTrak $PM_{2.5}$ monitoring data

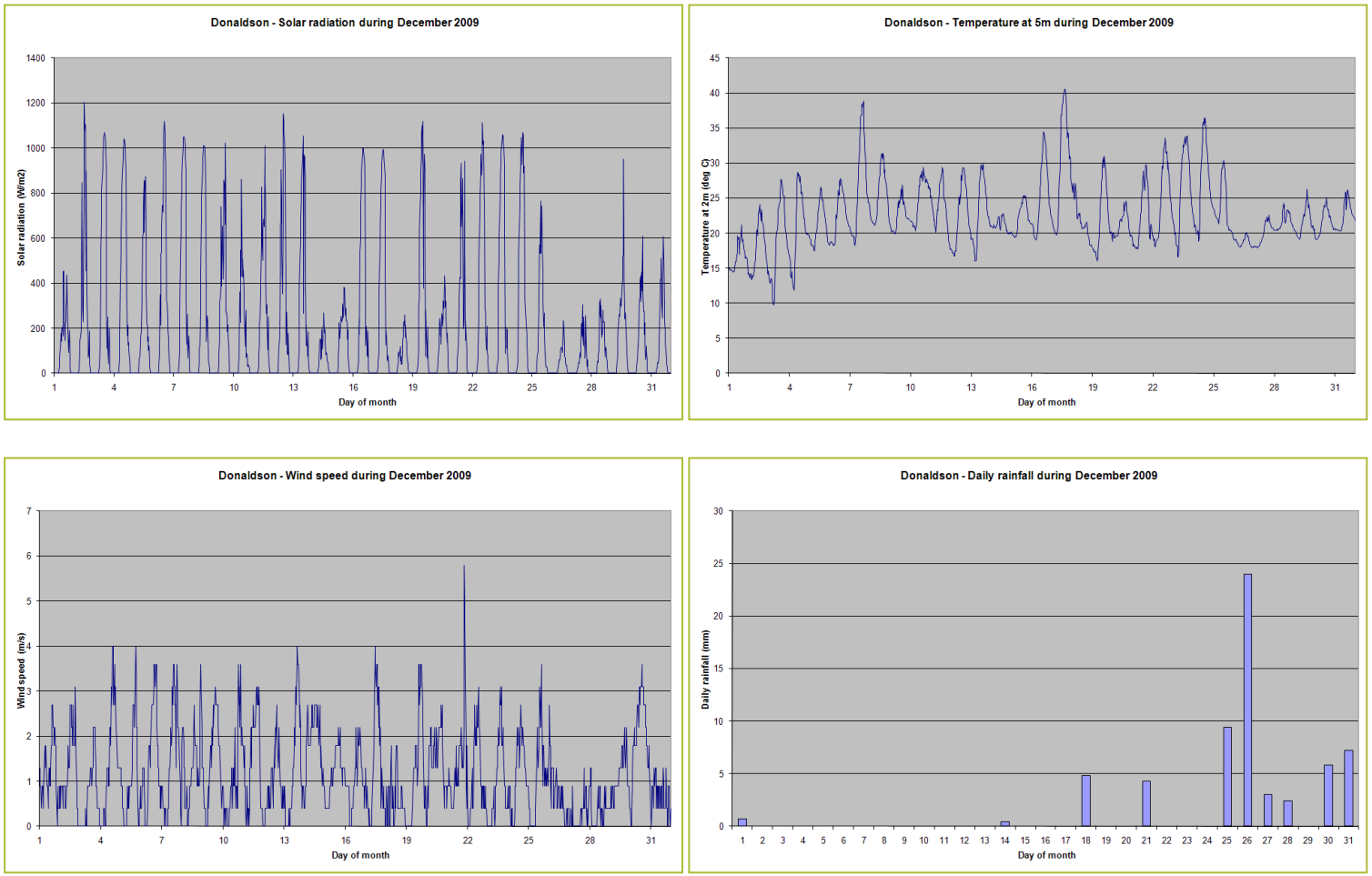

Figure 6: Meteorological conditions

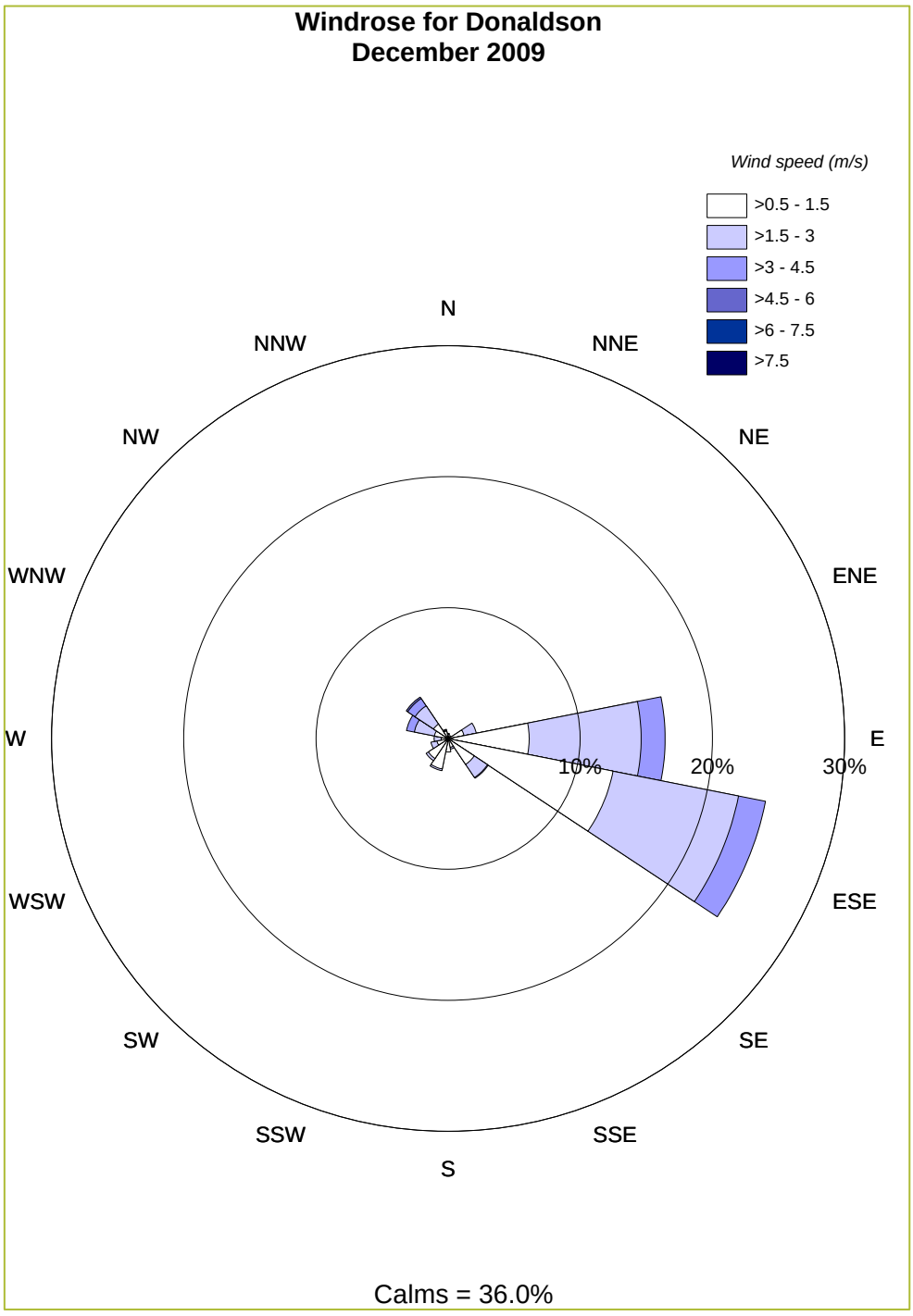

Figure 7: Windrose

DONALDSON MONITORING

DUST AND METEOROLOGICAL DATA
JANUARY 2010 REPORT

Donaldson Coal

Job No: **3003**

February 2010

A PEL Company

PROJECT TITLE:	**DUST AND METEOROLOGICAL DATA JANUARY 2010 REPORT**
JOB NUMBER:	**3003**
PREPARED FOR:	Phil Brown **DONALDSON COAL**
PREPARED BY:	Philip Henschke
QA PROCEDURES CHECKED BY:	Ronan Kellaghan
APPROVED FOR RELEASE BY:	Aleks Todoroski
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VERSION	DATE	PREPARED BY	REVIEWED BY
V1	16/02/2010	Philip Henschke	Ronan Kellaghan

Queensland Environment Pty Ltd trading as
PAEHolmes ABN 86 127 101 642

SYDNEY:
Suite 2B, 14 Glen Street
Eastwood NSW 2122
Ph: +61 2 9874 8644
Fax: +61 2 9874 8904

BRISBANE:
Level 1, La Melba, 59 Melbourne Street South Brisbane Qld 4101
PO Box 3306 South Brisbane Qld 4101
Ph: +61 7 3004 6400
Fax: +61 7 3844 5858

Email: info@paeholmes.com

Website: www.paeholmes.com

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1 INTRODUCTION

As part of their Air Quality Management Plan Donaldson Coal operate a dust monitoring network in the vicinity of the mining lease and a meteorological station on site. This report has been prepared in order to bring together the various data collected throughout the network during January 2010 and to summarise the information.

The dust network includes continuous monitoring, high volume air sampling and dust deposition monitoring. The continuous monitoring network consists of two DustTrak monitors measuring PM_{10} at two sites and an additional DustTrak monitor which is used for one week each quarter to measure $PM_{2.5}$.

There are two locations which use high volume air samplers to determine concentrations of PM_{10} and TSP. These operate on a six-day cycle in line with similar measurements made by the NSW Department of Environment, Climate Change and Water (DECCW) at other locations throughout the state.

In addition to concentration measurements, monthly levels of dust deposition are also measured using twelve gauges placed at various locations in the area of the mine. The locations of each of these monitors and gauges are shown in Figure 1.

Table 1 lists the monitors used and pollutants measured at these locations.

Table 1: Summary of monitoring locations and instruments

Monitoring Location	Instruments Used	Pollutant Monitored
Beresfield	HVAS	PM_{10}
Blackhill	HVAS	PM_{10}
	HVAS	TSP
	DustTrak	PM_{10}
	DustTrak (1 week per quarter)	$PM_{2.5}$
Weakleys Drive	DustTrak	PM_{10}
DG1 – DG12	Deposition Gauges	Dust Deposition

The meteorological station is situated at the site of the office buildings and measures the following parameters:

- wind speed
- wind direction
- temperature
- solar radiation
- rainfall

The data are downloaded at various intervals by Donaldson and then forwarded to PAEHolmes for processing.

2 HIGH VOLUME AIR SAMPLING

High Volume Air Sampling (HVAS) was carried out at Beresfield and Blackhill by Metford Laboratories. PM_{10} is measured at both sites while TSP is only measured at Blackhill. The data collected during January 2010 are summarised in **Table 2**. A graph consisting of all the data collected to date is shown in Figure 2.

Table 2: HVAS data from Beresfield and Blackhill for January 2010

Date	Beresfield PM_{10} ($\mu g/m^3$)	Blackhill PM_{10} ($\mu g/m^3$)	Blackhill TSP ($\mu g/m^3$)
1/01/2010	13	15	23
7/01/2010	16	18	33
13/01/2010	36	-	-
15/01/2010	-	7	15
19/01/2010	19	10	29
25/01/2010	28	23	47
31/01/2010	14	13	22
Annual average	**17**	**15**	**31**

Note: Blackhill TSP and PM_{10} ran on 13/01/2010 but was interupted due to lightning activity in the area. Makeup run was conducted on 15/01/2010.

These measurements will include all background sources relevant to that location, including contributions from the Donaldson mining operations.

On the days that the instruments were monitoring, the highest 24-hour average PM_{10} concentration recorded in January 2010 was 36 $\mu g/m^3$. This value was measured on the 13th at the Beresfield site. On this occasion the measured PM_{10} concentration did not exceed the 50 $\mu g/m^3$ 24-hour DECCW goal.

TSP measurements from the Blackhill site show that concentrations were below the DECCW 90 $\mu g/m^3$ annual average TSP goal. It should be noted that the DECCW goal refers to an annual average and not a 24-hour average as measured by the high volume air sampler. The annual average TSP concentration for the 12 months to January 2010 was 31 $\mu g/m^3$.

Figure 2 shows a seasonal trend in PM_{10} concentrations, peaking during the warmer months and decreasing during autumn and winter. This is a common trend and is seen consistently in the Hunter Valley.

The annual average PM_{10} concentrations for Beresfield and Blackhill were 17 $\mu g/m^3$ and 15 $\mu g/m^3$ respectively for the 12 months to January 2010. These values are below the DECCW's annual average PM_{10} air quality criterion of 30 $\mu g/m^3$.

3 CONTINUOUS MONITORING

3.1 DustTrak Monitoring at Blackhill

Figure 3 shows a time series of the PM_{10} data collected from the DustTrak monitor at the Blackhill site. During the month of Janaury, the DustTrak monitor located at the Blackhill site experienced a power failure. The DustTrak monitoring for the Blackhill site is available from the 1st to the 14th of January 2010.

Of the available data, the measured 24-hour average PM_{10} concentrations were below the DECCW goal of 50 $\mu g/m^3$. The maximum 24-hour average PM_{10} concentration was recorded on the 8th of December at 17 $\mu g/m^3$.

3.2 DustTrak Monitoring at Weakleys Drive

A time series of the PM_{10} data collected from the Weakleys Drive site is shown in Figure 4. The DustTrak monitoring for the Weakleys Drive site is available from the 5th to 31st of January.

Of the avaible data, the measured 24-hour average PM_{10} concentrations were below the DECCW goal of 50 $\mu g/m^3$. The maximum 24-hour average PM_{10} concentration was recorded on the 26th of January at 39.9 $\mu g/m^3$.

3.3 DustTrak $PM_{2.5}$ Monitoring at BlackHill

No $PM_{2.5}$ monitoring was scheduled for January 2010.

4 DUST DEPOSITION MONITORING

Dust deposition monitoring is carried out each month via a network consisting of twelve (12) gauges. The results for January 2010 are shown in **Table 3Error! Reference source not found.**, in conjunction with results for the previous eleven months in order to provide an annual average for that period. A table showing the complete data set from July 2000 in provided in **Appendix A**.

Table 3: Dust deposition monitoring for the 12-month period to January 2010

Month	Monthly dust deposition rate (g/m^2/month)											
	DG1	DG2	DG3	DG4	DG5A	DG6	DG7	DG8	DG9	DG10	DG11	DG12
Feb-09	0.4 #	4.4 #	1.5 #	1.1 #	0.9	1.6 #	0.8	1.2	1.4	2.5 #	1.2	-
Mar-09	2.8 #	5.8 #	2.7 #	2.4 #	1.9 #	2.1 #	2.5 #	2.4 #	2.3 #	5.7 #	2.7 #	-
Apr-09	2.0 #	0.8 #	0.8 #	0.6 #	0.6 #	3.2 #	1.1 #	1.1 #	1.0 #	0.6	0.9 #	-
May-09	0.6 #	1.6 #	0.8 #	2.4	0.9 #	5.6 +	1.4 #	1.1	1.3	0.7 #	1.5 #	-
Jun-09	0.4	1.3 #	0.8	0.5	0.5	3.3 #	0.9	0.6 #	1.0	3.4 #	0.7	-
Jul-09	0.2	1.0 #	0.6	0.4	0.3	3.8 #	0.5	0.6	0.6	0.3	0.6	-
Aug-09	0.8#	3.6#	0.8#	1.2#	1.0#	1.8#	0.8#	1.8	1.3#	0.8#	1.0	-
Sep-09	1.0	1.8#	1.8	8.3#	1	1.8	0.9#	1.8#	1.7#	0.7	1.4#	-
Oct-09	4.3	9#	5.2#	11.3#	3.2	3.8#	2.4#	6.8#	3#	2.2	3.2#	5.7#
Nov-09	0.8#	1.7#	1.4#	1.3#	0.7#	2.1#	1.3#	8.0#	*	1.0#	*	2.3#
Dec-09	1.4#	4.0#	1.6#	2.4#	1.7#	1.8	1.6	2.6#	1.7#	1.7#	2.2#	1.7
Jan-10	0.6#	0.8#	5.6#	1.2#	2.4#	1.2#	0.8	1.4	1.3#	0.8#	1.3#	1.1#
Annual Average	**1.0**	**2.4**	**1.7**	**2.0**	**1.1**	**2.6**	**1.1**	**2.1**	**1.4**	**1.7**	**1.4**	**-**

*Data supplied by Metford Laboratories. # Insects/bird droppings reported. +Invalid (excess bird droppings). * No recording, funnel damaged.*

The highest dust deposition measurement recorded in January 2010 was 5.6 g/m^2/month at DG3; the accompanying laboratory report showed the sample was contaminated with insects and leaf matter/vegetation.

Readings considered invalid have been removed when calculating the annual average. The annual average deposition rates for the gauges in the network were low and significantly below the goal of 4 g/m^2/month, indicating nuisance dust in the vicinity of the mine is not an issue.

5 METEOROLOGICAL MONITORING

Monthly plots of the wind speed, temperature, solar radiation, and rainfall data collected in January 2010 are shown in Figure 6 and a windrose plot is shown in Figure 7

The graphs shown in Figure 6 indicate that the instruments were recording appropriately. Data maxima and minima all appeared to be sensible for this site during January. Total rainfall for the month was 89 mm.

A windrose (see Figure 7) created from the available 30-minute average wind data shows that winds were predominantly from the east-southeast. The site recorded calms (wind speed less than or equal to 0.5 m/s) for approximately 39.9% of the time. The relatively large fraction of clam winds may arise from the generally forested area and the specific location of the weather station.

APPENDIX A

Dust Deposition Data

Dust deposition (g/m²/month)												
Month	D1	D2	D3	D4	D5A	D6	D7	D8	D9	D10	D11	D12
May-00	0.4	0.4	-	0.7	0.9	0.6	3.6	1.6	0.5	1.8	-	-
Jun-00	0.7	0.5	0.5	0.7	0.8	0.4	3.8	3.2	0.5	0.7	-	-
Jul-00	0.4	0.4	0.5	0.7	0.8	0.5	0.8	1.5	0.4	0.4	-	-
Aug-00	0.9	0.6	1.0	1.2	1.1	1.0	3.4	0.7	0.7	0.6	-	-
Sep-00	0.8	0.9	1.1	0.9	1.3	1.0	2.2	1.0	1.0	0.8	-	-
Oct-00	0.4	0.6	1.1	0.9	0.9	0.8	5.3	0.9	0.6	0.5	-	-
Nov-00	5.2	0.7	1.4	0.8	1.0	0.4	24.1	9.4	1.1	0.6	-	-
Dec-00	2.8	1.4	1.9	1.3	1.1	0.8	2.1	2.5	0.9	0.9	-	-
Jan-01	0.7	1.7	1.4	1.8	0.7	1.3	1.1	2.4	1.1	0.6	-	-
Feb-01	0.9	3.1	2.0	0.5	0.9	0.7	0.7	6.7	1.3	0.5	1.0	-
Mar-01	0.8	2.1	1.3	0.6	0.7	0.6	0.6	5.5	0.6	0.6	1.5	-
Apr-01	0.8	0.7	1.3	0.5	0.7	0.4	0.3	5.1	0.7	0.6	0.8	-
May-01	0.2	0.2	0.4	0.4	0.3	0.3	0.6	1.8	0.6	0.8	0.9	-
Jun-01	0.5	0.4	0.5	1.0	1.0	0.4	0.4	8.8	0.7	0.6	0.6	-
Jul-01	0.5	0.3	1.8	0.5	0.8	-	16.3	4.9	0.9	0.7	0.7	-
Aug-01	0.4	0.4	0.8	0.8	1.0	1.7	1.0	-	1.0	1.8	1.1	-
Sep-01	0.7	1.0	1.7	1.1	1.7	0.7	-	6.0	1.1	1.3	1.7	-
Oct-01	1.1	0.6	4.6	0.9	0.7	0.9	1.2	1.9	0.9	0.6	1.7	-
Nov-01	0.9	1.0	1.1	1.1	0.8	1.1	6.0	5.5	1.3	1.9	2.3	-
Dec-01	4.9	0.9	4.2	0.9	1.3	1.9	1.2	3.1	1.2	9.7	1.8	-
Jan-02	0.8	1.0	1.5	1.3	1.1	1.4	1.3	1.5	1.1	0.9	1.5	-
Feb-02	1.1	1.1	0.9	0.3	0.4	0.5	3.1	5.1	0.5	0.5	0.9	-
Mar-02	1.7	2.1	1.6	0.7	0.7	0.8	1.0	18	1.0	0.9	1.7	-
Apr-02	1.0	0.4	1.0	0.8	0.8	0.6	0.9	10.1	0.5	0.7	1.0	-
May-02	0.6	0.6	6.0	0.7	0.4	1.2	0.9	3.1	0.7	0.2	1.0	-
Jun-02	1.4	0.4	1.7	0.6	0.5	0.8	0.6	2.1	0.6	0.5	1.0	-
Jul-02	0.7	0.7	-	0.8	0.8	0.7	1.2	-	1.1	0.5	1.0	-
Aug-02	1.3	0.8	1.4	1.2	1.1	1.2	1.5	-	1.5	0.9	1.6	-
Sep-02	0.5	1.2	1.1	0.8	0.5	0.7	5.1	9.3	1.6	0.6	1.0	-
Oct-02	2.2	1.4	5.2	1.5	1.5	1.4	1.4	3.4	-	1.5	3.1	-
Nov-02	2.8	1.8	3.7	1.6	0.1	1.8	2.1	3.5	2.1	2	1.9	-
Dec-02	2.0	-	2.5	1.5	3.0	1.5	1.8	4.1	1.6	1.2	1.9	-
Jan-03	2.1	1.5	2.7	1.5	1.0	1.9	2.2	2.5	1.1	1.0	1.6	-
Feb-03	1.4	1.1	2.6	1.1	0.9	1.2	1.7	5.9	1.2	1.0	1.5	-
Mar-03	0.8	0.5	1.2	1.2	0.6	2.1	1.5	3.4	-	3.6	9.5	-
Apr-03	0.5	1.0	0.6	1.0	0.7	0.5	1.1	8.0	-	2.0	1.0	-
May-03	0.5	0.4	0.6	0.2	0.2	0.6	1.3	1.6	0.5	0.8	1.2	-
Jun-03	0.5	0.6	0.8	0.8	0.4	0.6	0.8	0.7	0.9	0.7	0.7	-
Jul-03	0.3	0.4	0.4	0.6	0.4	0.5	0.7	0.5	0.5	0.5	0.7	-
Aug-03	0.8	0.2	0.7	1.1	0.5	1.3	1.8	2.1	1.3	0.7	0.9	-
Sep-03	0.6	0.7	1.1	0.7	0.8	1.7	1.4	1.3	2.5	0.9	1.3	-
Oct-03	-	0.9	1.4	0.9	0.7	1.9	1.0	1.4	0.6	0.8	1.3	-
Nov-03	2.6	0.8	1.0	1.1	0.4	1.3	1.5	1.5	-	0.8	1.3	-
Dec-03	1.0	1.0	1.4	1.3	1.1	1.5	1.6	2.0	1.8	0.9	1.4	-
Jan-04	8.5	1.5	2.1	1.5	1.3	2.6	1.4	2.2	1.7	1.5	1.7	-
Feb-04	1.2	1.0	1.7	1.4	0.7	3.1	1.6	2.2	-	1.5	2.3	-

Mar-04	0.4	0.6	6.6	1.2	0.7	1.9	1.1	12.1	4.8	1.5	1.1	-
Apr-04	0.6	1.0	0.8	0.8	0.6	1.9	0.8	1.4	0.9	1.2	1.1	-
May-04	0.2	0.9	2.2	0.9	0.8	0.7	0.9	1.4	1.2	0.9	1.5	-
Jun-04	0.4	0.6	0.7	0.9	0.6	1.4	1.0	0.9	1.0	1.0	0.8	-
Jul-04	0.4	0.6	5.3#	0.6	0.5	2.9	1.0	1.1	0.9	0.6	1.2	-
Aug-04	0.5	0.5	0.5	1.3	0.7	1.1	1.1	1.4	-	1.0	1.0	-
Sep-04	0.6	0.6	0.8	2.2	1.0	1.0	0.9	4.4	0.9	16.7	1.1	-
Oct-04	0.7	0.9	1.2	0.9	0.8	1.4	1.0	10.5	1.0	1.0	0.8	-
Nov-04	0.8	0.7	1.3	1.9	0.7	0.9	1.0	3.0	1.1	1.1	1.6	-
Dec-04	2.0	1.4	3.6	1.5	1.3	2.2	3.2	7.9	1.8	5.5	2.5	-
Jan-05	1.2	1.0	3.7	1.6	1.4	4.0	2.3	2.7	2.6	2.5	2.8	-
Feb-05	1.2	1.2	1.8	1.6	1.3	2.0	1.7	-	2.3	1.5	2.3	-
Mar-05	1.3	0.9	1.4	0.9	0.9	3.0	1.2	7.7	-	0.8	1.3	-
Apr-05	1.1	0.7	0.9	0.8	0.7	0.9	1.4	3.3	1.1	0.8	0.9	-
May-05	0.7	8.6	1.1	0.8	0.7	0.8	0.9	4.4	1.2	0.8	1.1	-
Jun-05	1.3	0.8	1.3	1.3	0.8	1.2	1.2	1.3	1.5	2.5	0.9	-
Jul-05	1.0	0.5	0.5	0.7	0.4	1.6	0.7	1.2	0.8	4.3	1.1	-
Aug-05	0.6	0.6	0.8	1.0	0.8	0.9	0.7	1.0	0.9	1.0	0.9	-
Sep-05	0.6	0.7	0.8	0.7	0.7	1.2	1.3	1.3	1.0	0.9	1.1	-
Oct-05	0.8	0.9	1.3	0.9	0.8	1.4	1.2	1.9	1.3	1.1	1.3	-
Nov-05	-	2.3	2.3	2.0	1.7	1.2	2.0	3.2	1.6	1.4	2.2	-
Dec-05	1.9	3.2	2.3	3.3	2.6	3.4	2.3	-	1.3	2.1	3.9	-
Jan-06	1.0	2.1	1.7	1.0	23.	3.5	-	2.7	1.1	-	1.5	-
Feb-06	2.2	1.0	0.9	1.2	1.1	1.7	1.1	2.9	-	2.3	1.8	-
Mar-06	0.7	0.6	2.3	0.7	0.6	0.9	1.0	1.4	0.7	0.8	1.5	-
Apr-06	0.6	0.7	1.1	0.8	0.6	1.1	0.8	1.0	1.0	1.8	1.5	-
May-06	1.0	3.1	1.0	-	1.1	1.4	1.1	4.1	-	7.0	1.5	-
Jun-06	0.4	0.3	0.7	0.5	0.4	0.6	0.7	0.8	0.6	0.9	0.9	-
Jul-06	0.3	0.3	1	1.3	0.4	0.7	0.7	2.7	-	0.6	0.6	-
Aug-06	0.9	0.6	0.8	0.7	0.7	0.8	0.7	1.7	-	3.7	0.9	-
Sep-06	1.6	0.7	1.1	1.7	0.7	1	0.9	1.3	1.2	0.8	1.6	-
Oct-06	2	1.4	1.6	1.8	0.9	1.8	1.2	1.8	1.5	1.8	1.9	-
Nov-06	4.3	2.2	3	2.3	2.3	5.3	2.4	3.3	2.3	2.3	2.9	-
Dec-06	1.2	3.4	1.9	2.3	2.3		2.1	2.1		4.9	3.9	-
Jan-07	2	0.9	1.5	0.7	0.7	1.7	1.1		1.2	1.7	0.9	-
Feb-07	1.7	0.9	1.6	0.7	0.6	1	1.8	1.7	1.1	1.2	1.7	-
Mar-07	1.3	0.9	1.7	0.8	1.2	0.6	2.2	1.7	1	0.9	1.7	-
Apr-07	0.5	0.7	0.9	0.6	4.8	1.2	0.5	2.7	0.5	0.8	0.9	-
May-07	0.8	0.5	0.6	1.2	0.6	0.6	0.7	1.9	0.5	0.7	0.8	-
Jun-07	0.6	0.5	0.7	1.1	0.1	0.5	0.1	0.5	0.1	0.4	0.3	-
Jul-07	0.5	0.4	0.6	2.1	0.5	0.8	0.6	0.6	0.4	0.5	0.7	-
Aug-07	1.5	0.4	0.7	1	0.7	0.7	0.5	1	0.6	0.6	0.7	-
Sep-07	1.3	0.5	1.8	1	0.7	0.9	0.9	1.3	1	0.7	1.6	-
Oct-07	4.2	0.9	1.1	1.4	1.1	1.7	1.8	1.7	1.6	1.4	2.2	-
Nov-07	0.8	0.8	1.1	0.9	1.1	1.1	1.1	1.7	0.6	0.8	1.5	-
Dec-07	1.3	0.8	3	0.7	0.5	0.8	0.5	1.1	0.3	0.8	0.6	-
Jan-08	2.6	0.8	3.7	0.5	0.5	0.5	0.4	2.2	0.8	0.3	0.8	-

Feb-08	0.4	0.1	14	0.1	0.1	0.3	0.1	0.3	0.2	0.2	0.3	-
Mar-08	4.5	0.6	9.2+	0.6	2.9	2.1	0.6	1.5	0.5	1	0.9	-
April-08	0.4#	0.4#	0.8#	0.4#	0.4#	0.8#	1.1#	1.7#	1.2	1.1#	1.1#	-
May-08	1.1	2.4#	0.9	1.4	0.9	0.9	0.7	2.7	1#	1.1	1.3#	-
June-08	0.2	0.4#	0.1	0.5	0.1#	0.1	0.3	0.5#	0.1	0.8	0.2	-
July-08	0.4	0.7#	1.3#	0.6	0.8#	0.9	0.8	1	0.7	0.5	1.1	-
Aug-08	1	0.5	0.7	0.6	0.5	1.9	0.8	1	1	0.9	1.4	-
Sep-08	0.6	1	1.3	0.7	0.6	0.9	0.6	0.9	0.9	0.9	1.8	-
Oct-08	1	0.5	1	1.3	1.3	1.2	1	1.4	0.8	1.6	1.8	-
Nov-08	0.8	1.4	2.7	2.5	0.9	1.2	0.8	2.4	1.1	1	1.7	-
Dec-08	0.4	0.4	0.6	0.5	0.3	1.1	0.6	15	0.9	0.7	1.2	-
Jan-09	1.1	3#	1.6	0.8	0.9	1.4	0.7	1.5	0.9	0.9	5+	-
Feb-09	0.4	4.4	1.5	1.1	0.9	1.6	0.8	1.2	1.4	2.5	1.2	-
Mar-09	2.8	5.8	2.7	2.4	1.9	2.1	2.5	2.4	2.3	5.7	2.7	-
Apr-09	2	0.8	0.8	0.6	0.6	3.2	1.1	1.1	1	0.6	0.9	-
May-09	0.6	1.6	0.8	2.4	0.9	5.6 +	1.4	1.1	1.3	0.7	1.5	-
Jun-09	0.4	1.3	0.8	0.5	0.5	3.3	0.9	0.6	1	3.4	0.7	-
Jul-09	0.2	1.0	0.6	0.4	0.3	3.8	0.5	0.6	0.6	0.3	0.6	-
Aug-09	0.8	3.6	0.8	1.2	1.0	1.8	0.8	1.8	1.3	0.8	1.0	-
Sep-09	1.0	1.8#	1.8	8.3 +	1	1.8	0.9#	1.8#	1.7#	0.7	1.4#	-
Oct-09+	4.3	9#	5.2#	11.3#	3.2	3.8#	2.4#	6.8#	3.0#	2.2	3.2#	5.7#
Nov-09	0.8#	1.7#	1.4#	1.3#	0.7#	2.1#	1.3#	8.0#	*	1.0#	*	2.3
Dec-09	1.4#	4.0#	1.6#	2.4#	1.7#	1.8	1.6	2.6#	1.7#	1.7#	2.2#	1.7
Jan-10	0.6#	0.8#	5.6#	1.2#	2.4#	1.2#	0.8#	1.4#	1.3#	0.8#	1.3#	1.1#

 # - sample contaminated

+ - sample invalid

**Broken funnel*

[Note: Samples for October 2009 have been considered invalid, due to a widespread dust storm experienced on 23rd September 2009.]

APPENDIX B

Figures

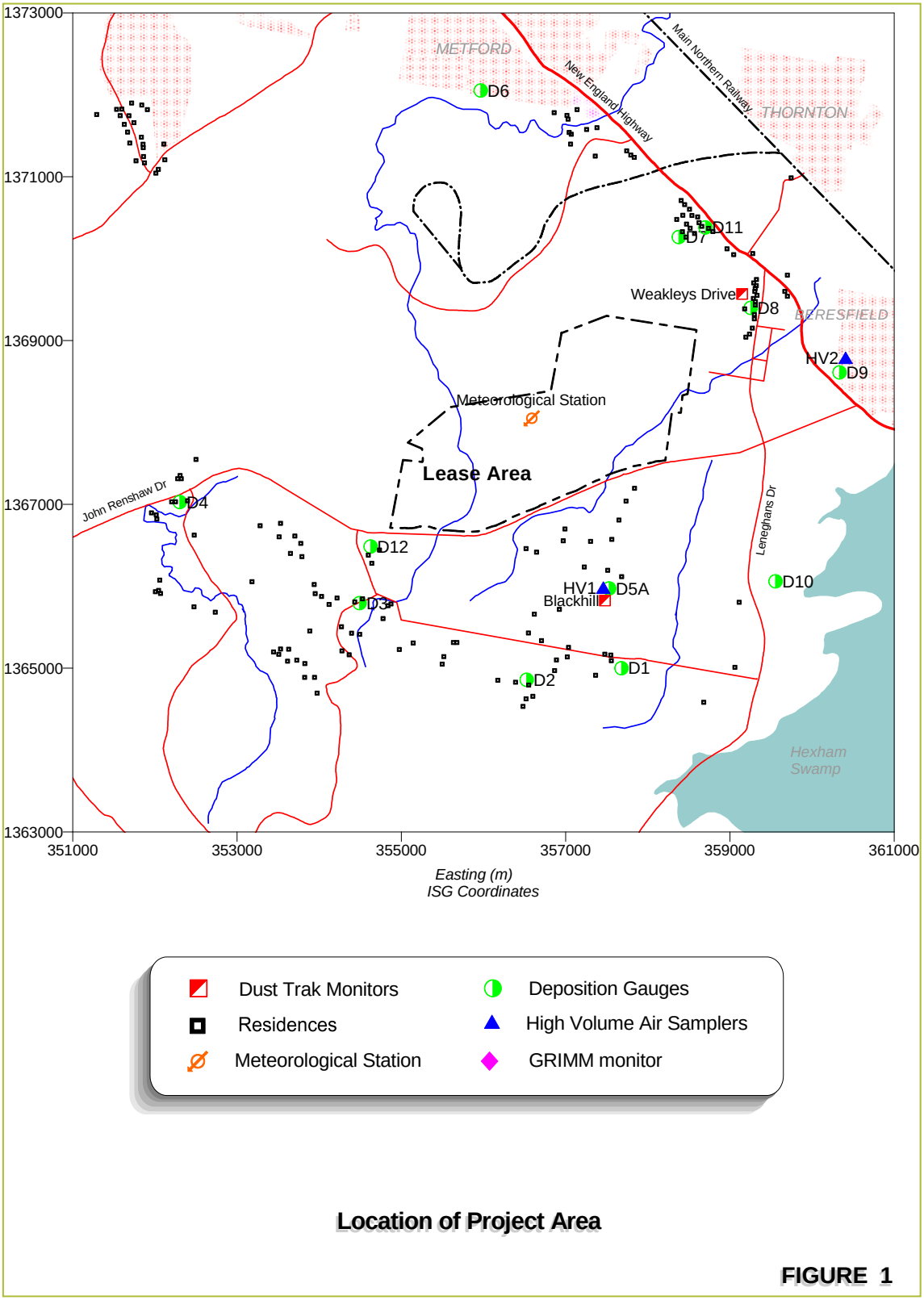

Figure 1: Project Location

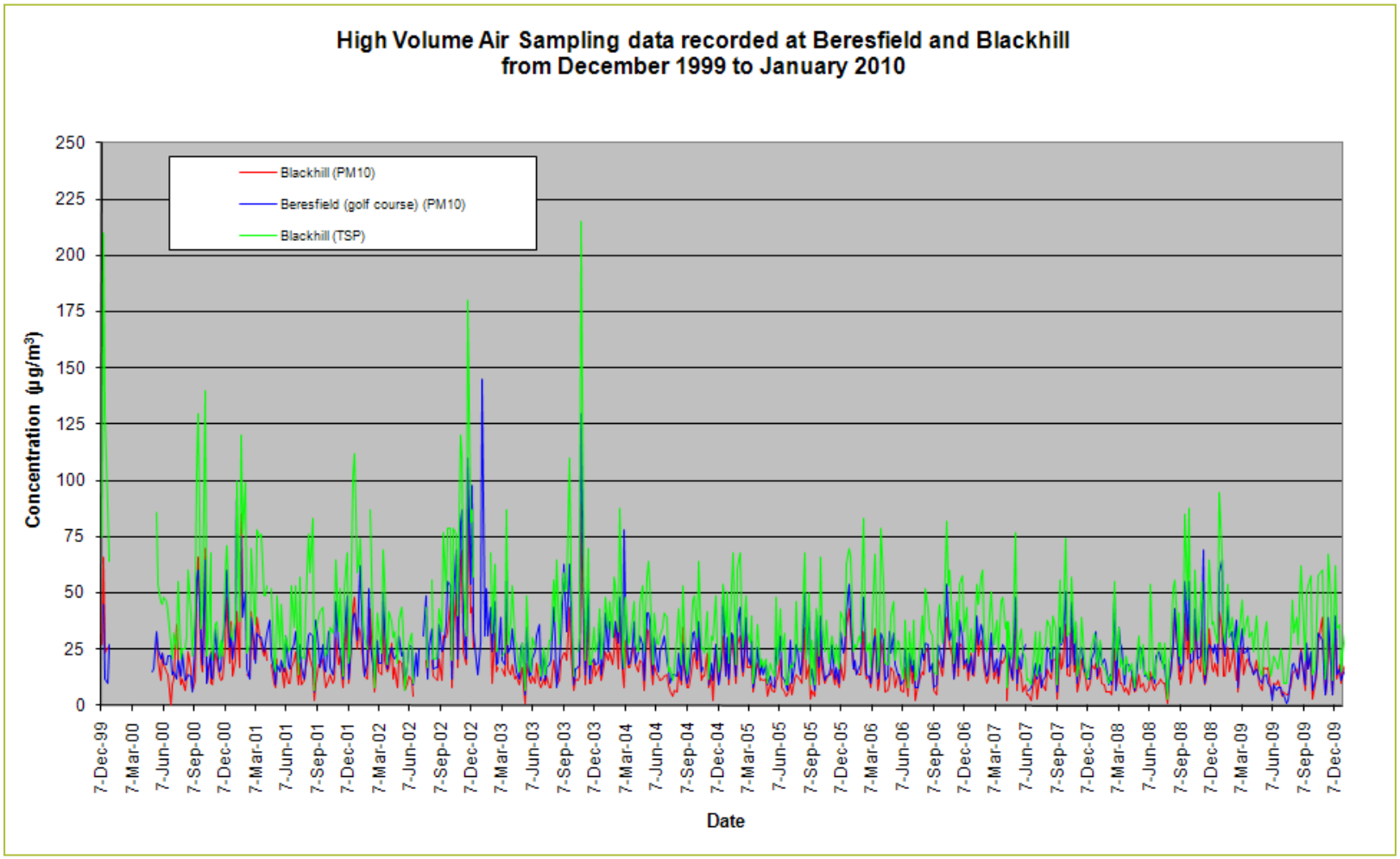

Figure 2: High Volume Air Sampling data

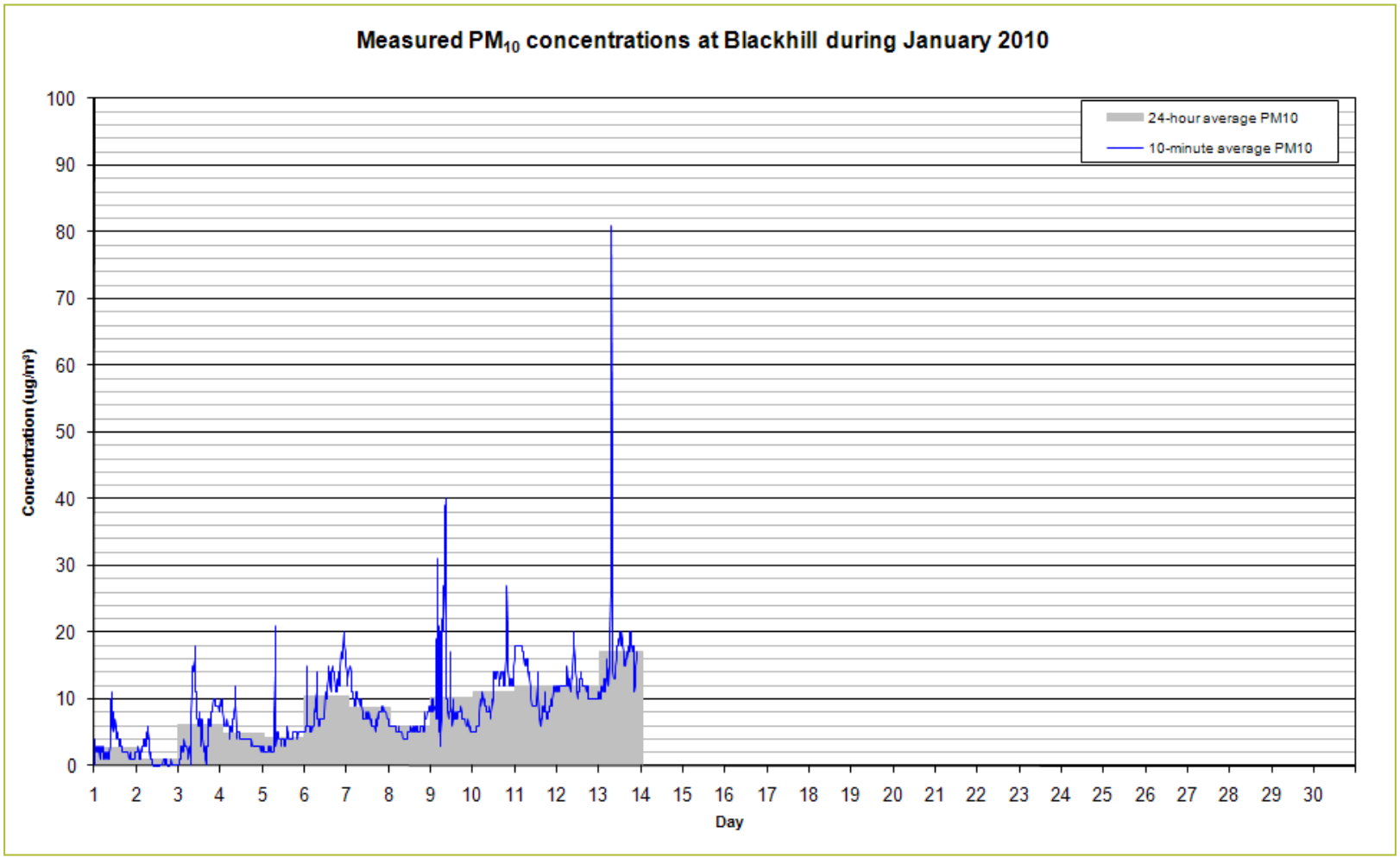

Figure 3: DustTrak sampling data, Blackhill site

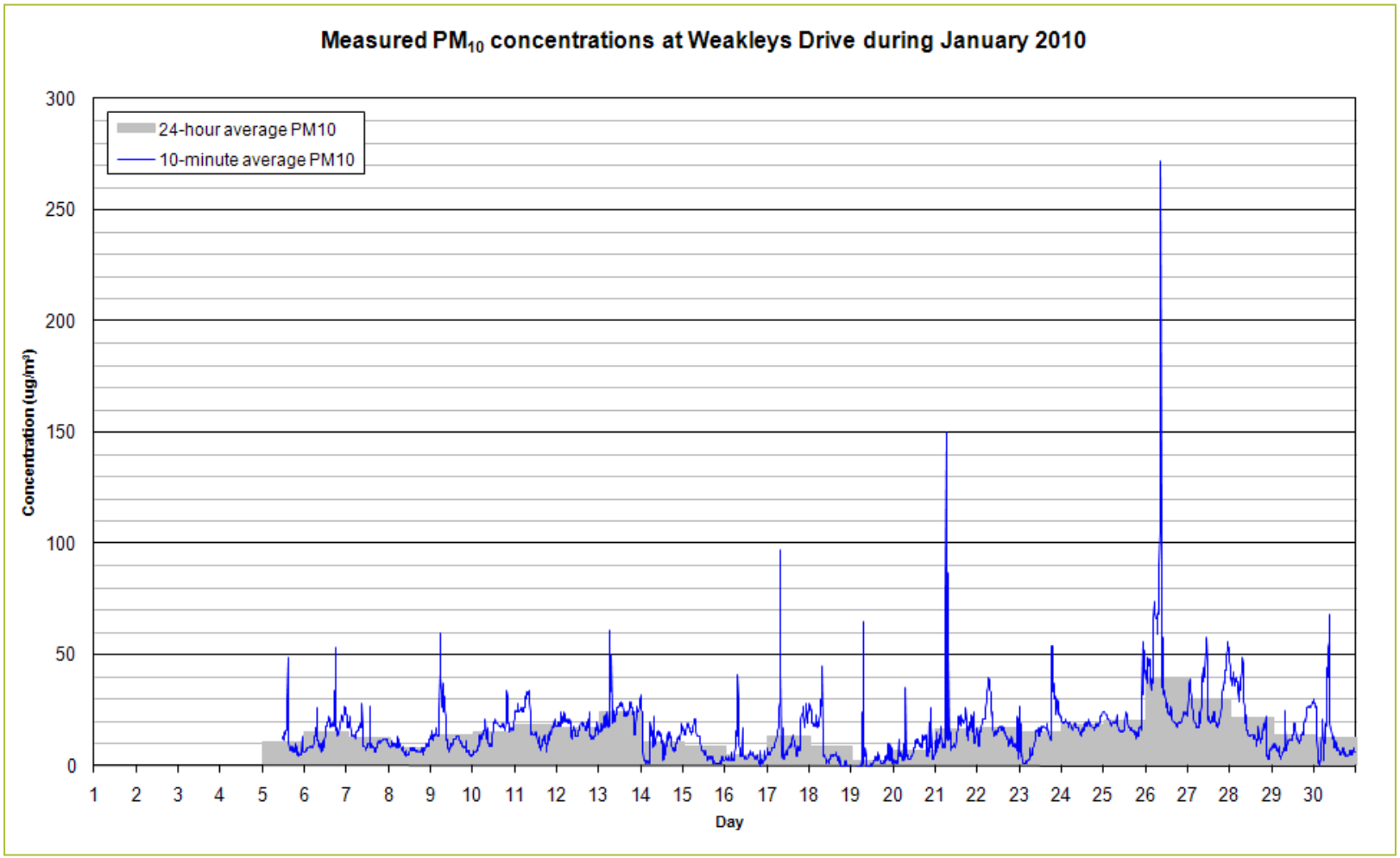

Figure 4: DustTrak sampling data, Weakleys Drive site

No $PM_{2.5}$ monitoring was scheduled for January 2010

Figure 5: DustTrak $PM_{2.5}$ monitoring data

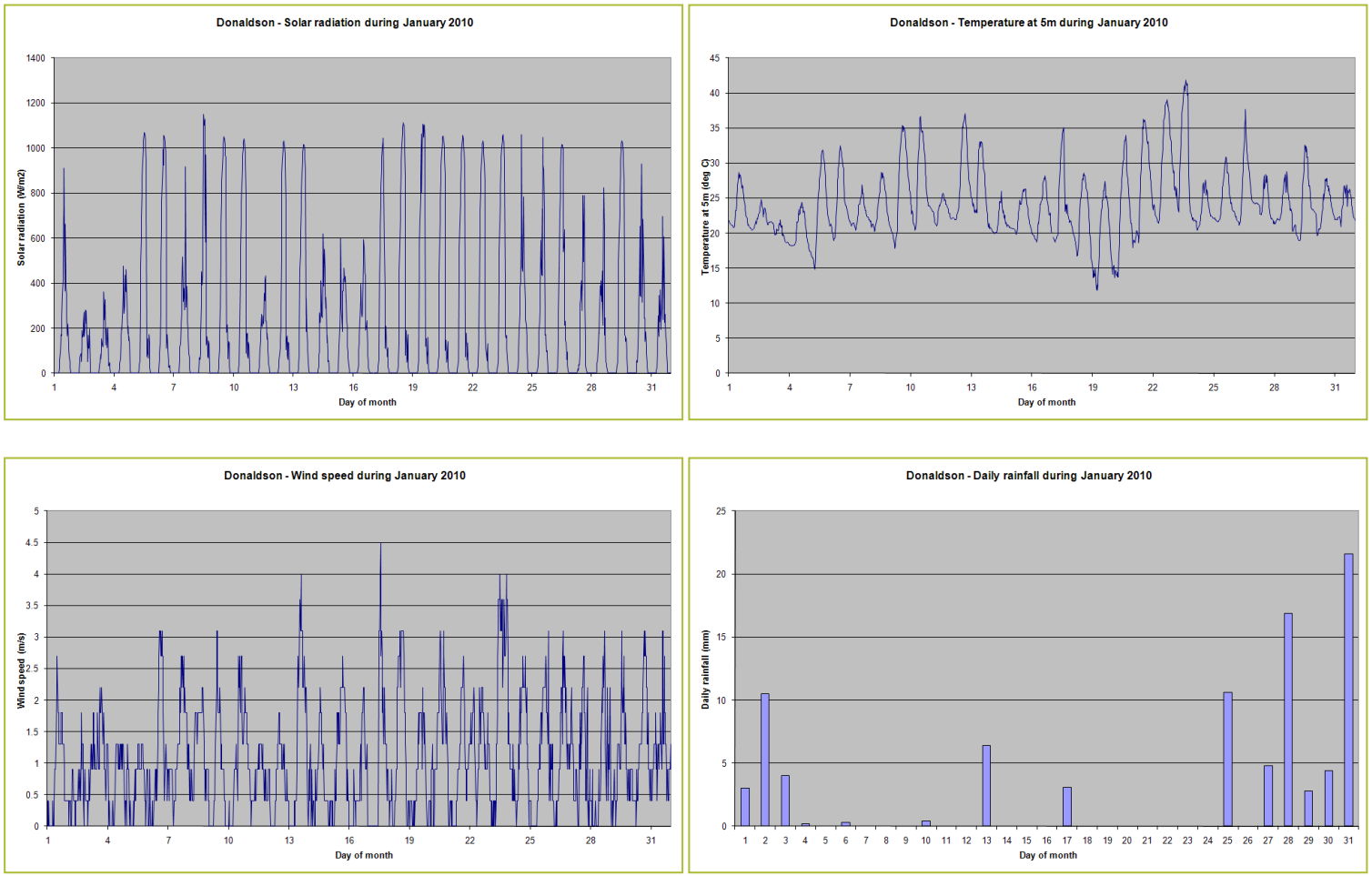

Figure 6: Meteorological conditions

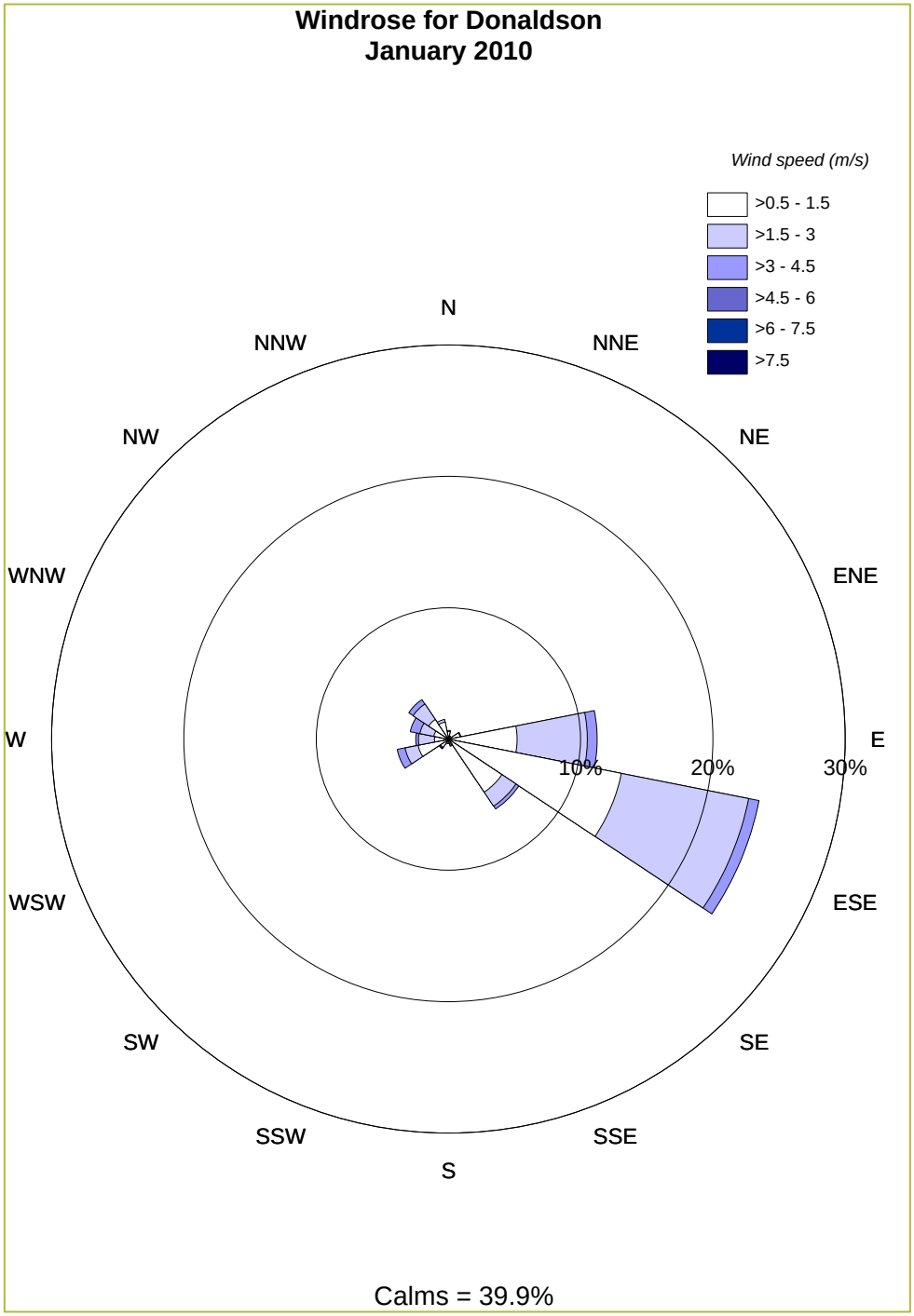

Figure 7: Windrose

DONALDSON MONITORING

DUST AND METEOROLOGICAL DATA
FEBRUARY 2010 REPORT

Donaldson Coal

Job No: **3003**

March 2010

PROJECT TITLE:	**DUST AND METEOROLOGICAL DATA FEBRUARY 2010 REPORT**
JOB NUMBER:	**3003**
PREPARED FOR:	Phil Brown **DONALDSON COAL**
PREPARED BY:	Philip Henschke
QA PROCEDURES CHECKED BY:	Ronan Kellaghan
APPROVED FOR RELEASE BY:	Aleks Todoroski
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VERSION	DATE	PREPARED BY	REVIEWED BY
V1	22/03/2010	Philip Henschke	Ronan Kellaghan

Queensland Environment Pty Ltd trading as
PAEHolmes ABN 86 127 101 642

SYDNEY:
Suite 2B, 14 Glen Street
Eastwood NSW 2122
Ph: +61 2 9874 8644
Fax: +61 2 9874 8904

BRISBANE:
Level 1, La Melba, 59 Melbourne Street South Brisbane Qld 4101
PO Box 3306 South Brisbane Qld 4101
Ph: +61 7 3004 6400
Fax: +61 7 3844 5858

Email: info@paeholmes.com

Website: www.paeholmes.com

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1 INTRODUCTION

As part of their Air Quality Management Plan Donaldson Coal operate a dust monitoring network in the vicinity of the mining lease and a meteorological station on site. This report has been prepared in order to bring together the various data collected throughout the network during February 2010 and to summarise the information.

The dust network includes continuous monitoring, high volume air sampling and dust deposition monitoring. The continuous monitoring network consists of two DustTrak monitors measuring PM_{10} at two sites and an additional DustTrak monitor which is used for one week each quarter to measure $PM_{2.5}$.

There are two locations which use high volume air samplers to determine concentrations of PM_{10} and TSP. These operate on a six-day cycle in line with similar measurements made by the NSW Department of Environment, Climate Change and Water (DECCW) at other locations throughout the state.

In addition to concentration measurements, monthly levels of dust deposition are also measured using twelve gauges placed at various locations in the area of the mine. The locations of each of these monitors and gauges are shown in Figure 1.

Table 1 lists the monitors used and pollutants measured at these locations.

Table 1: Summary of monitoring locations and instruments

Monitoring Location	Instruments Used	Pollutant Monitored
Beresfield	HVAS	PM_{10}
Blackhill	HVAS	PM_{10}
	HVAS	TSP
	DustTrak	PM_{10}
	DustTrak (1 week per quarter)	$PM_{2.5}$
Weakleys Drive	DustTrak	PM_{10}
DG1 – DG12	Deposition Gauges	Dust Deposition

The meteorological station is situated at the site of the office buildings and measures the following parameters:

- wind speed
- wind direction
- temperature
- solar radiation
- rainfall

The data are downloaded at various intervals by Donaldson and then forwarded to PAEHolmes for processing.

2 HIGH VOLUME AIR SAMPLING

High Volume Air Sampling (HVAS) was carried out at Beresfield and Blackhill by Metford Laboratories. PM_{10} is measured at both sites while TSP is only measured at Blackhill. The data collected during February 2010 are summarised in **Table 2**. A graph consisting of all the data collected to date is shown in Figure 2.

Table 2: HVAS data from Beresfield and Blackhill for February 2010

Date	Beresfield PM_{10} ($\mu g/m^3$)	Blackhill PM_{10} ($\mu g/m^3$)	Blackhill TSP ($\mu g/m^3$)
6/02/2010	15	13	21
12/02/2010	23	22	53
18/02/2010	8	8	17
24/02/2010	22	16	39
Annual average	**16**	**14**	**31**

These measurements will include all background sources relevant to that location, including contributions from the Donaldson mining operations.

On the days that the instruments were monitoring, the highest 24-hour average PM_{10} concentration recorded in February 2010 was 23 $\mu g/m^3$. This value was measured on the 12th at the Beresfield site. On this occasion the measured PM_{10} concentration did not exceed the 50 $\mu g/m^3$ 24-hour DECCW goal.

TSP measurements from the Blackhill site show that concentrations were below the DECCW 90 $\mu g/m^3$ annual average TSP goal. It should be noted that the DECCW goal refers to an annual average and not a 24-hour average as measured by the high volume air sampler. The annual average TSP concentration for the 12 months to February 2010 was 31 $\mu g/m^3$.

Figure 2 shows a seasonal trend in PM_{10} concentrations, peaking during the warmer months and decreasing during autumn and winter. This is a common trend and is seen consistently in the Hunter Valley.

The annual average PM_{10} concentrations for Beresfield and Blackhill were 16 $\mu g/m^3$ and 14 $\mu g/m^3$ respectively for the 12 months to February 2010. These values are below the DECCW's annual average PM_{10} air quality criterion of 30 $\mu g/m^3$.

3 CONTINUOUS MONITORING

3.1 DustTrak Monitoring at Blackhill

Figure 3 shows a time series of the PM_{10} data collected from the DustTrak monitor at the Blackhill site. During the month of February, the DustTrak monitor located at the Blackhill site experienced a power failure. As a result no DustTrak monitoring for the Blackhill site is available for the month of February 2010.

3.2 DustTrak Monitoring at Weakleys Drive

A time series of the PM_{10} data collected from the Weakleys Drive site is shown in Figure 4. The DustTrak monitor located at the Weakleys Drive site experienced a power failure. The DustTrak monitoring for the Weakleys Drive site is available from the 1st to 2nd of February.

Of the avaible data, the measured 24-hour average PM_{10} concentrations were below the DECCW goal of 50 $\mu g/m^3$. The maximum 24-hour average PM_{10} concentration was recorded on the 1st of February at 7.8 $\mu g/m^3$.

3.3 DustTrak $PM_{2.5}$ Monitoring at BlackHill

No $PM_{2.5}$ monitoring was scheduled for February 2010.

4 DUST DEPOSITION MONITORING

Dust deposition monitoring is carried out each month via a network consisting of twelve (12) gauges. The results for February 2010 are shown in **Table 3**, in conjunction with results for the previous eleven months in order to provide an annual average for that period. A table showing the complete data set from July 2000 in provided in **Appendix A**.

Table 3: Dust deposition monitoring for the 12-month period to February 2010

Month	Monthly dust deposition rate (g/m^2/month)											
	DG1	**DG2**	**DG3**	**DG4**	**DG5A**	**DG6**	**DG7**	**DG8**	**DG9**	**DG10**	**DG11**	**DG12**
Mar-09	2.8 #	5.8 #	2.7 #	2.4 #	1.9 #	2.1 #	2.5 #	2.4 #	2.3 #	5.7 #	2.7 #	-
Apr-09	2.0 #	0.8 #	0.8 #	0.6 #	0.6 #	3.2 #	1.1 #	1.1 #	1.0 #	0.6	0.9 #	-
May-09	0.6 #	1.6 #	0.8 #	2.4	0.9 #	5.6 +	1.4 #	1.1	1.3	0.7 #	1.5 #	-
Jun-09	0.4	1.3 #	0.8	0.5	0.5	3.3 #	0.9	0.6 #	1.0	3.4 #	0.7	-
Jul-09	0.2	1.0 #	0.6	0.4	0.3	3.8 #	0.5	0.6	0.6	0.3	0.6	-
Aug-09	0.8#	3.6#	0.8#	1.2#	1.0#	1.8#	0.8#	1.8	1.3#	0.8#	1.0	-
Sep-09	1.0	1.8#	1.8	8.3#	1	1.8	0.9#	1.8#	1.7#	0.7	1.4#	-
Oct-09	4.3	9#	5.2#	11.3#	3.2	3.8#	2.4#	6.8#	3#	2.2	3.2#	5.7#
Nov-09	0.8#	1.7#	1.4#	1.3#	0.7#	2.1#	1.3#	8.0#	*	1.0#	*	2.3#
Dec-09	1.4#	4.0#	1.6#	2.4#	1.7#	1.8	1.6	2.6#	1.7#	1.7#	2.2#	1.7
Jan-10	0.6#	0.8#	5.6#	1.2#	2.4#	1.2#	0.8	1.4	1.3#	0.8#	1.3#	1.1#
Feb-10	1.9#	11.3+	1.9#	1.4#	1.5#	1.1#	1.2#	1.6#	1.1#	0.8#	1.8#	1.3#
Annual Average	**1.1**	**2.2**	**1.7**	**2.0**	**1.1**	**2.5**	**1.2**	**2.1**	**1.3**	**1.5**	**1.4**	**-**

*Data supplied by Metford Laboratories. # Insects/bird droppings reported. +Invalid. * No recording, funnel damaged.*

Note: Bottle was stolen from D9, sampling for February only occurred over 26 days.

The highest dust deposition measurement recorded in February 2010 was 11.3 g/m^2/month at DG2; the accompanying laboratory report showed the sample was contaminated with insects and grass/grass seed as indicated by the high organic content. This sample was considered invalid due to excessive contamination.

Readings considered invalid have been removed when calculating the annual average. The annual average deposition rates for the gauges in the network were low and significantly below the goal of 4 g/m^2/month, indicating nuisance dust in the vicinity of the mine is not an issue.

5 METEOROLOGICAL MONITORING

Monthly plots of the wind speed, temperature, solar radiation, and rainfall data collected in February 2010 are shown in Figure 6 and a windrose plot is shown in Figure 7.

The graphs shown in Figure 6 indicate that the instruments were recording appropriately. Data maxima and minima all appeared to be sensible for this site during February. Total rainfall for the month was 52.1 mm.

A windrose (see Figure 7) created from the available 30-minute average wind data shows that winds were predominantly from the east-southeast. The site recorded calms (wind speed less than or equal to 0.5 m/s) for approximately 43.1% of the time. The relatively large fraction of clam winds may arise from the generally forested area and the specific location of the weather station.

APPENDIX A

Dust Deposition Data

Dust deposition (g/m²/month)												
Month	D1	D2	D3	D4	D5A	D6	D7	D8	D9	D10	D11	D12
May-00	0.4	0.4	-	0.7	0.9	0.6	3.6	1.6	0.5	1.8	-	-
Jun-00	0.7	0.5	0.5	0.7	0.8	0.4	3.8	3.2	0.5	0.7	-	-
Jul-00	0.4	0.4	0.5	0.7	0.8	0.5	0.8	1.5	0.4	0.4	-	-
Aug-00	0.9	0.6	1.0	1.2	1.1	1.0	3.4	0.7	0.7	0.6	-	-
Sep-00	0.8	0.9	1.1	0.9	1.3	1.0	2.2	1.0	1.0	0.8	-	-
Oct-00	0.4	0.6	1.1	0.9	0.9	0.8	5.3	0.9	0.6	0.5	-	-
Nov-00	5.2	0.7	1.4	0.8	1.0	0.4	24.1	9.4	1.1	0.6	-	-
Dec-00	2.8	1.4	1.9	1.3	1.1	0.8	2.1	2.5	0.9	0.9	-	-
Jan-01	0.7	1.7	1.4	1.8	0.7	1.3	1.1	2.4	1.1	0.6	-	-
Feb-01	0.9	3.1	2.0	0.5	0.9	0.7	0.7	6.7	1.3	0.5	1.0	-
Mar-01	0.8	2.1	1.3	0.6	0.7	0.6	0.6	5.5	0.6	0.6	1.5	-
Apr-01	0.8	0.7	1.3	0.5	0.7	0.4	0.3	5.1	0.7	0.6	0.8	-
May-01	0.2	0.2	0.4	0.4	0.3	0.3	0.6	1.8	0.6	0.8	0.9	-
Jun-01	0.5	0.4	0.5	1.0	1.0	0.4	0.4	8.8	0.7	0.6	0.6	-
Jul-01	0.5	0.3	1.8	0.5	0.8	-	16.3	4.9	0.9	0.7	0.7	-
Aug-01	0.4	0.4	0.8	0.8	1.0	1.7	1.0	-	1.0	1.8	1.1	-
Sep-01	0.7	1.0	1.7	1.1	1.7	0.7	-	6.0	1.1	1.3	1.7	-
Oct-01	1.1	0.6	4.6	0.9	0.7	0.9	1.2	1.9	0.9	0.6	1.7	-
Nov-01	0.9	1.0	1.1	1.1	0.8	1.1	6.0	5.5	1.3	1.9	2.3	-
Dec-01	4.9	0.9	4.2	0.9	1.3	1.9	1.2	3.1	1.2	9.7	1.8	-
Jan-02	0.8	1.0	1.5	1.3	1.1	1.4	1.3	1.5	1.1	0.9	1.5	-
Feb-02	1.1	1.1	0.9	0.3	0.4	0.5	3.1	5.1	0.5	0.5	0.9	-
Mar-02	1.7	2.1	1.6	0.7	0.7	0.8	1.0	18	1.0	0.9	1.7	-
Apr-02	1.0	0.4	1.0	0.8	0.8	0.6	0.9	10.1	0.5	0.7	1.0	-
May-02	0.6	0.6	6.0	0.7	0.4	1.2	0.9	3.1	0.7	0.2	1.0	-
Jun-02	1.4	0.4	1.7	0.6	0.5	0.8	0.6	2.1	0.6	0.5	1.0	-
Jul-02	0.7	0.7	-	0.8	0.8	0.7	1.2	-	1.1	0.5	1.0	-
Aug-02	1.3	0.8	1.4	1.2	1.1	1.2	1.5	-	1.5	0.9	1.6	-
Sep-02	0.5	1.2	1.1	0.8	0.5	0.7	5.1	9.3	1.6	0.6	1.0	-
Oct-02	2.2	1.4	5.2	1.5	1.5	1.4	1.4	3.4	-	1.5	3.1	-
Nov-02	2.8	1.8	3.7	1.6	0.1	1.8	2.1	3.5	2.1	2	1.9	-
Dec-02	2.0	-	2.5	1.5	3.0	1.5	1.8	4.1	1.6	1.2	1.9	-
Jan-03	2.1	1.5	2.7	1.5	1.0	1.9	2.2	2.5	1.1	1.0	1.6	-
Feb-03	1.4	1.1	2.6	1.1	0.9	1.2	1.7	5.9	1.2	1.0	1.5	-
Mar-03	0.8	0.5	1.2	1.2	0.6	2.1	1.5	3.4	-	3.6	9.5	-
Apr-03	0.5	1.0	0.6	1.0	0.7	0.5	1.1	8.0	-	2.0	1.0	-
May-03	0.5	0.4	0.6	0.2	0.2	0.6	1.3	1.6	0.5	0.8	1.2	-
Jun-03	0.5	0.6	0.8	0.8	0.4	0.6	0.8	0.7	0.9	0.7	0.7	-
Jul-03	0.3	0.4	0.4	0.6	0.4	0.5	0.7	0.5	0.5	0.5	0.7	-
Aug-03	0.8	0.2	0.7	1.1	0.5	1.3	1.8	2.1	1.3	0.7	0.9	-
Sep-03	0.6	0.7	1.1	0.7	0.8	1.7	1.4	1.3	2.5	0.9	1.3	-
Oct-03	-	0.9	1.4	0.9	0.7	1.9	1.0	1.4	0.6	0.8	1.3	-
Nov-03	2.6	0.8	1.0	1.1	0.4	1.3	1.5	1.5	-	0.8	1.3	-
Dec-03	1.0	1.0	1.4	1.3	1.1	1.5	1.6	2.0	1.8	0.9	1.4	-
Jan-04	8.5	1.5	2.1	1.5	1.3	2.6	1.4	2.2	1.7	1.5	1.7	-
Feb-04	1.2	1.0	1.7	1.4	0.7	3.1	1.6	2.2	-	1.5	2.3	-

Mar-04	0.4	0.6	6.6	1.2	0.7	1.9	1.1	12.1	4.8	1.5	1.1	-
Apr-04	0.6	1.0	0.8	0.8	0.6	1.9	0.8	1.4	0.9	1.2	1.1	-
May-04	0.2	0.9	2.2	0.9	0.8	0.7	0.9	1.4	1.2	0.9	1.5	-
Jun-04	0.4	0.6	0.7	0.9	0.6	1.4	1.0	0.9	1.0	1.0	0.8	-
Jul-04	0.4	0.6	5.3#	0.6	0.5	2.9	1.0	1.1	0.9	0.6	1.2	-
Aug-04	0.5	0.5	0.5	1.3	0.7	1.1	1.1	1.4	-	1.0	1.0	-
Sep-04	0.6	0.6	0.8	2.2	1.0	1.0	0.9	4.4	0.9	16.7	1.1	-
Oct-04	0.7	0.9	1.2	0.9	0.8	1.4	1.0	10.5	1.0	1.0	0.8	-
Nov-04	0.8	0.7	1.3	1.9	0.7	0.9	1.0	3.0	1.1	1.1	1.6	-
Dec-04	2.0	1.4	3.6	1.5	1.3	2.2	3.2	7.9	1.8	5.5	2.5	-
Jan-05	1.2	1.0	3.7	1.6	1.4	4.0	2.3	2.7	2.6	2.5	2.8	-
Feb-05	1.2	1.2	1.8	1.6	1.3	2.0	1.7	-	2.3	1.5	2.3	-
Mar-05	1.3	0.9	1.4	0.9	0.9	3.0	1.2	7.7	-	0.8	1.3	-
Apr-05	1.1	0.7	0.9	0.8	0.7	0.9	1.4	3.3	1.1	0.8	0.9	-
May-05	0.7	8.6	1.1	0.8	0.7	0.8	0.9	4.4	1.2	0.8	1.1	-
Jun-05	1.3	0.8	1.3	1.3	0.8	1.2	1.2	1.3	1.5	2.5	0.9	-
Jul-05	1.0	0.5	0.5	0.7	0.4	1.6	0.7	1.2	0.8	4.3	1.1	-
Aug-05	0.6	0.6	0.8	1.0	0.8	0.9	0.7	1.0	0.9	1.0	0.9	-
Sep-05	0.6	0.7	0.8	0.7	0.7	1.2	1.3	1.3	1.0	0.9	1.1	-
Oct-05	0.8	0.9	1.3	0.9	0.8	1.4	1.2	1.9	1.3	1.1	1.3	-
Nov-05	-	2.3	2.3	2.0	1.7	1.2	2.0	3.2	1.6	1.4	2.2	-
Dec-05	1.9	3.2	2.3	3.3	2.6	3.4	2.3	-	1.3	2.1	3.9	-
Jan-06	1.0	2.1	1.7	1.0	23.	3.5	-	2.7	1.1	-	1.5	-
Feb-06	2.2	1.0	0.9	1.2	1.1	1.7	1.1	2.9	-	2.3	1.8	-
Mar-06	0.7	0.6	2.3	0.7	0.6	0.9	1.0	1.4	0.7	0.8	1.5	-
Apr-06	0.6	0.7	1.1	0.8	0.6	1.1	0.8	1.0	1.0	1.8	1.5	-
May-06	1.0	3.1	1.0	-	1.1	1.4	1.1	4.1	-	7.0	1.5	-
Jun-06	0.4	0.3	0.7	0.5	0.4	0.6	0.7	0.8	0.6	0.9	0.9	-
Jul-06	0.3	0.3	1	1.3	0.4	0.7	0.7	2.7	-	0.6	0.6	-
Aug-06	0.9	0.6	0.8	0.7	0.7	0.8	0.7	1.7	-	3.7	0.9	-
Sep-06	1.6	0.7	1.1	1.7	0.7	1	0.9	1.3	1.2	0.8	1.6	-
Oct-06	2	1.4	1.6	1.8	0.9	1.8	1.2	1.8	1.5	1.8	1.9	-
Nov-06	4.3	2.2	3	2.3	2.3	5.3	2.4	3.3	2.3	2.3	2.9	-
Dec-06	1.2	3.4	1.9	2.3	2.3		2.1	2.1		4.9	3.9	-
Jan-07	2	0.9	1.5	0.7	0.7	1.7	1.1		1.2	1.7	0.9	-
Feb-07	1.7	0.9	1.6	0.7	0.6	1	1.8	1.7	1.1	1.2	1.7	-
Mar-07	1.3	0.9	1.7	0.8	1.2	0.6	2.2	1.7	1	0.9	1.7	-
Apr-07	0.5	0.7	0.9	0.6	4.8	1.2	0.5	2.7	0.5	0.8	0.9	-
May-07	0.8	0.5	0.6	1.2	0.6	0.6	0.7	1.9	0.5	0.7	0.8	-
Jun-07	0.6	0.5	0.7	1.1	0.1	0.5	0.1	0.5	0.1	0.4	0.3	-
Jul-07	0.5	0.4	0.6	2.1	0.5	0.8	0.6	0.6	0.4	0.5	0.7	-
Aug-07	1.5	0.4	0.7	1	0.7	0.7	0.5	1	0.6	0.6	0.7	-
Sep-07	1.3	0.5	1.8	1	0.7	0.9	0.9	1.3	1	0.7	1.6	-
Oct-07	4.2	0.9	1.1	1.4	1.1	1.7	1.8	1.7	1.6	1.4	2.2	-
Nov-07	0.8	0.8	1.1	0.9	1.1	1.1	1.1	1.7	0.6	0.8	1.5	-
Dec-07	1.3	0.8	3	0.7	0.5	0.8	0.5	1.1	0.3	0.8	0.6	-
Jan-08	2.6	0.8	3.7	0.5	0.5	0.5	0.4	2.2	0.8	0.3	0.8	-

Feb-08	0.4	0.1	14	0.1	0.1	0.3	0.1	0.3	0.2	0.2	0.3	-
Mar-08	4.5	0.6	9.2[+]	0.6	2.9	2.1	0.6	1.5	0.5	1	0.9	-
April-08	0.4[#]	0.4[#]	0.8[#]	0.4[#]	0.4[#]	0.8[#]	1.1[#]	1.7[#]	1.2	1.1[#]	1.1[#]	-
May-08	1.1	2.4[#]	0.9	1.4	0.9	0.9	0.7	2.7	1[#]	1.1	1.3[#]	-
June-08	0.2	0.4[#]	0.1	0.5	0.1[#]	0.1	0.3	0.5[#]	0.1	0.8	0.2	-
July-08	0.4	0.7[#]	1.3[#]	0.6	0.8[#]	0.9	0.8	1	0.7	0.5	1.1	-
Aug-08	1	0.5	0.7	0.6	0.5	1.9	0.8	1	1	0.9	1.4	-
Sep-08	0.6	1	1.3	0.7	0.6	0.9	0.6	0.9	0.9	0.9	1.8	-
Oct-08	1	0.5	1	1.3	1.3	1.2	1	1.4	0.8	1.6	1.8	-
Nov-08	0.8	1.4	2.7	2.5	0.9	1.2	0.8	2.4	1.1	1	1.7	-
Dec-08	0.4	0.4	0.6	0.5	0.3	1.1	0.6	15	0.9	0.7	1.2	-
Jan-09	1.1	3[#]	1.6	0.8	0.9	1.4	0.7	1.5	0.9	0.9	5[+]	-
Feb-09	0.4	4.4	1.5	1.1	0.9	1.6	0.8	1.2	1.4	2.5	1.2	-
Mar-09	2.8	5.8	2.7	2.4	1.9	2.1	2.5	2.4	2.3	5.7	2.7	-
Apr-09	2	0.8	0.8	0.6	0.6	3.2	1.1	1.1	1	0.6	0.9	-
May-09	0.6	1.6	0.8	2.4	0.9	5.6 [+]	1.4	1.1	1.3	0.7	1.5	-
Jun-09	0.4	1.3	0.8	0.5	0.5	3.3	0.9	0.6	1	3.4	0.7	-
Jul-09	0.2	1.0	0.6	0.4	0.3	3.8	0.5	0.6	0.6	0.3	0.6	-
Aug-09	0.8	3.6	0.8	1.2	1.0	1.8	0.8	1.8	1.3	0.8	1.0	-
Sep-09	1.0	1.8[#]	1.8	8.3 [+]	1	1.8	0.9[#]	1.8[#]	1.7[#]	0.7	1.4[#]	-
Oct-09[+]	4.3	9[#]	5.2[#]	11.3[#]	3.2	3.8[#]	2.4[#]	6.8[#]	3.0[#]	2.2	3.2[#]	5.7[#]
Nov-09	0.8[#]	1.7[#]	1.4[#]	1.3[#]	0.7[#]	2.1[#]	1.3[#]	8.0[#]	*	1.0[#]	*	2.3
Dec-09	1.4[#]	4.0[#]	1.6[#]	2.4[#]	1.7[#]	1.8	1.6	2.6[#]	1.7[#]	1.7[#]	2.2[#]	1.7
Jan-10	0.6[#]	0.8[#]	5.6[#]	1.2[#]	2.4[#]	1.2[#]	0.8[#]	1.4[#]	1.3[#]	0.8[#]	1.3[#]	1.1[#]
Feb-10	1.9[#]	11.3[+]	1.9[#]	1.4[#]	1.5[#]	1.1[#]	1.2[#]	1.6[#]	1.1[#]	0.8[#]	1.8[#]	1.3[#]

[#] - sample contaminated

+ - sample invalid

**Broken funnel*

[Note: Samples for October 2009 have been considered invalid, due to a widespread dust storm experienced on 23rd September 2009.]

APPENDIX B

Figures

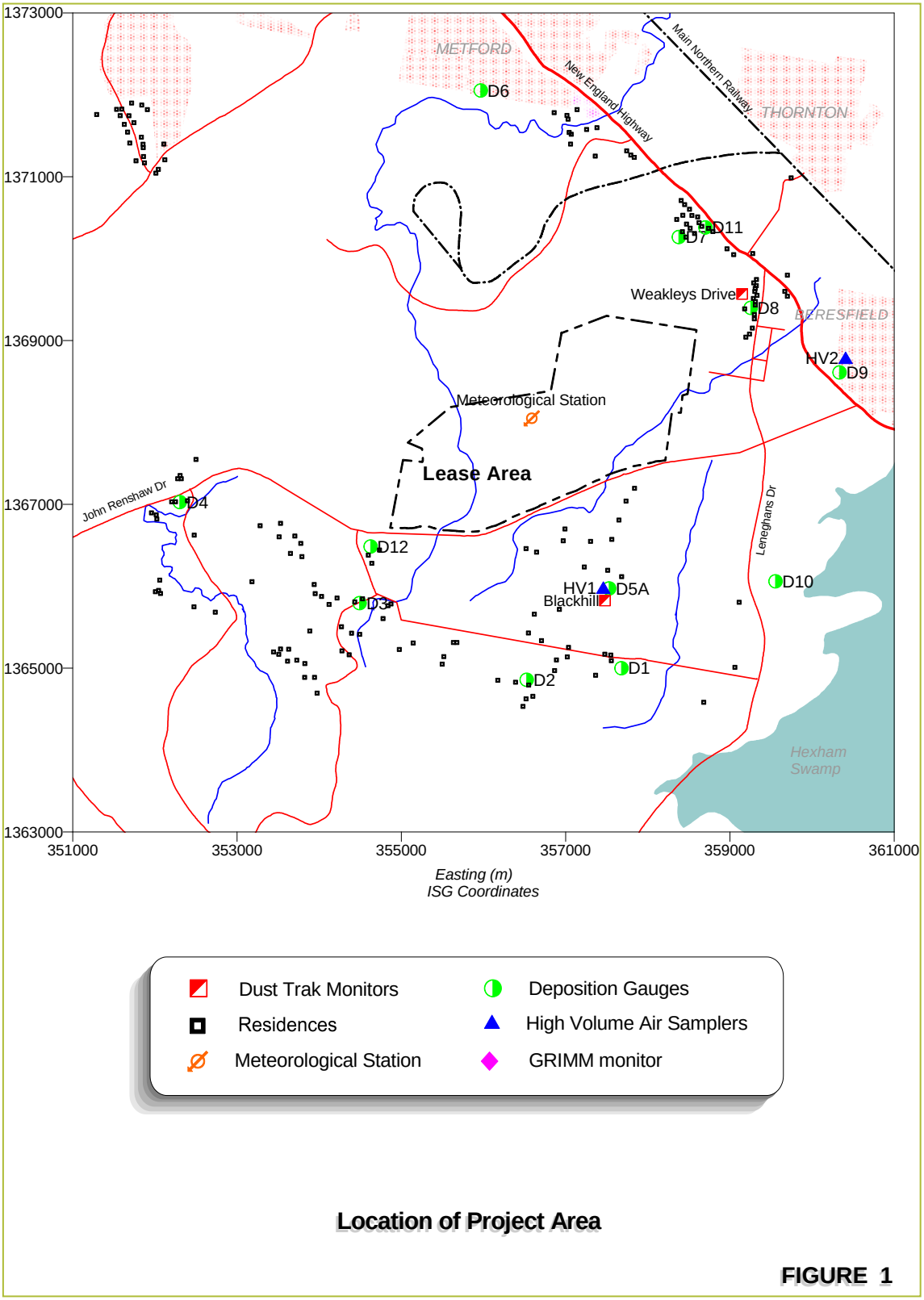

Figure 1: Project Location

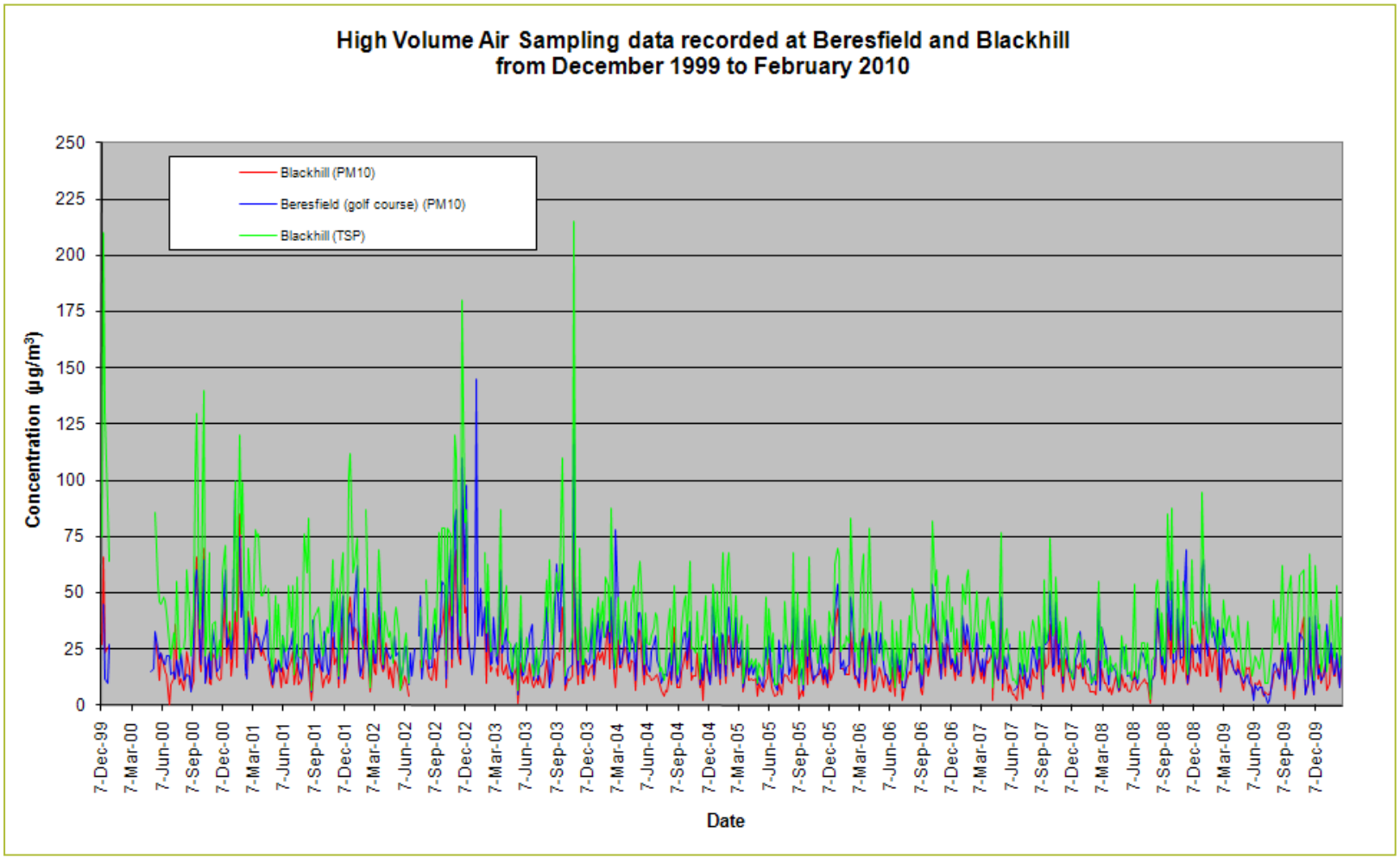

Figure 2: High Volume Air Sampling data

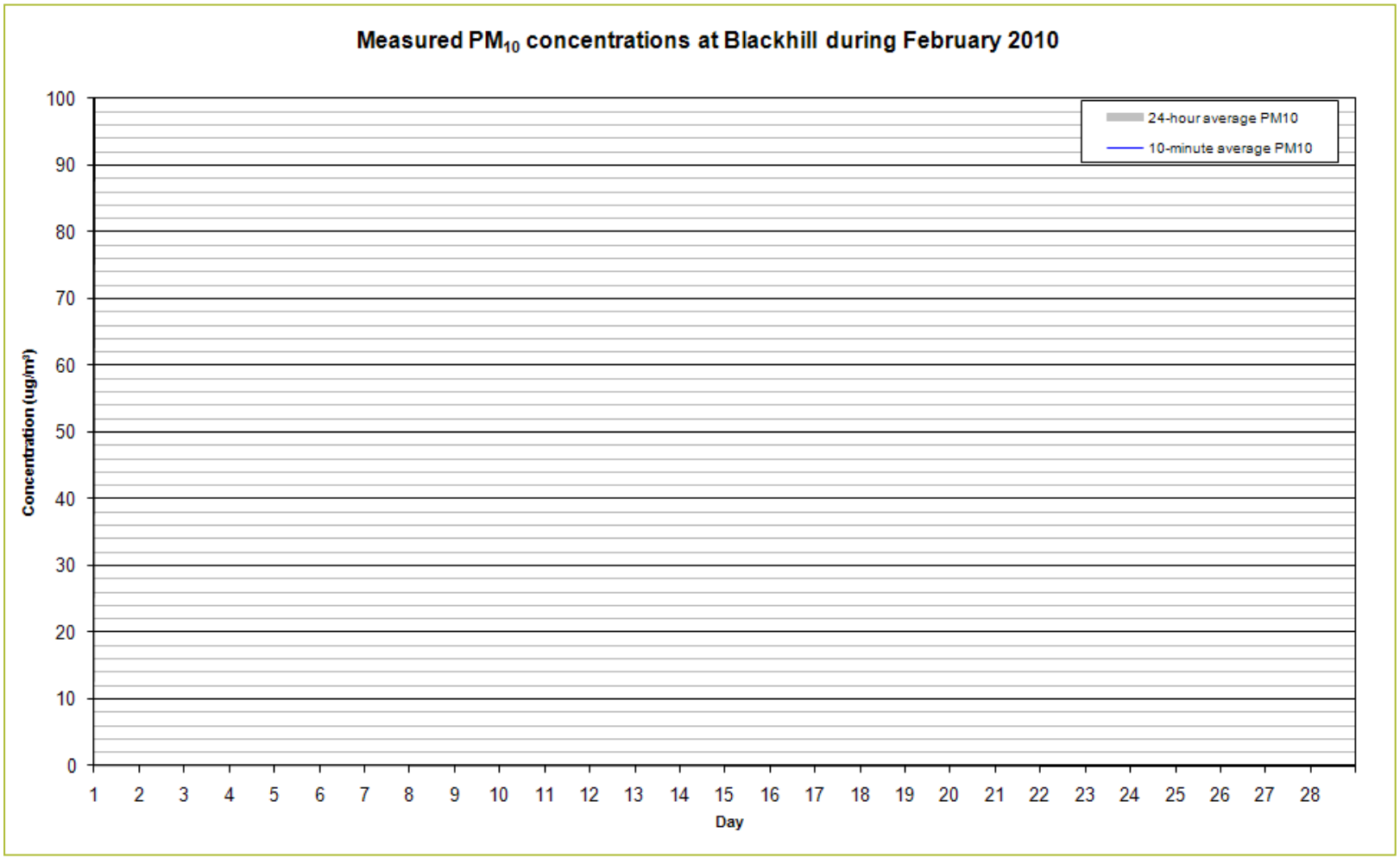

Figure 3: DustTrak sampling data, Blackhill site

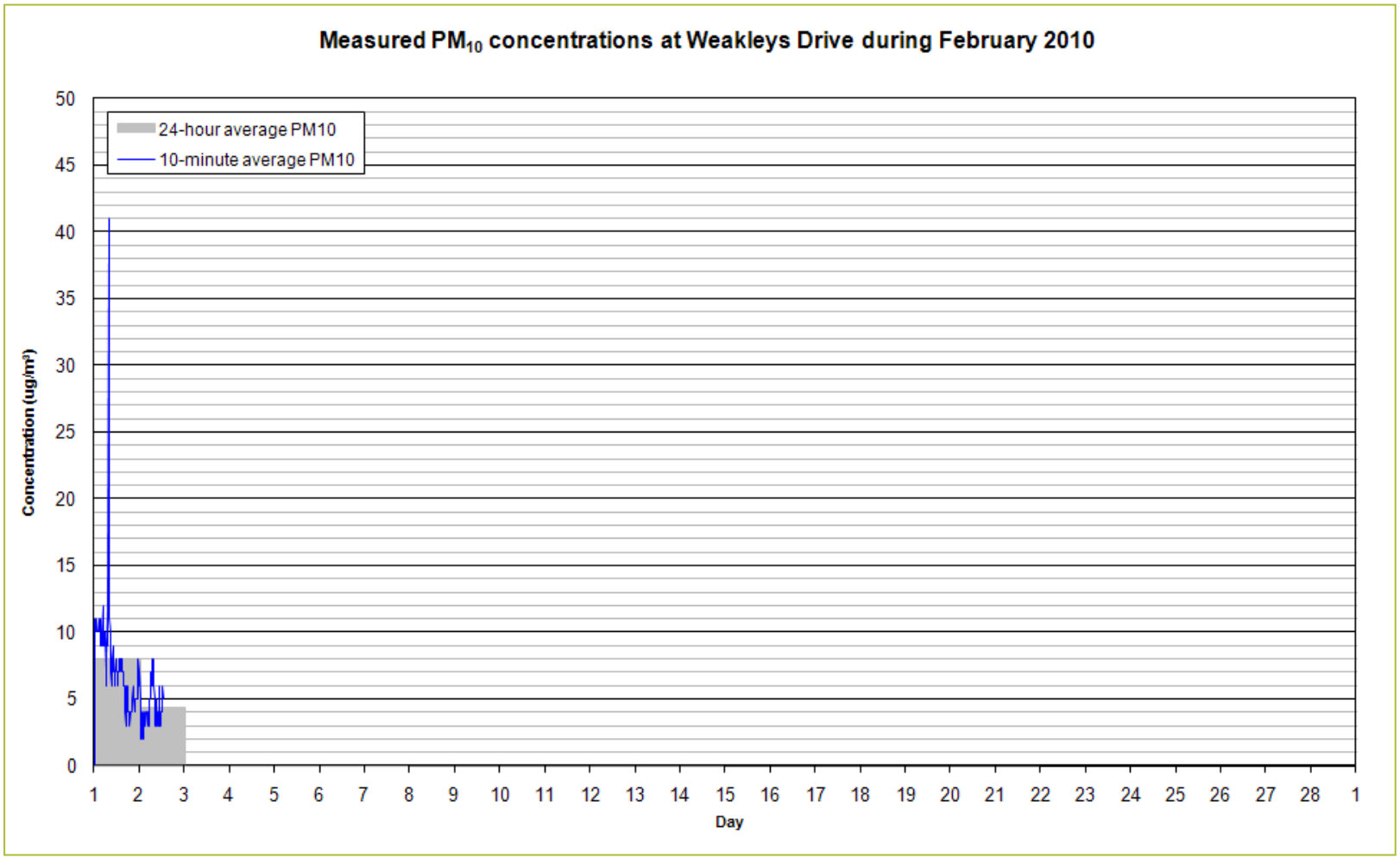

Figure 4: DustTrak sampling data, Weakleys Drive site

No $PM_{2.5}$ monitoring was scheduled for February 2010

Figure 5: DustTrak $PM_{2.5}$ monitoring data

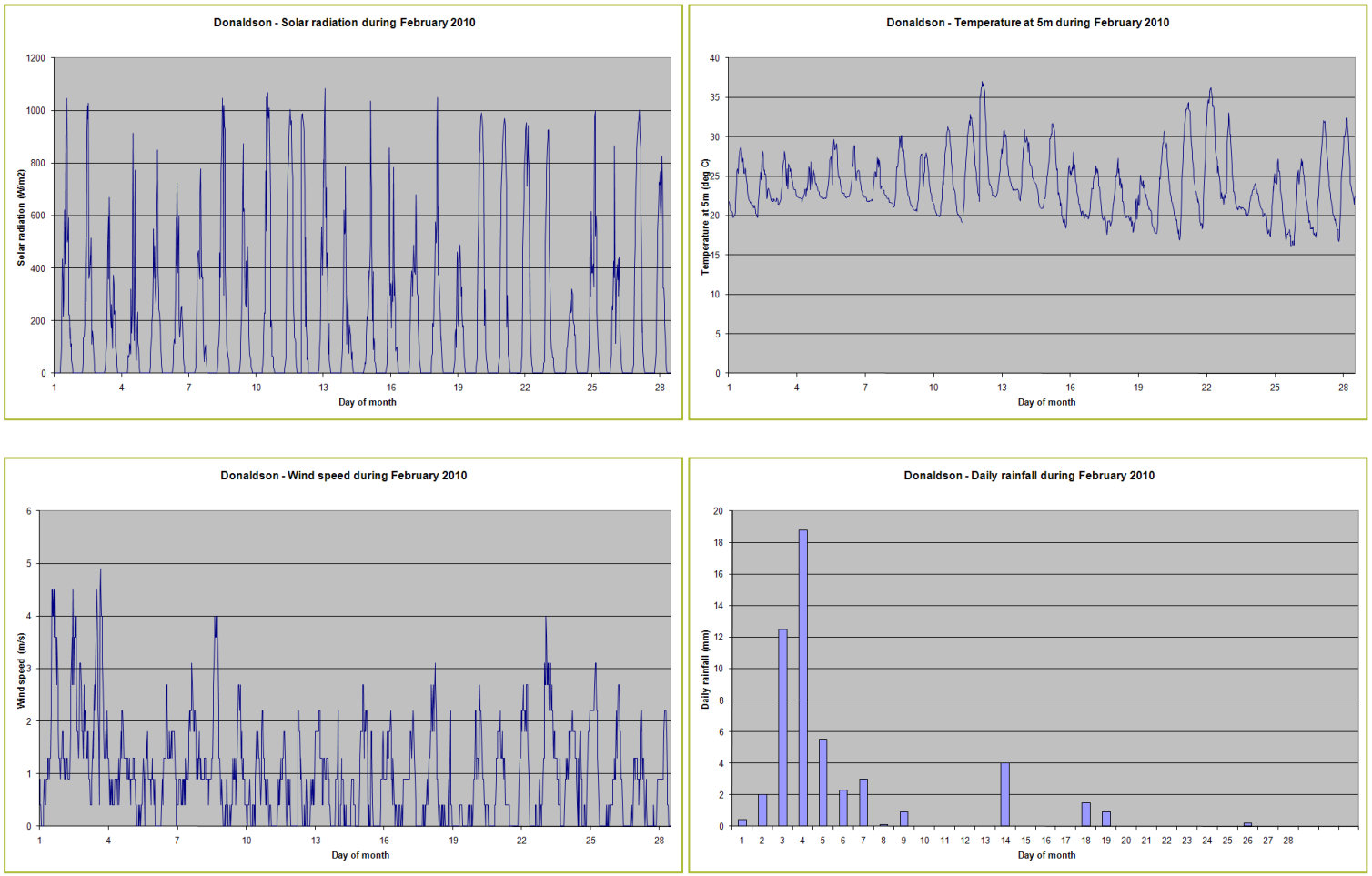

Figure 6: Meteorological conditions

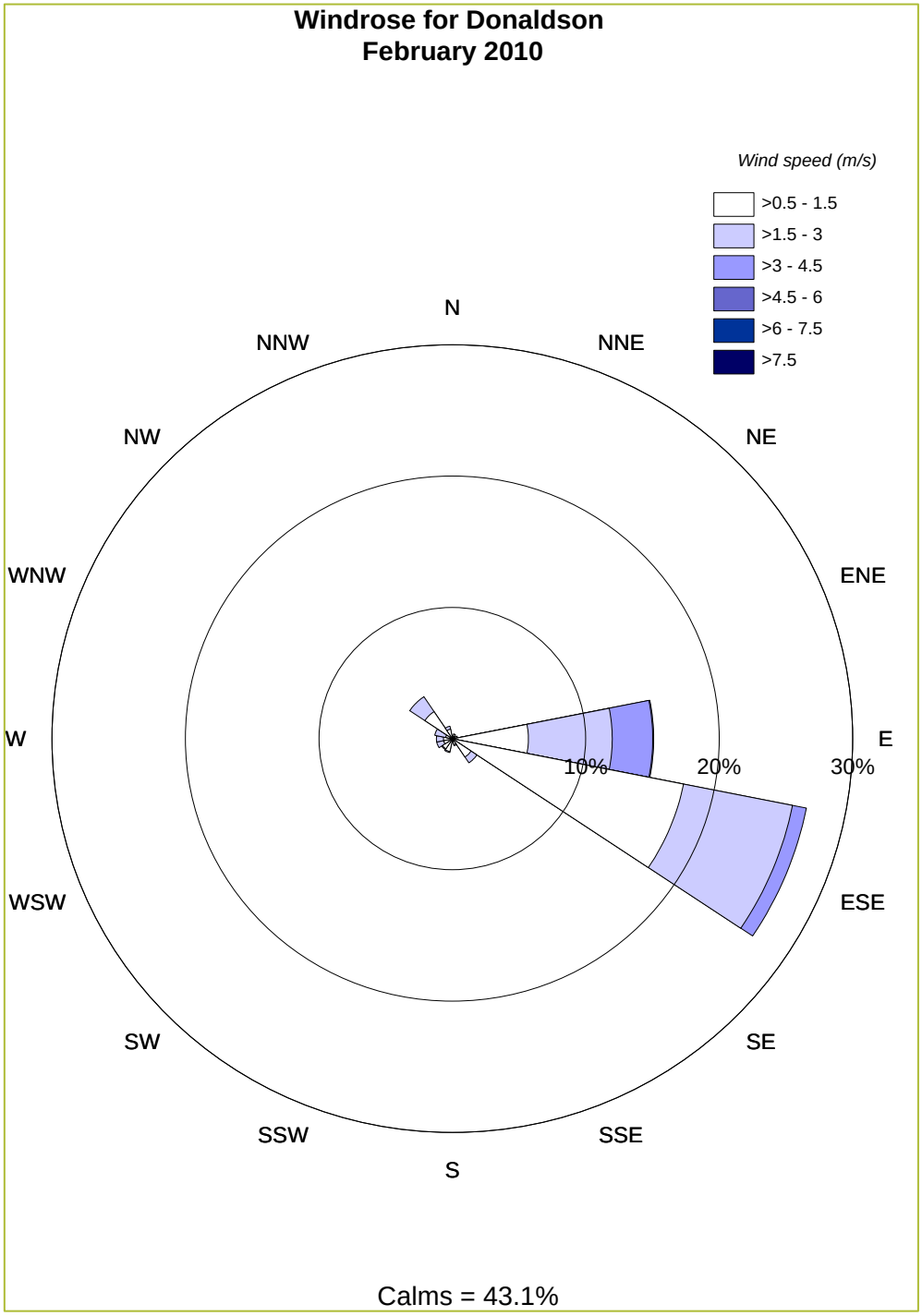

Figure 7: Windrose

DONALDSON MONITORING

DUST AND METEOROLOGICAL DATA
MARCH 2010 REPORT

Donaldson Coal

Job No: **3003**

18 June 2010

PROJECT TITLE:	**DUST AND METEOROLOGICAL DATA MARCH 2010 REPORT**
JOB NUMBER:	**3003**
PREPARED FOR:	Phil Brown **DONALDSON COAL**
PREPARED BY:	Philip Henschke
QA PROCEDURES CHECKED BY:	Ronan Kellaghan
APPROVED FOR RELEASE BY:	Aleks Todoroski
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VERSION	DATE	PREPARED BY	REVIEWED BY
V1	18/06/2010	Philip Henschke	Ronan Kellaghan

Queensland Environment Pty Ltd trading as
PAEHolmes ABN 86 127 101 642

SYDNEY:
Suite 2B, 14 Glen Street
Eastwood NSW 2122
Ph: +61 2 9874 8644
Fax: +61 2 9874 8904

BRISBANE:
Level 1, La Melba, 59 Melbourne Street South Brisbane Qld 4101
PO Box 3306 South Brisbane Qld 4101
Ph: +61 7 3004 6400
Fax: +61 7 3844 5858

Email: info@paeholmes.com

Website: www.paeholmes.com

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1 INTRODUCTION

As part of their Air Quality Management Plan Donaldson Coal operate a dust monitoring network in the vicinity of the mining lease and a meteorological station on site. This report has been prepared in order to bring together the various data collected throughout the network during March 2010 and to summarise the information.

The dust network includes continuous monitoring, high volume air sampling and dust deposition monitoring. The continuous monitoring network consists of two DustTrak monitors measuring PM_{10} at two sites and an additional DustTrak monitor which is used for one week each quarter to measure $PM_{2.5}$.

There are two locations which use high volume air samplers to determine concentrations of PM_{10} and TSP. These operate on a six-day cycle in line with similar measurements made by the NSW Department of Environment, Climate Change and Water (DECCW) at other locations throughout the state.

In addition to concentration measurements, monthly levels of dust deposition are also measured using twelve gauges placed at various locations in the area of the mine. The locations of each of these monitors and gauges are shown in Figure 1.

Table 1 lists the monitors used and pollutants measured at these locations.

Table 1: Summary of monitoring locations and instruments

Monitoring Location	Instruments Used	Pollutant Monitored
Beresfield	HVAS	PM_{10}
Blackhill	HVAS	PM_{10}
	HVAS	TSP
	DustTrak	PM_{10}
	DustTrak (1 week per quarter)	$PM_{2.5}$
Weakleys Drive	DustTrak	PM_{10}
DG1 – DG12	Deposition Gauges	Dust Deposition

The meteorological station is situated at the site of the office buildings and measures the following parameters:

- wind speed
- wind direction
- temperature
- solar radiation
- rainfall

The data are downloaded at various intervals by Donaldson and then forwarded to PAEHolmes for processing.

2 HIGH VOLUME AIR SAMPLING

High Volume Air Sampling (HVAS) was carried out at Beresfield and Blackhill by Metford Laboratories. PM_{10} is measured at both sites while TSP is only measured at Blackhill. The data collected during March 2010 are summarised in **Table 2**. A graph consisting of all the data collected to date is shown in Figure 2.

Table 2: HVAS data from Beresfield and Blackhill for March 2010

Date	Beresfield PM_{10} ($\mu g/m^3$)	Blackhill PM_{10} ($\mu g/m^3$)	Blackhill TSP ($\mu g/m^3$)
2/03/2010	10	8	18
8/03/2010	10	10	32
14/03/2010	5	1	7
20/03/2010	24	23	40
26/03/2010	23	22	50
Annual average	**15**	**13**	**41**

These measurements will include all background sources relevant to that location, including contributions from the Donaldson mining operations.

On the days that the instruments were monitoring, the highest 24-hour average PM_{10} concentration recorded in March 2010 was 24 $\mu g/m^3$. This value was measured on the 20th at the Beresfield site. On this occasion the measured PM_{10} concentration did not exceed the 50 $\mu g/m^3$ 24-hour DECCW goal.

TSP measurements from the Blackhill site show that concentrations were below the DECCW 90 $\mu g/m^3$ annual average TSP goal. It should be noted that the DECCW goal refers to an annual average and not a 24-hour average as measured by the high volume air sampler. The annual average TSP concentration for the 12 months to March 2010 was 41 $\mu g/m^3$.

Figure 2 shows a seasonal trend in PM_{10} concentrations, peaking during the warmer months and decreasing during autumn and winter. This is a common trend and is seen consistently in the Hunter Valley.

The annual average PM_{10} concentrations for Beresfield and Blackhill were 15 $\mu g/m^3$ and 13 $\mu g/m^3$ respectively for the 12 months to March 2010. These values are below the DECCW's annual average PM_{10} air quality criterion of 30 $\mu g/m^3$.

3 CONTINUOUS MONITORING

3.1 DustTrak Monitoring at Blackhill

Figure 3 shows a time series of the PM_{10} data collected from the DustTrak monitor at the Blackhill site. During the month of March, the DustTrak monitor located at the Blackhill site experienced a power failure. As a result DustTrak monitoring for the Blackhill site is available from 2nd to the 28th of March 2010.

Of the available data, the measured 24-hour average PM_{10} concentrations were below the DECCW goal of 50 $\mu g/m^3$. The maximum 24-hour average PM_{10} concentration was recorded on the 28th of March at 48.7 $\mu g/m^3$.

The data shows some strange peaking trends occurring during the hours of 8:00 am to 9:00 am. The cause of these events has not been determined and need to be investigated. The DustTrak has since been replaced to be recalibrated.

3.2 DustTrak Monitoring at Weakleys Drive

A time series of the PM_{10} data collected from the Weakleys Drive site is shown in Figure 4. The DustTrak monitor located at the Weakleys Drive site experienced a power failure at the beginning of the month and was restarted on the 2nd of March. The DustTrak monitoring for the Weakleys Drive site is available from the 2nd to 31st of March.

Of the available data, the measured 24-hour average PM_{10} concentrations were below the DECCW goal of 50 $\mu g/m^3$ with the exception of the 27th of March. On this day the recorded 24-hour average PM_{10} concentration was 113.5 $\mu g/m^3$.

A review of the data recorded by the DustTrak monitor on this day show the cause of this exceedence was due to a spiking of the measured data with a peak value of 2240 $\mu g/m^3$ occurring at 3:40 am in the morning. It is unlikely that this measurement was a direct result of activities occurring at Donaldson. The possible cause of this exceedence may be due to wood smoke from a chimney or excessive moisture. The DustTrak has since been calibrated in the field.

The maximum 24-hour average PM_{10} concentration was recorded on the 28th of March at 38.8 $\mu g/m^3$.

3.3 DustTrak $PM_{2.5}$ Monitoring at BlackHill

No $PM_{2.5}$ monitoring was scheduled for March 2010.

4 DUST DEPOSITION MONITORING

Dust deposition monitoring is carried out each month via a network consisting of twelve (12) gauges. The results for March 2010 are shown in **Table 3**, in conjunction with results for the previous eleven months in order to provide an annual average for that period. A table showing the complete data set from July 2000 in provided in **Appendix A**.

Table 3: Dust deposition monitoring for the 12-month period to March 2010

Month	Monthly dust deposition rate (g/m^2/month)											
	DG1	**DG2**	**DG3**	**DG4**	**DG5A**	**DG6**	**DG7**	**DG8**	**DG9**	**DG10**	**DG11**	**DG12**
Apr-09	2.0 #	0.8 #	0.8 #	0.6 #	0.6 #	3.2 #	1.1 #	1.1 #	1.0 #	0.6	0.9 #	-
May-09	0.6 #	1.6 #	0.8 #	2.4	0.9 #	5.6 +	1.4 #	1.1	1.3	0.7 #	1.5 #	-
Jun-09	0.4	1.3 #	0.8	0.5	0.5	3.3 #	0.9	0.6 #	1.0	3.4 #	0.7	-
Jul-09	0.2	1.0 #	0.6	0.4	0.3	3.8 #	0.5	0.6	0.6	0.3	0.6	-
Aug-09	0.8#	3.6#	0.8#	1.2#	1.0#	1.8#	0.8#	1.8	1.3#	0.8#	1.0	-
Sep-09	1.0	1.8#	1.8	8.3#	1	1.8	0.9#	1.8#	1.7#	0.7	1.4#	-
Oct-09	4.3	9#	5.2#	11.3#	3.2	3.8#	2.4#	6.8#	3#	2.2	3.2#	5.7#
Nov-09	0.8#	1.7#	1.4#	1.3#	0.7#	2.1#	1.3#	8.0#	*	1.0#	*	2.3#
Dec-09	1.4#	4.0#	1.6#	2.4#	1.7#	1.8	1.6	2.6#	1.7#	1.7#	2.2#	1.7
Jan-10	0.6#	0.8#	5.6#	1.2#	2.4#	1.2#	0.8	1.4	1.3#	0.8#	1.3#	1.1#
Feb-10	1.9#	11.3+	1.9#	1.4#	1.5#	1.1#	1.2#	1.6#	1.1#	0.8#	1.8#	1.3#
Mar-10	0.6#	0.6#	3.2#	1#	4.1#	0.6#	0.6#	1.2	0.6	0.2#	0.8#	1.1#
Annual Average	**0.9**	**2.6**	**1.8**	**1.9**	**1.3**	**2.4**	**1.0**	**2.0**	**1.2**	**1.0**	**1.2**	**-**

*Data supplied by Metford Laboratories. # Insects/bird droppings reported. +Invalid. * No recording, funnel damaged.*

The highest dust deposition measurement recorded in March 2010 was 4.1 g/m^2/month at DG5A. The accompanying laboratory report showed the sample was contaminated with insects and bird droppings and the sample contained a high organic content.

Readings considered invalid have been removed when calculating the annual average. The annual average deposition rates for the gauges in the network were low and significantly below the goal of 4 g/m^2/month, indicating nuisance dust in the vicinity of the mine is not an issue.

5 METEOROLOGICAL MONITORING

Monthly plots of the wind speed, temperature, solar radiation, and rainfall data collected in March 2010 are shown in Figure 6 and a windrose plot is shown in Figure 7.

The graphs shown in Figure 6 indicate that the instruments were recording appropriately. Data maxima and minima all appeared to be sensible for this site during March. Total rainfall for the month was 83.9 mm.

A windrose (see Figure 7) created from the available 30-minute average wind data shows that winds were predominantly from the east-southeast. The site recorded calms (wind speed less than or equal to 0.5 m/s) for approximately 50.5% of the time. The relatively large fraction of clam winds may arise from the generally forested area and the specific location of the weather station.

APPENDIX A

Dust Deposition Data

Dust deposition (g/m²/month)												
Month	D1	D2	D3	D4	D5A	D6	D7	D8	D9	D10	D11	D12
May-00	0.4	0.4	-	0.7	0.9	0.6	3.6	1.6	0.5	1.8	-	-
Jun-00	0.7	0.5	0.5	0.7	0.8	0.4	3.8	3.2	0.5	0.7	-	-
Jul-00	0.4	0.4	0.5	0.7	0.8	0.5	0.8	1.5	0.4	0.4	-	-
Aug-00	0.9	0.6	1.0	1.2	1.1	1.0	3.4	0.7	0.7	0.6	-	-
Sep-00	0.8	0.9	1.1	0.9	1.3	1.0	2.2	1.0	1.0	0.8	-	-
Oct-00	0.4	0.6	1.1	0.9	0.9	0.8	5.3	0.9	0.6	0.5	-	-
Nov-00	5.2	0.7	1.4	0.8	1.0	0.4	24.1	9.4	1.1	0.6	-	-
Dec-00	2.8	1.4	1.9	1.3	1.1	0.8	2.1	2.5	0.9	0.9	-	-
Jan-01	0.7	1.7	1.4	1.8	0.7	1.3	1.1	2.4	1.1	0.6	-	-
Feb-01	0.9	3.1	2.0	0.5	0.9	0.7	0.7	6.7	1.3	0.5	1.0	-
Mar-01	0.8	2.1	1.3	0.6	0.7	0.6	0.6	5.5	0.6	0.6	1.5	-
Apr-01	0.8	0.7	1.3	0.5	0.7	0.4	0.3	5.1	0.7	0.6	0.8	-
May-01	0.2	0.2	0.4	0.4	0.3	0.3	0.6	1.8	0.6	0.8	0.9	-
Jun-01	0.5	0.4	0.5	1.0	1.0	0.4	0.4	8.8	0.7	0.6	0.6	-
Jul-01	0.5	0.3	1.8	0.5	0.8	-	16.3	4.9	0.9	0.7	0.7	-
Aug-01	0.4	0.4	0.8	0.8	1.0	1.7	1.0	-	1.0	1.8	1.1	-
Sep-01	0.7	1.0	1.7	1.1	1.7	0.7	-	6.0	1.1	1.3	1.7	-
Oct-01	1.1	0.6	4.6	0.9	0.7	0.9	1.2	1.9	0.9	0.6	1.7	-
Nov-01	0.9	1.0	1.1	1.1	0.8	1.1	6.0	5.5	1.3	1.9	2.3	-
Dec-01	4.9	0.9	4.2	0.9	1.3	1.9	1.2	3.1	1.2	9.7	1.8	-
Jan-02	0.8	1.0	1.5	1.3	1.1	1.4	1.3	1.5	1.1	0.9	1.5	-
Feb-02	1.1	1.1	0.9	0.3	0.4	0.5	3.1	5.1	0.5	0.5	0.9	-
Mar-02	1.7	2.1	1.6	0.7	0.7	0.8	1.0	18	1.0	0.9	1.7	-
Apr-02	1.0	0.4	1.0	0.8	0.8	0.6	0.9	10.1	0.5	0.7	1.0	-
May-02	0.6	0.6	6.0	0.7	0.4	1.2	0.9	3.1	0.7	0.2	1.0	-
Jun-02	1.4	0.4	1.7	0.6	0.5	0.8	0.6	2.1	0.6	0.5	1.0	-
Jul-02	0.7	0.7	-	0.8	0.8	0.7	1.2	-	1.1	0.5	1.0	-
Aug-02	1.3	0.8	1.4	1.2	1.1	1.2	1.5	-	1.5	0.9	1.6	-
Sep-02	0.5	1.2	1.1	0.8	0.5	0.7	5.1	9.3	1.6	0.6	1.0	-
Oct-02	2.2	1.4	5.2	1.5	1.5	1.4	1.4	3.4	-	1.5	3.1	-
Nov-02	2.8	1.8	3.7	1.6	0.1	1.8	2.1	3.5	2.1	2	1.9	-
Dec-02	2.0	-	2.5	1.5	3.0	1.5	1.8	4.1	1.6	1.2	1.9	-
Jan-03	2.1	1.5	2.7	1.5	1.0	1.9	2.2	2.5	1.1	1.0	1.6	-
Feb-03	1.4	1.1	2.6	1.1	0.9	1.2	1.7	5.9	1.2	1.0	1.5	-
Mar-03	0.8	0.5	1.2	1.2	0.6	2.1	1.5	3.4	-	3.6	9.5	-
Apr-03	0.5	1.0	0.6	1.0	0.7	0.5	1.1	8.0	-	2.0	1.0	-
May-03	0.5	0.4	0.6	0.2	0.2	0.6	1.3	1.6	0.5	0.8	1.2	-
Jun-03	0.5	0.6	0.8	0.8	0.4	0.6	0.8	0.7	0.9	0.7	0.7	-
Jul-03	0.3	0.4	0.4	0.6	0.4	0.5	0.7	0.5	0.5	0.5	0.7	-
Aug-03	0.8	0.2	0.7	1.1	0.5	1.3	1.8	2.1	1.3	0.7	0.9	-
Sep-03	0.6	0.7	1.1	0.7	0.8	1.7	1.4	1.3	2.5	0.9	1.3	-
Oct-03	-	0.9	1.4	0.9	0.7	1.9	1.0	1.4	0.6	0.8	1.3	-
Nov-03	2.6	0.8	1.0	1.1	0.4	1.3	1.5	1.5	-	0.8	1.3	-
Dec-03	1.0	1.0	1.4	1.3	1.1	1.5	1.6	2.0	1.8	0.9	1.4	-
Jan-04	8.5	1.5	2.1	1.5	1.3	2.6	1.4	2.2	1.7	1.5	1.7	-
Feb-04	1.2	1.0	1.7	1.4	0.7	3.1	1.6	2.2	-	1.5	2.3	-

Mar-04	0.4	0.6	6.6	1.2	0.7	1.9	1.1	12.1	4.8	1.5	1.1	-
Apr-04	0.6	1.0	0.8	0.8	0.6	1.9	0.8	1.4	0.9	1.2	1.1	-
May-04	0.2	0.9	2.2	0.9	0.8	0.7	0.9	1.4	1.2	0.9	1.5	-
Jun-04	0.4	0.6	0.7	0.9	0.6	1.4	1.0	0.9	1.0	1.0	0.8	-
Jul-04	0.4	0.6	5.3#	0.6	0.5	2.9	1.0	1.1	0.9	0.6	1.2	-
Aug-04	0.5	0.5	0.5	1.3	0.7	1.1	1.1	1.4	-	1.0	1.0	-
Sep-04	0.6	0.6	0.8	2.2	1.0	1.0	0.9	4.4	0.9	16.7	1.1	-
Oct-04	0.7	0.9	1.2	0.9	0.8	1.4	1.0	10.5	1.0	1.0	0.8	-
Nov-04	0.8	0.7	1.3	1.9	0.7	0.9	1.0	3.0	1.1	1.1	1.6	-
Dec-04	2.0	1.4	3.6	1.5	1.3	2.2	3.2	7.9	1.8	5.5	2.5	-
Jan-05	1.2	1.0	3.7	1.6	1.4	4.0	2.3	2.7	2.6	2.5	2.8	-
Feb-05	1.2	1.2	1.8	1.6	1.3	2.0	1.7	-	2.3	1.5	2.3	-
Mar-05	1.3	0.9	1.4	0.9	0.9	3.0	1.2	7.7	-	0.8	1.3	-
Apr-05	1.1	0.7	0.9	0.8	0.7	0.9	1.4	3.3	1.1	0.8	0.9	-
May-05	0.7	8.6	1.1	0.8	0.7	0.8	0.9	4.4	1.2	0.8	1.1	-
Jun-05	1.3	0.8	1.3	1.3	0.8	1.2	1.2	1.3	1.5	2.5	0.9	-
Jul-05	1.0	0.5	0.5	0.7	0.4	1.6	0.7	1.2	0.8	4.3	1.1	-
Aug-05	0.6	0.6	0.8	1.0	0.8	0.9	0.7	1.0	0.9	1.0	0.9	-
Sep-05	0.6	0.7	0.8	0.7	0.7	1.2	1.3	1.3	1.0	0.9	1.1	-
Oct-05	0.8	0.9	1.3	0.9	0.8	1.4	1.2	1.9	1.3	1.1	1.3	-
Nov-05	-	2.3	2.3	2.0	1.7	1.2	2.0	3.2	1.6	1.4	2.2	-
Dec-05	1.9	3.2	2.3	3.3	2.6	3.4	2.3	-	1.3	2.1	3.9	-
Jan-06	1.0	2.1	1.7	1.0	23.	3.5	-	2.7	1.1	-	1.5	-
Feb-06	2.2	1.0	0.9	1.2	1.1	1.7	1.1	2.9	-	2.3	1.8	-
Mar-06	0.7	0.6	2.3	0.7	0.6	0.9	1.0	1.4	0.7	0.8	1.5	-
Apr-06	0.6	0.7	1.1	0.8	0.6	1.1	0.8	1.0	1.0	1.8	1.5	-
May-06	1.0	3.1	1.0	-	1.1	1.4	1.1	4.1	-	7.0	1.5	-
Jun-06	0.4	0.3	0.7	0.5	0.4	0.6	0.7	0.8	0.6	0.9	0.9	-
Jul-06	0.3	0.3	1	1.3	0.4	0.7	0.7	2.7	-	0.6	0.6	-
Aug-06	0.9	0.6	0.8	0.7	0.7	0.8	0.7	1.7	-	3.7	0.9	-
Sep-06	1.6	0.7	1.1	1.7	0.7	1	0.9	1.3	1.2	0.8	1.6	-
Oct-06	2	1.4	1.6	1.8	0.9	1.8	1.2	1.8	1.5	1.8	1.9	-
Nov-06	4.3	2.2	3	2.3	2.3	5.3	2.4	3.3	2.3	2.3	2.9	-
Dec-06	1.2	3.4	1.9	2.3	2.3		2.1	2.1		4.9	3.9	-
Jan-07	2	0.9	1.5	0.7	0.7	1.7	1.1		1.2	1.7	0.9	-
Feb-07	1.7	0.9	1.6	0.7	0.6	1	1.8	1.7	1.1	1.2	1.7	-
Mar-07	1.3	0.9	1.7	0.8	1.2	0.6	2.2	1.7	1	0.9	1.7	-
Apr-07	0.5	0.7	0.9	0.6	4.8	1.2	0.5	2.7	0.5	0.8	0.9	-
May-07	0.8	0.5	0.6	1.2	0.6	0.6	0.7	1.9	0.5	0.7	0.8	-
Jun-07	0.6	0.5	0.7	1.1	0.1	0.5	0.1	0.5	0.1	0.4	0.3	-
Jul-07	0.5	0.4	0.6	2.1	0.5	0.8	0.6	0.6	0.4	0.5	0.7	-
Aug-07	1.5	0.4	0.7	1	0.7	0.7	0.5	1	0.6	0.6	0.7	-
Sep-07	1.3	0.5	1.8	1	0.7	0.9	0.9	1.3	1	0.7	1.6	-
Oct-07	4.2	0.9	1.1	1.4	1.1	1.7	1.8	1.7	1.6	1.4	2.2	-
Nov-07	0.8	0.8	1.1	0.9	1.1	1.1	1.1	1.7	0.6	0.8	1.5	-
Dec-07	1.3	0.8	3	0.7	0.5	0.8	0.5	1.1	0.3	0.8	0.6	-
Jan-08	2.6	0.8	3.7	0.5	0.5	0.5	0.4	2.2	0.8	0.3	0.8	-

Feb-08	0.4	0.1	14	0.1	0.1	0.3	0.1	0.3	0.2	0.2	0.3	-
Mar-08	4.5	0.6	9.2[+]	0.6	2.9	2.1	0.6	1.5	0.5	1	0.9	-
April-08	0.4[#]	0.4[#]	0.8[#]	0.4[#]	0.4[#]	0.8[#]	1.1[#]	1.7[#]	1.2	1.1[#]	1.1[#]	-
May-08	1.1	2.4[#]	0.9	1.4	0.9	0.9	0.7	2.7	1[#]	1.1	1.3[#]	-
June-08	0.2	0.4[#]	0.1	0.5	0.1[#]	0.1	0.3	0.5[#]	0.1	0.8	0.2	-
July-08	0.4	0.7[#]	1.3[#]	0.6	0.8[#]	0.9	0.8	1	0.7	0.5	1.1	-
Aug-08	1	0.5	0.7	0.6	0.5	1.9	0.8	1	1	0.9	1.4	-
Sep-08	0.6	1	1.3	0.7	0.6	0.9	0.6	0.9	0.9	0.9	1.8	-
Oct-08	1	0.5	1	1.3	1.3	1.2	1	1.4	0.8	1.6	1.8	-
Nov-08	0.8	1.4	2.7	2.5	0.9	1.2	0.8	2.4	1.1	1	1.7	-
Dec-08	0.4	0.4	0.6	0.5	0.3	1.1	0.6	15	0.9	0.7	1.2	-
Jan-09	1.1	3[#]	1.6	0.8	0.9	1.4	0.7	1.5	0.9	0.9	5[+]	-
Feb-09	0.4	4.4	1.5	1.1	0.9	1.6	0.8	1.2	1.4	2.5	1.2	-
Mar-09	2.8	5.8	2.7	2.4	1.9	2.1	2.5	2.4	2.3	5.7	2.7	-
Apr-09	2	0.8	0.8	0.6	0.6	3.2	1.1	1.1	1	0.6	0.9	-
May-09	0.6	1.6	0.8	2.4	0.9	5.6 [+]	1.4	1.1	1.3	0.7	1.5	-
Jun-09	0.4	1.3	0.8	0.5	0.5	3.3	0.9	0.6	1	3.4	0.7	-
Jul-09	0.2	1.0	0.6	0.4	0.3	3.8	0.5	0.6	0.6	0.3	0.6	-
Aug-09	0.8	3.6	0.8	1.2	1.0	1.8	0.8	1.8	1.3	0.8	1.0	-
Sep-09	1.0	1.8[#]	1.8	8.3 [+]	1	1.8	0.9[#]	1.8[#]	1.7[#]	0.7	1.4[#]	-
Oct-09[+]	4.3	9[#]	5.2[#]	11.3[#]	3.2	3.8[#]	2.4[#]	6.8[#]	3.0[#]	2.2	3.2[#]	5.7[#]
Nov-09	0.8[#]	1.7[#]	1.4[#]	1.3[#]	0.7[#]	2.1[#]	1.3[#]	8.0[#]	*	1.0[#]	*	2.3
Dec-09	1.4[#]	4.0[#]	1.6[#]	2.4[#]	1.7[#]	1.8	1.6	2.6[#]	1.7[#]	1.7[#]	2.2[#]	1.7
Jan-10	0.6[#]	0.8[#]	5.6[#]	1.2[#]	2.4[#]	1.2[#]	0.8[#]	1.4[#]	1.3[#]	0.8[#]	1.3[#]	1.1[#]
Feb-10	1.9[#]	11.3[+]	1.9[#]	1.4[#]	1.5[#]	1.1[#]	1.2[#]	1.6[#]	1.1[#]	0.8[#]	1.8[#]	1.3[#]
Mar-10	0.6[#]	0.6[#]	3.2[#]	1[#]	4.1[#]	0.6[#]	0.6[#]	1.2	0.6	0.2[#]	0.8[#]	1.1[#]

[#] *- sample contaminated*

+ - sample invalid

**Broken funnel*

[Note: Samples for October 2009 have been considered invalid, due to a widespread dust storm experienced on 23rd September 2009.]

APPENDIX B

Figures

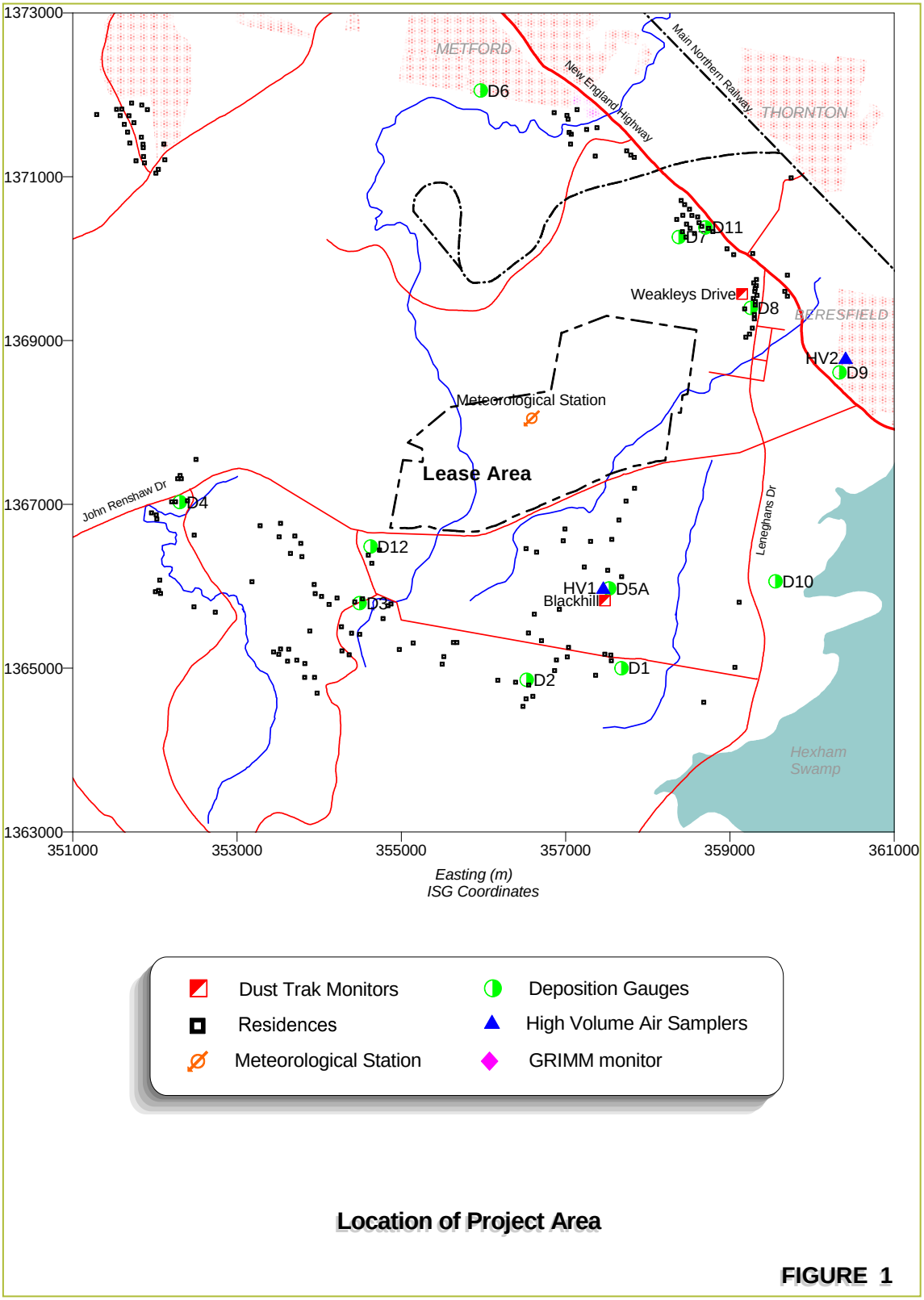

Figure 1: Project Location

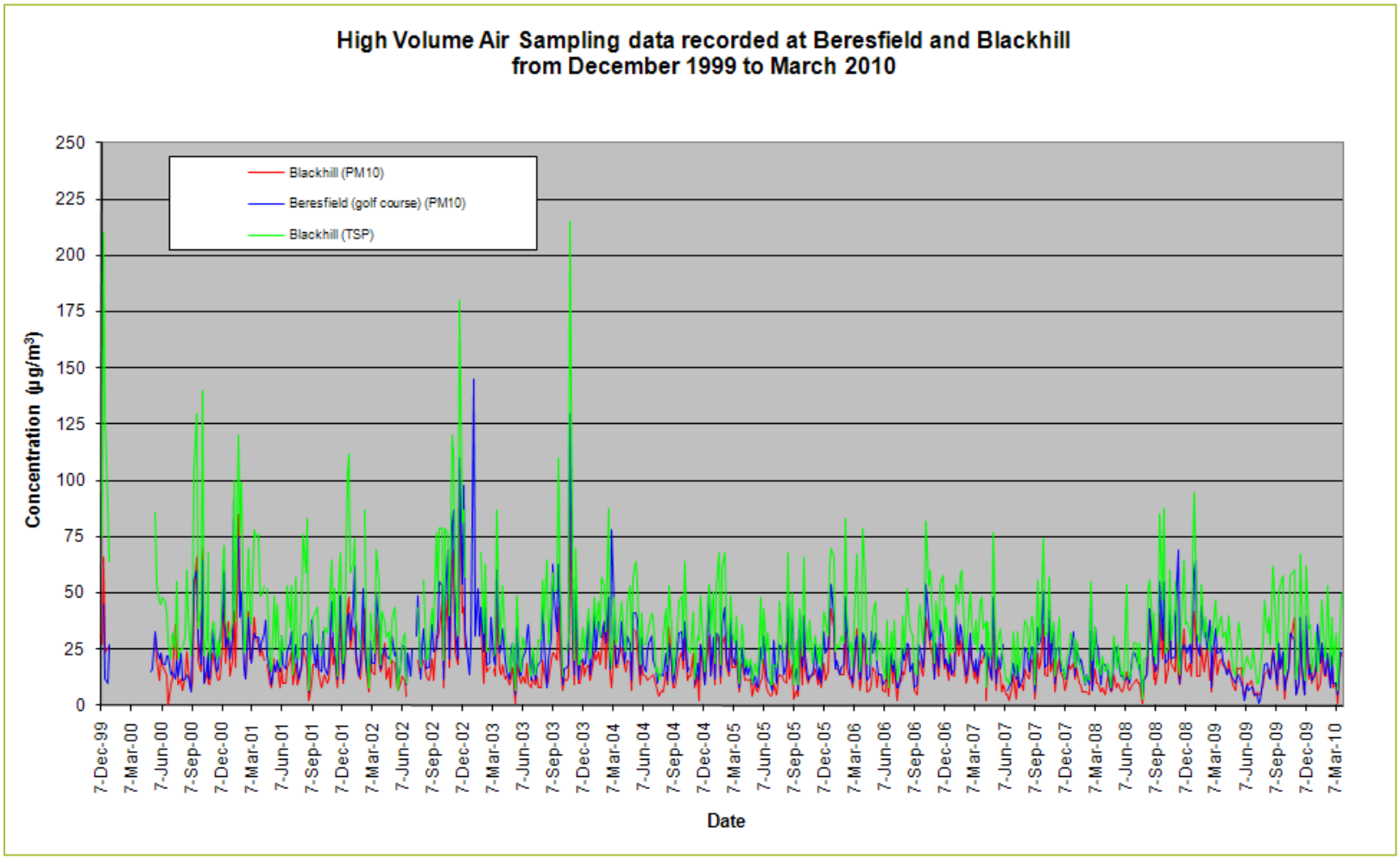

Figure 2: High Volume Air Sampling data

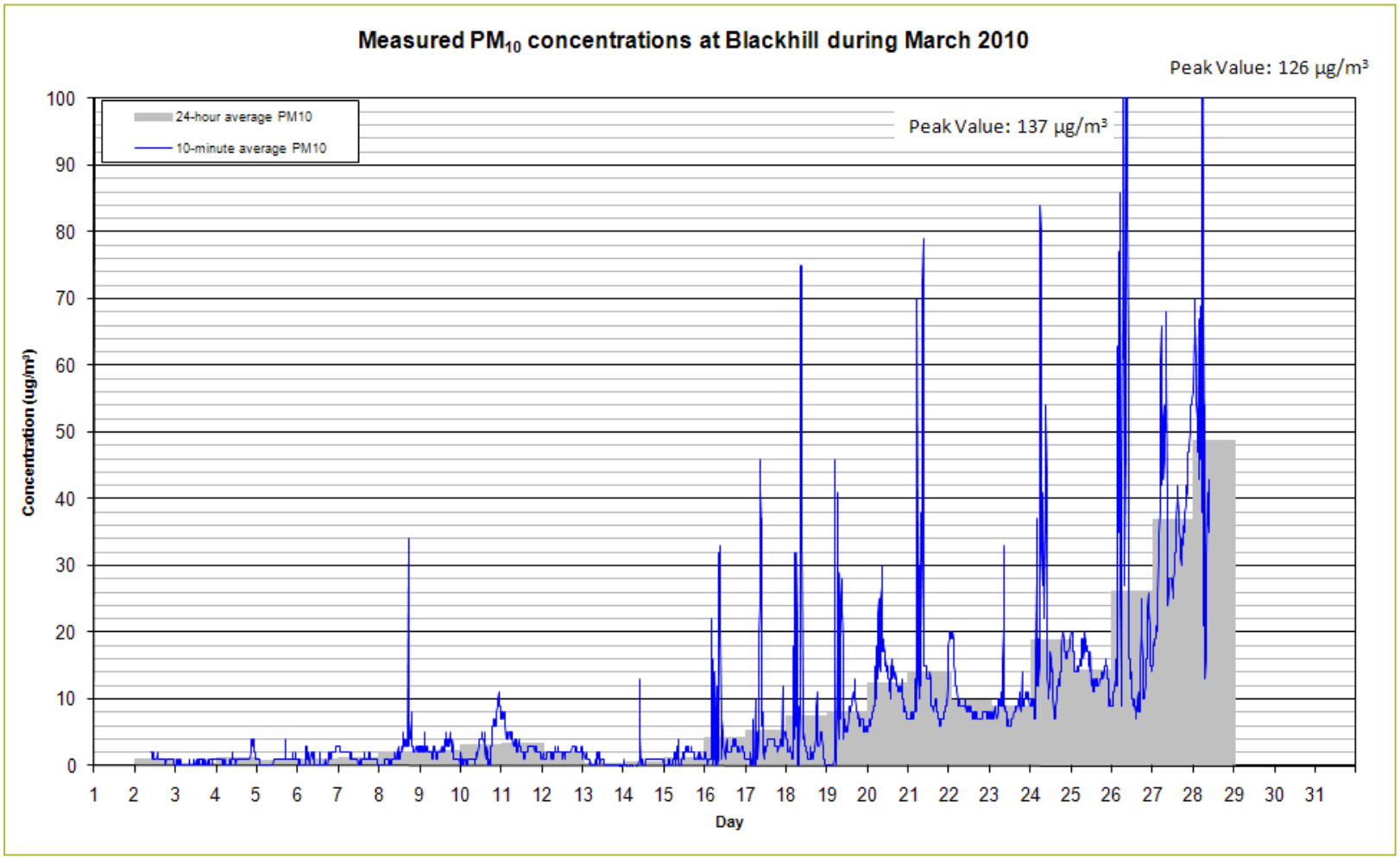

Figure 3: DustTrak sampling data, Blackhill site

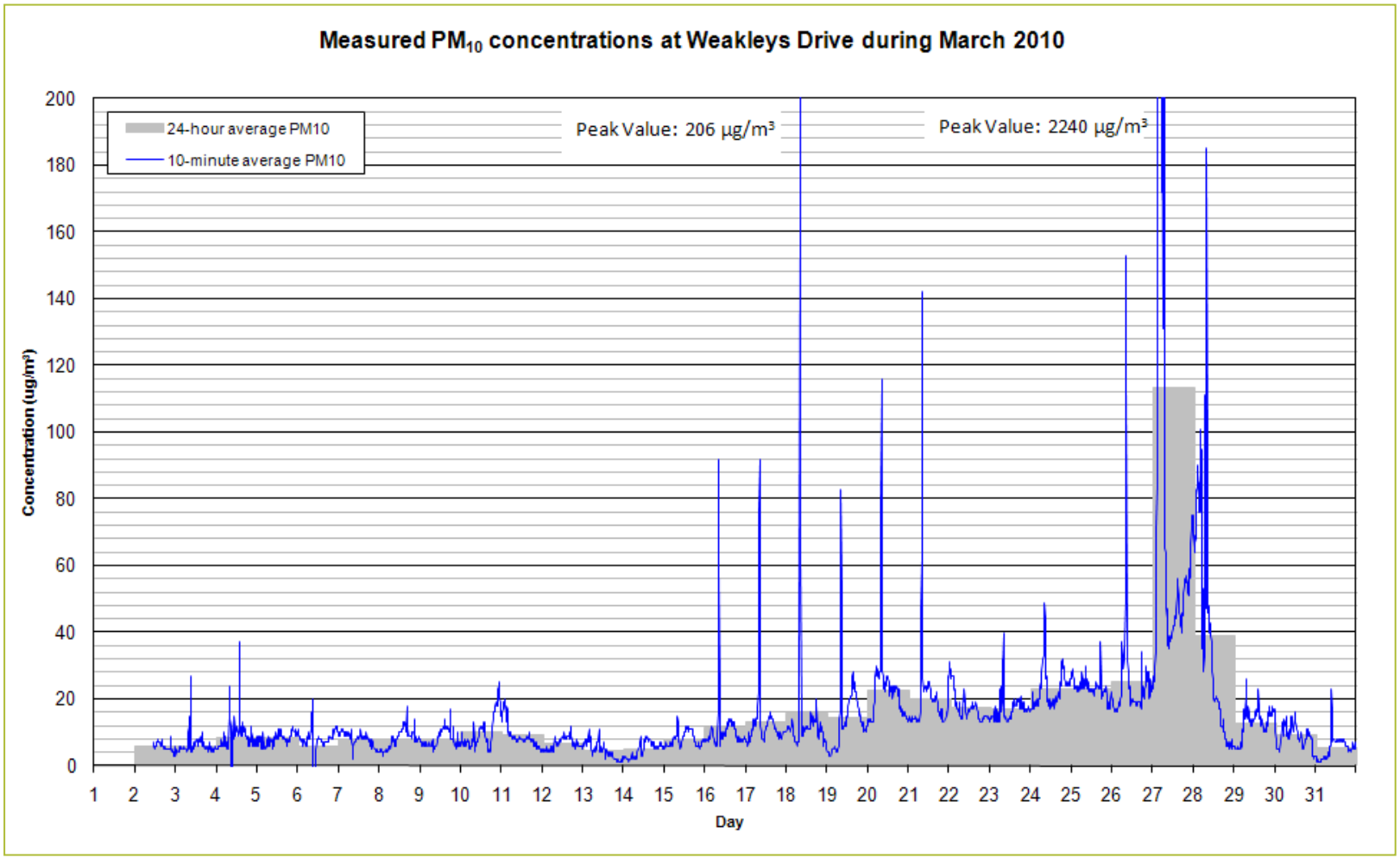

Figure 4: DustTrak sampling data, Weakleys Drive site

No $PM_{2.5}$ monitoring was scheduled for March 2010

Figure 5: DustTrak $PM_{2.5}$ monitoring data

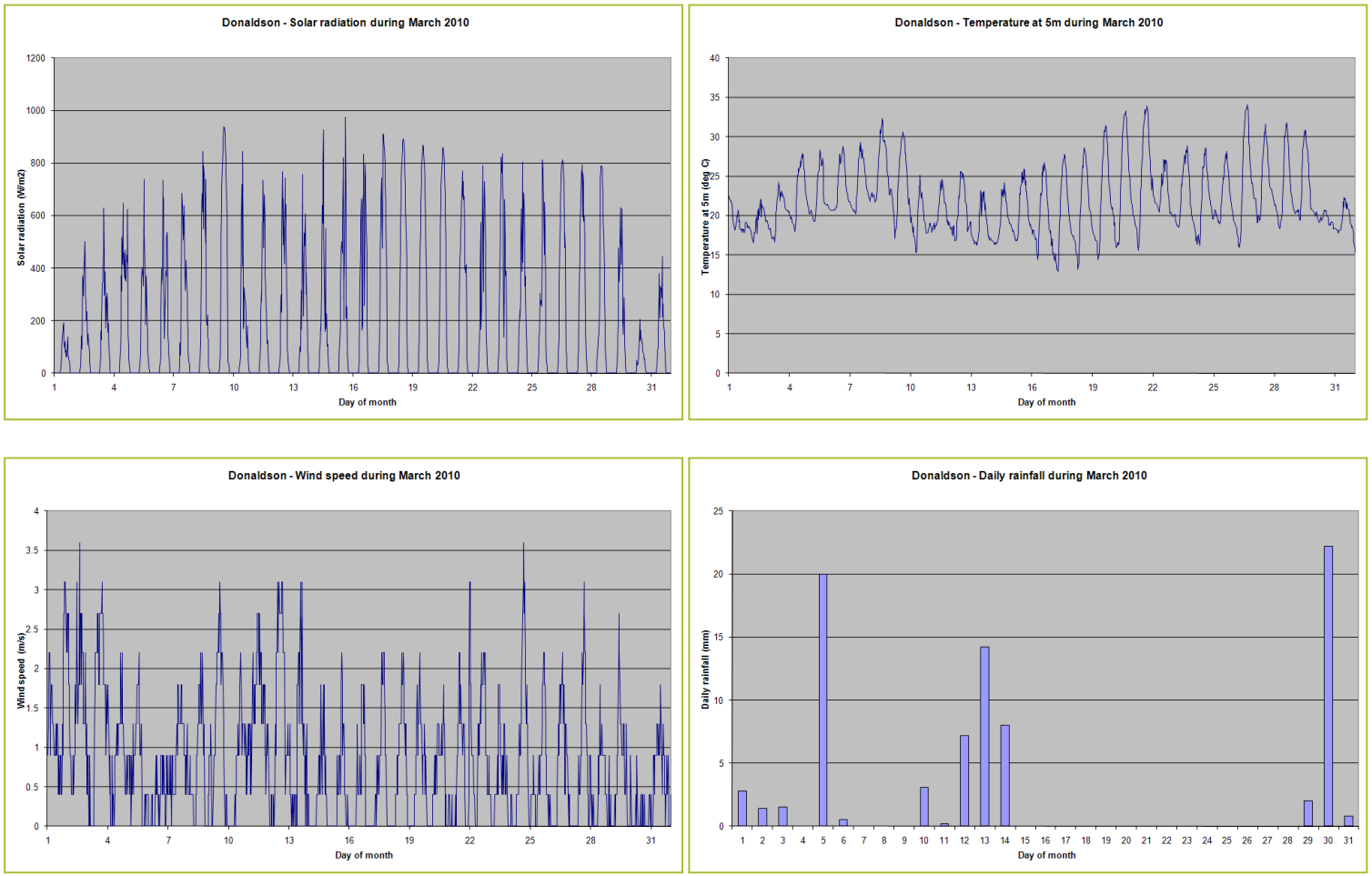

Figure 6: Meteorological conditions

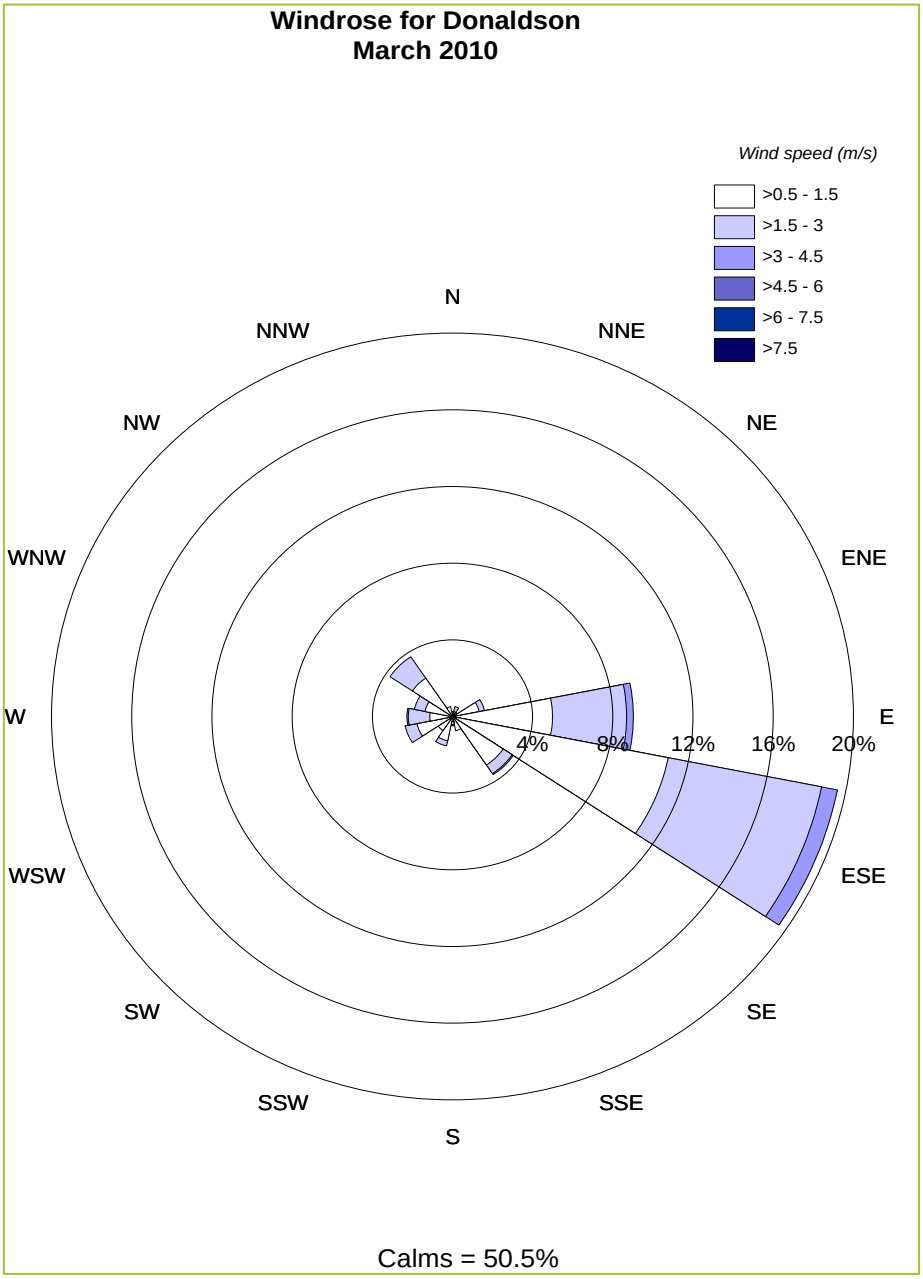

Figure 7: Windrose

DONALDSON MONITORING

DUST AND METEOROLOGICAL DATA
APRIL 2010 REPORT

Donaldson Coal

Job No: **3003**

18 June 2010

A PEL Company

PROJECT TITLE:	**DUST AND METEOROLOGICAL DATA APRIL 2010 REPORT**
JOB NUMBER:	**3003**
PREPARED FOR:	Phil Brown **DONALDSON COAL**
PREPARED BY:	Philip Henschke
QA PROCEDURES CHECKED BY:	Ronan Kellaghan
APPROVED FOR RELEASE BY:	Aleks Todoroski
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VERSION	DATE	PREPARED BY	REVIEWED BY
V1	18/06/2010	Philip Henschke	Ronan Kellaghan

Queensland Environment Pty Ltd trading as
PAEHolmes ABN 86 127 101 642

SYDNEY:
Suite 2B, 14 Glen Street
Eastwood NSW 2122
Ph: +61 2 9874 8644
Fax: +61 2 9874 8904

BRISBANE:
Level 1, La Melba, 59 Melbourne Street South Brisbane Qld 4101
PO Box 3306 South Brisbane Qld 4101
Ph: +61 7 3004 6400
Fax: +61 7 3844 5858

Email: info@paeholmes.com

Website: www.paeholmes.com

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1 INTRODUCTION

As part of their Air Quality Management Plan Donaldson Coal operate a dust monitoring network in the vicinity of the mining lease and a meteorological station on site. This report has been prepared in order to bring together the various data collected throughout the network during April 2010 and to summarise the information.

The dust network includes continuous monitoring, high volume air sampling and dust deposition monitoring. The continuous monitoring network consists of two DustTrak monitors measuring PM_{10} at two sites and an additional DustTrak monitor which is used for one week each quarter to measure $PM_{2.5}$.

There are two locations which use high volume air samplers to determine concentrations of PM_{10} and TSP. These operate on a six-day cycle in line with similar measurements made by the NSW Department of Environment, Climate Change and Water (DECCW) at other locations throughout the state.

In addition to concentration measurements, monthly levels of dust deposition are also measured using twelve gauges placed at various locations in the area of the mine. The locations of each of these monitors and gauges are shown in Figure 1.

Table 1 lists the monitors used and pollutants measured at these locations.

Table 1: Summary of monitoring locations and instruments

Monitoring Location	Instruments Used	Pollutant Monitored
Beresfield	HVAS	PM_{10}
Blackhill	HVAS	PM_{10}
	HVAS	TSP
	DustTrak	PM_{10}
	DustTrak (1 week per quarter)	$PM_{2.5}$
Weakleys Drive	DustTrak	PM_{10}
DG1 – DG12	Deposition Gauges	Dust Deposition

The meteorological station is situated at the site of the office buildings and measures the following parameters:

- wind speed
- wind direction
- temperature
- solar radiation
- rainfall

The data are downloaded at various intervals by Donaldson and then forwarded to PAEHolmes for processing.

2 HIGH VOLUME AIR SAMPLING

High Volume Air Sampling (HVAS) was carried out at Beresfield and Blackhill by Metford Laboratories. PM_{10} is measured at both sites while TSP is only measured at Blackhill. The data collected during April 2010 are summarised in **Table 2**. A graph consisting of all the data collected to date is shown in Figure 2.

Table 2: HVAS data from Beresfield and Blackhill for April 2010

Date	Beresfield PM_{10} ($\mu g/m^3$)	Blackhill PM_{10} ($\mu g/m^3$)	Blackhill TSP ($\mu g/m^3$)
1/04/2010	13	10	20
7/04/2010	9	5	11
13/04/2010	20	13	33
19/04/2010	13	5	17
25/04/2010	7	7	19
Annual average	**15**	**13**	**30**

These measurements will include all background sources relevant to that location, including contributions from the Donaldson mining operations.

On the days that the instruments were monitoring, the highest 24-hour average PM_{10} concentration recorded in April 2010 was 20 $\mu g/m^3$. This value was measured on the 13th at the Beresfield site. On this occasion the measured PM_{10} concentration did not exceed the 50 $\mu g/m^3$ 24-hour DECCW goal.

TSP measurements from the Blackhill site show that concentrations were below the DECCW 90 $\mu g/m^3$ annual average TSP goal. It should be noted that the DECCW goal refers to an annual average and not a 24-hour average as measured by the high volume air sampler. The annual average TSP concentration for the 12 months to April 2010 was 30 $\mu g/m^3$.

Figure 2 shows a seasonal trend in PM_{10} concentrations, peaking during the warmer months and decreasing during autumn and winter. This is a common trend and is seen consistently in the Hunter Valley.

The annual average PM_{10} concentrations for Beresfield and Blackhill were 15 $\mu g/m^3$ and 13 $\mu g/m^3$ respectively for the 12 months to April 2010. These values are below the DECCW's annual average PM_{10} air quality criterion of 30 $\mu g/m^3$.

3 CONTINUOUS MONITORING

3.1 DustTrak Monitoring at Blackhill

Figure 3 shows a time series of the PM_{10} data collected from the DustTrak monitor at the Blackhill site. During the month of April, the DustTrak monitor located at the Blackhill site experienced a significant power failure. As a result no DustTrak monitoring for the Blackhill site is available for the month of April 2010.

The DustTrak monitor has since been restarted.

3.2 DustTrak Monitoring at Weakleys Drive

A time series of the PM_{10} data collected from the Weakleys Drive site is shown in Figure 4. The DustTrak monitoring for the Weakleys Drive site is available from the 1st to 30th of April.

Of the available data, the measured 24-hour average PM_{10} concentrations were below the DECCW goal of 50 $\mu g/m^3$. The maximum 24-hour average PM_{10} concentration was recorded on the 23rd of April at 30.6 $\mu g/m^3$.

3.3 DustTrak $PM_{2.5}$ Monitoring at BlackHill

No $PM_{2.5}$ monitoring was scheduled for April 2010.

4 DUST DEPOSITION MONITORING

Dust deposition monitoring is carried out each month via a network consisting of twelve (12) gauges. The results for April 2010 are shown in **Table 3**, in conjunction with results for the previous eleven months in order to provide an annual average for that period. A table showing the complete data set from July 2000 in provided in **Appendix A**.

Table 3: Dust deposition monitoring for the 12-month period to April 2010

Month	Monthly dust deposition rate (g/m^2/month)											
	DG1	**DG2**	**DG3**	**DG4**	**DG5A**	**DG6**	**DG7**	**DG8**	**DG9**	**DG10**	**DG11**	**DG12**
May-09	0.6 #	1.6 #	0.8 #	2.4	0.9 #	5.6 +	1.4 #	1.1	1.3	0.7 #	1.5 #	-
Jun-09	0.4	1.3 #	0.8	0.5	0.5	3.3 #	0.9	0.6 #	1.0	3.4 #	0.7	-
Jul-09	0.2	1.0 #	0.6	0.4	0.3	3.8 #	0.5	0.6	0.6	0.3	0.6	-
Aug-09	0.8#	3.6#	0.8#	1.2#	1.0#	1.8#	0.8#	1.8	1.3#	0.8#	1.0	-
Sep-09	1.0	1.8#	1.8	8.3#	1	1.8	0.9#	1.8#	1.7#	0.7	1.4#	-
Oct-09	4.3	9#	5.2#	11.3#	3.2	3.8#	2.4#	6.8#	3#	2.2	3.2#	5.7#
Nov-09	0.8#	1.7#	1.4#	1.3#	0.7#	2.1#	1.3#	8.0#	*	1.0#	*	2.3#
Dec-09	1.4#	4.0#	1.6#	2.4#	1.7#	1.8	1.6	2.6#	1.7#	1.7#	2.2#	1.7
Jan-10	0.6#	0.8#	5.6#	1.2#	2.4#	1.2#	0.8	1.4	1.3#	0.8#	1.3#	1.1#
Feb-10	1.9#	11.3+	1.9#	1.4#	1.5#	1.1#	1.2#	1.6#	1.1#	0.8#	1.8#	1.3#
Mar-10	0.6#	0.6#	3.2#	1#	4.1#	0.6#	0.6#	1.2	0.6#	0.2#	0.8#	1.1#
Apr-10	0.8#	1.8#	2.4#	0.7#	+	0.3	0.6#	0.9#	0.6#	0.4#	0.8#	0.8#
Annual Average	**0.8**	**2.7**	**1.9**	**1.9**	**1.4**	**2.1**	**1.0**	**2.0**	**1.1**	**1.0**	**1.2**	**-**

*Data supplied by Metford Laboratories. # Insects/bird droppings reported. +Invalid. * No recording, funnel damaged.*

The highest dust deposition measurement recorded in April 2010 was 2.4 g/m^2/month at DG3; the accompanying laboratory report showed the sample was contaminated with insects.

Readings considered invalid have been removed when calculating the annual average. The annual average deposition rates for the gauges in the network were low and significantly below the goal of 4 g/m^2/month, indicating nuisance dust in the vicinity of the mine is not an issue.

5 METEOROLOGICAL MONITORING

Monthly plots of the wind speed, temperature, solar radiation, and rainfall data collected in April 2010 are shown in Figure 6 and a windrose plot is shown in Figure 7.

The graphs shown in Figure 6 indicate that the instruments were recording appropriately. Data maxima and minima all appeared to be sensible for this site during April. Total rainfall for the month was 37.1 mm.

A windrose (see Figure 7) created from the available 30-minute average wind data shows that winds were predominantly from the east-southeast. The site recorded calms (wind speed less than or equal to 0.5 m/s) for approximately 59.9% of the time. The relatively large fraction of clam winds may arise from the generally forested area and the specific location of the weather station.

APPENDIX A

Dust Deposition Data

Dust deposition (g/m²/month)												
Month	D1	D2	D3	D4	D5A	D6	D7	D8	D9	D10	D11	D12
May-00	0.4	0.4	-	0.7	0.9	0.6	3.6	1.6	0.5	1.8	-	-
Jun-00	0.7	0.5	0.5	0.7	0.8	0.4	3.8	3.2	0.5	0.7	-	-
Jul-00	0.4	0.4	0.5	0.7	0.8	0.5	0.8	1.5	0.4	0.4	-	-
Aug-00	0.9	0.6	1.0	1.2	1.1	1.0	3.4	0.7	0.7	0.6	-	-
Sep-00	0.8	0.9	1.1	0.9	1.3	1.0	2.2	1.0	1.0	0.8	-	-
Oct-00	0.4	0.6	1.1	0.9	0.9	0.8	5.3	0.9	0.6	0.5	-	-
Nov-00	5.2	0.7	1.4	0.8	1.0	0.4	24.1	9.4	1.1	0.6	-	-
Dec-00	2.8	1.4	1.9	1.3	1.1	0.8	2.1	2.5	0.9	0.9	-	-
Jan-01	0.7	1.7	1.4	1.8	0.7	1.3	1.1	2.4	1.1	0.6	-	-
Feb-01	0.9	3.1	2.0	0.5	0.9	0.7	0.7	6.7	1.3	0.5	1.0	-
Mar-01	0.8	2.1	1.3	0.6	0.7	0.6	0.6	5.5	0.6	0.6	1.5	-
Apr-01	0.8	0.7	1.3	0.5	0.7	0.4	0.3	5.1	0.7	0.6	0.8	-
May-01	0.2	0.2	0.4	0.4	0.3	0.3	0.6	1.8	0.6	0.8	0.9	-
Jun-01	0.5	0.4	0.5	1.0	1.0	0.4	0.4	8.8	0.7	0.6	0.6	-
Jul-01	0.5	0.3	1.8	0.5	0.8	-	16.3	4.9	0.9	0.7	0.7	-
Aug-01	0.4	0.4	0.8	0.8	1.0	1.7	1.0	-	1.0	1.8	1.1	-
Sep-01	0.7	1.0	1.7	1.1	1.7	0.7	-	6.0	1.1	1.3	1.7	-
Oct-01	1.1	0.6	4.6	0.9	0.7	0.9	1.2	1.9	0.9	0.6	1.7	-
Nov-01	0.9	1.0	1.1	1.1	0.8	1.1	6.0	5.5	1.3	1.9	2.3	-
Dec-01	4.9	0.9	4.2	0.9	1.3	1.9	1.2	3.1	1.2	9.7	1.8	-
Jan-02	0.8	1.0	1.5	1.3	1.1	1.4	1.3	1.5	1.1	0.9	1.5	-
Feb-02	1.1	1.1	0.9	0.3	0.4	0.5	3.1	5.1	0.5	0.5	0.9	-
Mar-02	1.7	2.1	1.6	0.7	0.7	0.8	1.0	18	1.0	0.9	1.7	-
Apr-02	1.0	0.4	1.0	0.8	0.8	0.6	0.9	10.1	0.5	0.7	1.0	-
May-02	0.6	0.6	6.0	0.7	0.4	1.2	0.9	3.1	0.7	0.2	1.0	-
Jun-02	1.4	0.4	1.7	0.6	0.5	0.8	0.6	2.1	0.6	0.5	1.0	-
Jul-02	0.7	0.7	-	0.8	0.8	0.7	1.2	-	1.1	0.5	1.0	-
Aug-02	1.3	0.8	1.4	1.2	1.1	1.2	1.5	-	1.5	0.9	1.6	-
Sep-02	0.5	1.2	1.1	0.8	0.5	0.7	5.1	9.3	1.6	0.6	1.0	-
Oct-02	2.2	1.4	5.2	1.5	1.5	1.4	1.4	3.4	-	1.5	3.1	-
Nov-02	2.8	1.8	3.7	1.6	0.1	1.8	2.1	3.5	2.1	2	1.9	-
Dec-02	2.0	-	2.5	1.5	3.0	1.5	1.8	4.1	1.6	1.2	1.9	-
Jan-03	2.1	1.5	2.7	1.5	1.0	1.9	2.2	2.5	1.1	1.0	1.6	-
Feb-03	1.4	1.1	2.6	1.1	0.9	1.2	1.7	5.9	1.2	1.0	1.5	-
Mar-03	0.8	0.5	1.2	1.2	0.6	2.1	1.5	3.4	-	3.6	9.5	-
Apr-03	0.5	1.0	0.6	1.0	0.7	0.5	1.1	8.0	-	2.0	1.0	-
May-03	0.5	0.4	0.6	0.2	0.2	0.6	1.3	1.6	0.5	0.8	1.2	-
Jun-03	0.5	0.6	0.8	0.8	0.4	0.6	0.8	0.7	0.9	0.7	0.7	-
Jul-03	0.3	0.4	0.4	0.6	0.4	0.5	0.7	0.5	0.5	0.5	0.7	-
Aug-03	0.8	0.2	0.7	1.1	0.5	1.3	1.8	2.1	1.3	0.7	0.9	-
Sep-03	0.6	0.7	1.1	0.7	0.8	1.7	1.4	1.3	2.5	0.9	1.3	-
Oct-03	-	0.9	1.4	0.9	0.7	1.9	1.0	1.4	0.6	0.8	1.3	-
Nov-03	2.6	0.8	1.0	1.1	0.4	1.3	1.5	1.5	-	0.8	1.3	-
Dec-03	1.0	1.0	1.4	1.3	1.1	1.5	1.6	2.0	1.8	0.9	1.4	-
Jan-04	8.5	1.5	2.1	1.5	1.3	2.6	1.4	2.2	1.7	1.5	1.7	-
Feb-04	1.2	1.0	1.7	1.4	0.7	3.1	1.6	2.2	-	1.5	2.3	-

Mar-04	0.4	0.6	6.6	1.2	0.7	1.9	1.1	12.1	4.8	1.5	1.1	-
Apr-04	0.6	1.0	0.8	0.8	0.6	1.9	0.8	1.4	0.9	1.2	1.1	-
May-04	0.2	0.9	2.2	0.9	0.8	0.7	0.9	1.4	1.2	0.9	1.5	-
Jun-04	0.4	0.6	0.7	0.9	0.6	1.4	1.0	0.9	1.0	1.0	0.8	-
Jul-04	0.4	0.6	5.3#	0.6	0.5	2.9	1.0	1.1	0.9	0.6	1.2	-
Aug-04	0.5	0.5	0.5	1.3	0.7	1.1	1.1	1.4	-	1.0	1.0	-
Sep-04	0.6	0.6	0.8	2.2	1.0	1.0	0.9	4.4	0.9	16.7	1.1	-
Oct-04	0.7	0.9	1.2	0.9	0.8	1.4	1.0	10.5	1.0	1.0	0.8	-
Nov-04	0.8	0.7	1.3	1.9	0.7	0.9	1.0	3.0	1.1	1.1	1.6	-
Dec-04	2.0	1.4	3.6	1.5	1.3	2.2	3.2	7.9	1.8	5.5	2.5	-
Jan-05	1.2	1.0	3.7	1.6	1.4	4.0	2.3	2.7	2.6	2.5	2.8	-
Feb-05	1.2	1.2	1.8	1.6	1.3	2.0	1.7	-	2.3	1.5	2.3	-
Mar-05	1.3	0.9	1.4	0.9	0.9	3.0	1.2	7.7	-	0.8	1.3	-
Apr-05	1.1	0.7	0.9	0.8	0.7	0.9	1.4	3.3	1.1	0.8	0.9	-
May-05	0.7	8.6	1.1	0.8	0.7	0.8	0.9	4.4	1.2	0.8	1.1	-
Jun-05	1.3	0.8	1.3	1.3	0.8	1.2	1.2	1.3	1.5	2.5	0.9	-
Jul-05	1.0	0.5	0.5	0.7	0.4	1.6	0.7	1.2	0.8	4.3	1.1	-
Aug-05	0.6	0.6	0.8	1.0	0.8	0.9	0.7	1.0	0.9	1.0	0.9	-
Sep-05	0.6	0.7	0.8	0.7	0.7	1.2	1.3	1.3	1.0	0.9	1.1	-
Oct-05	0.8	0.9	1.3	0.9	0.8	1.4	1.2	1.9	1.3	1.1	1.3	-
Nov-05	-	2.3	2.3	2.0	1.7	1.2	2.0	3.2	1.6	1.4	2.2	-
Dec-05	1.9	3.2	2.3	3.3	2.6	3.4	2.3	-	1.3	2.1	3.9	-
Jan-06	1.0	2.1	1.7	1.0	23.	3.5	-	2.7	1.1	-	1.5	-
Feb-06	2.2	1.0	0.9	1.2	1.1	1.7	1.1	2.9	-	2.3	1.8	-
Mar-06	0.7	0.6	2.3	0.7	0.6	0.9	1.0	1.4	0.7	0.8	1.5	-
Apr-06	0.6	0.7	1.1	0.8	0.6	1.1	0.8	1.0	1.0	1.8	1.5	-
May-06	1.0	3.1	1.0	-	1.1	1.4	1.1	4.1	-	7.0	1.5	-
Jun-06	0.4	0.3	0.7	0.5	0.4	0.6	0.7	0.8	0.6	0.9	0.9	-
Jul-06	0.3	0.3	1	1.3	0.4	0.7	0.7	2.7	-	0.6	0.6	-
Aug-06	0.9	0.6	0.8	0.7	0.7	0.8	0.7	1.7	-	3.7	0.9	-
Sep-06	1.6	0.7	1.1	1.7	0.7	1	0.9	1.3	1.2	0.8	1.6	-
Oct-06	2	1.4	1.6	1.8	0.9	1.8	1.2	1.8	1.5	1.8	1.9	-
Nov-06	4.3	2.2	3	2.3	2.3	5.3	2.4	3.3	2.3	2.3	2.9	-
Dec-06	1.2	3.4	1.9	2.3	2.3		2.1	2.1		4.9	3.9	-
Jan-07	2	0.9	1.5	0.7	0.7	1.7	1.1		1.2	1.7	0.9	-
Feb-07	1.7	0.9	1.6	0.7	0.6	1	1.8	1.7	1.1	1.2	1.7	-
Mar-07	1.3	0.9	1.7	0.8	1.2	0.6	2.2	1.7	1	0.9	1.7	-
Apr-07	0.5	0.7	0.9	0.6	4.8	1.2	0.5	2.7	0.5	0.8	0.9	-
May-07	0.8	0.5	0.6	1.2	0.6	0.6	0.7	1.9	0.5	0.7	0.8	-
Jun-07	0.6	0.5	0.7	1.1	0.1	0.5	0.1	0.5	0.1	0.4	0.3	-
Jul-07	0.5	0.4	0.6	2.1	0.5	0.8	0.6	0.6	0.4	0.5	0.7	-
Aug-07	1.5	0.4	0.7	1	0.7	0.7	0.5	1	0.6	0.6	0.7	-
Sep-07	1.3	0.5	1.8	1	0.7	0.9	0.9	1.3	1	0.7	1.6	-
Oct-07	4.2	0.9	1.1	1.4	1.1	1.7	1.8	1.7	1.6	1.4	2.2	-
Nov-07	0.8	0.8	1.1	0.9	1.1	1.1	1.1	1.7	0.6	0.8	1.5	-
Dec-07	1.3	0.8	3	0.7	0.5	0.8	0.5	1.1	0.3	0.8	0.6	-
Jan-08	2.6	0.8	3.7	0.5	0.5	0.5	0.4	2.2	0.8	0.3	0.8	-

Feb-08	0.4	0.1	14	0.1	0.1	0.3	0.1	0.3	0.2	0.2	0.3	-
Mar-08	4.5	0.6	9.2+	0.6	2.9	2.1	0.6	1.5	0.5	1	0.9	-
April-08	0.4#	0.4#	0.8#	0.4#	0.4#	0.8#	1.1#	1.7#	1.2	1.1#	1.1#	-
May-08	1.1	2.4#	0.9	1.4	0.9	0.9	0.7	2.7	1#	1.1	1.3#	-
June-08	0.2	0.4#	0.1	0.5	0.1#	0.1	0.3	0.5#	0.1	0.8	0.2	-
July-08	0.4	0.7#	1.3#	0.6	0.8#	0.9	0.8	1	0.7	0.5	1.1	-
Aug-08	1	0.5	0.7	0.6	0.5	1.9	0.8	1	1	0.9	1.4	-
Sep-08	0.6	1	1.3	0.7	0.6	0.9	0.6	0.9	0.9	0.9	1.8	-
Oct-08	1	0.5	1	1.3	1.3	1.2	1	1.4	0.8	1.6	1.8	-
Nov-08	0.8	1.4	2.7	2.5	0.9	1.2	0.8	2.4	1.1	1	1.7	-
Dec-08	0.4	0.4	0.6	0.5	0.3	1.1	0.6	15	0.9	0.7	1.2	-
Jan-09	1.1	3#	1.6	0.8	0.9	1.4	0.7	1.5	0.9	0.9	5+	-
Feb-09	0.4	4.4	1.5	1.1	0.9	1.6	0.8	1.2	1.4	2.5	1.2	-
Mar-09	2.8	5.8	2.7	2.4	1.9	2.1	2.5	2.4	2.3	5.7	2.7	-
Apr-09	2	0.8	0.8	0.6	0.6	3.2	1.1	1.1	1	0.6	0.9	-
May-09	0.6	1.6	0.8	2.4	0.9	5.6 +	1.4	1.1	1.3	0.7	1.5	-
Jun-09	0.4	1.3	0.8	0.5	0.5	3.3	0.9	0.6	1	3.4	0.7	-
Jul-09	0.2	1.0	0.6	0.4	0.3	3.8	0.5	0.6	0.6	0.3	0.6	-
Aug-09	0.8	3.6	0.8	1.2	1.0	1.8	0.8	1.8	1.3	0.8	1.0	-
Sep-09	1.0	1.8#	1.8	8.3 +	1	1.8	0.9#	1.8#	1.7#	0.7	1.4#	-
Oct-09+	4.3	9#	5.2#	11.3#	3.2	3.8#	2.4#	6.8#	3.0#	2.2	3.2#	5.7#
Nov-09	0.8#	1.7#	1.4#	1.3#	0.7#	2.1#	1.3#	8.0#	*	1.0#	*	2.3
Dec-09	1.4#	4.0#	1.6#	2.4#	1.7#	1.8	1.6	2.6#	1.7#	1.7#	2.2#	1.7
Jan-10	0.6#	0.8#	5.6#	1.2#	2.4#	1.2#	0.8#	1.4#	1.3#	0.8#	1.3#	1.1#
Feb-10	1.9#	11.3+	1.9#	1.4#	1.5#	1.1#	1.2#	1.6#	1.1#	0.8#	1.8#	1.3#
Mar-10	0.6#	0.6#	3.2#	1#	4.1#	0.6#	0.6#	1.2	0.6	0.2#	0.8#	1.1#
Apr-10	0.8#	1.8#	2.4#	0.7#	+	0.3	0.6#	0.9#	0.6#	0.4#	0.8#	0.8#

 # - sample contaminated

+ - sample invalid

**Broken funnel*

[Note: Samples for October 2009 have been considered invalid, due to a widespread dust storm experienced on 23rd September 2009.]

APPENDIX B

Figures

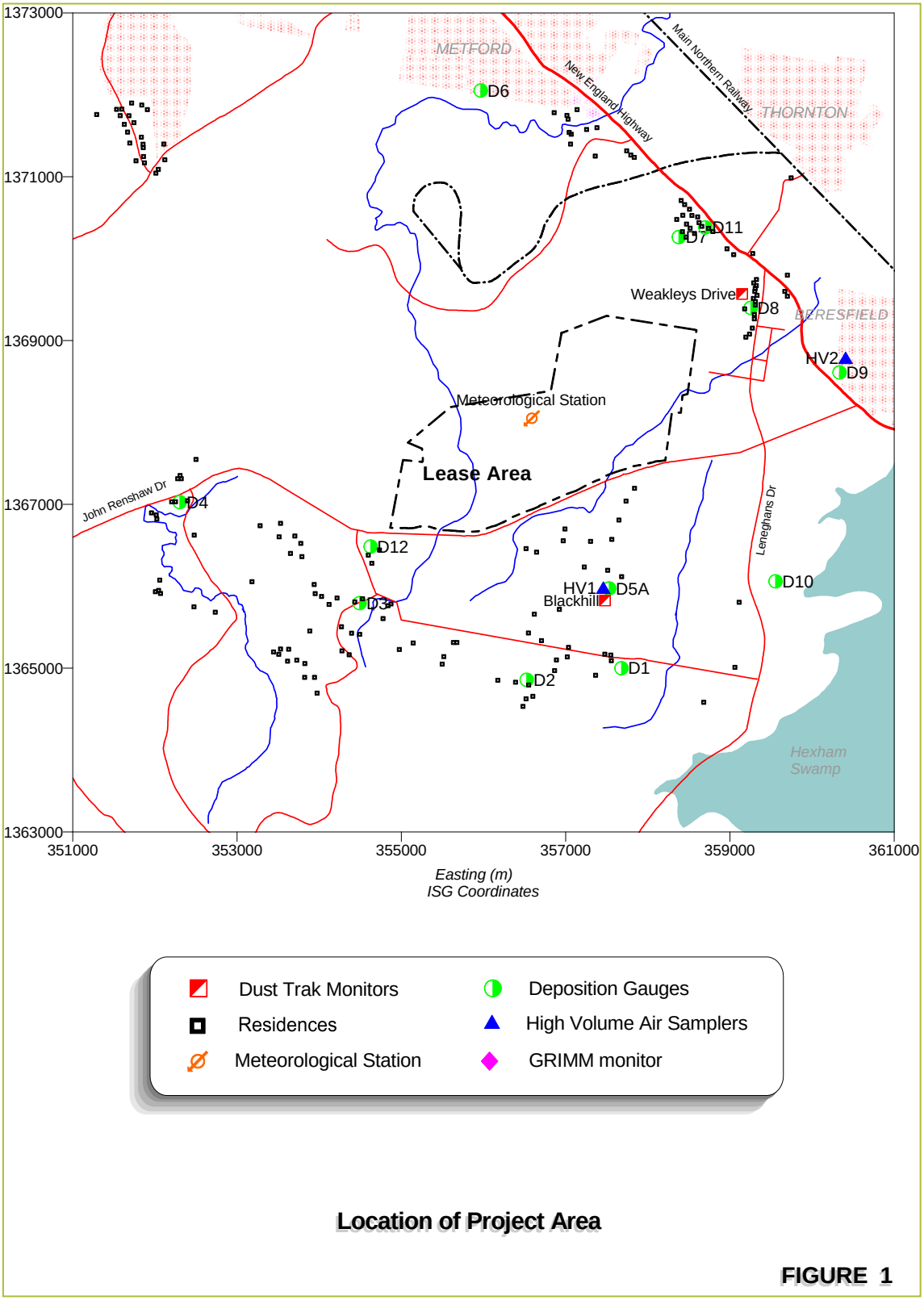

Figure 1: Project Location

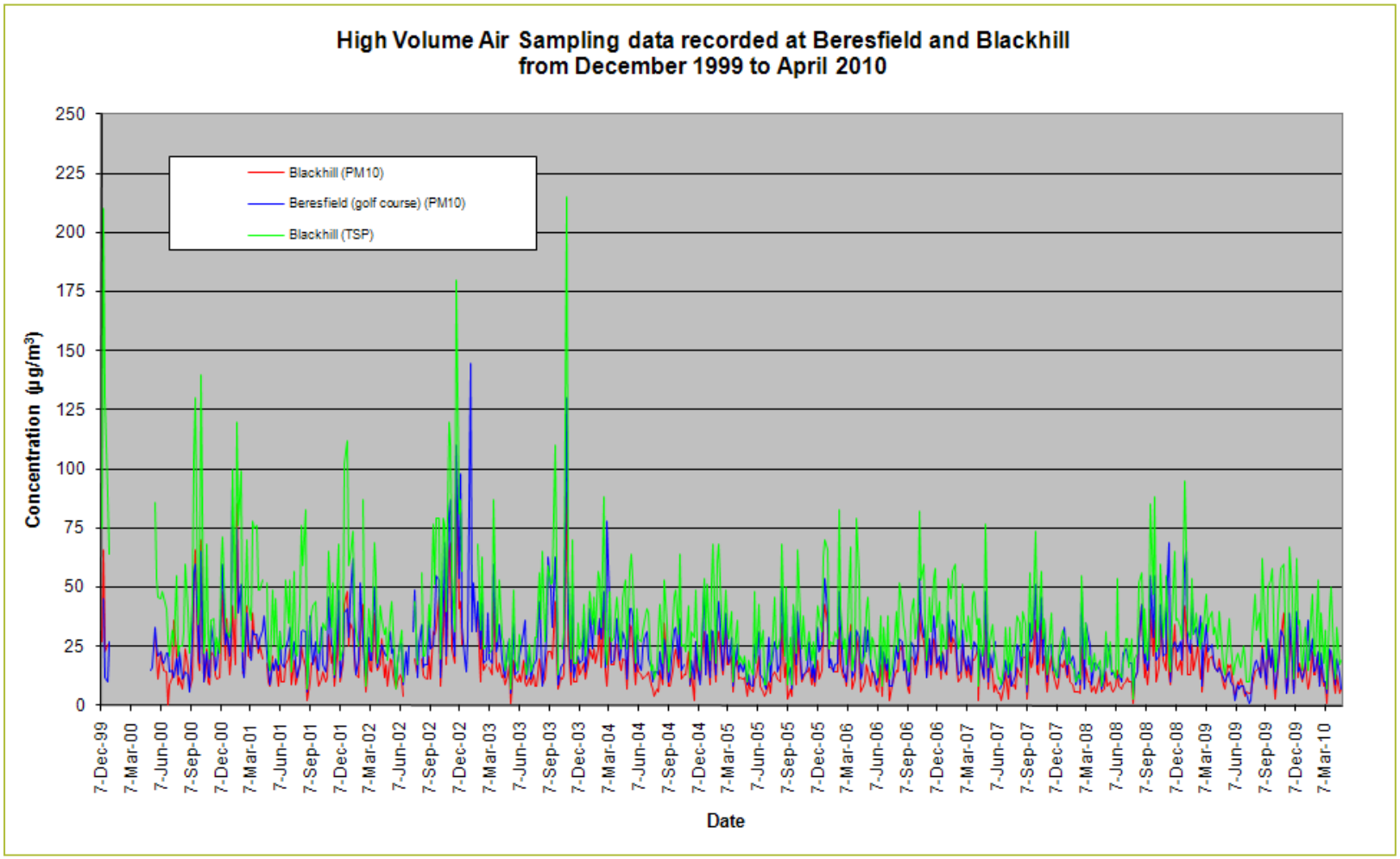

Figure 2: High Volume Air Sampling data

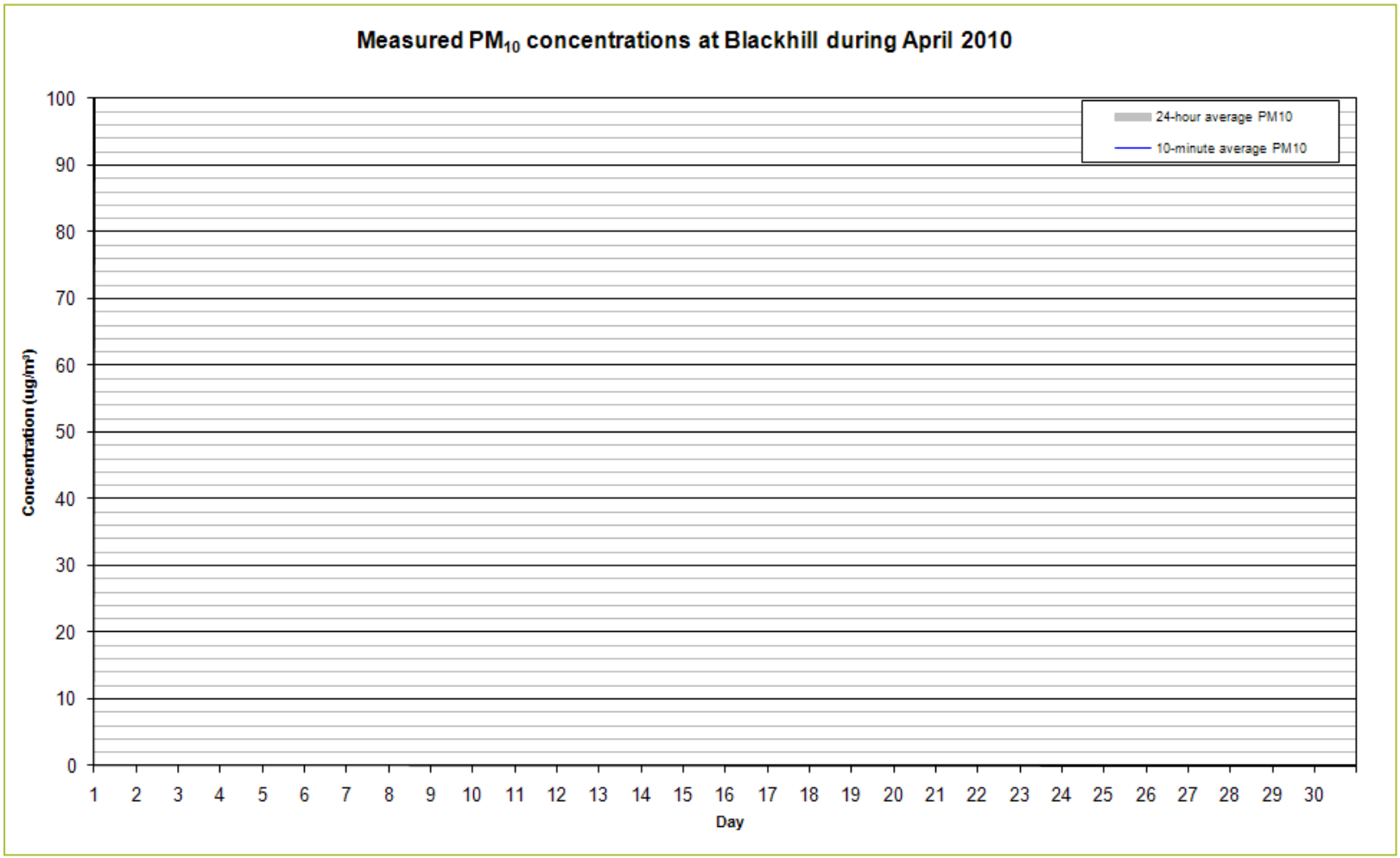

Figure 3: DustTrak sampling data, Blackhill site

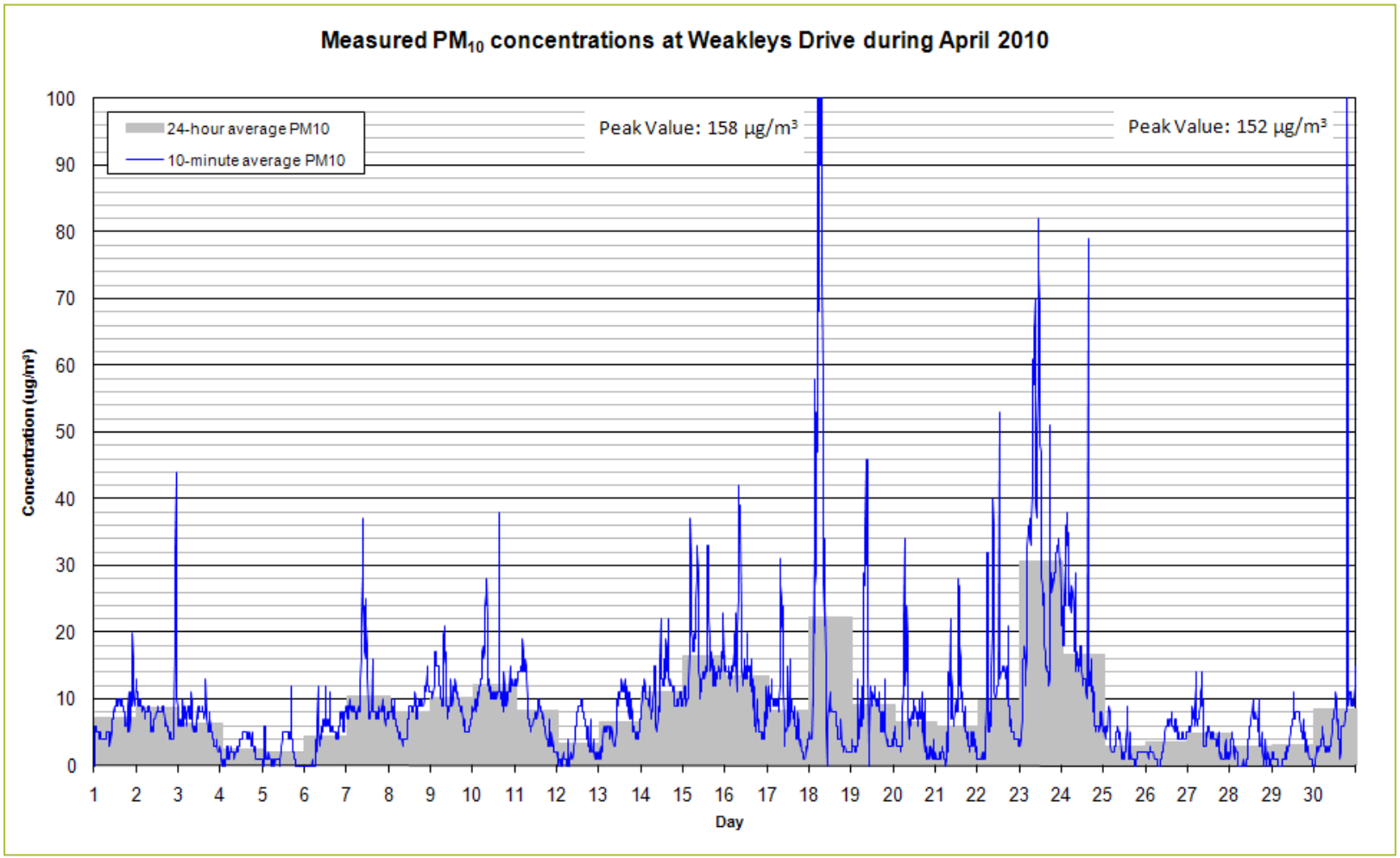

Figure 4: DustTrak sampling data, Weakleys Drive site

No $PM_{2.5}$ monitoring was scheduled for April 2010

Figure 5: DustTrak $PM_{2.5}$ monitoring data

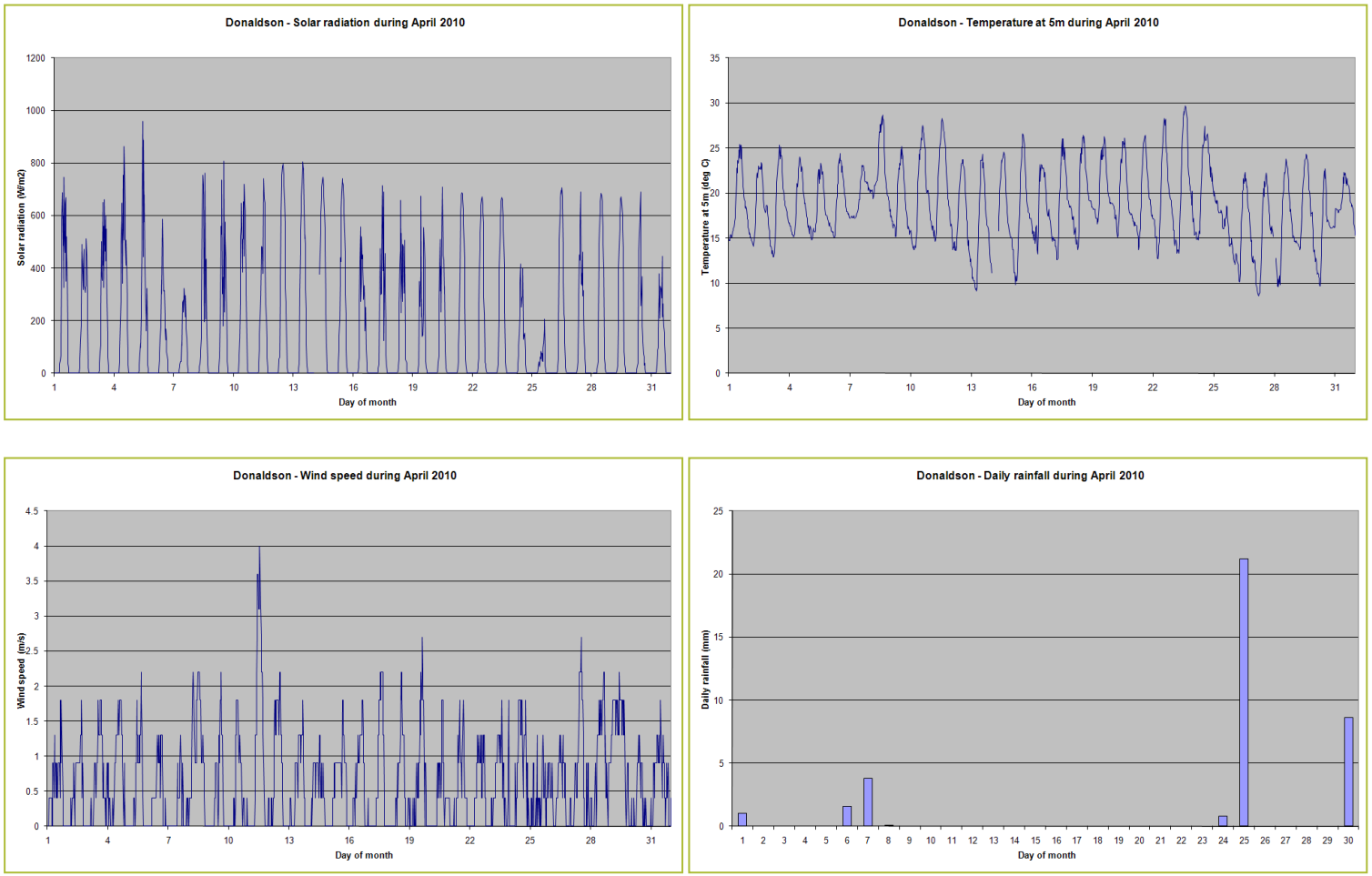

Figure 6: Meteorological conditions

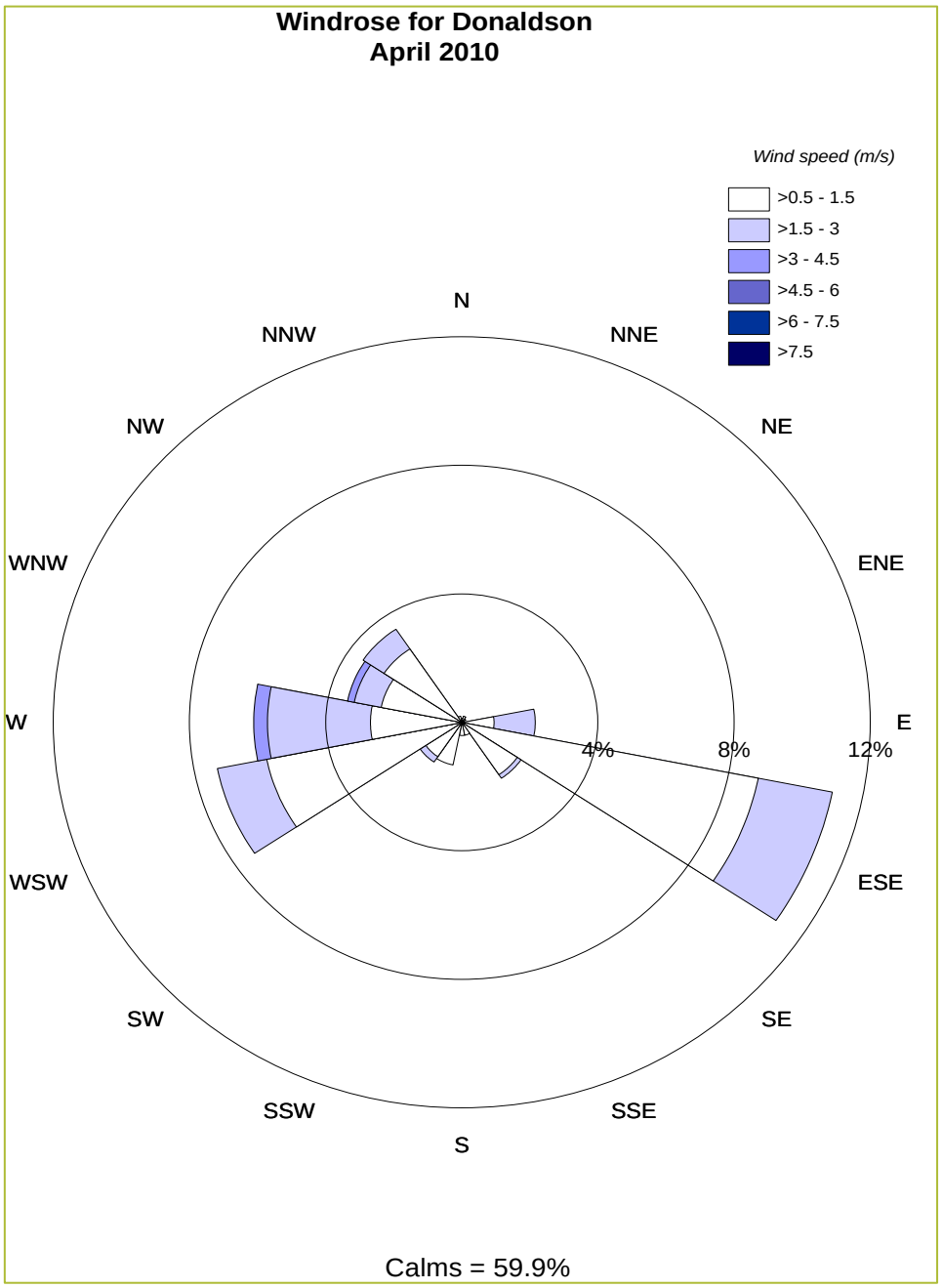

Figure 7: Windrose

DONALDSON MONITORING

DUST AND METEOROLOGICAL DATA
MAY 2010 REPORT

Donaldson Coal

Job No: **3003**

14 July 2010

PROJECT TITLE:	**DUST AND METEOROLOGICAL DATA MAY 2010 REPORT**
JOB NUMBER:	**3003**
PREPARED FOR:	Phil Brown **DONALDSON COAL**
PREPARED BY:	Philip Henschke
QA PROCEDURES CHECKED BY:	Ronan Kellaghan
APPROVED FOR RELEASE BY:	Aleks Todoroski
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VERSION	DATE	PREPARED BY	REVIEWED BY
V1	14/07/2010	Philip Henschke	Ronan Kellaghan

Queensland Environment Pty Ltd trading as
PAEHolmes ABN 86 127 101 642

SYDNEY:
Suite 2B, 14 Glen Street
Eastwood NSW 2122
Ph: +61 2 9874 8644
Fax: +61 2 9874 8904

BRISBANE:
Level 1, La Melba, 59 Melbourne Street South Brisbane Qld 4101
PO Box 3306 South Brisbane Qld 4101
Ph: +61 7 3004 6400
Fax: +61 7 3844 5858

Email: info@paeholmes.com

Website: www.paeholmes.com

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1 INTRODUCTION

As part of their Air Quality Management Plan Donaldson Coal operate a dust monitoring network in the vicinity of the mining lease and a meteorological station on site. This report has been prepared in order to bring together the various data collected throughout the network during May 2010 and to summarise the information.

The dust network includes continuous monitoring, high volume air sampling and dust deposition monitoring. The continuous monitoring network consists of two DustTrak monitors measuring PM_{10} at two sites and an additional DustTrak monitor which is used for one week each quarter to measure $PM_{2.5}$.

There are two locations which use high volume air samplers to determine concentrations of PM_{10} and TSP. These operate on a six-day cycle in line with similar measurements made by the NSW Department of Environment, Climate Change and Water (DECCW) at other locations throughout the state.

In addition to concentration measurements, monthly levels of dust deposition are also measured using twelve gauges placed at various locations in the area of the mine. The locations of each of these monitors and gauges are shown in Figure 1.

Table 1 lists the monitors used and pollutants measured at these locations.

Table 1: Summary of monitoring locations and instruments

Monitoring Location	Instruments Used	Pollutant Monitored
Beresfield	HVAS	PM_{10}
Blackhill	HVAS	PM_{10}
	HVAS	TSP
	DustTrak	PM_{10}
	DustTrak (1 week per quarter)	$PM_{2.5}$
Weakleys Drive	DustTrak	PM_{10}
DG1 – DG12	Deposition Gauges	Dust Deposition

The meteorological station is situated at the site of the office buildings and measures the following parameters:

- wind speed
- wind direction
- temperature
- solar radiation
- rainfall

The data are downloaded at various intervals by Donaldson and then forwarded to PAEHolmes for processing.

2 HIGH VOLUME AIR SAMPLING

High Volume Air Sampling (HVAS) was carried out at Beresfield and Blackhill by Metford Laboratories. PM_{10} is measured at both sites while TSP is only measured at Blackhill. The data collected during May 2010 are summarised in **Table 2**. A graph consisting of all the data collected to date is shown in Figure 2.

Table 2: HVAS data from Beresfield and Blackhill for May 2010

Date	Beresfield PM_{10} ($\mu g/m^3$)	Blackhill PM_{10} ($\mu g/m^3$)	Blackhill TSP ($\mu g/m^3$)
01/05/2010	6	6	14
07/05/2010	15	14	27
13/05/2010	16	12	26
19/05/2010	7	6	9
25/05/2010	10	5	8
31/05/2010	7	12	19
Annual average	**15**	**13**	**29**

These measurements will include all background sources relevant to that location, including contributions from the Donaldson mining operations.

On the days that the instruments were monitoring, the highest 24-hour average PM_{10} concentration recorded in May 2010 was 16 $\mu g/m^3$. This value was measured on the 13th at the Beresfield site. On this occasion the measured PM_{10} concentration did not exceed the 50 $\mu g/m^3$ 24-hour DECCW goal.

TSP measurements from the Blackhill site show that concentrations were below the DECCW 90 $\mu g/m^3$ annual average TSP goal. It should be noted that the DECCW goal refers to an annual average and not a 24-hour average as measured by the high volume air sampler. The annual average TSP concentration for the 12 months to May 2010 was 29 $\mu g/m^3$.

Figure 2 shows a seasonal trend in PM_{10} concentrations, peaking during the warmer months and decreasing during autumn and winter. This is a common trend and is seen consistently in the Hunter Valley.

The annual average PM_{10} concentrations for Beresfield and Blackhill were 15 $\mu g/m^3$ and 13 $\mu g/m^3$ respectively for the 12 months to May 2010. These values are below the DECCW's annual average PM_{10} air quality criterion of 30 $\mu g/m^3$.

3 CONTINUOUS MONITORING

3.1 DustTrak Monitoring at Blackhill

Figure 3 shows a time series of the PM_{10} data collected from the DustTrak monitor at the Blackhill site. The DustTrak monitoring for the Blackhill site is avaible from the 3rd to 31st of May.

Of the available data, the measured 24-hour average PM_{10} concentrations did not exceed the DECCW goal of 50 $\mu g/m^3$. The maximum 24-hour average PM_{10} concentration was recorded on the 10th of May at 50 $\mu g/m^3$.

3.2 DustTrak Monitoring at Weakleys Drive

A time series of the PM_{10} data collected from the Weakleys Drive site is shown in Figure 4. During the month of May, the DustTrak monitor located at the Weakleys Drive site experienced a power failure. As a result DustTrak monitoring for the Weakleys Drive site is available from the 1st to 3rd of May 2010.

Of the available data, the measured 24-hour average PM_{10} concentrations did not exceed the DECCW goal of 50 $\mu g/m^3$. The maximum 24-hour average PM_{10} concentration was recorded on the 2nd of May at 13.7 $\mu g/m^3$.

3.3 DustTrak $PM_{2.5}$ Monitoring at BlackHill

DustTrak $PM_{2.5}$ monitoring was carried out between the 12th and 19th of May 2010 and the data are presented in Figure 5. The measurements show that there are no occurrences above the 24-hour average DECCW advisory standard of 25 $\mu g/m^3$ during this period.

The 10-minute logged data for both PM_{10} and $PM_{2.5}$ show reasonable correlation, with peaks and troughs following the same trends. The average $PM_{2.5}$ fraction in the PM_{10} size range was calculated from the measurements as 17%. This suggests that the PM_{10} is predominantly coarse particles, consistent with windblown dust.

4 DUST DEPOSITION MONITORING

Dust deposition monitoring is carried out each month via a network consisting of twelve (12) gauges. The results for May 2010 are shown in **Table 3**, in conjunction with results for the previous eleven months in order to provide an annual average for that period. A table showing the complete data set from July 2000 in provided in **Appendix A**.

Table 3: Dust deposition monitoring for the 12-month period to May 2010

Month	Monthly dust deposition rate (g/m^2/month)											
	DG1	**DG2**	**DG3**	**DG4**	**DG5A**	**DG6**	**DG7**	**DG8**	**DG9**	**DG10**	**DG11**	**DG12**
Jun-09	0.4	1.3 #	0.8	0.5	0.5	3.3 #	0.9	0.6 #	1.0	3.4 #	0.7	-
Jul-09	0.2	1.0 #	0.6	0.4	0.3	3.8 #	0.5	0.6	0.6	0.3	0.6	-
Aug-09	0.8#	3.6#	0.8#	1.2#	1.0#	1.8#	0.8#	1.8	1.3#	0.8#	1.0	-
Sep-09	1.0	1.8#	1.8	8.3#	1	1.8	0.9#	1.8#	1.7#	0.7	1.4#	-
Oct-09	4.3	9#	5.2#	11.3#	3.2	3.8#	2.4#	6.8#	3#	2.2	3.2#	5.7#
Nov-09	0.8#	1.7#	1.4#	1.3#	0.7#	2.1#	1.3#	8.0#	*	1.0#	*	2.3#
Dec-09	1.4#	4.0#	1.6#	2.4#	1.7#	1.8	1.6	2.6#	1.7#	1.7#	2.2#	1.7
Jan-10	0.6#	0.8#	5.6#	1.2#	2.4#	1.2#	0.8	1.4	1.3#	0.8#	1.3#	1.1#
Feb-10	1.9#	11.3+	1.9#	1.4#	1.5#	1.1#	1.2#	1.6#	1.1#	0.8#	1.8#	1.3#
Mar-10	0.6#	0.6#	3.2#	1#	4.1#	0.6#	0.6#	1.2	0.6#	0.2#	0.8#	1.1#
Apr-10	0.8#	1.8#	2.4#	0.7#	+	0.3	0.6#	0.9#	0.6#	0.4#	0.8#	0.8#
May-10	0.8	4.9#	3.0#	1.1	1.2	1.0	0.7	1.3#	1.0	0.5	1.1#	0.8
Annual Average	**0.8**	**3.0**	**2.1**	**1.8**	**1.4**	**1.7**	**0.9**	**2.0**	**1.1**	**1.0**	**1.2**	**-**

*Data supplied by Metford Laboratories. # Insects/bird droppings reported. +Invalid. * No recording, funnel damaged.*

The highest dust deposition measurement recorded in May 2010 was 4.9 g/m^2/month at DG3; the accompanying laboratory report showed the sample was contaminated with bird droppings and insects. Combustible matter for this gauge was 3.1 g/m^2/month, indicating that a large portion of the insoluble solids were organic.

Readings considered invalid have been removed when calculating the annual average. The annual average deposition rates for the gauges in the network were low and significantly below the goal of 4 g/m^2/month, indicating nuisance dust in the vicinity of the mine is not an issue.

5 METEOROLOGICAL MONITORING

Monthly plots of the wind speed, temperature, solar radiation, and rainfall data collected in May 2010 are shown in Figure 6 and a windrose plot is shown in Figure 7.

The graphs shown in Figure 6 indicate that the instruments were recording appropriately. Data maxima and minima all appeared to be sensible for this site during May. Total rainfall for the month was 89.4 mm.

A windrose (see Figure 7) created from the available 30-minute average wind data shows that winds were predominantly from the west-southwest. The site recorded calms (wind speed less than or equal to 0.5 m/s) for approximately 64.4% of the time. The relatively large fraction of clam winds may arise from the generally forested area and the specific location of the weather station.

APPENDIX A

Dust Deposition Data

Dust deposition (g/m²/month)												
Month	D1	D2	D3	D4	D5A	D6	D7	D8	D9	D10	D11	D12
May-00	0.4	0.4	-	0.7	0.9	0.6	3.6	1.6	0.5	1.8	-	-
Jun-00	0.7	0.5	0.5	0.7	0.8	0.4	3.8	3.2	0.5	0.7	-	-
Jul-00	0.4	0.4	0.5	0.7	0.8	0.5	0.8	1.5	0.4	0.4	-	-
Aug-00	0.9	0.6	1.0	1.2	1.1	1.0	3.4	0.7	0.7	0.6	-	-
Sep-00	0.8	0.9	1.1	0.9	1.3	1.0	2.2	1.0	1.0	0.8	-	-
Oct-00	0.4	0.6	1.1	0.9	0.9	0.8	5.3	0.9	0.6	0.5	-	-
Nov-00	5.2	0.7	1.4	0.8	1.0	0.4	24.1	9.4	1.1	0.6	-	-
Dec-00	2.8	1.4	1.9	1.3	1.1	0.8	2.1	2.5	0.9	0.9	-	-
Jan-01	0.7	1.7	1.4	1.8	0.7	1.3	1.1	2.4	1.1	0.6	-	-
Feb-01	0.9	3.1	2.0	0.5	0.9	0.7	0.7	6.7	1.3	0.5	1.0	-
Mar-01	0.8	2.1	1.3	0.6	0.7	0.6	0.6	5.5	0.6	0.6	1.5	-
Apr-01	0.8	0.7	1.3	0.5	0.7	0.4	0.3	5.1	0.7	0.6	0.8	-
May-01	0.2	0.2	0.4	0.4	0.3	0.3	0.6	1.8	0.6	0.8	0.9	-
Jun-01	0.5	0.4	0.5	1.0	1.0	0.4	0.4	8.8	0.7	0.6	0.6	-
Jul-01	0.5	0.3	1.8	0.5	0.8	-	16.3	4.9	0.9	0.7	0.7	-
Aug-01	0.4	0.4	0.8	0.8	1.0	1.7	1.0	-	1.0	1.8	1.1	-
Sep-01	0.7	1.0	1.7	1.1	1.7	0.7	-	6.0	1.1	1.3	1.7	-
Oct-01	1.1	0.6	4.6	0.9	0.7	0.9	1.2	1.9	0.9	0.6	1.7	-
Nov-01	0.9	1.0	1.1	1.1	0.8	1.1	6.0	5.5	1.3	1.9	2.3	-
Dec-01	4.9	0.9	4.2	0.9	1.3	1.9	1.2	3.1	1.2	9.7	1.8	-
Jan-02	0.8	1.0	1.5	1.3	1.1	1.4	1.3	1.5	1.1	0.9	1.5	-
Feb-02	1.1	1.1	0.9	0.3	0.4	0.5	3.1	5.1	0.5	0.5	0.9	-
Mar-02	1.7	2.1	1.6	0.7	0.7	0.8	1.0	18	1.0	0.9	1.7	-
Apr-02	1.0	0.4	1.0	0.8	0.8	0.6	0.9	10.1	0.5	0.7	1.0	-
May-02	0.6	0.6	6.0	0.7	0.4	1.2	0.9	3.1	0.7	0.2	1.0	-
Jun-02	1.4	0.4	1.7	0.6	0.5	0.8	0.6	2.1	0.6	0.5	1.0	-
Jul-02	0.7	0.7	-	0.8	0.8	0.7	1.2	-	1.1	0.5	1.0	-
Aug-02	1.3	0.8	1.4	1.2	1.1	1.2	1.5	-	1.5	0.9	1.6	-
Sep-02	0.5	1.2	1.1	0.8	0.5	0.7	5.1	9.3	1.6	0.6	1.0	-
Oct-02	2.2	1.4	5.2	1.5	1.5	1.4	1.4	3.4	-	1.5	3.1	-
Nov-02	2.8	1.8	3.7	1.6	0.1	1.8	2.1	3.5	2.1	2	1.9	-
Dec-02	2.0	-	2.5	1.5	3.0	1.5	1.8	4.1	1.6	1.2	1.9	-
Jan-03	2.1	1.5	2.7	1.5	1.0	1.9	2.2	2.5	1.1	1.0	1.6	-
Feb-03	1.4	1.1	2.6	1.1	0.9	1.2	1.7	5.9	1.2	1.0	1.5	-
Mar-03	0.8	0.5	1.2	1.2	0.6	2.1	1.5	3.4	-	3.6	9.5	-
Apr-03	0.5	1.0	0.6	1.0	0.7	0.5	1.1	8.0	-	2.0	1.0	-
May-03	0.5	0.4	0.6	0.2	0.2	0.6	1.3	1.6	0.5	0.8	1.2	-
Jun-03	0.5	0.6	0.8	0.8	0.4	0.6	0.8	0.7	0.9	0.7	0.7	-
Jul-03	0.3	0.4	0.4	0.6	0.4	0.5	0.7	0.5	0.5	0.5	0.7	-
Aug-03	0.8	0.2	0.7	1.1	0.5	1.3	1.8	2.1	1.3	0.7	0.9	-
Sep-03	0.6	0.7	1.1	0.7	0.8	1.7	1.4	1.3	2.5	0.9	1.3	-
Oct-03	-	0.9	1.4	0.9	0.7	1.9	1.0	1.4	0.6	0.8	1.3	-
Nov-03	2.6	0.8	1.0	1.1	0.4	1.3	1.5	1.5	-	0.8	1.3	-
Dec-03	1.0	1.0	1.4	1.3	1.1	1.5	1.6	2.0	1.8	0.9	1.4	-
Jan-04	8.5	1.5	2.1	1.5	1.3	2.6	1.4	2.2	1.7	1.5	1.7	-
Feb-04	1.2	1.0	1.7	1.4	0.7	3.1	1.6	2.2	-	1.5	2.3	-

Mar-04	0.4	0.6	6.6	1.2	0.7	1.9	1.1	12.1	4.8	1.5	1.1	-
Apr-04	0.6	1.0	0.8	0.8	0.6	1.9	0.8	1.4	0.9	1.2	1.1	-
May-04	0.2	0.9	2.2	0.9	0.8	0.7	0.9	1.4	1.2	0.9	1.5	-
Jun-04	0.4	0.6	0.7	0.9	0.6	1.4	1.0	0.9	1.0	1.0	0.8	-
Jul-04	0.4	0.6	5.3#	0.6	0.5	2.9	1.0	1.1	0.9	0.6	1.2	-
Aug-04	0.5	0.5	0.5	1.3	0.7	1.1	1.1	1.4	-	1.0	1.0	-
Sep-04	0.6	0.6	0.8	2.2	1.0	1.0	0.9	4.4	0.9	16.7	1.1	-
Oct-04	0.7	0.9	1.2	0.9	0.8	1.4	1.0	10.5	1.0	1.0	0.8	-
Nov-04	0.8	0.7	1.3	1.9	0.7	0.9	1.0	3.0	1.1	1.1	1.6	-
Dec-04	2.0	1.4	3.6	1.5	1.3	2.2	3.2	7.9	1.8	5.5	2.5	-
Jan-05	1.2	1.0	3.7	1.6	1.4	4.0	2.3	2.7	2.6	2.5	2.8	-
Feb-05	1.2	1.2	1.8	1.6	1.3	2.0	1.7	-	2.3	1.5	2.3	-
Mar-05	1.3	0.9	1.4	0.9	0.9	3.0	1.2	7.7	-	0.8	1.3	-
Apr-05	1.1	0.7	0.9	0.8	0.7	0.9	1.4	3.3	1.1	0.8	0.9	-
May-05	0.7	8.6	1.1	0.8	0.7	0.8	0.9	4.4	1.2	0.8	1.1	-
Jun-05	1.3	0.8	1.3	1.3	0.8	1.2	1.2	1.3	1.5	2.5	0.9	-
Jul-05	1.0	0.5	0.5	0.7	0.4	1.6	0.7	1.2	0.8	4.3	1.1	-
Aug-05	0.6	0.6	0.8	1.0	0.8	0.9	0.7	1.0	0.9	1.0	0.9	-
Sep-05	0.6	0.7	0.8	0.7	0.7	1.2	1.3	1.3	1.0	0.9	1.1	-
Oct-05	0.8	0.9	1.3	0.9	0.8	1.4	1.2	1.9	1.3	1.1	1.3	-
Nov-05	-	2.3	2.3	2.0	1.7	1.2	2.0	3.2	1.6	1.4	2.2	-
Dec-05	1.9	3.2	2.3	3.3	2.6	3.4	2.3	-	1.3	2.1	3.9	-
Jan-06	1.0	2.1	1.7	1.0	23.	3.5	-	2.7	1.1	-	1.5	-
Feb-06	2.2	1.0	0.9	1.2	1.1	1.7	1.1	2.9	-	2.3	1.8	-
Mar-06	0.7	0.6	2.3	0.7	0.6	0.9	1.0	1.4	0.7	0.8	1.5	-
Apr-06	0.6	0.7	1.1	0.8	0.6	1.1	0.8	1.0	1.0	1.8	1.5	-
May-06	1.0	3.1	1.0	-	1.1	1.4	1.1	4.1	-	7.0	1.5	-
Jun-06	0.4	0.3	0.7	0.5	0.4	0.6	0.7	0.8	0.6	0.9	0.9	-
Jul-06	0.3	0.3	1	1.3	0.4	0.7	0.7	2.7	-	0.6	0.6	-
Aug-06	0.9	0.6	0.8	0.7	0.7	0.8	0.7	1.7	-	3.7	0.9	-
Sep-06	1.6	0.7	1.1	1.7	0.7	1	0.9	1.3	1.2	0.8	1.6	-
Oct-06	2	1.4	1.6	1.8	0.9	1.8	1.2	1.8	1.5	1.8	1.9	-
Nov-06	4.3	2.2	3	2.3	2.3	5.3	2.4	3.3	2.3	2.3	2.9	-
Dec-06	1.2	3.4	1.9	2.3	2.3		2.1	2.1		4.9	3.9	-
Jan-07	2	0.9	1.5	0.7	0.7	1.7	1.1		1.2	1.7	0.9	-
Feb-07	1.7	0.9	1.6	0.7	0.6	1	1.8	1.7	1.1	1.2	1.7	-
Mar-07	1.3	0.9	1.7	0.8	1.2	0.6	2.2	1.7	1	0.9	1.7	-
Apr-07	0.5	0.7	0.9	0.6	4.8	1.2	0.5	2.7	0.5	0.8	0.9	-
May-07	0.8	0.5	0.6	1.2	0.6	0.6	0.7	1.9	0.5	0.7	0.8	-
Jun-07	0.6	0.5	0.7	1.1	0.1	0.5	0.1	0.5	0.1	0.4	0.3	-
Jul-07	0.5	0.4	0.6	2.1	0.5	0.8	0.6	0.6	0.4	0.5	0.7	-
Aug-07	1.5	0.4	0.7	1	0.7	0.7	0.5	1	0.6	0.6	0.7	-
Sep-07	1.3	0.5	1.8	1	0.7	0.9	0.9	1.3	1	0.7	1.6	-
Oct-07	4.2	0.9	1.1	1.4	1.1	1.7	1.8	1.7	1.6	1.4	2.2	-
Nov-07	0.8	0.8	1.1	0.9	1.1	1.1	1.1	1.7	0.6	0.8	1.5	-
Dec-07	1.3	0.8	3	0.7	0.5	0.8	0.5	1.1	0.3	0.8	0.6	-
Jan-08	2.6	0.8	3.7	0.5	0.5	0.5	0.4	2.2	0.8	0.3	0.8	-

Feb-08	0.4	0.1	14	0.1	0.1	0.3	0.1	0.3	0.2	0.2	0.3	-
Mar-08	4.5	0.6	9.2+	0.6	2.9	2.1	0.6	1.5	0.5	1	0.9	-
April-08	0.4#	0.4#	0.8#	0.4#	0.4#	0.8#	1.1#	1.7#	1.2	1.1#	1.1#	-
May-08	1.1	2.4#	0.9	1.4	0.9	0.9	0.7	2.7	1#	1.1	1.3#	-
June-08	0.2	0.4#	0.1	0.5	0.1#	0.1	0.3	0.5#	0.1	0.8	0.2	-
July-08	0.4	0.7#	1.3#	0.6	0.8#	0.9	0.8	1	0.7	0.5	1.1	-
Aug-08	1	0.5	0.7	0.6	0.5	1.9	0.8	1	1	0.9	1.4	-
Sep-08	0.6	1	1.3	0.7	0.6	0.9	0.6	0.9	0.9	0.9	1.8	-
Oct-08	1	0.5	1	1.3	1.3	1.2	1	1.4	0.8	1.6	1.8	-
Nov-08	0.8	1.4	2.7	2.5	0.9	1.2	0.8	2.4	1.1	1	1.7	-
Dec-08	0.4	0.4	0.6	0.5	0.3	1.1	0.6	15	0.9	0.7	1.2	-
Jan-09	1.1	3#	1.6	0.8	0.9	1.4	0.7	1.5	0.9	0.9	5+	-
Feb-09	0.4	4.4	1.5	1.1	0.9	1.6	0.8	1.2	1.4	2.5	1.2	-
Mar-09	2.8	5.8	2.7	2.4	1.9	2.1	2.5	2.4	2.3	5.7	2.7	-
Apr-09	2	0.8	0.8	0.6	0.6	3.2	1.1	1.1	1	0.6	0.9	-
May-09	0.6	1.6	0.8	2.4	0.9	5.6 +	1.4	1.1	1.3	0.7	1.5	-
Jun-09	0.4	1.3	0.8	0.5	0.5	3.3	0.9	0.6	1	3.4	0.7	-
Jul-09	0.2	1.0	0.6	0.4	0.3	3.8	0.5	0.6	0.6	0.3	0.6	-
Aug-09	0.8	3.6	0.8	1.2	1.0	1.8	0.8	1.8	1.3	0.8	1.0	-
Sep-09	1.0	1.8#	1.8	8.3 +	1	1.8	0.9#	1.8#	1.7#	0.7	1.4#	-
Oct-09+	4.3	9#	5.2#	11.3#	3.2	3.8#	2.4#	6.8#	3.0#	2.2	3.2#	5.7#
Nov-09	0.8#	1.7#	1.4#	1.3#	0.7#	2.1#	1.3#	8.0#	*	1.0#	*	2.3
Dec-09	1.4#	4.0#	1.6#	2.4#	1.7#	1.8	1.6	2.6#	1.7#	1.7#	2.2#	1.7
Jan-10	0.6#	0.8#	5.6#	1.2#	2.4#	1.2#	0.8#	1.4#	1.3#	0.8#	1.3#	1.1#
Feb-10	1.9#	11.3+	1.9#	1.4#	1.5#	1.1#	1.2#	1.6#	1.1#	0.8#	1.8#	1.3#
Mar-10	0.6#	0.6#	3.2#	1#	4.1#	0.6#	0.6#	1.2	0.6	0.2#	0.8#	1.1#
Apr-10	0.8#	1.8#	2.4#	0.7#	+	0.3	0.6#	0.9#	0.6#	0.4#	0.8#	0.8#
May-10	0.8	4.9#	3.0#	1.1	1.2	1.0	0.7	1.3	1.0#	0.5	1.1#	0.8

 # - sample contaminated

+ - sample invalid

**Broken funnel*

[Note: Samples for October 2009 have been considered invalid, due to a widespread dust storm experienced on 23rd September 2009.]

APPENDIX B

Figures

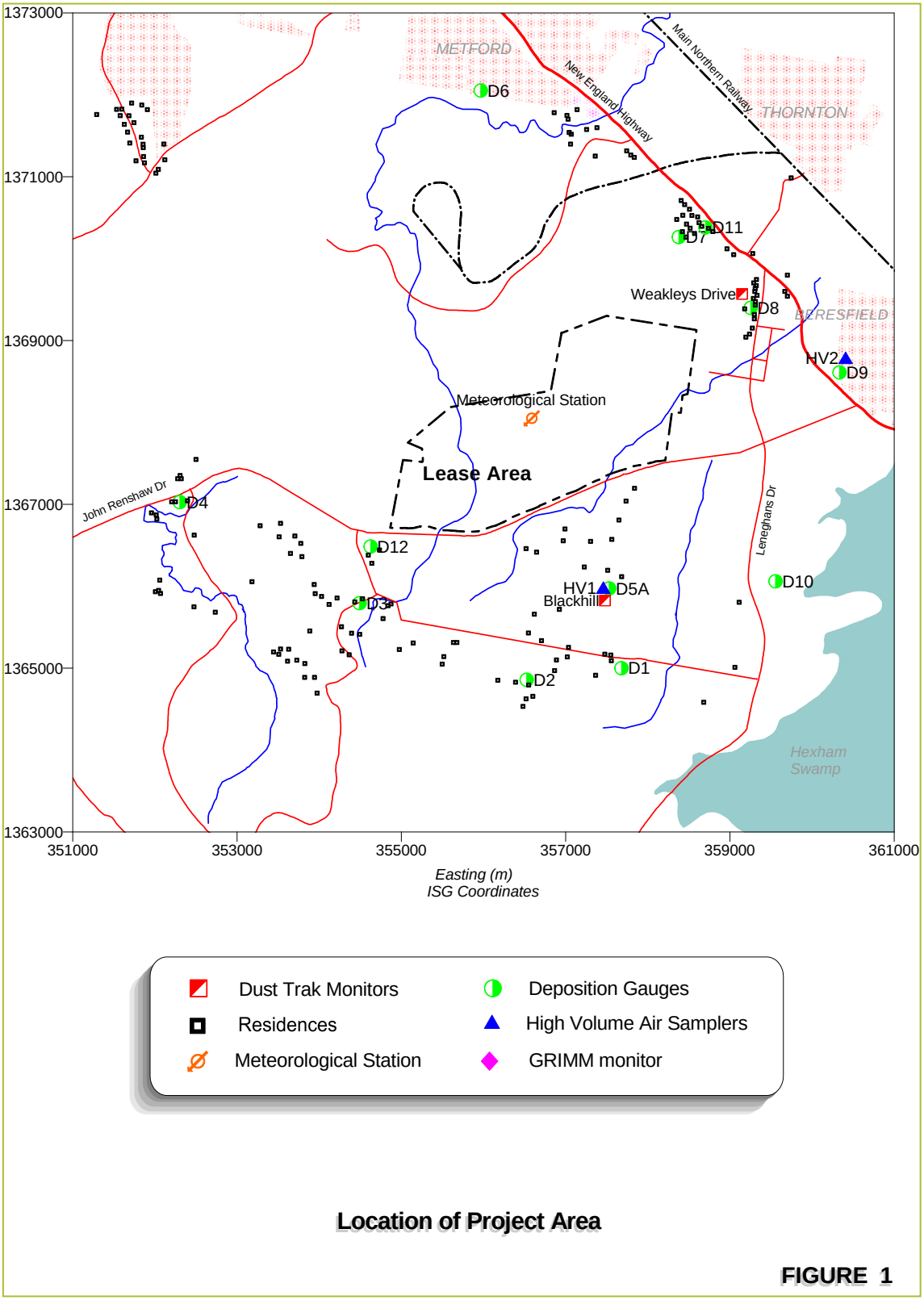

Figure 1: Project Location

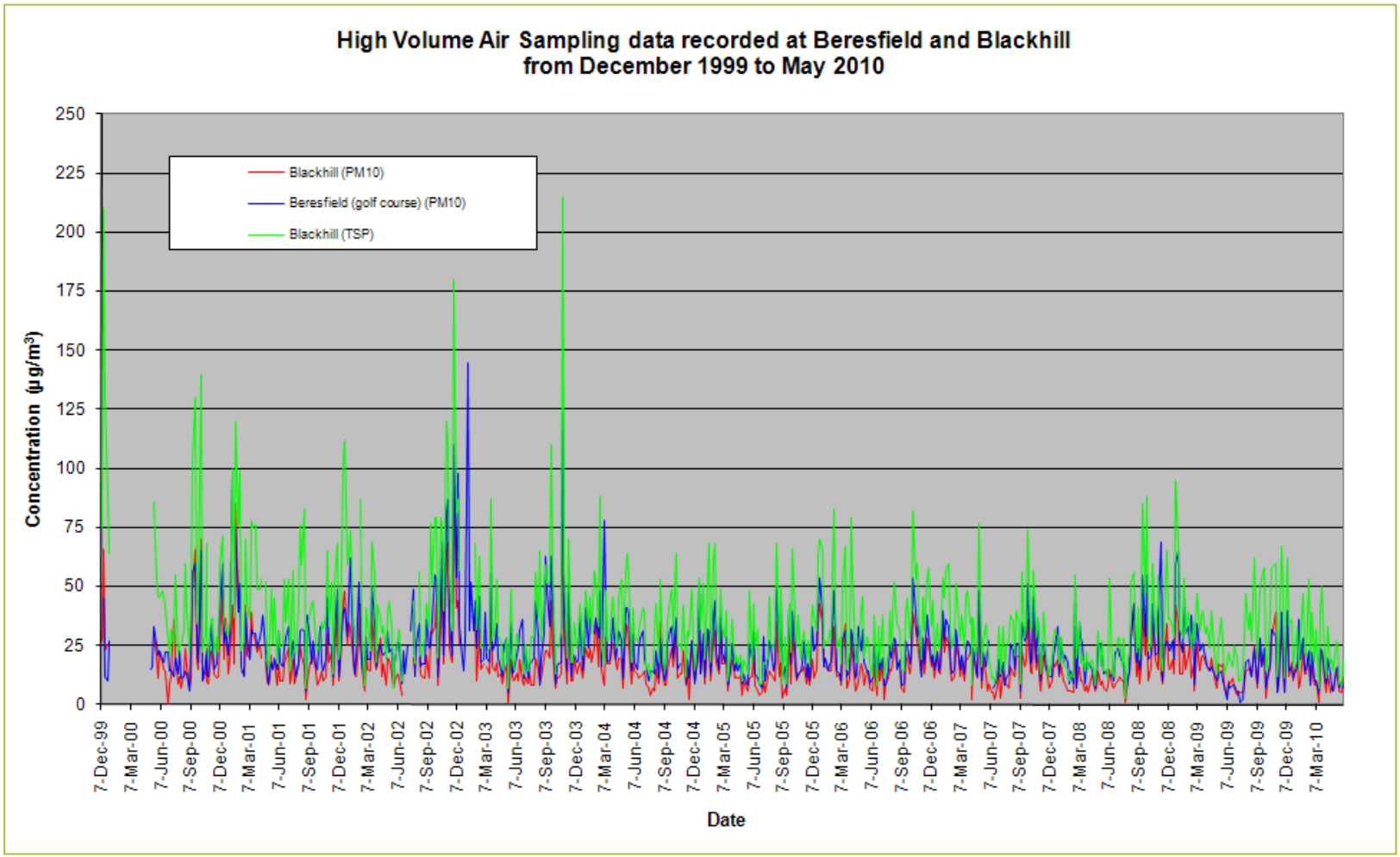

Figure 2: High Volume Air Sampling data

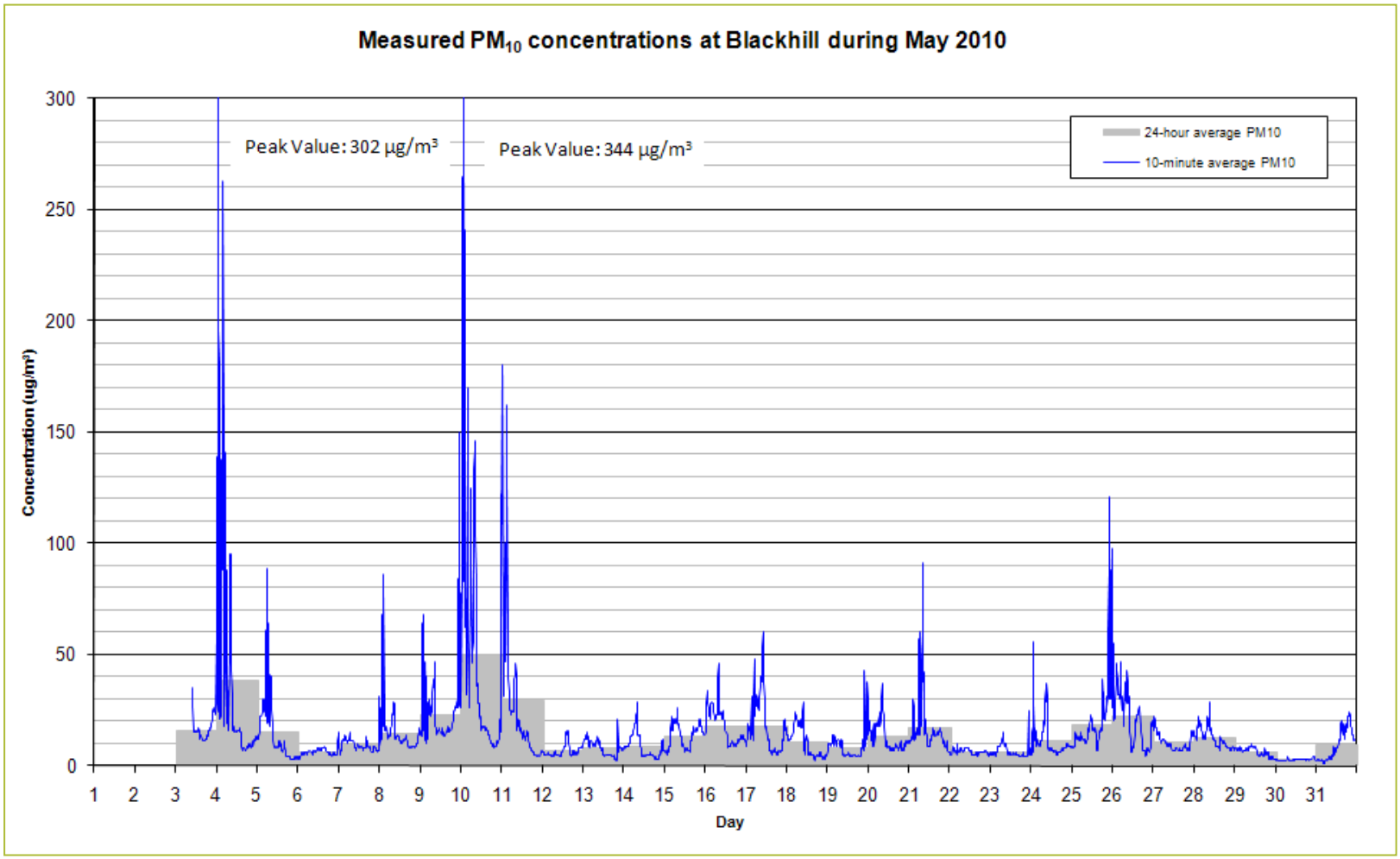

Figure 3: DustTrak sampling data, Blackhill site

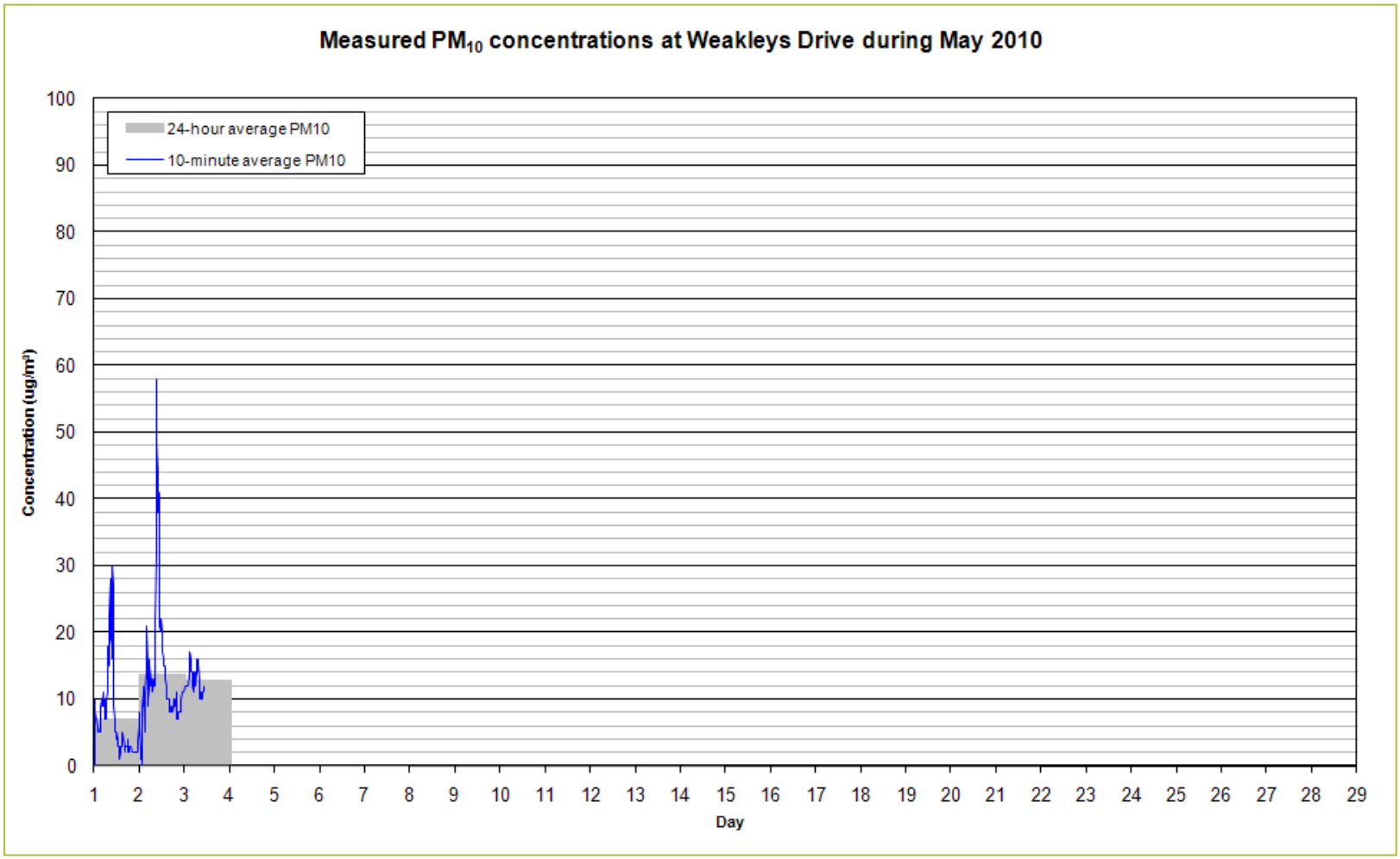

Figure 4: DustTrak sampling data, Weakleys Drive site

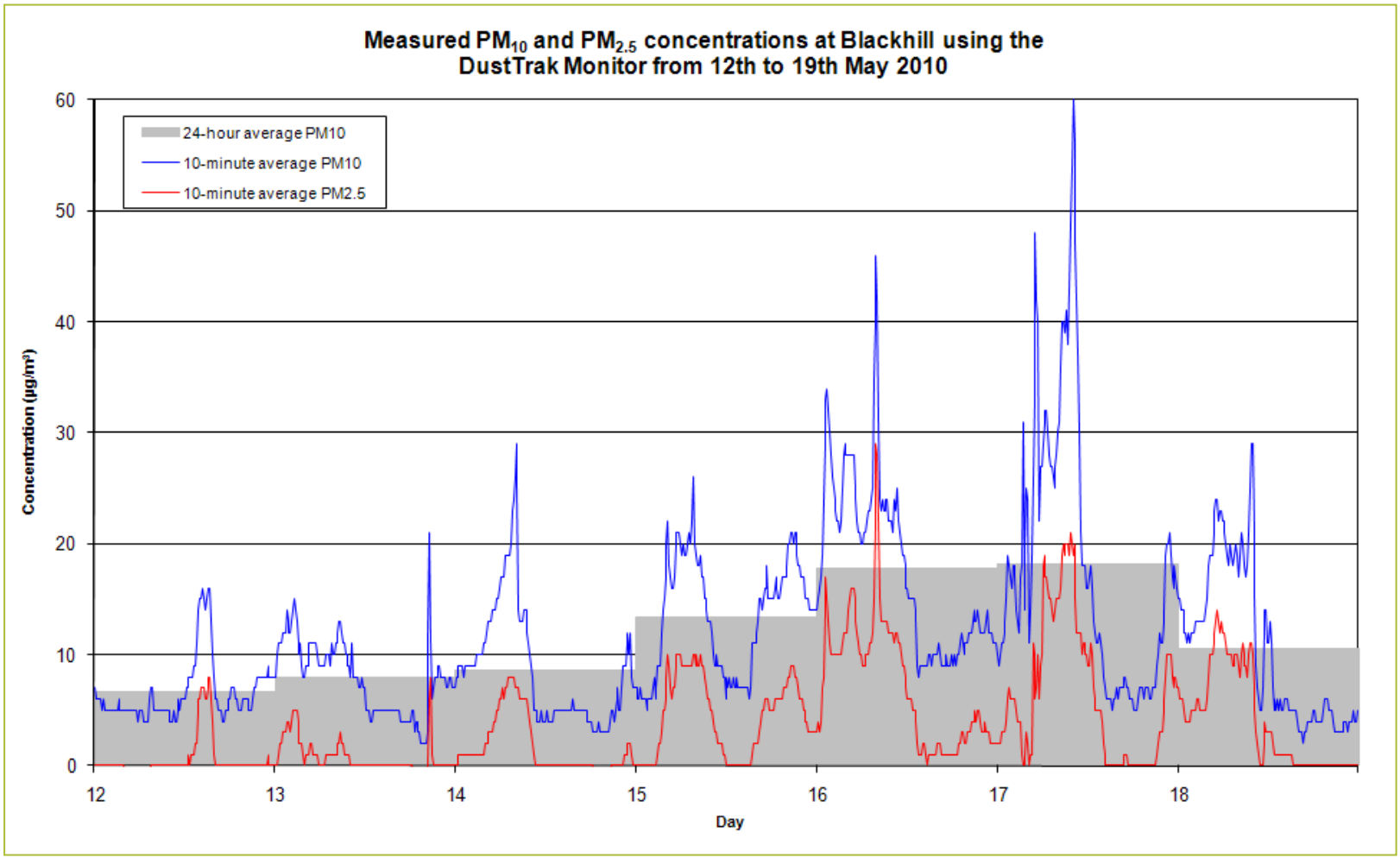

Figure 5: DustTrak $PM_{2.5}$ monitoring data

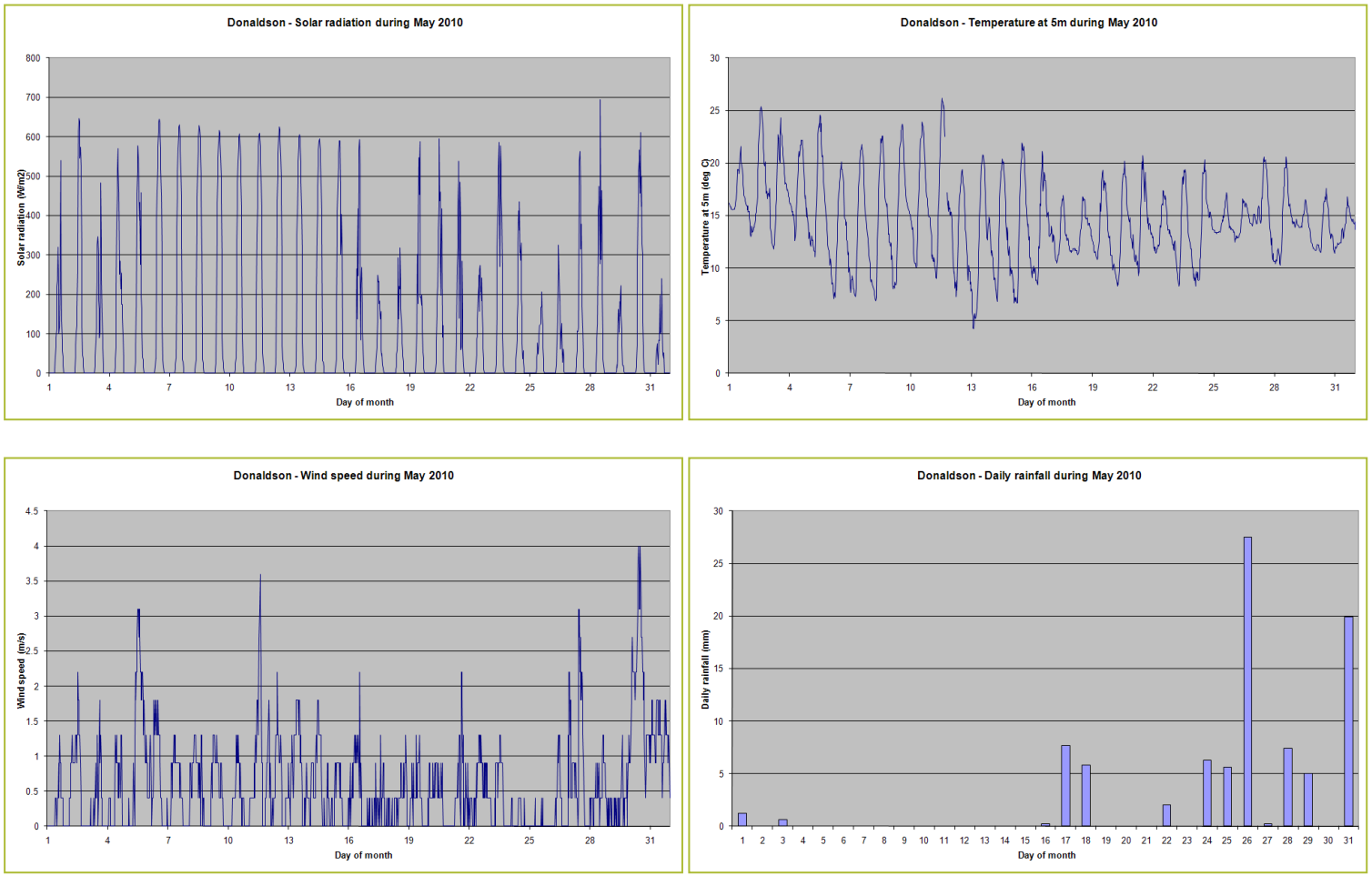

Figure 6: Meteorological conditions

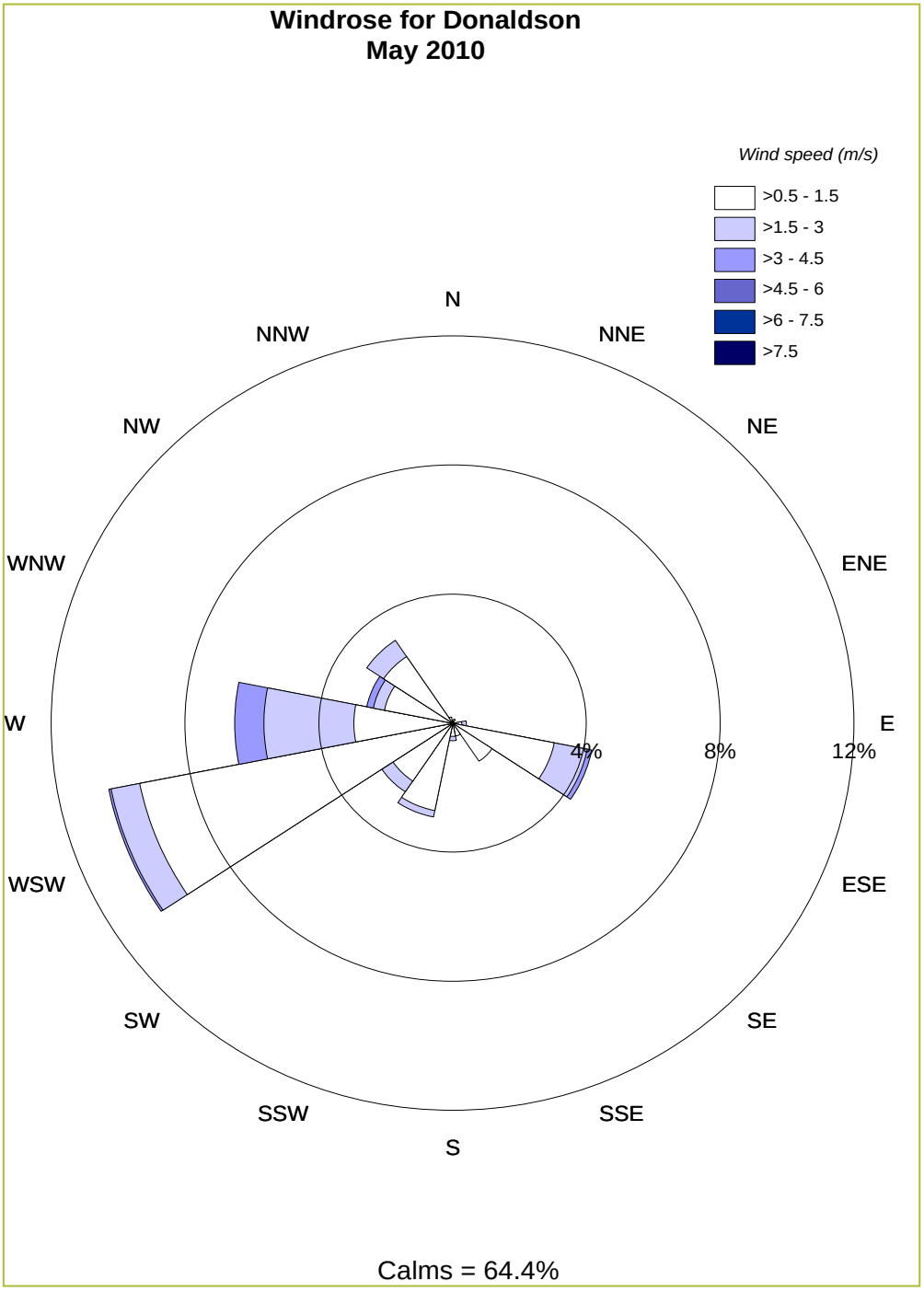

Figure 7: Windrose

DONALDSON MONITORING

DUST AND METEOROLOGICAL DATA
JUNE 2010 REPORT

Donaldson Coal

Job No: **3003**

17 September 2010

PROJECT TITLE:	**DUST AND METEOROLOGICAL DATA JUNE 2010 REPORT**
JOB NUMBER:	**3003**
PREPARED FOR:	Phil Brown **DONALDSON COAL**
PREPARED BY:	Philip Henschke
QA PROCEDURES CHECKED BY:	Ronan Kellaghan
APPROVED FOR RELEASE BY:	Aleks Todoroski
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VERSION	DATE	PREPARED BY	REVIEWED BY
V1	17/09/2010	Philip Henschke	Ronan Kellaghan

Queensland Environment Pty Ltd trading as
PAEHolmes ABN 86 127 101 642

SYDNEY:
Suite 2B, 14 Glen Street
Eastwood NSW 2122
Ph: +61 2 9874 8644
Fax: +61 2 9874 8904

BRISBANE:
Level 1, La Melba, 59 Melbourne Street South Brisbane Qld 4101
PO Box 3306 South Brisbane Qld 4101
Ph: +61 7 3004 6400
Fax: +61 7 3844 5858

Email: info@paeholmes.com

Website: www.paeholmes.com

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1 INTRODUCTION

As part of their Air Quality Management Plan Donaldson Coal operate a dust monitoring network in the vicinity of the mining lease and a meteorological station on site. This report has been prepared in order to bring together the various data collected throughout the network during June 2010 and to summarise the information.

The dust network includes continuous monitoring, high volume air sampling and dust deposition monitoring. The continuous monitoring network consists of two DustTrak monitors measuring PM_{10} at two sites and an additional DustTrak monitor which is used for one week each quarter to measure $PM_{2.5}$.

There are two locations which use high volume air samplers to determine concentrations of PM_{10} and TSP. These operate on a six-day cycle in line with similar measurements made by the NSW Department of Environment, Climate Change and Water (DECCW) at other locations throughout the state.

In addition to concentration measurements, monthly levels of dust deposition are also measured using twelve gauges placed at various locations in the area of the mine. The locations of each of these monitors and gauges are shown in Figure 1.

Table 1 lists the monitors used and pollutants measured at these locations.

Table 1: Summary of monitoring locations and instruments

Monitoring Location	Instruments Used	Pollutant Monitored
Beresfield	HVAS	PM_{10}
Blackhill	HVAS	PM_{10}
	HVAS	TSP
	DustTrak	PM_{10}
	DustTrak (1 week per quarter)	$PM_{2.5}$
Weakleys Drive	DustTrak	PM_{10}
DG1 – DG12	Deposition Gauges	Dust Deposition

The meteorological station is situated at the site of the office buildings and measures the following parameters:

- wind speed
- wind direction
- temperature
- solar radiation
- rainfall

The data are downloaded at various intervals by Donaldson and then forwarded to PAEHolmes for processing.

2 HIGH VOLUME AIR SAMPLING

High Volume Air Sampling (HVAS) was carried out at Beresfield and Blackhill by Metford Laboratories. PM_{10} is measured at both sites while TSP is only measured at Blackhill. The data collected during June 2010 are summarised in **Table 2**. A graph consisting of all the data collected to date is shown in Figure 2.

Table 2: HVAS data from Beresfield and Blackhill for June 2010

Date	Beresfield PM_{10} ($\mu g/m^3$)	Blackhill PM_{10} ($\mu g/m^3$)	Blackhill TSP ($\mu g/m^3$)
6/06/2010	4	3	9
12/06/2010	9	8	18
18/06/2010	10	9	28
24/06/2010	13	5	9
30/06/2010	8	10	37
Annual average	**15**	**13**	**29**

These measurements will include all background sources relevant to that location, including contributions from the Donaldson mining operations.

On the days that the instruments were monitoring, the highest 24-hour average PM_{10} concentration recorded in June 2010 was 13 $\mu g/m^3$. This value was measured on the 24th at the Beresfield site. On this occasion the measured PM_{10} concentration did not exceed the 50 $\mu g/m^3$ 24-hour DECCW goal.

TSP measurements from the Blackhill site show that concentrations were below the DECCW 90 $\mu g/m^3$ annual average TSP goal. It should be noted that the DECCW goal refers to an annual average and not a 24-hour average as measured by the high volume air sampler. The annual average TSP concentration for the 12 months to June 2010 was 29 $\mu g/m^3$.

Figure 2 shows a seasonal trend in PM_{10} concentrations, peaking during the warmer months and decreasing during autumn and winter. This is a common trend and is seen consistently in the Hunter Valley.

The annual average PM_{10} concentrations for Beresfield and Blackhill were 15 $\mu g/m^3$ and 13 $\mu g/m^3$ respectively for the 12 months to June 2010. These values are below the DECCW's annual average PM_{10} air quality criterion of 30 $\mu g/m^3$.

3 CONTINUOUS MONITORING

3.1 DustTrak Monitoring at Blackhill

Figure 3 shows a time series of the PM_{10} data collected from the DustTrak monitor at the Blackhill site. The DustTrak monitoring for the Blackhill site is available from the 1st to 4th of June. During this period the DustTrak monitor experienced a significant power failure resulting in the loss of data.

Of the available data, the measured 24-hour average PM_{10} concentrations did not exceed the DECCW goal of 50 $\mu g/m^3$. The maximum 24-hour average PM_{10} concentration was recorded on the 4th of June at 20 $\mu g/m^3$.

3.2 DustTrak Monitoring at Weakleys Drive

A time series of the PM_{10} data collected from the Weakleys Drive site is shown in Figure 4. During the month of June, the DustTrak monitor located at the Weakleys Drive site experienced a power failure. As a result DustTrak monitoring for the Weakleys Drive site is available from the 3rd to 23rd of June 2010.

Of the available data, the measured 24-hour average PM_{10} concentrations did not exceed the DECCW goal of 50 $\mu g/m^3$. The maximum 24-hour average PM_{10} concentration was recorded on the 16th of June at 16 $\mu g/m^3$.

3.3 DustTrak $PM_{2.5}$ Monitoring at BlackHill

No $PM_{2.5}$ monitoring was scheduled for June 2010.

4 DUST DEPOSITION MONITORING

Dust deposition monitoring is carried out each month via a network consisting of twelve (12) gauges. The results for June 2010 are shown in **Table 3**, in conjunction with results for the previous eleven months in order to provide an annual average for that period. A table showing the complete data set from July 2000 in provided in **Appendix A**.

Table 3: Dust deposition monitoring for the 12-month period to June 2010

Month	Monthly dust deposition rate (g/m^2/month)											
	DG1	**DG2**	**DG3**	**DG4**	**DG5A**	**DG6**	**DG7**	**DG8**	**DG9**	**DG10**	**DG11**	**DG12**
Jul-09	0.2	1.0 #	0.6	0.4	0.3	3.8 #	0.5	0.6	0.6	0.3	0.6	-
Aug-09	0.8#	3.6#	0.8#	1.2#	1.0#	1.8#	0.8#	1.8	1.3#	0.8#	1.0	-
Sep-09	1.0	1.8#	1.8	8.3#	1	1.8	0.9#	1.8#	1.7#	0.7	1.4#	-
Oct-09	4.3	9#	5.2#	11.3#	3.2	3.8#	2.4#	6.8#	3#	2.2	3.2#	5.7#
Nov-09	0.8#	1.7#	1.4#	1.3#	0.7#	2.1#	1.3#	8.0#	*	1.0#	*	2.3#
Dec-09	1.4#	4.0#	1.6#	2.4#	1.7#	1.8	1.6	2.6#	1.7#	1.7#	2.2#	1.7
Jan-10	0.6#	0.8#	5.6#	1.2#	2.4#	1.2#	0.8	1.4	1.3#	0.8#	1.3#	1.1#
Feb-10	1.9#	11.3+	1.9#	1.4#	1.5#	1.1#	1.2#	1.6#	1.1#	0.8#	1.8#	1.3#
Mar-10	0.6#	0.6#	3.2#	1#	4.1#	0.6#	0.6#	1.2	0.6#	0.2#	0.8#	1.1#
Apr-10	0.8#	1.8#	2.4#	0.7#	+	0.3	0.6#	0.9#	0.6#	0.4#	0.8#	0.8#
May-10	0.8	4.9#	3.0#	1.1	1.2	1.0	0.7	1.3#	1.0	0.5	1.1#	0.8
June-10	0.3	2.2	3.0	0.6	0.2	1.2	0.5	0.5	0.6	0.7	0.7	0.4
Annual Average	**0.8**	**3.1**	**2.3**	**1.8**	**1.4**	**1.5**	**0.9**	**2.0**	**1.1**	**0.7**	**1.2**	**-**

*Data supplied by Metford Laboratories. # Insects/bird droppings reported. +Invalid. * No recording, funnel damaged.*

The highest dust deposition measurement recorded in June 2010 was 3.0 g/m^2/month at DG3; the accompanying laboratory report showed the sample was contaminated with plant matter.

Readings considered invalid have been removed when calculating the annual average. The annual average deposition rates for the gauges in the network were low and significantly below the goal of 4 g/m^2/month, indicating nuisance dust in the vicinity of the mine is not an issue.

5 METEOROLOGICAL MONITORING

Monthly plots of the wind speed, temperature, solar radiation, and rainfall data collected in June 2010 are shown in Figure 6 and a windrose plot is shown in Figure 7.

The graphs shown in Figure 6 indicate that the instruments were recording appropriately. Data maxima and minima all appeared to be sensible for this site during June. Total rainfall for the month was 112.8 mm.

A windrose (see Figure 7) created from the available 30-minute average wind data shows that winds were predominantly from the west. The site recorded calms (wind speed less than or equal to 0.5 m/s) for approximately 59% of the time. The relatively large fraction of clam winds may arise from the generally forested area and the specific location of the weather station.

APPENDIX A

Dust Deposition Data

Dust deposition (g/m²/month)												
Month	D1	D2	D3	D4	D5A	D6	D7	D8	D9	D10	D11	D12
May-00	0.4	0.4	-	0.7	0.9	0.6	3.6	1.6	0.5	1.8	-	-
Jun-00	0.7	0.5	0.5	0.7	0.8	0.4	3.8	3.2	0.5	0.7	-	-
Jul-00	0.4	0.4	0.5	0.7	0.8	0.5	0.8	1.5	0.4	0.4	-	-
Aug-00	0.9	0.6	1.0	1.2	1.1	1.0	3.4	0.7	0.7	0.6	-	-
Sep-00	0.8	0.9	1.1	0.9	1.3	1.0	2.2	1.0	1.0	0.8	-	-
Oct-00	0.4	0.6	1.1	0.9	0.9	0.8	5.3	0.9	0.6	0.5	-	-
Nov-00	5.2	0.7	1.4	0.8	1.0	0.4	24.1	9.4	1.1	0.6	-	-
Dec-00	2.8	1.4	1.9	1.3	1.1	0.8	2.1	2.5	0.9	0.9	-	-
Jan-01	0.7	1.7	1.4	1.8	0.7	1.3	1.1	2.4	1.1	0.6	-	-
Feb-01	0.9	3.1	2.0	0.5	0.9	0.7	0.7	6.7	1.3	0.5	1.0	-
Mar-01	0.8	2.1	1.3	0.6	0.7	0.6	0.6	5.5	0.6	0.6	1.5	-
Apr-01	0.8	0.7	1.3	0.5	0.7	0.4	0.3	5.1	0.7	0.6	0.8	-
May-01	0.2	0.2	0.4	0.4	0.3	0.3	0.6	1.8	0.6	0.8	0.9	-
Jun-01	0.5	0.4	0.5	1.0	1.0	0.4	0.4	8.8	0.7	0.6	0.6	-
Jul-01	0.5	0.3	1.8	0.5	0.8	-	16.3	4.9	0.9	0.7	0.7	-
Aug-01	0.4	0.4	0.8	0.8	1.0	1.7	1.0	-	1.0	1.8	1.1	-
Sep-01	0.7	1.0	1.7	1.1	1.7	0.7	-	6.0	1.1	1.3	1.7	-
Oct-01	1.1	0.6	4.6	0.9	0.7	0.9	1.2	1.9	0.9	0.6	1.7	-
Nov-01	0.9	1.0	1.1	1.1	0.8	1.1	6.0	5.5	1.3	1.9	2.3	-
Dec-01	4.9	0.9	4.2	0.9	1.3	1.9	1.2	3.1	1.2	9.7	1.8	-
Jan-02	0.8	1.0	1.5	1.3	1.1	1.4	1.3	1.5	1.1	0.9	1.5	-
Feb-02	1.1	1.1	0.9	0.3	0.4	0.5	3.1	5.1	0.5	0.5	0.9	-
Mar-02	1.7	2.1	1.6	0.7	0.7	0.8	1.0	18	1.0	0.9	1.7	-
Apr-02	1.0	0.4	1.0	0.8	0.8	0.6	0.9	10.1	0.5	0.7	1.0	-
May-02	0.6	0.6	6.0	0.7	0.4	1.2	0.9	3.1	0.7	0.2	1.0	-
Jun-02	1.4	0.4	1.7	0.6	0.5	0.8	0.6	2.1	0.6	0.5	1.0	-
Jul-02	0.7	0.7	-	0.8	0.8	0.7	1.2	-	1.1	0.5	1.0	-
Aug-02	1.3	0.8	1.4	1.2	1.1	1.2	1.5	-	1.5	0.9	1.6	-
Sep-02	0.5	1.2	1.1	0.8	0.5	0.7	5.1	9.3	1.6	0.6	1.0	-
Oct-02	2.2	1.4	5.2	1.5	1.5	1.4	1.4	3.4	-	1.5	3.1	-
Nov-02	2.8	1.8	3.7	1.6	0.1	1.8	2.1	3.5	2.1	2	1.9	-
Dec-02	2.0	-	2.5	1.5	3.0	1.5	1.8	4.1	1.6	1.2	1.9	-
Jan-03	2.1	1.5	2.7	1.5	1.0	1.9	2.2	2.5	1.1	1.0	1.6	-
Feb-03	1.4	1.1	2.6	1.1	0.9	1.2	1.7	5.9	1.2	1.0	1.5	-
Mar-03	0.8	0.5	1.2	1.2	0.6	2.1	1.5	3.4	-	3.6	9.5	-
Apr-03	0.5	1.0	0.6	1.0	0.7	0.5	1.1	8.0	-	2.0	1.0	-
May-03	0.5	0.4	0.6	0.2	0.2	0.6	1.3	1.6	0.5	0.8	1.2	-
Jun-03	0.5	0.6	0.8	0.8	0.4	0.6	0.8	0.7	0.9	0.7	0.7	-
Jul-03	0.3	0.4	0.4	0.6	0.4	0.5	0.7	0.5	0.5	0.5	0.7	-
Aug-03	0.8	0.2	0.7	1.1	0.5	1.3	1.8	2.1	1.3	0.7	0.9	-
Sep-03	0.6	0.7	1.1	0.7	0.8	1.7	1.4	1.3	2.5	0.9	1.3	-
Oct-03	-	0.9	1.4	0.9	0.7	1.9	1.0	1.4	0.6	0.8	1.3	-
Nov-03	2.6	0.8	1.0	1.1	0.4	1.3	1.5	1.5	-	0.8	1.3	-
Dec-03	1.0	1.0	1.4	1.3	1.1	1.5	1.6	2.0	1.8	0.9	1.4	-
Jan-04	8.5	1.5	2.1	1.5	1.3	2.6	1.4	2.2	1.7	1.5	1.7	-
Feb-04	1.2	1.0	1.7	1.4	0.7	3.1	1.6	2.2	-	1.5	2.3	-

Mar-04	0.4	0.6	6.6	1.2	0.7	1.9	1.1	12.1	4.8	1.5	1.1	-
Apr-04	0.6	1.0	0.8	0.8	0.6	1.9	0.8	1.4	0.9	1.2	1.1	-
May-04	0.2	0.9	2.2	0.9	0.8	0.7	0.9	1.4	1.2	0.9	1.5	-
Jun-04	0.4	0.6	0.7	0.9	0.6	1.4	1.0	0.9	1.0	1.0	0.8	-
Jul-04	0.4	0.6	5.3#	0.6	0.5	2.9	1.0	1.1	0.9	0.6	1.2	-
Aug-04	0.5	0.5	0.5	1.3	0.7	1.1	1.1	1.4	-	1.0	1.0	-
Sep-04	0.6	0.6	0.8	2.2	1.0	1.0	0.9	4.4	0.9	16.7	1.1	-
Oct-04	0.7	0.9	1.2	0.9	0.8	1.4	1.0	10.5	1.0	1.0	0.8	-
Nov-04	0.8	0.7	1.3	1.9	0.7	0.9	1.0	3.0	1.1	1.1	1.6	-
Dec-04	2.0	1.4	3.6	1.5	1.3	2.2	3.2	7.9	1.8	5.5	2.5	-
Jan-05	1.2	1.0	3.7	1.6	1.4	4.0	2.3	2.7	2.6	2.5	2.8	-
Feb-05	1.2	1.2	1.8	1.6	1.3	2.0	1.7	-	2.3	1.5	2.3	-
Mar-05	1.3	0.9	1.4	0.9	0.9	3.0	1.2	7.7	-	0.8	1.3	-
Apr-05	1.1	0.7	0.9	0.8	0.7	0.9	1.4	3.3	1.1	0.8	0.9	-
May-05	0.7	8.6	1.1	0.8	0.7	0.8	0.9	4.4	1.2	0.8	1.1	-
Jun-05	1.3	0.8	1.3	1.3	0.8	1.2	1.2	1.3	1.5	2.5	0.9	-
Jul-05	1.0	0.5	0.5	0.7	0.4	1.6	0.7	1.2	0.8	4.3	1.1	-
Aug-05	0.6	0.6	0.8	1.0	0.8	0.9	0.7	1.0	0.9	1.0	0.9	-
Sep-05	0.6	0.7	0.8	0.7	0.7	1.2	1.3	1.3	1.0	0.9	1.1	-
Oct-05	0.8	0.9	1.3	0.9	0.8	1.4	1.2	1.9	1.3	1.1	1.3	-
Nov-05	-	2.3	2.3	2.0	1.7	1.2	2.0	3.2	1.6	1.4	2.2	-
Dec-05	1.9	3.2	2.3	3.3	2.6	3.4	2.3	-	1.3	2.1	3.9	-
Jan-06	1.0	2.1	1.7	1.0	23.	3.5	-	2.7	1.1	-	1.5	-
Feb-06	2.2	1.0	0.9	1.2	1.1	1.7	1.1	2.9	-	2.3	1.8	-
Mar-06	0.7	0.6	2.3	0.7	0.6	0.9	1.0	1.4	0.7	0.8	1.5	-
Apr-06	0.6	0.7	1.1	0.8	0.6	1.1	0.8	1.0	1.0	1.8	1.5	-
May-06	1.0	3.1	1.0	-	1.1	1.4	1.1	4.1	-	7.0	1.5	-
Jun-06	0.4	0.3	0.7	0.5	0.4	0.6	0.7	0.8	0.6	0.9	0.9	-
Jul-06	0.3	0.3	1	1.3	0.4	0.7	0.7	2.7	-	0.6	0.6	-
Aug-06	0.9	0.6	0.8	0.7	0.7	0.8	0.7	1.7	-	3.7	0.9	-
Sep-06	1.6	0.7	1.1	1.7	0.7	1	0.9	1.3	1.2	0.8	1.6	-
Oct-06	2	1.4	1.6	1.8	0.9	1.8	1.2	1.8	1.5	1.8	1.9	-
Nov-06	4.3	2.2	3	2.3	2.3	5.3	2.4	3.3	2.3	2.3	2.9	-
Dec-06	1.2	3.4	1.9	2.3	2.3		2.1	2.1		4.9	3.9	-
Jan-07	2	0.9	1.5	0.7	0.7	1.7	1.1		1.2	1.7	0.9	-
Feb-07	1.7	0.9	1.6	0.7	0.6	1	1.8	1.7	1.1	1.2	1.7	-
Mar-07	1.3	0.9	1.7	0.8	1.2	0.6	2.2	1.7	1	0.9	1.7	-
Apr-07	0.5	0.7	0.9	0.6	4.8	1.2	0.5	2.7	0.5	0.8	0.9	-
May-07	0.8	0.5	0.6	1.2	0.6	0.6	0.7	1.9	0.5	0.7	0.8	-
Jun-07	0.6	0.5	0.7	1.1	0.1	0.5	0.1	0.5	0.1	0.4	0.3	-
Jul-07	0.5	0.4	0.6	2.1	0.5	0.8	0.6	0.6	0.4	0.5	0.7	-
Aug-07	1.5	0.4	0.7	1	0.7	0.7	0.5	1	0.6	0.6	0.7	-
Sep-07	1.3	0.5	1.8	1	0.7	0.9	0.9	1.3	1	0.7	1.6	-
Oct-07	4.2	0.9	1.1	1.4	1.1	1.7	1.8	1.7	1.6	1.4	2.2	-
Nov-07	0.8	0.8	1.1	0.9	1.1	1.1	1.1	1.7	0.6	0.8	1.5	-
Dec-07	1.3	0.8	3	0.7	0.5	0.8	0.5	1.1	0.3	0.8	0.6	-
Jan-08	2.6	0.8	3.7	0.5	0.5	0.5	0.4	2.2	0.8	0.3	0.8	-

Feb-08	0.4	0.1	14	0.1	0.1	0.3	0.1	0.3	0.2	0.2	0.3	-
Mar-08	4.5	0.6	9.2+	0.6	2.9	2.1	0.6	1.5	0.5	1	0.9	-
April-08	0.4#	0.4#	0.8#	0.4#	0.4#	0.8#	1.1#	1.7#	1.2	1.1#	1.1#	-
May-08	1.1	2.4#	0.9	1.4	0.9	0.9	0.7	2.7	1#	1.1	1.3#	-
June-08	0.2	0.4#	0.1	0.5	0.1#	0.1	0.3	0.5#	0.1	0.8	0.2	-
July-08	0.4	0.7#	1.3#	0.6	0.8#	0.9	0.8	1	0.7	0.5	1.1	-
Aug-08	1	0.5	0.7	0.6	0.5	1.9	0.8	1	1	0.9	1.4	-
Sep-08	0.6	1	1.3	0.7	0.6	0.9	0.6	0.9	0.9	0.9	1.8	-
Oct-08	1	0.5	1	1.3	1.3	1.2	1	1.4	0.8	1.6	1.8	-
Nov-08	0.8	1.4	2.7	2.5	0.9	1.2	0.8	2.4	1.1	1	1.7	-
Dec-08	0.4	0.4	0.6	0.5	0.3	1.1	0.6	15	0.9	0.7	1.2	-
Jan-09	1.1	3#	1.6	0.8	0.9	1.4	0.7	1.5	0.9	0.9	5+	-
Feb-09	0.4	4.4	1.5	1.1	0.9	1.6	0.8	1.2	1.4	2.5	1.2	-
Mar-09	2.8	5.8	2.7	2.4	1.9	2.1	2.5	2.4	2.3	5.7	2.7	-
Apr-09	2	0.8	0.8	0.6	0.6	3.2	1.1	1.1	1	0.6	0.9	-
May-09	0.6	1.6	0.8	2.4	0.9	5.6 +	1.4	1.1	1.3	0.7	1.5	-
Jun-09	0.4	1.3	0.8	0.5	0.5	3.3	0.9	0.6	1	3.4	0.7	-
Jul-09	0.2	1.0	0.6	0.4	0.3	3.8	0.5	0.6	0.6	0.3	0.6	-
Aug-09	0.8	3.6	0.8	1.2	1.0	1.8	0.8	1.8	1.3	0.8	1.0	-
Sep-09	1.0	1.8#	1.8	8.3 +	1	1.8	0.9#	1.8#	1.7#	0.7	1.4#	-
Oct-09+	4.3	9#	5.2#	11.3#	3.2	3.8#	2.4#	6.8#	3.0#	2.2	3.2#	5.7#
Nov-09	0.8#	1.7#	1.4#	1.3#	0.7#	2.1#	1.3#	8.0#	*	1.0#	*	2.3
Dec-09	1.4#	4.0#	1.6#	2.4#	1.7#	1.8	1.6	2.6#	1.7#	1.7#	2.2#	1.7
Jan-10	0.6#	0.8#	5.6#	1.2#	2.4#	1.2#	0.8#	1.4#	1.3#	0.8#	1.3#	1.1#
Feb-10	1.9#	11.3+	1.9#	1.4#	1.5#	1.1#	1.2#	1.6#	1.1#	0.8#	1.8#	1.3#
Mar-10	0.6#	0.6#	3.2#	1#	4.1#	0.6#	0.6#	1.2	0.6	0.2#	0.8#	1.1#
Apr-10	0.8#	1.8#	2.4#	0.7#	+	0.3	0.6#	0.9#	0.6#	0.4#	0.8#	0.8#
May-10	0.8	4.9#	3.0#	1.1	1.2	1.0	0.7	1.3	1.0#	0.5	1.1#	0.8
Jun-10	0.3	2.2#	3.0#	0.6#	0.2	1.2#	0.5	0.5#	0.6	0.7#	0.7#	0.4#

 # - sample contaminated

+ - sample invalid

**Broken funnel*

[Note: Samples for October 2009 have been considered invalid, due to a widespread dust storm experienced on 23rd September 2009.]

APPENDIX B

Figures

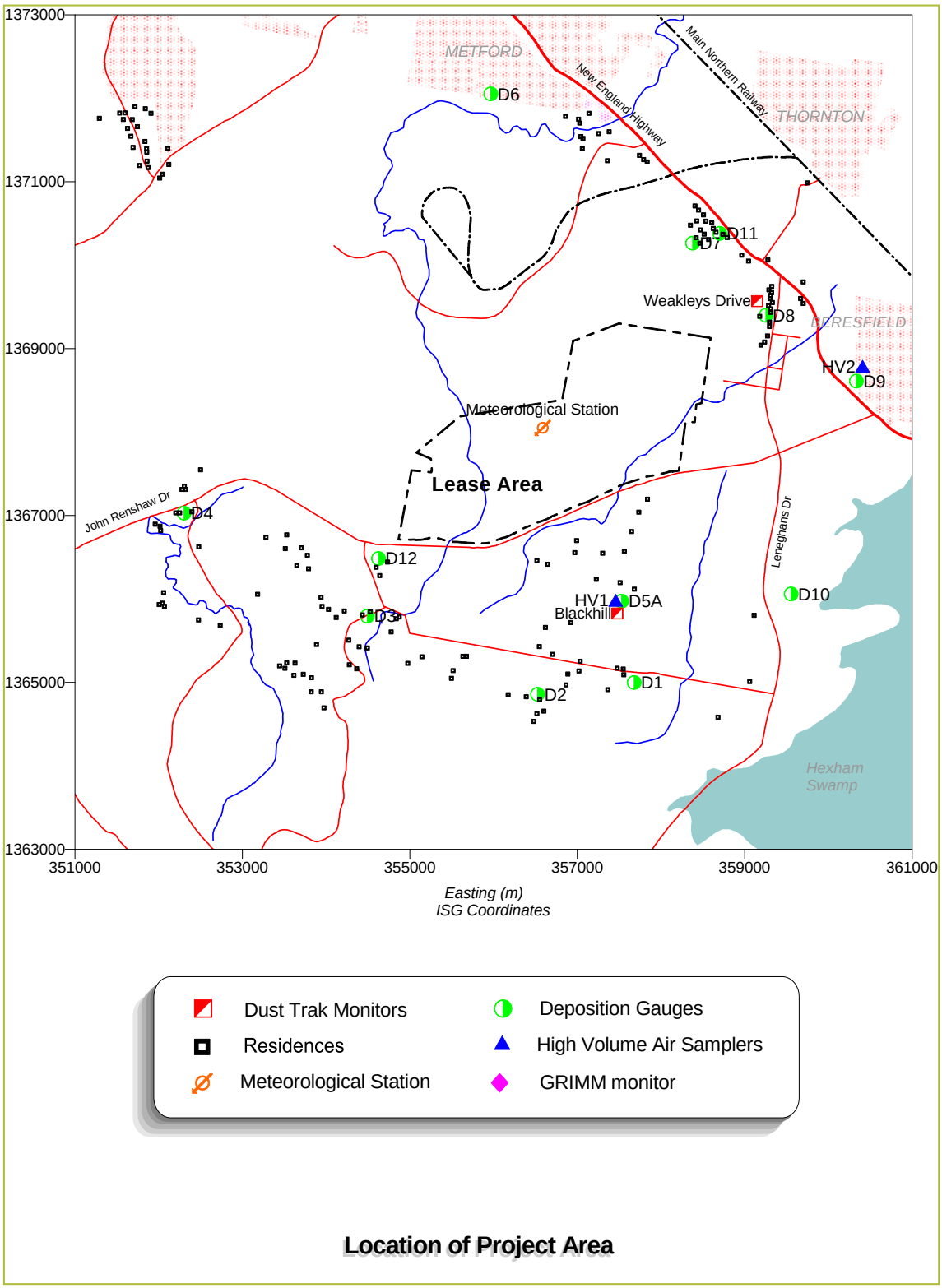

Figure 1: Project Location

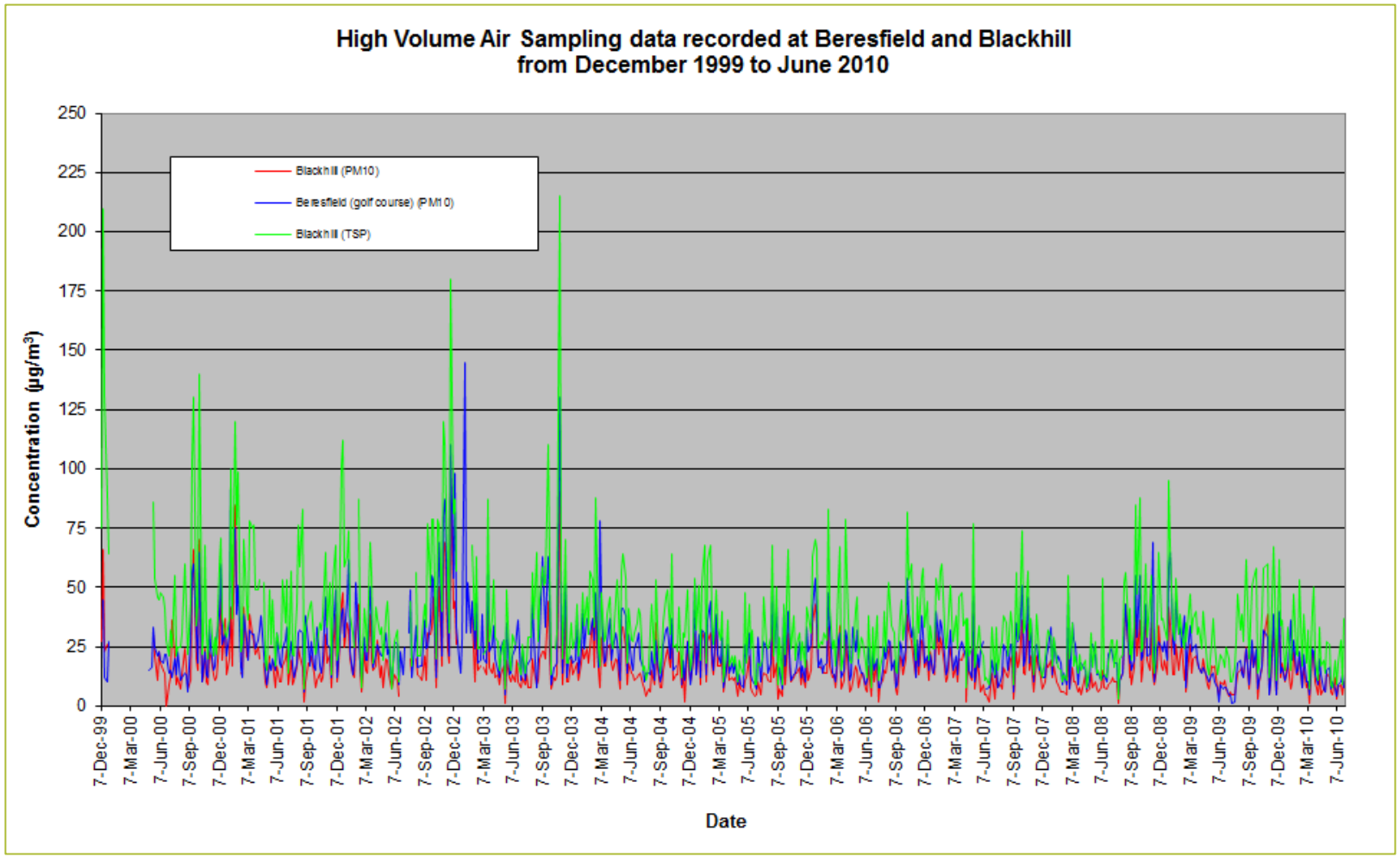

Figure 2: High Volume Air Sampling data

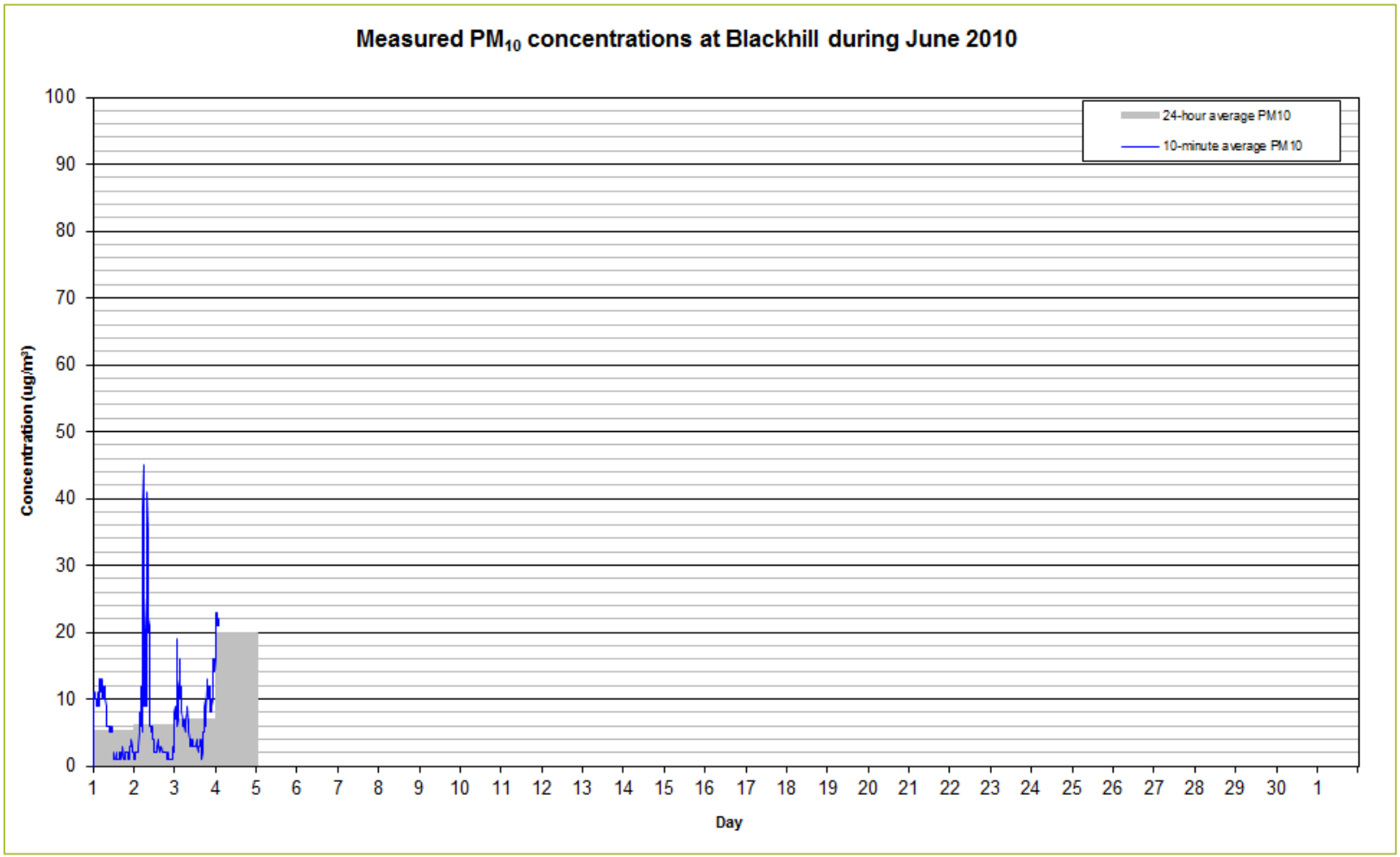

Figure 3: DustTrak sampling data, Blackhill site

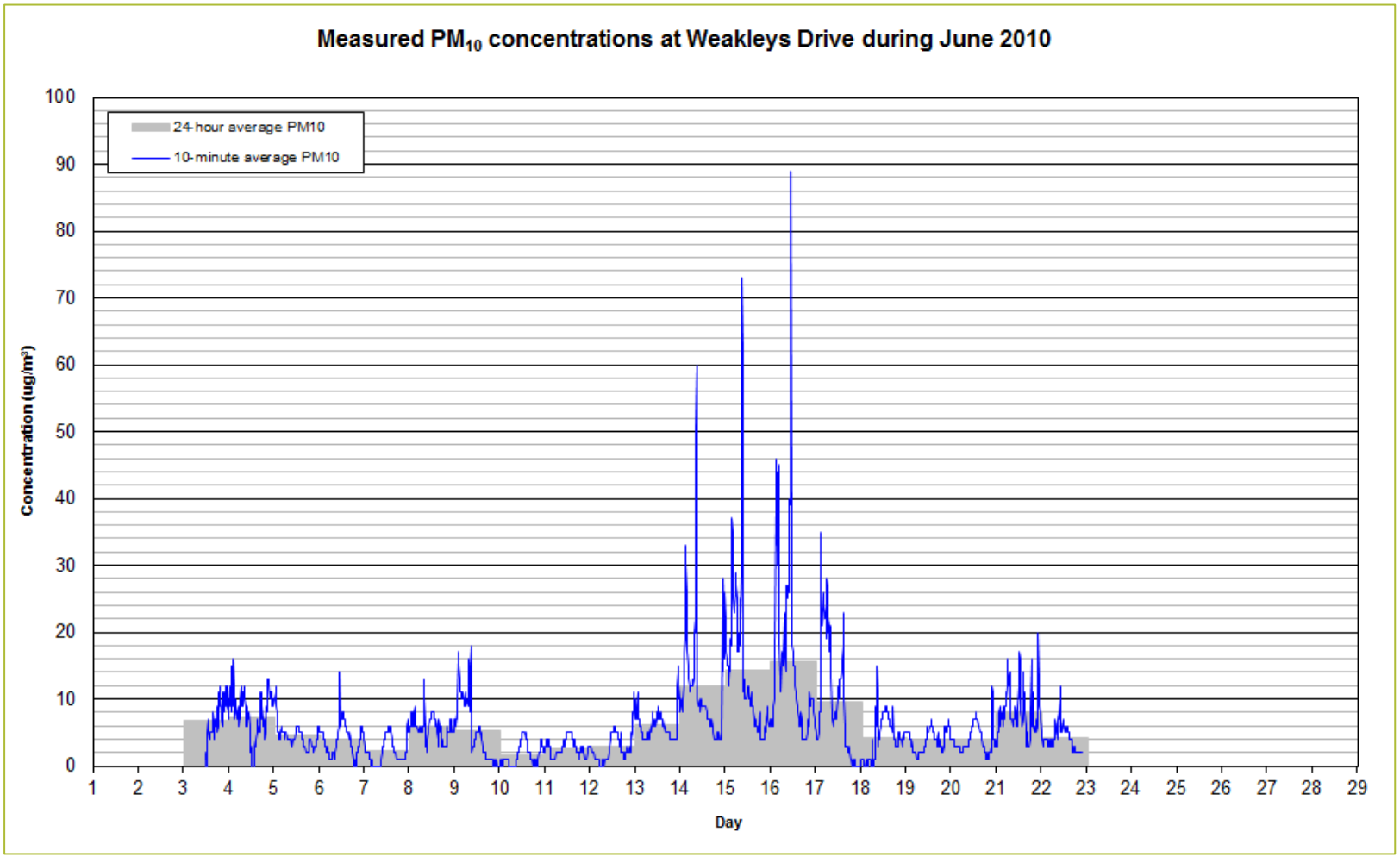

Figure 4: DustTrak sampling data, Weakleys Drive site

No $PM_{2.5}$ monitoring was scheduled from June 2010

Figure 5: DustTrak $PM_{2.5}$ monitoring data

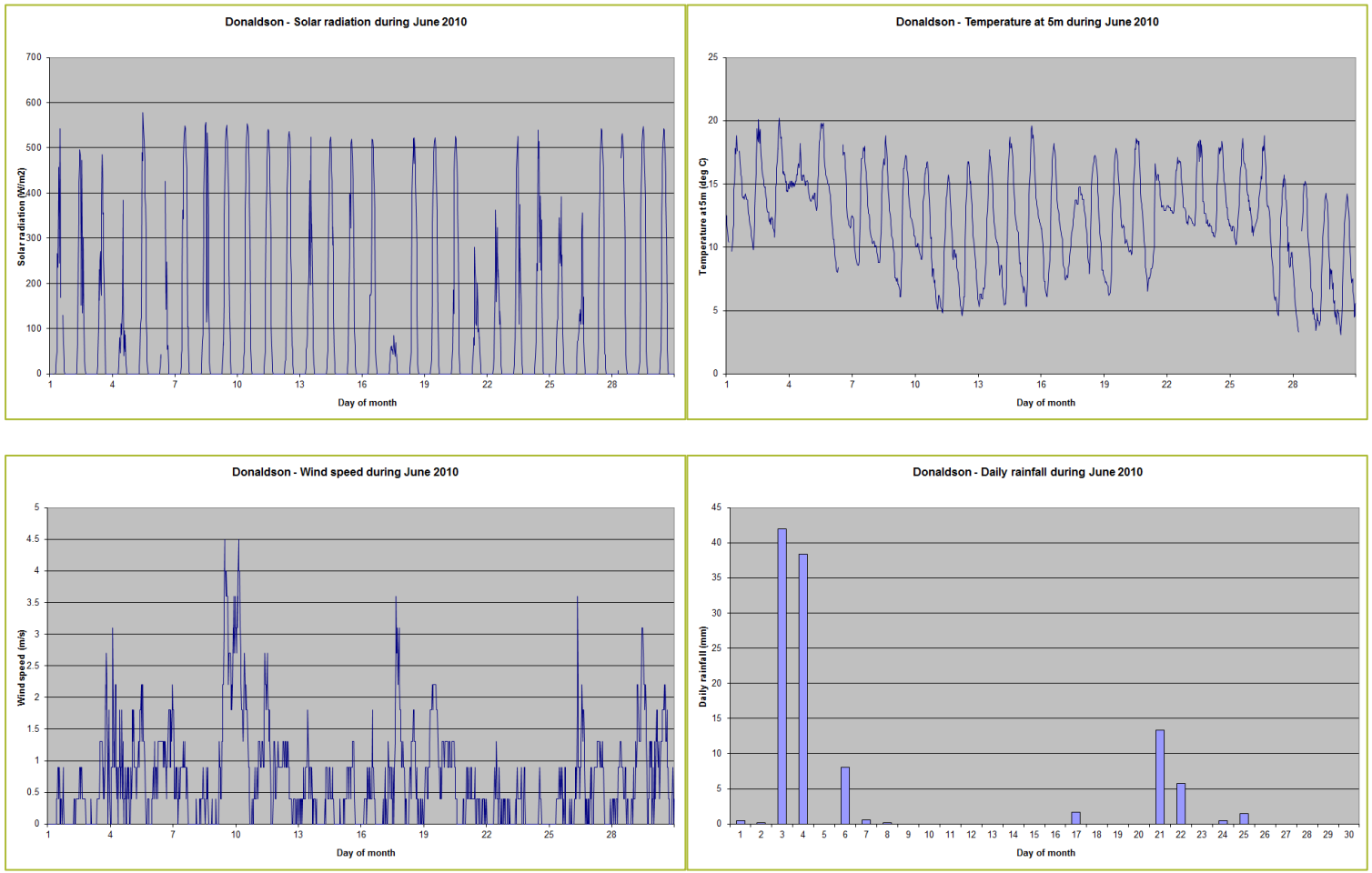

Figure 6: Meteorological conditions

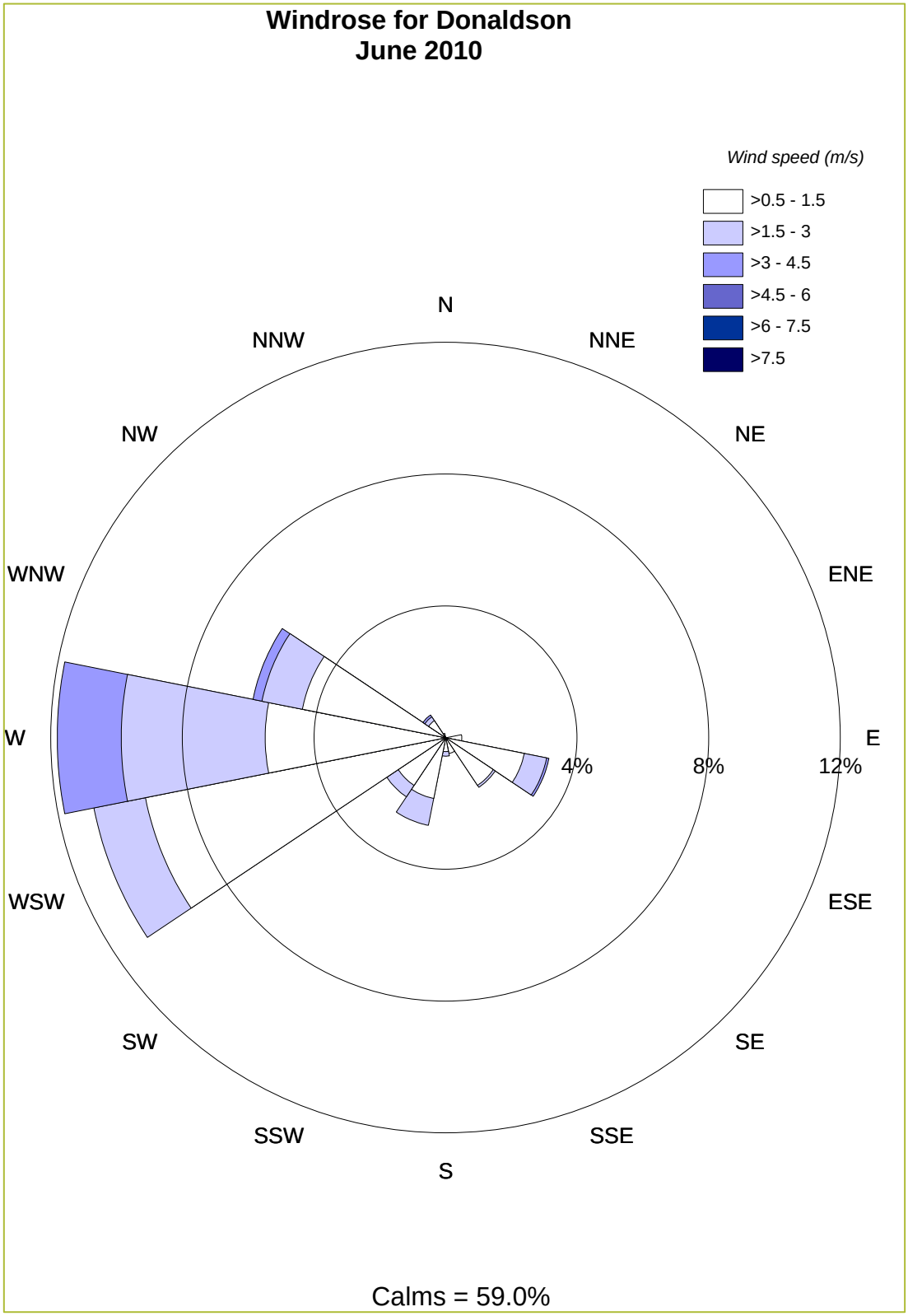

Figure 7: Windrose

DONALDSON MONITORING

DUST AND METEOROLOGICAL DATA
JULY 2010 REPORT

Donaldson Coal

Job No: **3003**

17 September 2010

A PEL Company

PROJECT TITLE:	**DUST AND METEOROLOGICAL DATA JULY 2010 REPORT**
JOB NUMBER:	**3003**
PREPARED FOR:	Phil Brown **DONALDSON COAL**
PREPARED BY:	Philip Henschke
QA PROCEDURES CHECKED BY:	Ronan Kellaghan
APPROVED FOR RELEASE BY:	Aleks Todoroski
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VERSION	DATE	PREPARED BY	REVIEWED BY
V1	17/09/2010	Philip Henschke	Ronan Kellaghan

Queensland Environment Pty Ltd trading as
PAEHolmes ABN 86 127 101 642

SYDNEY:
Suite 2B, 14 Glen Street
Eastwood NSW 2122
Ph: +61 2 9874 8644
Fax: +61 2 9874 8904

BRISBANE:
Level 1, La Melba, 59 Melbourne Street South Brisbane Qld 4101
PO Box 3306 South Brisbane Qld 4101
Ph: +61 7 3004 6400
Fax: +61 7 3844 5858

Email: info@paeholmes.com

Website: www.paeholmes.com

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1 INTRODUCTION

As part of their Air Quality Management Plan Donaldson Coal operate a dust monitoring network in the vicinity of the mining lease and a meteorological station on site. This report has been prepared in order to bring together the various data collected throughout the network during July 2010 and to summarise the information.

The dust network includes continuous monitoring, high volume air sampling and dust deposition monitoring. The continuous monitoring network consists of two DustTrak monitors measuring PM_{10} at two sites and an additional DustTrak monitor which is used for one week each quarter to measure $PM_{2.5}$.

There are two locations which use high volume air samplers to determine concentrations of PM_{10} and TSP. These operate on a six-day cycle in line with similar measurements made by the NSW Department of Environment, Climate Change and Water (DECCW) at other locations throughout the state.

In addition to concentration measurements, monthly levels of dust deposition are also measured using twelve gauges placed at various locations in the area of the mine. The locations of each of these monitors and gauges are shown in Figure 1.

Table 1 lists the monitors used and pollutants measured at these locations.

Table 1: Summary of monitoring locations and instruments

Monitoring Location	Instruments Used	Pollutant Monitored
Beresfield	HVAS	PM_{10}
Blackhill	HVAS	PM_{10}
	HVAS	TSP
	DustTrak	PM_{10}
	DustTrak (1 week per quarter)	$PM_{2.5}$
Weakleys Drive	DustTrak	PM_{10}
DG1 – DG12	Deposition Gauges	Dust Deposition

The meteorological station is situated at the site of the office buildings and measures the following parameters:

- wind speed
- wind direction
- temperature
- solar radiation
- rainfall

The data are downloaded at various intervals by Donaldson and then forwarded to PAEHolmes for processing.

2 HIGH VOLUME AIR SAMPLING

High Volume Air Sampling (HVAS) was carried out at Beresfield and Blackhill by Metford Laboratories. PM_{10} is measured at both sites while TSP is only measured at Blackhill. The data collected during July 2010 are summarised in **Table 2**. A graph consisting of all the data collected to date is shown in Figure 2.

Table 2: HVAS data from Beresfield and Blackhill for July 2010

Date	Beresfield PM_{10} ($\mu g/m^3$)	Blackhill PM_{10} ($\mu g/m^3$)	Blackhill TSP ($\mu g/m^3$)
06/07/2010	8	3	11
12/07/2010	14	10	16
18/07/2010	11	11	19
24/07/2010	12	8	13
30/07/2010	10	1	12
Annual average	**15**	**13**	**29**

These measurements will include all background sources relevant to that location, including contributions from the Donaldson mining operations.

On the days that the instruments were monitoring, the highest 24-hour average PM_{10} concentration recorded in July 2010 was 14 $\mu g/m^3$. This value was measured on the 12th at the Beresfield site. On this occasion the measured PM_{10} concentration did not exceed the 50 $\mu g/m^3$ 24-hour DECCW goal.

TSP measurements from the Blackhill site show that concentrations were below the DECCW 90 $\mu g/m^3$ annual average TSP goal. It should be noted that the DECCW goal refers to an annual average and not a 24-hour average as measured by the high volume air sampler. The annual average TSP concentration for the 12 months to July 2010 was 29 $\mu g/m^3$.

Figure 2 shows a seasonal trend in PM_{10} concentrations, peaking during the warmer months and decreasing during autumn and winter. This is a common trend and is seen consistently in the Hunter Valley.

The annual average PM_{10} concentrations for Beresfield and Blackhill were 15 $\mu g/m^3$ and 13 $\mu g/m^3$ respectively for the 12 months to July 2010. These values are below the DECCW's annual average PM_{10} air quality criterion of 30 $\mu g/m^3$.

3 CONTINUOUS MONITORING

3.1 DustTrak Monitoring at Blackhill

Figure 3 shows a time series of the PM_{10} data collected from the DustTrak monitor at the Blackhill site. During the month of July, the DustTrak monitor located at the Blackhill site experienced a power failure. As a result no DustTrak monitoring for the Blackhill site is available for July 2010.

3.2 DustTrak Monitoring at Weakleys Drive

A time series of the PM_{10} data collected from the Weakleys Drive site is shown in Figure 4. During the month of June, the DustTrak monitor located at the Weakleys Drive site experienced a power failure. As a result no DustTrak monitoring for the Weakleys Drive site is available for July 2010.

3.3 DustTrak $PM_{2.5}$ Monitoring at BlackHill

No $PM_{2.5}$ monitoring was scheduled for July 2010.

4 DUST DEPOSITION MONITORING

Dust deposition monitoring is carried out each month via a network consisting of twelve (12) gauges. The results for July 2010 are shown in **Table 3**, in conjunction with results for the previous eleven months in order to provide an annual average for that period. A table showing the complete data set from July 2000 in provided in **Appendix A**.

Table 3: Dust deposition monitoring for the 12-month period to July 2010

Month	Monthly dust deposition rate (g/m^2/month)											
	DG1	**DG2**	**DG3**	**DG4**	**DG5A**	**DG6**	**DG7**	**DG8**	**DG9**	**DG10**	**DG11**	**DG12**
Aug-09	0.8#	3.6#	0.8#	1.2#	1.0#	1.8#	0.8#	1.8	1.3#	0.8#	1.0	-
Sep-09	1.0	1.8#	1.8	8.3#	1	1.8	0.9#	1.8#	1.7#	0.7	1.4#	-
Oct-09	4.3	9#	5.2#	11.3#	3.2	3.8#	2.4#	6.8#	3#	2.2	3.2#	5.7#
Nov-09	0.8#	1.7#	1.4#	1.3#	0.7#	2.1#	1.3#	8.0#	*	1.0#	*	2.3#
Dec-09	1.4#	4.0#	1.6#	2.4#	1.7#	1.8	1.6	2.6#	1.7#	1.7#	2.2#	1.7
Jan-10	0.6#	0.8#	5.6#	1.2#	2.4#	1.2#	0.8	1.4	1.3#	0.8#	1.3#	1.1#
Feb-10	1.9#	11.3+	1.9#	1.4#	1.5#	1.1#	1.2#	1.6#	1.1#	0.8#	1.8#	1.3#
Mar-10	0.6#	0.6#	3.2#	1#	4.1#	0.6#	0.6#	1.2	0.6#	0.2#	0.8#	1.1#
Apr-10	0.8#	1.8#	2.4#	0.7#	+	0.3	0.6#	0.9#	0.6#	0.4#	0.8#	0.8#
May-10	0.8	4.9#	3.0#	1.1	1.2	1.0	0.7	1.3#	1.0	0.5	1.1#	0.8
Jun-10	0.3	2.2#	3.0#	0.6#	0.2	1.2#	0.5	0.5#	0.6	0.7#	0.7#	0.4#
Jul-10	0.6#	1.1#	0.7#	0.7	0.5	0.3	0.5#	0.6#	0.7	0.2#	0.8	0.5
Annual Average	**0.9**	**3.1**	**2.3**	**1.8**	**1.4**	**1.2**	**0.9**	**2.0**	**1.1**	**0.7**	**1.2**	**-**

*Data supplied by Metford Laboratories. # Insects/bird droppings reported. +Invalid. * No recording, funnel damaged.*

The highest dust deposition measurement recorded in July 2010 was 1.1 g/m^2/month at DG2, the accompanying laboratory report showed the sample was contaminated with bird droppings and insects.

Readings considered invalid have been removed when calculating the annual average. The annual average deposition rates for the gauges in the network were low and significantly below the goal of 4 g/m^2/month, indicating nuisance dust in the vicinity of the mine is not an issue.

5 METEOROLOGICAL MONITORING

Monthly plots of the wind speed, temperature, solar radiation, and rainfall data collected in July 2010 are shown in Figure 6 and a windrose plot is shown in Figure 7.

The graphs shown in Figure 6 indicate that the instruments were recording appropriately. Data maxima and minima all appeared to be sensible for this site during July. Total rainfall for the month was 65.3 mm.

A windrose (see Figure 7) created from the available 30-minute average wind data shows that winds were predominantly from the west-southwest. The site recorded calms (wind speed less than or equal to 0.5 m/s) for approximately 64.4% of the time. The relatively large fraction of clam winds may arise from the generally forested area and the specific location of the weather station.

APPENDIX A

Dust Deposition Data

Dust deposition (g/m²/month)												
Month	D1	D2	D3	D4	D5A	D6	D7	D8	D9	D10	D11	D12
May-00	0.4	0.4	-	0.7	0.9	0.6	3.6	1.6	0.5	1.8	-	-
Jun-00	0.7	0.5	0.5	0.7	0.8	0.4	3.8	3.2	0.5	0.7	-	-
Jul-00	0.4	0.4	0.5	0.7	0.8	0.5	0.8	1.5	0.4	0.4	-	-
Aug-00	0.9	0.6	1.0	1.2	1.1	1.0	3.4	0.7	0.7	0.6	-	-
Sep-00	0.8	0.9	1.1	0.9	1.3	1.0	2.2	1.0	1.0	0.8	-	-
Oct-00	0.4	0.6	1.1	0.9	0.9	0.8	5.3	0.9	0.6	0.5	-	-
Nov-00	5.2	0.7	1.4	0.8	1.0	0.4	24.1	9.4	1.1	0.6	-	-
Dec-00	2.8	1.4	1.9	1.3	1.1	0.8	2.1	2.5	0.9	0.9	-	-
Jan-01	0.7	1.7	1.4	1.8	0.7	1.3	1.1	2.4	1.1	0.6	-	-
Feb-01	0.9	3.1	2.0	0.5	0.9	0.7	0.7	6.7	1.3	0.5	1.0	-
Mar-01	0.8	2.1	1.3	0.6	0.7	0.6	0.6	5.5	0.6	0.6	1.5	-
Apr-01	0.8	0.7	1.3	0.5	0.7	0.4	0.3	5.1	0.7	0.6	0.8	-
May-01	0.2	0.2	0.4	0.4	0.3	0.3	0.6	1.8	0.6	0.8	0.9	-
Jun-01	0.5	0.4	0.5	1.0	1.0	0.4	0.4	8.8	0.7	0.6	0.6	-
Jul-01	0.5	0.3	1.8	0.5	0.8	-	16.3	4.9	0.9	0.7	0.7	-
Aug-01	0.4	0.4	0.8	0.8	1.0	1.7	1.0	-	1.0	1.8	1.1	-
Sep-01	0.7	1.0	1.7	1.1	1.7	0.7	-	6.0	1.1	1.3	1.7	-
Oct-01	1.1	0.6	4.6	0.9	0.7	0.9	1.2	1.9	0.9	0.6	1.7	-
Nov-01	0.9	1.0	1.1	1.1	0.8	1.1	6.0	5.5	1.3	1.9	2.3	-
Dec-01	4.9	0.9	4.2	0.9	1.3	1.9	1.2	3.1	1.2	9.7	1.8	-
Jan-02	0.8	1.0	1.5	1.3	1.1	1.4	1.3	1.5	1.1	0.9	1.5	-
Feb-02	1.1	1.1	0.9	0.3	0.4	0.5	3.1	5.1	0.5	0.5	0.9	-
Mar-02	1.7	2.1	1.6	0.7	0.7	0.8	1.0	18	1.0	0.9	1.7	-
Apr-02	1.0	0.4	1.0	0.8	0.8	0.6	0.9	10.1	0.5	0.7	1.0	-
May-02	0.6	0.6	6.0	0.7	0.4	1.2	0.9	3.1	0.7	0.2	1.0	-
Jun-02	1.4	0.4	1.7	0.6	0.5	0.8	0.6	2.1	0.6	0.5	1.0	-
Jul-02	0.7	0.7	-	0.8	0.8	0.7	1.2	-	1.1	0.5	1.0	-
Aug-02	1.3	0.8	1.4	1.2	1.1	1.2	1.5	-	1.5	0.9	1.6	-
Sep-02	0.5	1.2	1.1	0.8	0.5	0.7	5.1	9.3	1.6	0.6	1.0	-
Oct-02	2.2	1.4	5.2	1.5	1.5	1.4	1.4	3.4	-	1.5	3.1	-
Nov-02	2.8	1.8	3.7	1.6	0.1	1.8	2.1	3.5	2.1	2	1.9	-
Dec-02	2.0	-	2.5	1.5	3.0	1.5	1.8	4.1	1.6	1.2	1.9	-
Jan-03	2.1	1.5	2.7	1.5	1.0	1.9	2.2	2.5	1.1	1.0	1.6	-
Feb-03	1.4	1.1	2.6	1.1	0.9	1.2	1.7	5.9	1.2	1.0	1.5	-
Mar-03	0.8	0.5	1.2	1.2	0.6	2.1	1.5	3.4	-	3.6	9.5	-
Apr-03	0.5	1.0	0.6	1.0	0.7	0.5	1.1	8.0	-	2.0	1.0	-
May-03	0.5	0.4	0.6	0.2	0.2	0.6	1.3	1.6	0.5	0.8	1.2	-
Jun-03	0.5	0.6	0.8	0.8	0.4	0.6	0.8	0.7	0.9	0.7	0.7	-
Jul-03	0.3	0.4	0.4	0.6	0.4	0.5	0.7	0.5	0.5	0.5	0.7	-
Aug-03	0.8	0.2	0.7	1.1	0.5	1.3	1.8	2.1	1.3	0.7	0.9	-
Sep-03	0.6	0.7	1.1	0.7	0.8	1.7	1.4	1.3	2.5	0.9	1.3	-
Oct-03	-	0.9	1.4	0.9	0.7	1.9	1.0	1.4	0.6	0.8	1.3	-
Nov-03	2.6	0.8	1.0	1.1	0.4	1.3	1.5	1.5	-	0.8	1.3	-
Dec-03	1.0	1.0	1.4	1.3	1.1	1.5	1.6	2.0	1.8	0.9	1.4	-
Jan-04	8.5	1.5	2.1	1.5	1.3	2.6	1.4	2.2	1.7	1.5	1.7	-
Feb-04	1.2	1.0	1.7	1.4	0.7	3.1	1.6	2.2	-	1.5	2.3	-

Mar-04	0.4	0.6	6.6	1.2	0.7	1.9	1.1	12.1	4.8	1.5	1.1	-
Apr-04	0.6	1.0	0.8	0.8	0.6	1.9	0.8	1.4	0.9	1.2	1.1	-
May-04	0.2	0.9	2.2	0.9	0.8	0.7	0.9	1.4	1.2	0.9	1.5	-
Jun-04	0.4	0.6	0.7	0.9	0.6	1.4	1.0	0.9	1.0	1.0	0.8	-
Jul-04	0.4	0.6	5.3#	0.6	0.5	2.9	1.0	1.1	0.9	0.6	1.2	-
Aug-04	0.5	0.5	0.5	1.3	0.7	1.1	1.1	1.4	-	1.0	1.0	-
Sep-04	0.6	0.6	0.8	2.2	1.0	1.0	0.9	4.4	0.9	16.7	1.1	-
Oct-04	0.7	0.9	1.2	0.9	0.8	1.4	1.0	10.5	1.0	1.0	0.8	-
Nov-04	0.8	0.7	1.3	1.9	0.7	0.9	1.0	3.0	1.1	1.1	1.6	-
Dec-04	2.0	1.4	3.6	1.5	1.3	2.2	3.2	7.9	1.8	5.5	2.5	-
Jan-05	1.2	1.0	3.7	1.6	1.4	4.0	2.3	2.7	2.6	2.5	2.8	-
Feb-05	1.2	1.2	1.8	1.6	1.3	2.0	1.7	-	2.3	1.5	2.3	-
Mar-05	1.3	0.9	1.4	0.9	0.9	3.0	1.2	7.7	-	0.8	1.3	-
Apr-05	1.1	0.7	0.9	0.8	0.7	0.9	1.4	3.3	1.1	0.8	0.9	-
May-05	0.7	8.6	1.1	0.8	0.7	0.8	0.9	4.4	1.2	0.8	1.1	-
Jun-05	1.3	0.8	1.3	1.3	0.8	1.2	1.2	1.3	1.5	2.5	0.9	-
Jul-05	1.0	0.5	0.5	0.7	0.4	1.6	0.7	1.2	0.8	4.3	1.1	-
Aug-05	0.6	0.6	0.8	1.0	0.8	0.9	0.7	1.0	0.9	1.0	0.9	-
Sep-05	0.6	0.7	0.8	0.7	0.7	1.2	1.3	1.3	1.0	0.9	1.1	-
Oct-05	0.8	0.9	1.3	0.9	0.8	1.4	1.2	1.9	1.3	1.1	1.3	-
Nov-05	-	2.3	2.3	2.0	1.7	1.2	2.0	3.2	1.6	1.4	2.2	-
Dec-05	1.9	3.2	2.3	3.3	2.6	3.4	2.3	-	1.3	2.1	3.9	-
Jan-06	1.0	2.1	1.7	1.0	23.	3.5	-	2.7	1.1	-	1.5	-
Feb-06	2.2	1.0	0.9	1.2	1.1	1.7	1.1	2.9	-	2.3	1.8	-
Mar-06	0.7	0.6	2.3	0.7	0.6	0.9	1.0	1.4	0.7	0.8	1.5	-
Apr-06	0.6	0.7	1.1	0.8	0.6	1.1	0.8	1.0	1.0	1.8	1.5	-
May-06	1.0	3.1	1.0	-	1.1	1.4	1.1	4.1	-	7.0	1.5	-
Jun-06	0.4	0.3	0.7	0.5	0.4	0.6	0.7	0.8	0.6	0.9	0.9	-
Jul-06	0.3	0.3	1	1.3	0.4	0.7	0.7	2.7	-	0.6	0.6	-
Aug-06	0.9	0.6	0.8	0.7	0.7	0.8	0.7	1.7	-	3.7	0.9	-
Sep-06	1.6	0.7	1.1	1.7	0.7	1	0.9	1.3	1.2	0.8	1.6	-
Oct-06	2	1.4	1.6	1.8	0.9	1.8	1.2	1.8	1.5	1.8	1.9	-
Nov-06	4.3	2.2	3	2.3	2.3	5.3	2.4	3.3	2.3	2.3	2.9	-
Dec-06	1.2	3.4	1.9	2.3	2.3		2.1	2.1		4.9	3.9	-
Jan-07	2	0.9	1.5	0.7	0.7	1.7	1.1		1.2	1.7	0.9	-
Feb-07	1.7	0.9	1.6	0.7	0.6	1	1.8	1.7	1.1	1.2	1.7	-
Mar-07	1.3	0.9	1.7	0.8	1.2	0.6	2.2	1.7	1	0.9	1.7	-
Apr-07	0.5	0.7	0.9	0.6	4.8	1.2	0.5	2.7	0.5	0.8	0.9	-
May-07	0.8	0.5	0.6	1.2	0.6	0.6	0.7	1.9	0.5	0.7	0.8	-
Jun-07	0.6	0.5	0.7	1.1	0.1	0.5	0.1	0.5	0.1	0.4	0.3	-
Jul-07	0.5	0.4	0.6	2.1	0.5	0.8	0.6	0.6	0.4	0.5	0.7	-
Aug-07	1.5	0.4	0.7	1	0.7	0.7	0.5	1	0.6	0.6	0.7	-
Sep-07	1.3	0.5	1.8	1	0.7	0.9	0.9	1.3	1	0.7	1.6	-
Oct-07	4.2	0.9	1.1	1.4	1.1	1.7	1.8	1.7	1.6	1.4	2.2	-
Nov-07	0.8	0.8	1.1	0.9	1.1	1.1	1.1	1.7	0.6	0.8	1.5	-
Dec-07	1.3	0.8	3	0.7	0.5	0.8	0.5	1.1	0.3	0.8	0.6	-
Jan-08	2.6	0.8	3.7	0.5	0.5	0.5	0.4	2.2	0.8	0.3	0.8	-

Feb-08	0.4	0.1	14	0.1	0.1	0.3	0.1	0.3	0.2	0.2	0.3	-
Mar-08	4.5	0.6	9.2+	0.6	2.9	2.1	0.6	1.5	0.5	1	0.9	-
April-08	0.4#	0.4#	0.8#	0.4#	0.4#	0.8#	1.1#	1.7#	1.2	1.1#	1.1#	-
May-08	1.1	2.4#	0.9	1.4	0.9	0.9	0.7	2.7	1#	1.1	1.3#	-
June-08	0.2	0.4#	0.1	0.5	0.1#	0.1	0.3	0.5#	0.1	0.8	0.2	-
July-08	0.4	0.7#	1.3#	0.6	0.8#	0.9	0.8	1	0.7	0.5	1.1	-
Aug-08	1	0.5	0.7	0.6	0.5	1.9	0.8	1	1	0.9	1.4	-
Sep-08	0.6	1	1.3	0.7	0.6	0.9	0.6	0.9	0.9	0.9	1.8	-
Oct-08	1	0.5	1	1.3	1.3	1.2	1	1.4	0.8	1.6	1.8	-
Nov-08	0.8	1.4	2.7	2.5	0.9	1.2	0.8	2.4	1.1	1	1.7	-
Dec-08	0.4	0.4	0.6	0.5	0.3	1.1	0.6	15	0.9	0.7	1.2	-
Jan-09	1.1	3#	1.6	0.8	0.9	1.4	0.7	1.5	0.9	0.9	5+	-
Feb-09	0.4	4.4	1.5	1.1	0.9	1.6	0.8	1.2	1.4	2.5	1.2	-
Mar-09	2.8	5.8	2.7	2.4	1.9	2.1	2.5	2.4	2.3	5.7	2.7	-
Apr-09	2	0.8	0.8	0.6	0.6	3.2	1.1	1.1	1	0.6	0.9	-
May-09	0.6	1.6	0.8	2.4	0.9	5.6 +	1.4	1.1	1.3	0.7	1.5	-
Jun-09	0.4	1.3	0.8	0.5	0.5	3.3	0.9	0.6	1	3.4	0.7	-
Jul-09	0.2	1.0	0.6	0.4	0.3	3.8	0.5	0.6	0.6	0.3	0.6	-
Aug-09	0.8	3.6	0.8	1.2	1.0	1.8	0.8	1.8	1.3	0.8	1.0	-
Sep-09	1.0	1.8#	1.8	8.3 +	1	1.8	0.9#	1.8#	1.7#	0.7	1.4#	-
Oct-09+	4.3	9#	5.2#	11.3#	3.2	3.8#	2.4#	6.8#	3.0#	2.2	3.2#	5.7#
Nov-09	0.8#	1.7#	1.4#	1.3#	0.7#	2.1#	1.3#	8.0#	*	1.0#	*	2.3
Dec-09	1.4#	4.0#	1.6#	2.4#	1.7#	1.8	1.6	2.6#	1.7#	1.7#	2.2#	1.7
Jan-10	0.6#	0.8#	5.6#	1.2#	2.4#	1.2#	0.8#	1.4#	1.3#	0.8#	1.3#	1.1#
Feb-10	1.9#	11.3+	1.9#	1.4#	1.5#	1.1#	1.2#	1.6#	1.1#	0.8#	1.8#	1.3#
Mar-10	0.6#	0.6#	3.2#	1#	4.1#	0.6#	0.6#	1.2	0.6	0.2#	0.8#	1.1#
Apr-10	0.8#	1.8#	2.4#	0.7#	+	0.3	0.6#	0.9#	0.6#	0.4#	0.8#	0.8#
May-10	0.8	4.9#	3.0#	1.1	1.2	1.0	0.7	1.3	1.0#	0.5	1.1#	0.8
Jun-10	0.3	2.2#	3.0#	0.6#	0.2	1.2#	0.5	0.5#	0.6	0.7#	0.7#	0.4#
Jul-10	0.6#	1.1#	0.7#	0.7	0.5	0.3	0.5#	0.6#	0.7	0.2#	0.8	0.5

 # - sample contaminated

+ - sample invalid

**Broken funnel*

[Note: Samples for October 2009 have been considered invalid, due to a widespread dust storm experienced on 23rd September 2009.]

APPENDIX B

Figures

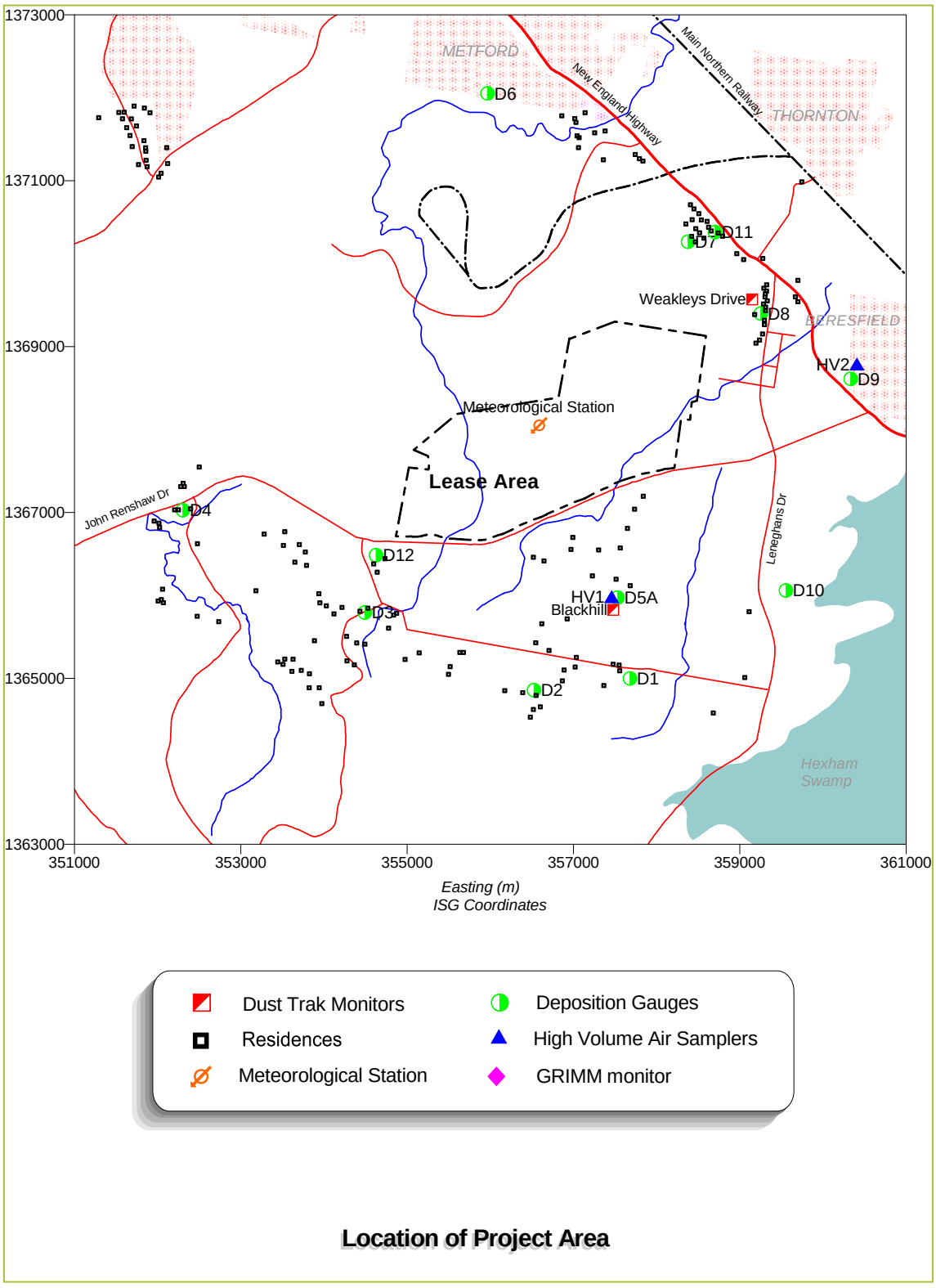

Figure 1: Project Location

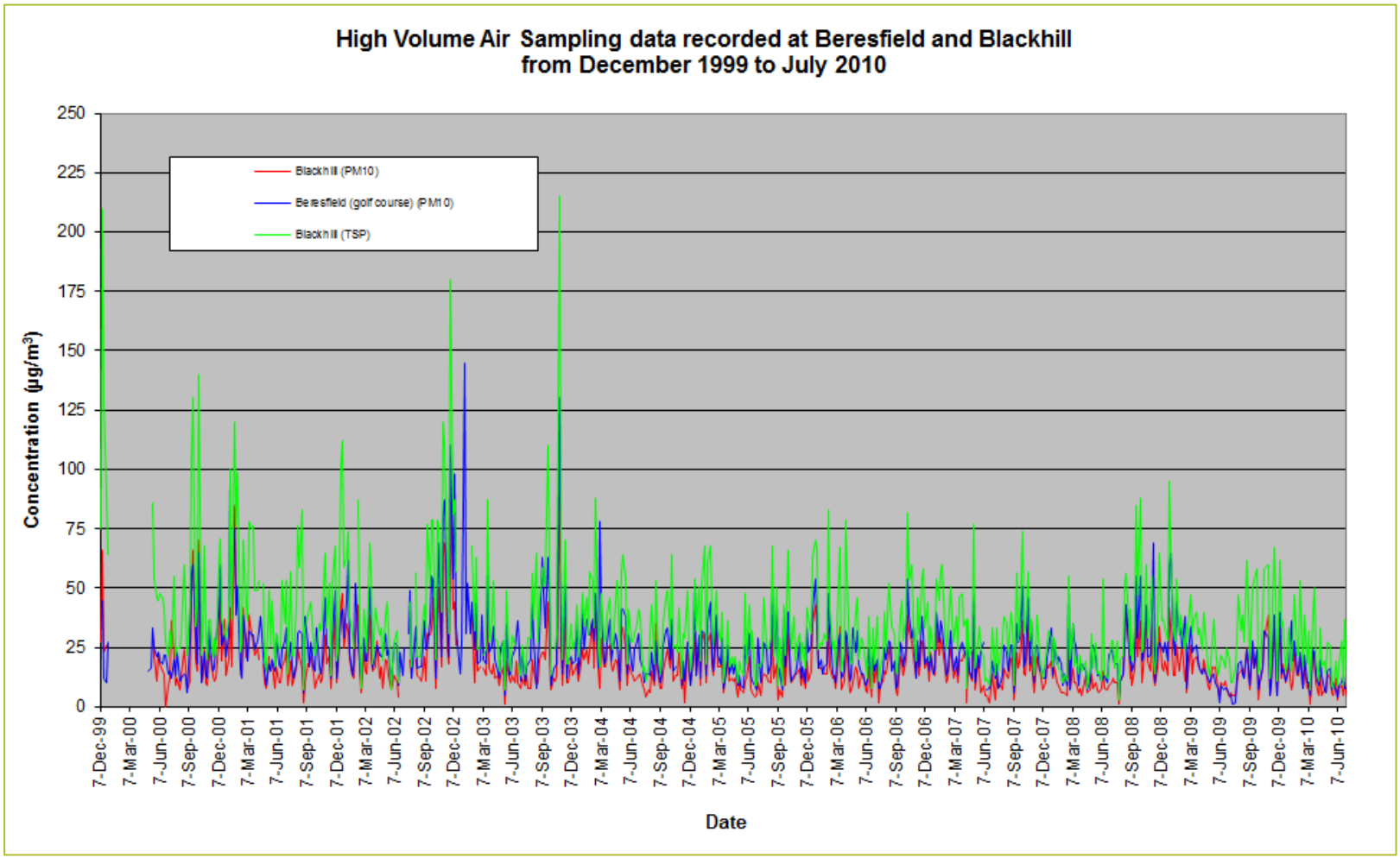

Figure 2: High Volume Air Sampling data

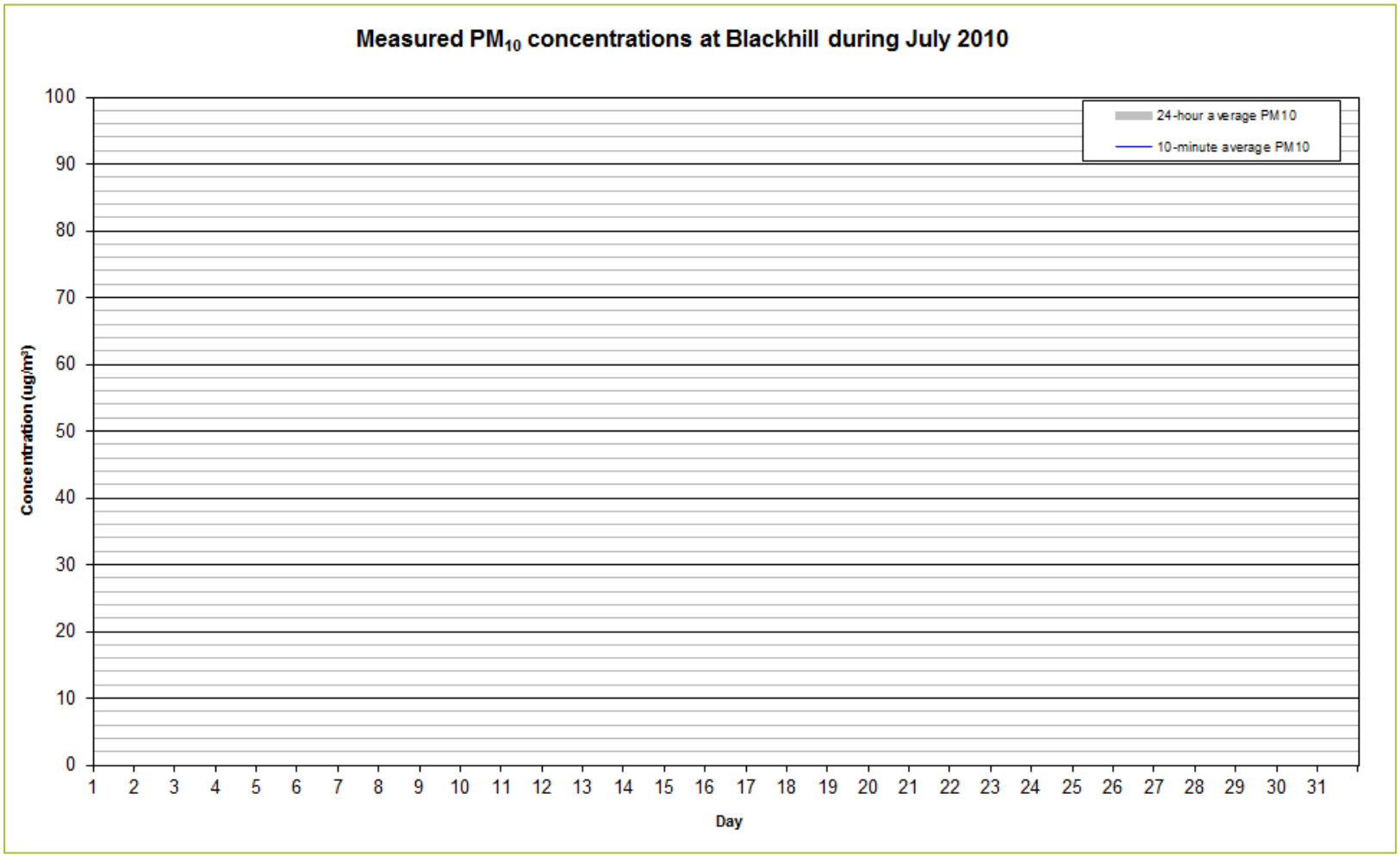

Figure 3: DustTrak sampling data, Blackhill site

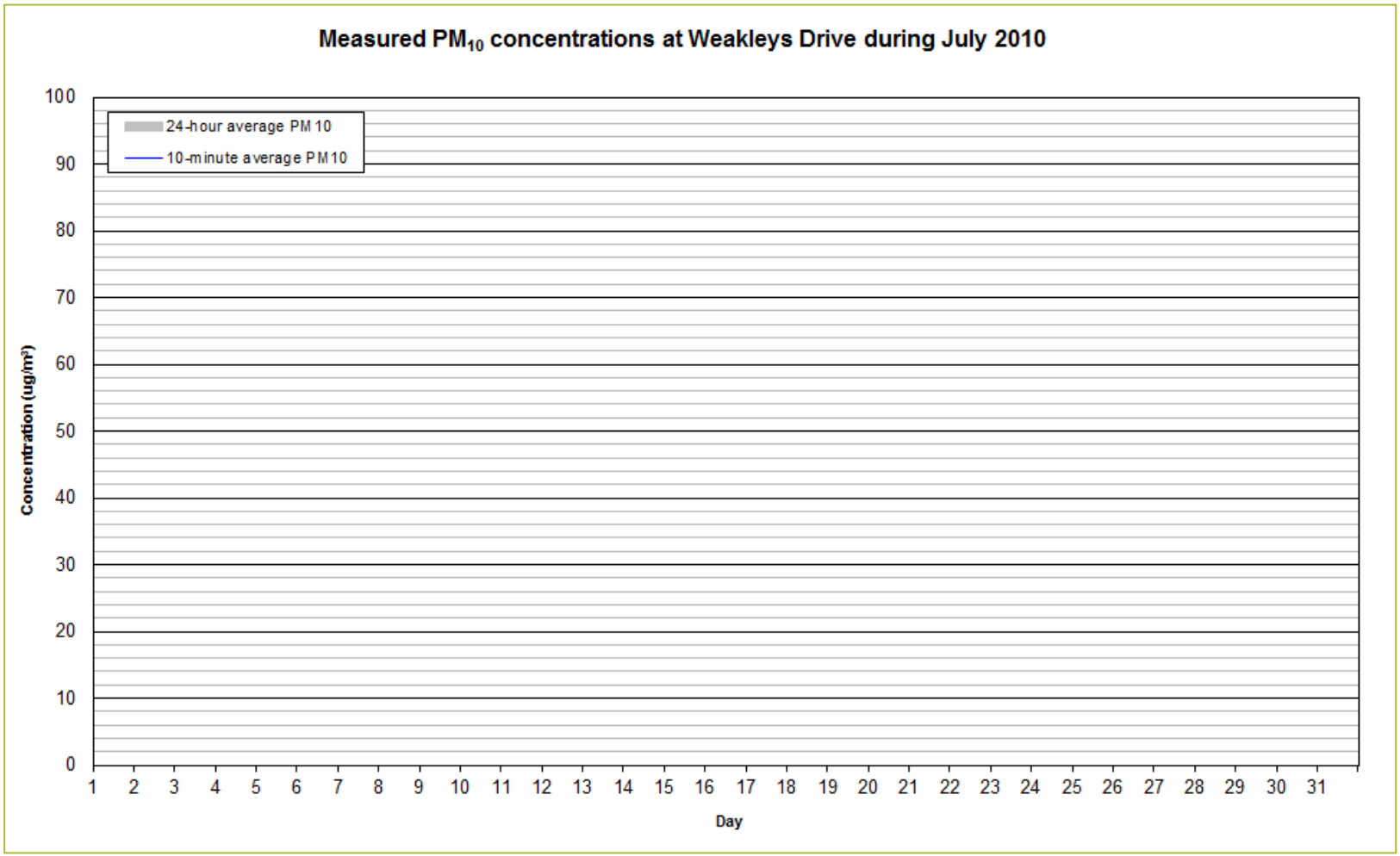

Figure 4: DustTrak sampling data, Weakleys Drive site

No $PM_{2.5}$ monitoring was scheduled for July 2010

Figure 5: DustTrak $PM_{2.5}$ monitoring data

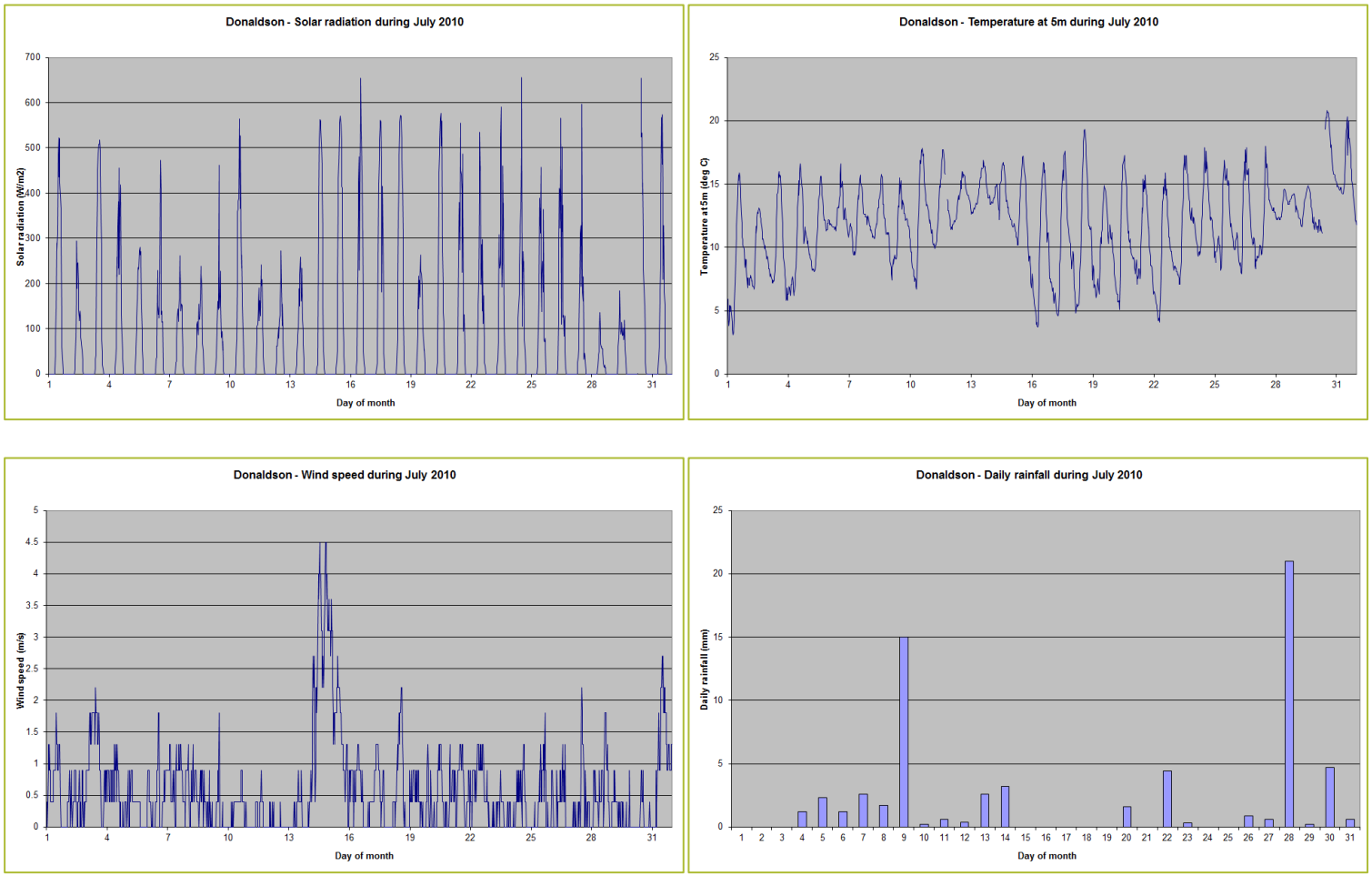

Figure 6: Meteorological conditions

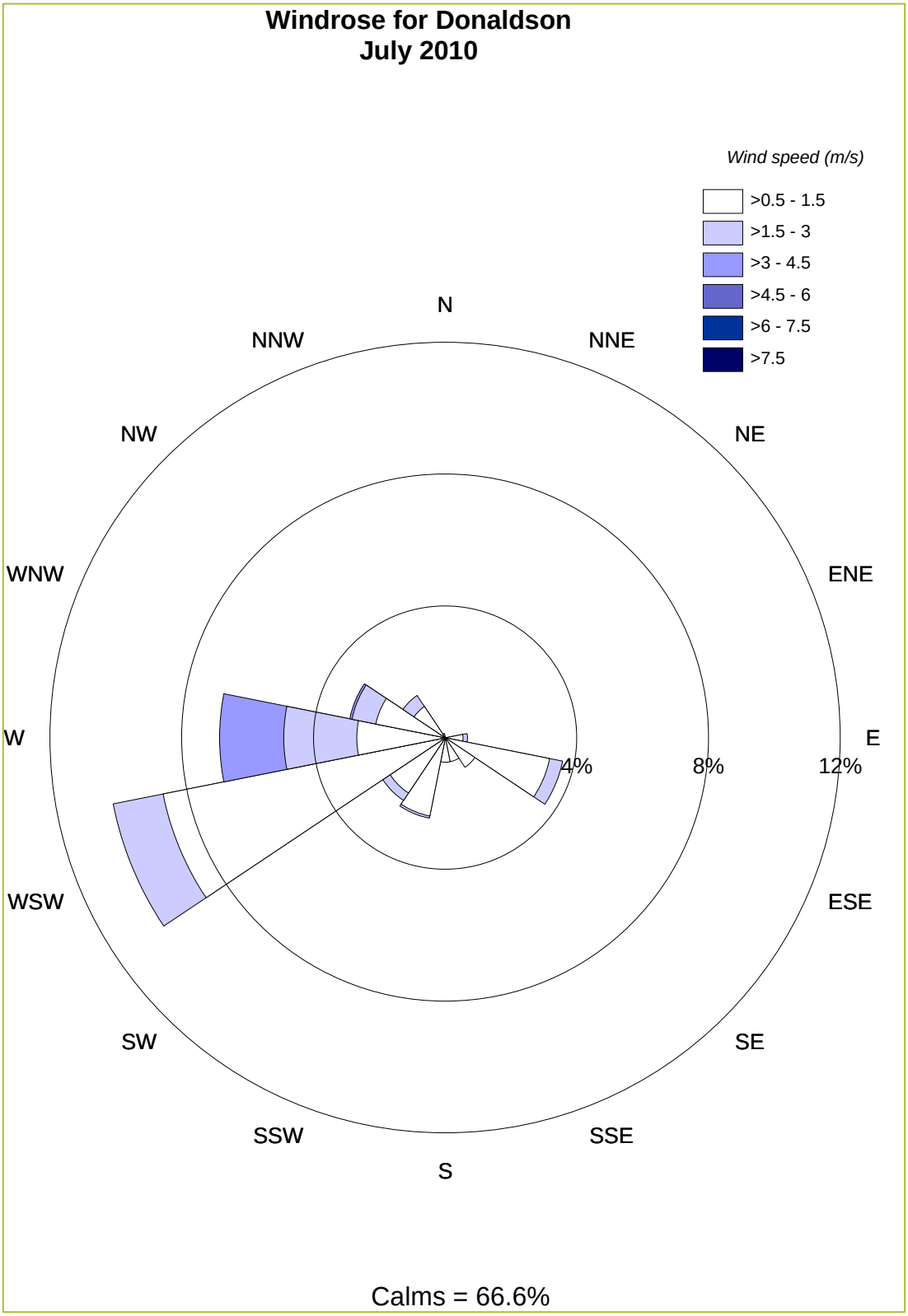

Figure 7: Windrose

DONALDSON MONITORING

DUST AND METEOROLOGICAL DATA
AUGUST 2010 REPORT

Donaldson Coal

Job No: **3003**

1 November 2010

PROJECT TITLE:	**DUST AND METEOROLOGICAL DATA AUGUST 2010 REPORT**
JOB NUMBER:	**3003**
PREPARED FOR:	Phil Brown **DONALDSON COAL**
PREPARED BY:	Philip Henschke
QA PROCEDURES CHECKED BY:	Ronan Kellaghan
APPROVED FOR RELEASE BY:	Aleks Todoroski
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VERSION	DATE	PREPARED BY	REVIEWED BY
V1	1/11/2010	Philip Henschke	Ronan Kellaghan

Queensland Environment Pty Ltd trading as
PAEHolmes ABN 86 127 101 642

SYDNEY:
Suite 2B, 14 Glen Street
Eastwood NSW 2122
Ph: +61 2 9874 8644
Fax: +61 2 9874 8904

BRISBANE:
Level 1, La Melba, 59 Melbourne Street South Brisbane Qld 4101
PO Box 3306 South Brisbane Qld 4101
Ph: +61 7 3004 6400
Fax: +61 7 3844 5858

Email: info@paeholmes.com

Website: www.paeholmes.com

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1 INTRODUCTION

As part of their Air Quality Management Plan Donaldson Coal operate a dust monitoring network in the vicinity of the mining lease and a meteorological station on site. This report has been prepared in order to bring together the various data collected throughout the network during August 2010 and to summarise the information.

The dust network includes continuous monitoring, high volume air sampling and dust deposition monitoring. The continuous monitoring network consists of two DustTrak monitors measuring PM_{10} at two sites and an additional DustTrak monitor which is used for one week each quarter to measure $PM_{2.5}$.

There are two locations which use high volume air samplers to determine concentrations of PM_{10} and TSP. These operate on a six-day cycle in line with similar measurements made by the NSW Department of Environment, Climate Change and Water (DECCW) at other locations throughout the state.

In addition to concentration measurements, monthly levels of dust deposition are also measured using twelve gauges placed at various locations in the area of the mine. The locations of each of these monitors and gauges are shown in Figure 1.

Table 1 lists the monitors used and pollutants measured at these locations.

Table 1: Summary of monitoring locations and instruments

Monitoring Location	Instruments Used	Pollutant Monitored
Beresfield	HVAS	PM_{10}
Blackhill	HVAS	PM_{10}
	HVAS	TSP
	DustTrak	PM_{10}
	DustTrak (1 week per quarter)	$PM_{2.5}$
Weakleys Drive	DustTrak	PM_{10}
DG1 – DG12	Deposition Gauges	Dust Deposition

The meteorological station is situated at the site of the office buildings and measures the following parameters:

- wind speed
- wind direction
- temperature
- solar radiation
- rainfall

The data are downloaded at various intervals by Donaldson and then forwarded to PAEHolmes for processing.

2 HIGH VOLUME AIR SAMPLING

High Volume Air Sampling (HVAS) was carried out at Beresfield and Blackhill by Metford Laboratories. PM_{10} is measured at both sites while TSP is only measured at Blackhill. The data collected during August 2010 are summarised in **Table 2**. A graph consisting of all the data collected to date is shown in Figure 2.

Table 2: HVAS data from Beresfield and Blackhill for August 2010

Date	Beresfield PM_{10} ($\mu g/m^3$)	Blackhill PM_{10} ($\mu g/m^3$)	Blackhill TSP ($\mu g/m^3$)
5/08/2010	11	6	20
11/08/2010	7	8	20
17/08/2010	11	6	24
23/08/2010	6	7	16
29/08/2010	15	11	25
Annual average	**15**	**12**	**27**

These measurements will include all background sources relevant to that location, including contributions from the Donaldson mining operations.

On the days that the instruments were monitoring, the highest 24-hour average PM_{10} concentration recorded in August 2010 was 15 $\mu g/m^3$. This value was measured on the 29th at the Beresfield site. On this occasion the measured PM_{10} concentration did not exceed the 50 $\mu g/m^3$ 24-hour DECCW goal.

TSP measurements from the Blackhill site show that concentrations were below the DECCW 90 $\mu g/m^3$ annual average TSP goal. It should be noted that the DECCW goal refers to an annual average and not a 24-hour average as measured by the high volume air sampler. The annual average TSP concentration for the 12 months to August 2010 was 27 $\mu g/m^3$.

Figure 2 shows a seasonal trend in PM_{10} concentrations, peaking during the warmer months and decreasing during autumn and winter. This is a common trend and is seen consistently in the Hunter Valley.

The annual average PM_{10} concentrations for Beresfield and Blackhill were 15 $\mu g/m^3$ and 12 $\mu g/m^3$ respectively for the 12 months to August 2010. These values are below the DECCW's annual average PM_{10} air quality criterion of 30 $\mu g/m^3$.

3 CONTINUOUS MONITORING

3.1 DustTrak Monitoring at Blackhill

Figure 3 shows a time series of the PM_{10} data collected from the DustTrak monitor at the Blackhill site. During the month of August, the DustTrak monitor located at the Blackhill site experienced a power failure. As a result only two days of DustTrak monitoring for the Blackhill site is available for August 2010.

Of the available data, the measured 24-hour average PM_{10} concentrations did not exceed the DECCW goal of 50 µg/m^3.

3.2 DustTrak Monitoring at Weakleys Drive

A time series of the PM_{10} data collected from the Weakleys Drive site is shown in Figure 4. During the month of August, the DustTrak monitor located at the Weakleys Drive site experienced an internal calibration failure. The data recorded for the month of August showed erroneous results that are not representative of the ambient air quality. As a result no valid DustTrak monitoring for the Weakleys Drive site is available for August 2010.

3.3 DustTrak $PM_{2.5}$ Monitoring at BlackHill

No $PM_{2.5}$ monitoring was scheduled for August 2010.

4 DUST DEPOSITION MONITORING

Dust deposition monitoring is carried out each month via a network consisting of twelve (12) gauges. The results for August 2010 are shown in **Table 3**, in conjunction with results for the previous eleven months in order to provide an annual average for that period. A table showing the complete data set from August 2000 in provided in **Appendix A**.

Table 3: Dust deposition monitoring for the 12-month period to August 2010

Month	Monthly dust deposition rate (g/m^2/month)											
	DG1	**DG2**	**DG3**	**DG4**	**DG5A**	**DG6**	**DG7**	**DG8**	**DG9**	**DG10**	**DG11**	**DG12**
Sep-09	1.0	1.8#	1.8	8.3#	1	1.8	0.9#	1.8#	1.7#	0.7	1.4#	-
Oct-09+	4.3	9#	5.2#	11.3#	3.2	3.8#	2.4#	6.8#	3#	2.2	3.2#	5.7#
Nov-09	0.8#	1.7#	1.4#	1.3#	0.7#	2.1#	1.3#	8.0#	*	1.0#	*	2.3#
Dec-09	1.4#	4.0#	1.6#	2.4#	1.7#	1.8	1.6	2.6#	1.7#	1.7#	2.2#	1.7
Jan-10	0.6#	0.8#	5.6#	1.2#	2.4#	1.2#	0.8	1.4	1.3#	0.8#	1.3#	1.1#
Feb-10	1.9#	11.3+	1.9#	1.4#	1.5#	1.1#	1.2#	1.6#	1.1#	0.8#	1.8#	1.3#
Mar-10	0.6#	0.6#	3.2#	1#	4.1#	0.6#	0.6#	1.2	0.6#	0.2#	0.8#	1.1#
Apr-10	0.8#	1.8#	2.4#	0.7#	+	0.3	0.6#	0.9#	0.6#	0.4#	0.8#	0.8#
May-10	0.8	4.9#	3.0#	1.1	1.2	1.0	0.7	1.3#	1.0	0.5	1.1#	0.8
Jun-10	0.3	2.2#	3.0#	0.6#	0.2	1.2#	0.5	0.5#	0.6	0.7#	0.7#	0.4#
Jul-10	0.6#	1.1#	0.7#	0.7	0.5	0.3	0.5#	0.6#	0.7	0.2#	0.8	0.5
Aug-10	0.4	0.5#	1.9#	0.8#	0.2#	0.7#	0.5#	0.5#	0.6	0.5#	0.7#	0.4#
Annual Average	**0.8**	**2.8**	**2.4**	**1.8**	**1.4**	**1.1**	**0.8**	**1.9**	**1.0**	**0.7**	**1.2**	**-**

*Data supplied by Metford Laboratories. # Insects/bird droppings reported. +Invalid. * No recording, funnel damaged.*

The highest dust deposition measurement recorded in August 2010 was 1.9 g/m^2/month at DG3, the accompanying laboratory report showed the sample was contaminated with insects.

Readings considered invalid have been removed when calculating the annual average. The annual average deposition rates for the gauges in the network were low and significantly below the goal of 4 g/m^2/month, indicating nuisance dust in the vicinity of the mine is not an issue.

5 METEOROLOGICAL MONITORING

Monthly plots of the wind speed, temperature, solar radiation, and rainfall data collected in August 2010 are shown in Figure 6 and a windrose plot is shown in Figure 7.

The graphs shown in Figure 6 indicate that the instruments were recording appropriately. Data maxima and minima all appeared to be sensible for this site during August. Total rainfall for the month was 38.5 mm.

A windrose (see Figure 7) created from the available 30-minute average wind data shows that winds were predominantly from the west. The site recorded calms (wind speed less than or equal to 0.5 m/s) for approximately 36.3% of the time. The relatively large fraction of clam winds may arise from the generally forested area and the specific location of the weather station.

APPENDIX A

Dust Deposition Data

Dust deposition (g/m²/month)												
Month	D1	D2	D3	D4	D5A	D6	D7	D8	D9	D10	D11	D12
May-00	0.4	0.4	-	0.7	0.9	0.6	3.6	1.6	0.5	1.8	-	-
Jun-00	0.7	0.5	0.5	0.7	0.8	0.4	3.8	3.2	0.5	0.7	-	-
Jul-00	0.4	0.4	0.5	0.7	0.8	0.5	0.8	1.5	0.4	0.4	-	-
Aug-00	0.9	0.6	1.0	1.2	1.1	1.0	3.4	0.7	0.7	0.6	-	-
Sep-00	0.8	0.9	1.1	0.9	1.3	1.0	2.2	1.0	1.0	0.8	-	-
Oct-00	0.4	0.6	1.1	0.9	0.9	0.8	5.3	0.9	0.6	0.5	-	-
Nov-00	5.2	0.7	1.4	0.8	1.0	0.4	24.1	9.4	1.1	0.6	-	-
Dec-00	2.8	1.4	1.9	1.3	1.1	0.8	2.1	2.5	0.9	0.9	-	-
Jan-01	0.7	1.7	1.4	1.8	0.7	1.3	1.1	2.4	1.1	0.6	-	-
Feb-01	0.9	3.1	2.0	0.5	0.9	0.7	0.7	6.7	1.3	0.5	1.0	-
Mar-01	0.8	2.1	1.3	0.6	0.7	0.6	0.6	5.5	0.6	0.6	1.5	-
Apr-01	0.8	0.7	1.3	0.5	0.7	0.4	0.3	5.1	0.7	0.6	0.8	-
May-01	0.2	0.2	0.4	0.4	0.3	0.3	0.6	1.8	0.6	0.8	0.9	-
Jun-01	0.5	0.4	0.5	1.0	1.0	0.4	0.4	8.8	0.7	0.6	0.6	-
Jul-01	0.5	0.3	1.8	0.5	0.8	-	16.3	4.9	0.9	0.7	0.7	-
Aug-01	0.4	0.4	0.8	0.8	1.0	1.7	1.0	-	1.0	1.8	1.1	-
Sep-01	0.7	1.0	1.7	1.1	1.7	0.7	-	6.0	1.1	1.3	1.7	-
Oct-01	1.1	0.6	4.6	0.9	0.7	0.9	1.2	1.9	0.9	0.6	1.7	-
Nov-01	0.9	1.0	1.1	1.1	0.8	1.1	6.0	5.5	1.3	1.9	2.3	-
Dec-01	4.9	0.9	4.2	0.9	1.3	1.9	1.2	3.1	1.2	9.7	1.8	-
Jan-02	0.8	1.0	1.5	1.3	1.1	1.4	1.3	1.5	1.1	0.9	1.5	-
Feb-02	1.1	1.1	0.9	0.3	0.4	0.5	3.1	5.1	0.5	0.5	0.9	-
Mar-02	1.7	2.1	1.6	0.7	0.7	0.8	1.0	18	1.0	0.9	1.7	-
Apr-02	1.0	0.4	1.0	0.8	0.8	0.6	0.9	10.1	0.5	0.7	1.0	-
May-02	0.6	0.6	6.0	0.7	0.4	1.2	0.9	3.1	0.7	0.2	1.0	-
Jun-02	1.4	0.4	1.7	0.6	0.5	0.8	0.6	2.1	0.6	0.5	1.0	-
Jul-02	0.7	0.7	-	0.8	0.8	0.7	1.2	-	1.1	0.5	1.0	-
Aug-02	1.3	0.8	1.4	1.2	1.1	1.2	1.5	-	1.5	0.9	1.6	-
Sep-02	0.5	1.2	1.1	0.8	0.5	0.7	5.1	9.3	1.6	0.6	1.0	-
Oct-02	2.2	1.4	5.2	1.5	1.5	1.4	1.4	3.4	-	1.5	3.1	-
Nov-02	2.8	1.8	3.7	1.6	0.1	1.8	2.1	3.5	2.1	2	1.9	-
Dec-02	2.0	-	2.5	1.5	3.0	1.5	1.8	4.1	1.6	1.2	1.9	-
Jan-03	2.1	1.5	2.7	1.5	1.0	1.9	2.2	2.5	1.1	1.0	1.6	-
Feb-03	1.4	1.1	2.6	1.1	0.9	1.2	1.7	5.9	1.2	1.0	1.5	-
Mar-03	0.8	0.5	1.2	1.2	0.6	2.1	1.5	3.4	-	3.6	9.5	-
Apr-03	0.5	1.0	0.6	1.0	0.7	0.5	1.1	8.0	-	2.0	1.0	-
May-03	0.5	0.4	0.6	0.2	0.2	0.6	1.3	1.6	0.5	0.8	1.2	-
Jun-03	0.5	0.6	0.8	0.8	0.4	0.6	0.8	0.7	0.9	0.7	0.7	-
Jul-03	0.3	0.4	0.4	0.6	0.4	0.5	0.7	0.5	0.5	0.5	0.7	-
Aug-03	0.8	0.2	0.7	1.1	0.5	1.3	1.8	2.1	1.3	0.7	0.9	-
Sep-03	0.6	0.7	1.1	0.7	0.8	1.7	1.4	1.3	2.5	0.9	1.3	-
Oct-03	-	0.9	1.4	0.9	0.7	1.9	1.0	1.4	0.6	0.8	1.3	-
Nov-03	2.6	0.8	1.0	1.1	0.4	1.3	1.5	1.5	-	0.8	1.3	-
Dec-03	1.0	1.0	1.4	1.3	1.1	1.5	1.6	2.0	1.8	0.9	1.4	-
Jan-04	8.5	1.5	2.1	1.5	1.3	2.6	1.4	2.2	1.7	1.5	1.7	-
Feb-04	1.2	1.0	1.7	1.4	0.7	3.1	1.6	2.2	-	1.5	2.3	-

Mar-04	0.4	0.6	6.6	1.2	0.7	1.9	1.1	12.1	4.8	1.5	1.1	-
Apr-04	0.6	1.0	0.8	0.8	0.6	1.9	0.8	1.4	0.9	1.2	1.1	-
May-04	0.2	0.9	2.2	0.9	0.8	0.7	0.9	1.4	1.2	0.9	1.5	-
Jun-04	0.4	0.6	0.7	0.9	0.6	1.4	1.0	0.9	1.0	1.0	0.8	-
Jul-04	0.4	0.6	5.3#	0.6	0.5	2.9	1.0	1.1	0.9	0.6	1.2	-
Aug-04	0.5	0.5	0.5	1.3	0.7	1.1	1.1	1.4	-	1.0	1.0	-
Sep-04	0.6	0.6	0.8	2.2	1.0	1.0	0.9	4.4	0.9	16.7	1.1	-
Oct-04	0.7	0.9	1.2	0.9	0.8	1.4	1.0	10.5	1.0	1.0	0.8	-
Nov-04	0.8	0.7	1.3	1.9	0.7	0.9	1.0	3.0	1.1	1.1	1.6	-
Dec-04	2.0	1.4	3.6	1.5	1.3	2.2	3.2	7.9	1.8	5.5	2.5	-
Jan-05	1.2	1.0	3.7	1.6	1.4	4.0	2.3	2.7	2.6	2.5	2.8	-
Feb-05	1.2	1.2	1.8	1.6	1.3	2.0	1.7	-	2.3	1.5	2.3	-
Mar-05	1.3	0.9	1.4	0.9	0.9	3.0	1.2	7.7	-	0.8	1.3	-
Apr-05	1.1	0.7	0.9	0.8	0.7	0.9	1.4	3.3	1.1	0.8	0.9	-
May-05	0.7	8.6	1.1	0.8	0.7	0.8	0.9	4.4	1.2	0.8	1.1	-
Jun-05	1.3	0.8	1.3	1.3	0.8	1.2	1.2	1.3	1.5	2.5	0.9	-
Jul-05	1.0	0.5	0.5	0.7	0.4	1.6	0.7	1.2	0.8	4.3	1.1	-
Aug-05	0.6	0.6	0.8	1.0	0.8	0.9	0.7	1.0	0.9	1.0	0.9	-
Sep-05	0.6	0.7	0.8	0.7	0.7	1.2	1.3	1.3	1.0	0.9	1.1	-
Oct-05	0.8	0.9	1.3	0.9	0.8	1.4	1.2	1.9	1.3	1.1	1.3	-
Nov-05	-	2.3	2.3	2.0	1.7	1.2	2.0	3.2	1.6	1.4	2.2	-
Dec-05	1.9	3.2	2.3	3.3	2.6	3.4	2.3	-	1.3	2.1	3.9	-
Jan-06	1.0	2.1	1.7	1.0	23.	3.5	-	2.7	1.1	-	1.5	-
Feb-06	2.2	1.0	0.9	1.2	1.1	1.7	1.1	2.9	-	2.3	1.8	-
Mar-06	0.7	0.6	2.3	0.7	0.6	0.9	1.0	1.4	0.7	0.8	1.5	-
Apr-06	0.6	0.7	1.1	0.8	0.6	1.1	0.8	1.0	1.0	1.8	1.5	-
May-06	1.0	3.1	1.0	-	1.1	1.4	1.1	4.1	-	7.0	1.5	-
Jun-06	0.4	0.3	0.7	0.5	0.4	0.6	0.7	0.8	0.6	0.9	0.9	-
Jul-06	0.3	0.3	1	1.3	0.4	0.7	0.7	2.7	-	0.6	0.6	-
Aug-06	0.9	0.6	0.8	0.7	0.7	0.8	0.7	1.7	-	3.7	0.9	-
Sep-06	1.6	0.7	1.1	1.7	0.7	1	0.9	1.3	1.2	0.8	1.6	-
Oct-06	2	1.4	1.6	1.8	0.9	1.8	1.2	1.8	1.5	1.8	1.9	-
Nov-06	4.3	2.2	3	2.3	2.3	5.3	2.4	3.3	2.3	2.3	2.9	-
Dec-06	1.2	3.4	1.9	2.3	2.3		2.1	2.1		4.9	3.9	-
Jan-07	2	0.9	1.5	0.7	0.7	1.7	1.1		1.2	1.7	0.9	-
Feb-07	1.7	0.9	1.6	0.7	0.6	1	1.8	1.7	1.1	1.2	1.7	-
Mar-07	1.3	0.9	1.7	0.8	1.2	0.6	2.2	1.7	1	0.9	1.7	-
Apr-07	0.5	0.7	0.9	0.6	4.8	1.2	0.5	2.7	0.5	0.8	0.9	-
May-07	0.8	0.5	0.6	1.2	0.6	0.6	0.7	1.9	0.5	0.7	0.8	-
Jun-07	0.6	0.5	0.7	1.1	0.1	0.5	0.1	0.5	0.1	0.4	0.3	-
Jul-07	0.5	0.4	0.6	2.1	0.5	0.8	0.6	0.6	0.4	0.5	0.7	-
Aug-07	1.5	0.4	0.7	1	0.7	0.7	0.5	1	0.6	0.6	0.7	-
Sep-07	1.3	0.5	1.8	1	0.7	0.9	0.9	1.3	1	0.7	1.6	-
Oct-07	4.2	0.9	1.1	1.4	1.1	1.7	1.8	1.7	1.6	1.4	2.2	-
Nov-07	0.8	0.8	1.1	0.9	1.1	1.1	1.1	1.7	0.6	0.8	1.5	-
Dec-07	1.3	0.8	3	0.7	0.5	0.8	0.5	1.1	0.3	0.8	0.6	-
Jan-08	2.6	0.8	3.7	0.5	0.5	0.5	0.4	2.2	0.8	0.3	0.8	-

Feb-08	0.4	0.1	14	0.1	0.1	0.3	0.1	0.3	0.2	0.2	0.3	-
Mar-08	4.5	0.6	9.2+	0.6	2.9	2.1	0.6	1.5	0.5	1	0.9	-
April-08	0.4#	0.4#	0.8#	0.4#	0.4#	0.8#	1.1#	1.7#	1.2	1.1#	1.1#	-
May-08	1.1	2.4#	0.9	1.4	0.9	0.9	0.7	2.7	1#	1.1	1.3#	-
June-08	0.2	0.4#	0.1	0.5	0.1#	0.1	0.3	0.5#	0.1	0.8	0.2	-
July-08	0.4	0.7#	1.3#	0.6	0.8#	0.9	0.8	1	0.7	0.5	1.1	-
Aug-08	1	0.5	0.7	0.6	0.5	1.9	0.8	1	1	0.9	1.4	-
Sep-08	0.6	1	1.3	0.7	0.6	0.9	0.6	0.9	0.9	0.9	1.8	-
Oct-08	1	0.5	1	1.3	1.3	1.2	1	1.4	0.8	1.6	1.8	-
Nov-08	0.8	1.4	2.7	2.5	0.9	1.2	0.8	2.4	1.1	1	1.7	-
Dec-08	0.4	0.4	0.6	0.5	0.3	1.1	0.6	15	0.9	0.7	1.2	-
Jan-09	1.1	3#	1.6	0.8	0.9	1.4	0.7	1.5	0.9	0.9	5+	-
Feb-09	0.4	4.4	1.5	1.1	0.9	1.6	0.8	1.2	1.4	2.5	1.2	-
Mar-09	2.8	5.8	2.7	2.4	1.9	2.1	2.5	2.4	2.3	5.7	2.7	-
Apr-09	2	0.8	0.8	0.6	0.6	3.2	1.1	1.1	1	0.6	0.9	-
May-09	0.6	1.6	0.8	2.4	0.9	5.6 +	1.4	1.1	1.3	0.7	1.5	-
Jun-09	0.4	1.3	0.8	0.5	0.5	3.3	0.9	0.6	1	3.4	0.7	-
Jul-09	0.2	1.0	0.6	0.4	0.3	3.8	0.5	0.6	0.6	0.3	0.6	-
Aug-09	0.8	3.6	0.8	1.2	1.0	1.8	0.8	1.8	1.3	0.8	1.0	-
Sep-09	1.0	1.8#	1.8	8.3 +	1	1.8	0.9#	1.8#	1.7#	0.7	1.4#	-
Oct-09+	4.3	9#	5.2#	11.3#	3.2	3.8#	2.4#	6.8#	3.0#	2.2	3.2#	5.7#
Nov-09	0.8#	1.7#	1.4#	1.3#	0.7#	2.1#	1.3#	8.0#	*	1.0#	*	2.3
Dec-09	1.4#	4.0#	1.6#	2.4#	1.7#	1.8	1.6	2.6#	1.7#	1.7#	2.2#	1.7
Jan-10	0.6#	0.8#	5.6#	1.2#	2.4#	1.2#	0.8#	1.4#	1.3#	0.8#	1.3#	1.1#
Feb-10	1.9#	11.3+	1.9#	1.4#	1.5#	1.1#	1.2#	1.6#	1.1#	0.8#	1.8#	1.3#
Mar-10	0.6#	0.6#	3.2#	1#	4.1#	0.6#	0.6#	1.2	0.6	0.2#	0.8#	1.1#
Apr-10	0.8#	1.8#	2.4#	0.7#	+	0.3	0.6#	0.9#	0.6#	0.4#	0.8#	0.8#
May-10	0.8	4.9#	3.0#	1.1	1.2	1.0	0.7	1.3	1.0#	0.5	1.1#	0.8
Jun-10	0.3	2.2#	3.0#	0.6#	0.2	1.2#	0.5	0.5#	0.6	0.7#	0.7#	0.4#
Jul-10	0.6#	1.1#	0.7#	0.7	0.5	0.3	0.5#	0.6#	0.7	0.2#	0.8	0.5
Aug-10	0.4	0.5#	1.9#	0.8#	0.2#	0.7#	0.5#	0.5#	0.6	0.5#	0.7#	0.4#

 # - sample contaminated

+ - sample invalid

**Broken funnel*

[Note: Samples for October 2009 have been considered invalid, due to a widespread dust storm experienced on 23rd September 2009.]

APPENDIX B

Figures

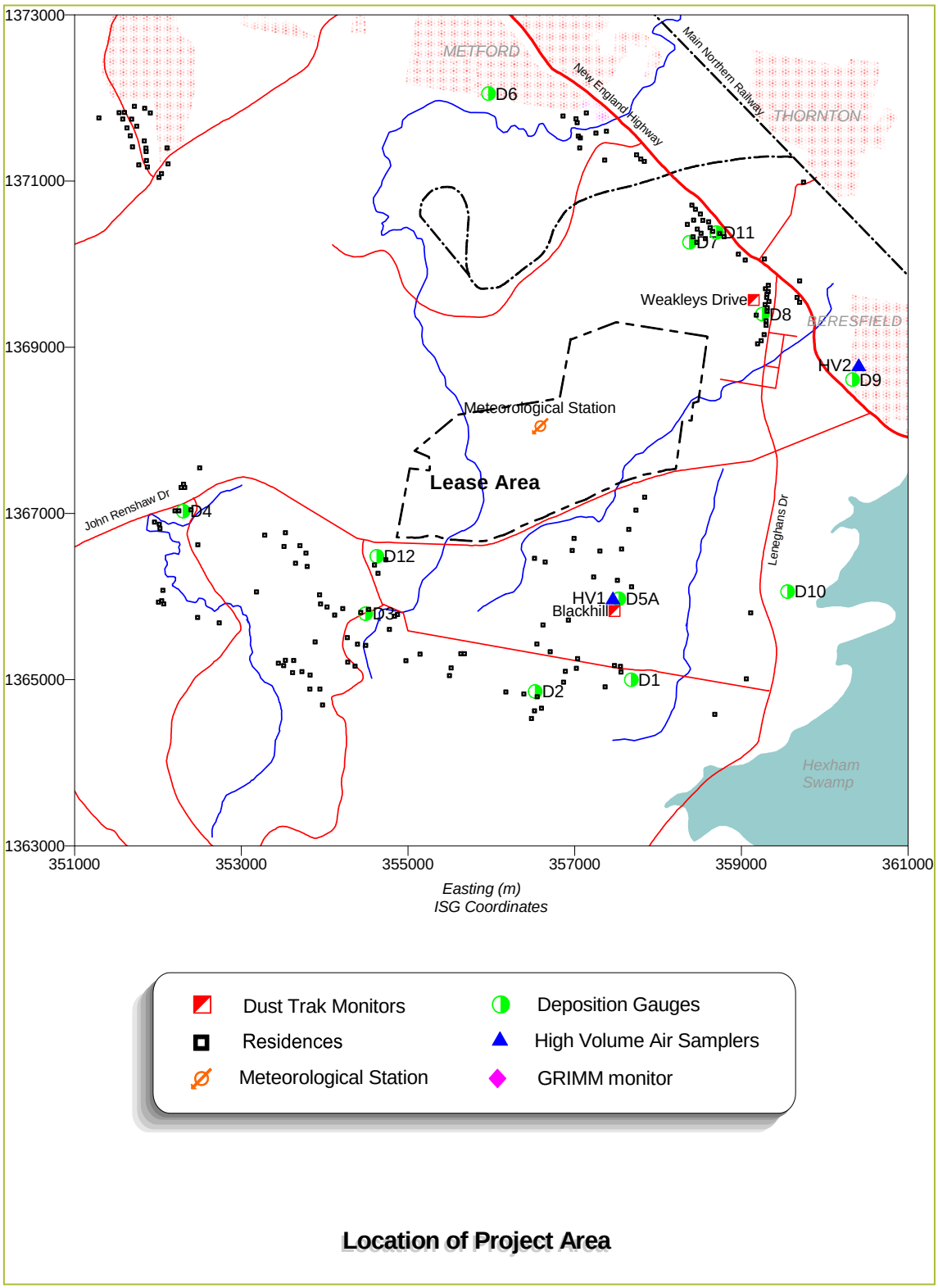

Figure 1: Project Location

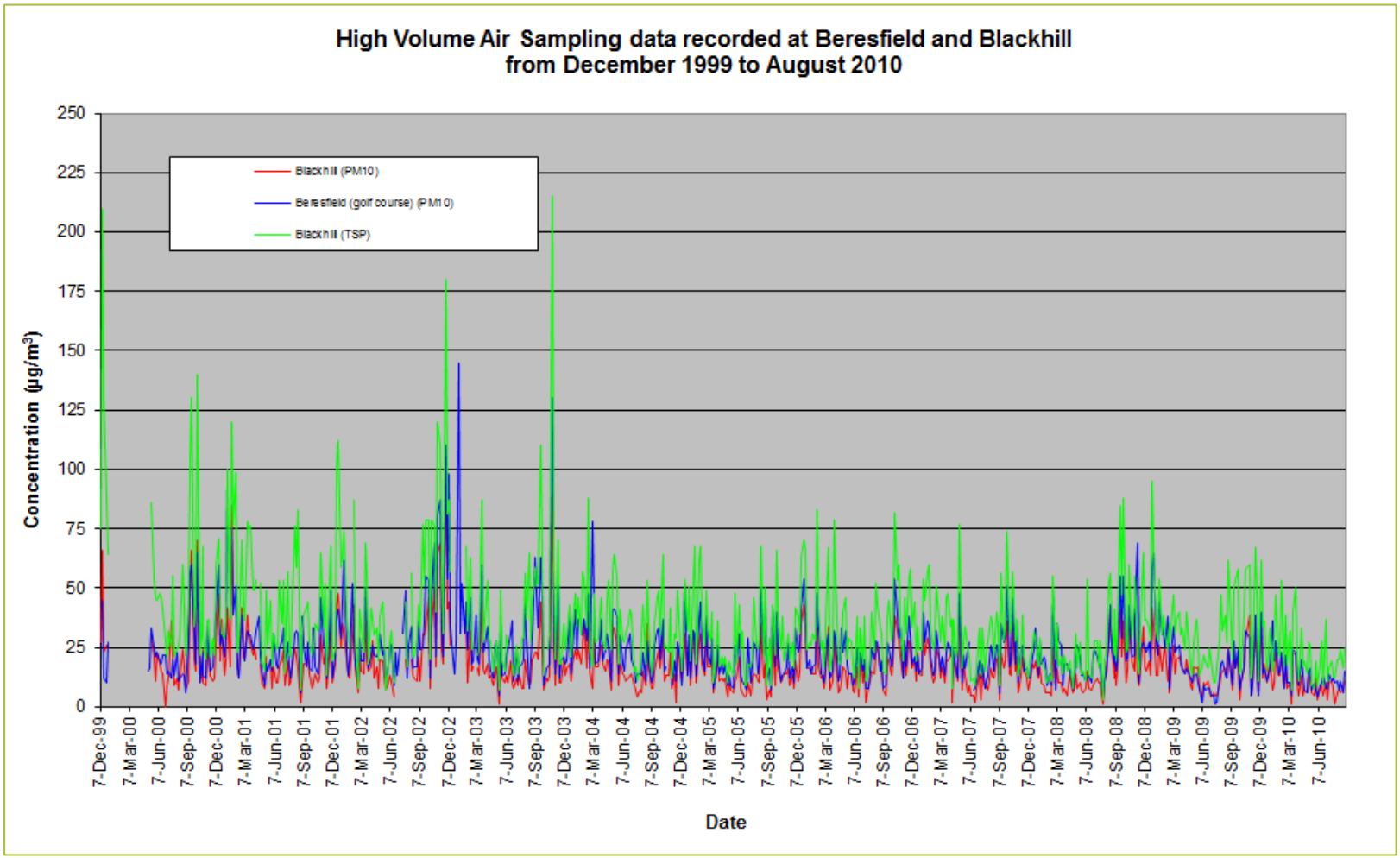

Figure 2: High Volume Air Sampling data

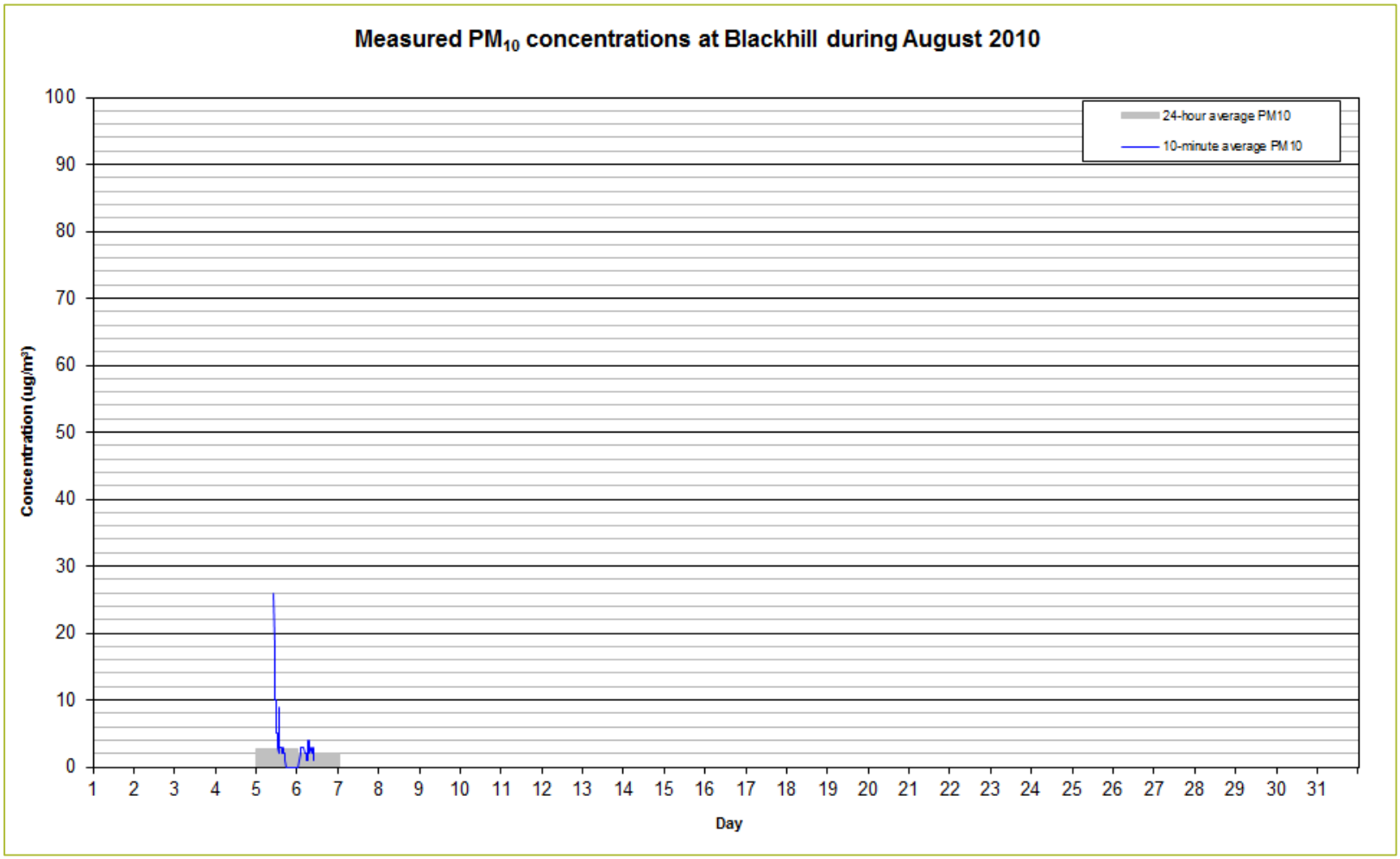

Figure 3: DustTrak sampling data, Blackhill site

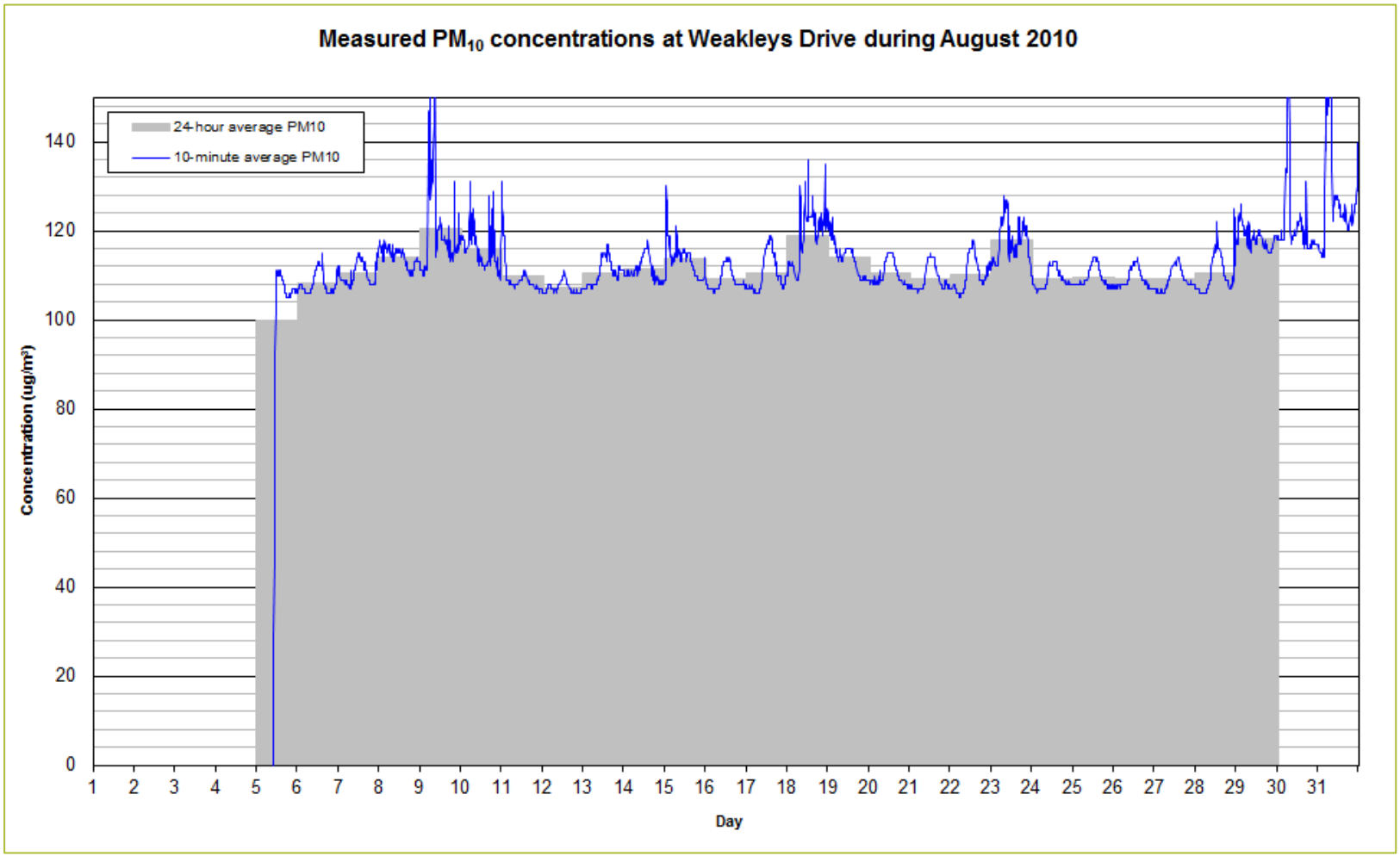

Figure 4: DustTrak sampling data, Weakleys Drive site

No $PM_{2.5}$ monitoring was scheduled for August 2010

Figure 5: DustTrak $PM_{2.5}$ monitoring data

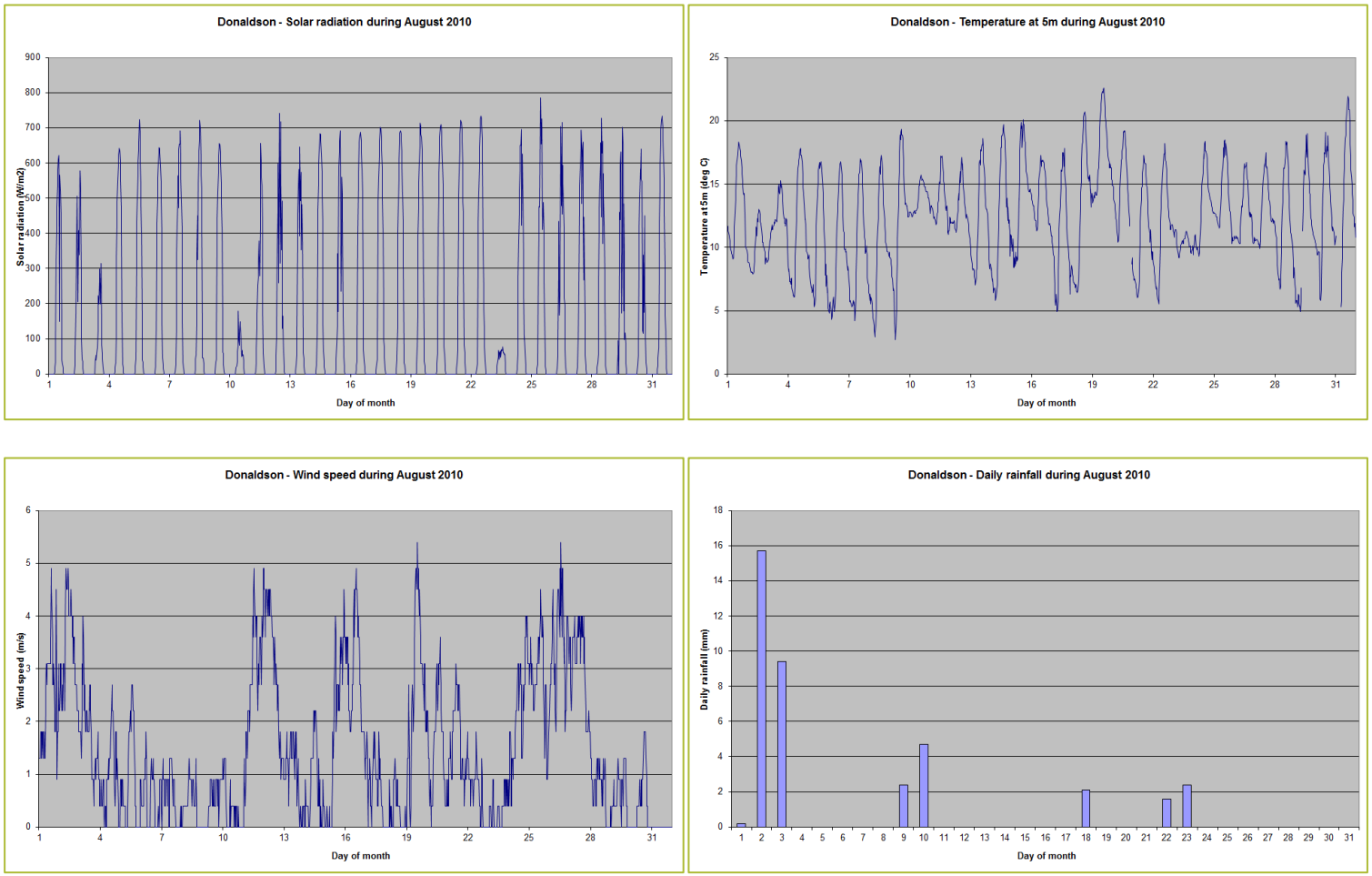

Figure 6: Meteorological conditions

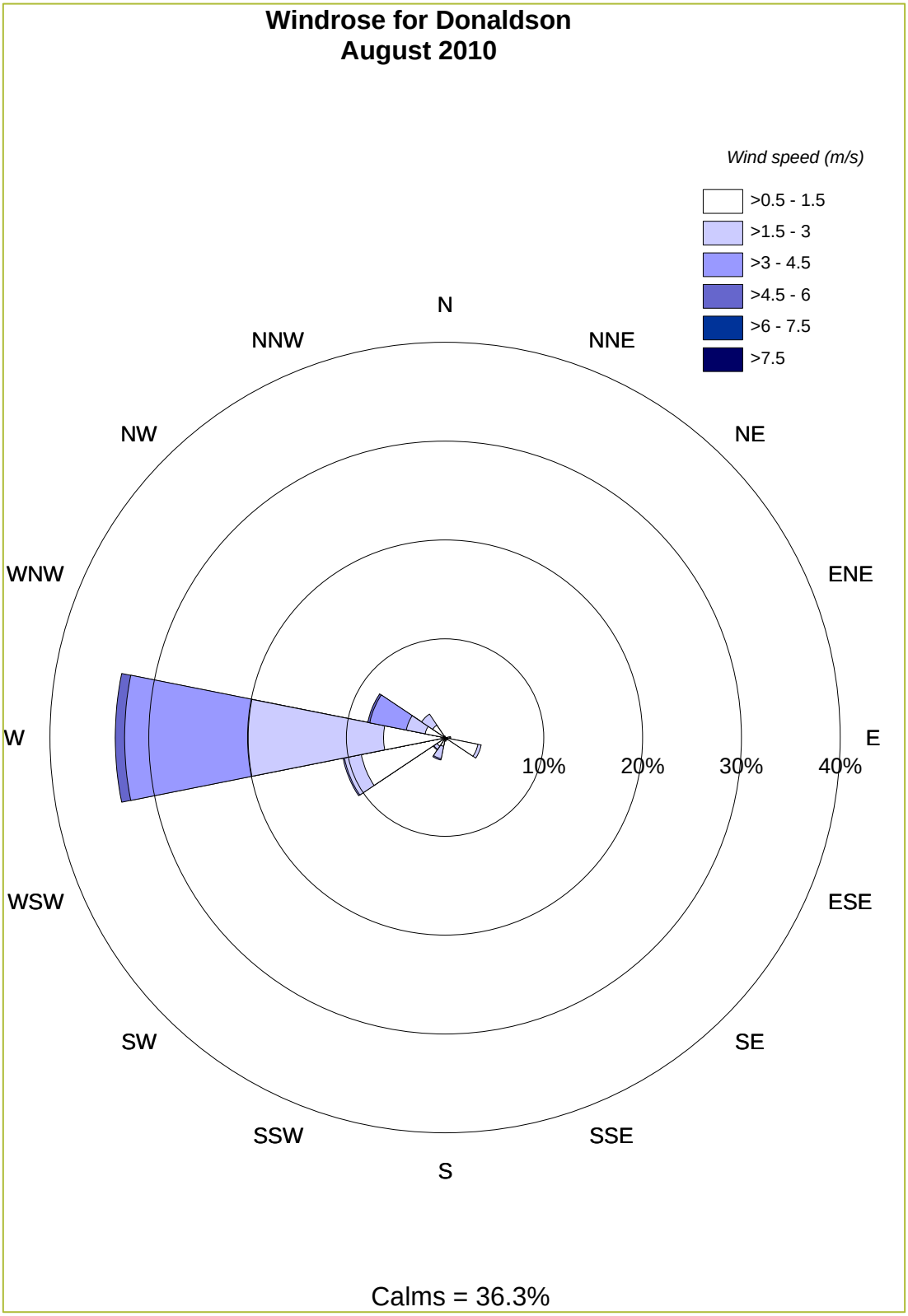

Figure 7: Windrose

DONALDSON MONITORING

DUST AND METEOROLOGICAL DATA
SEPTEMBER 2010 REPORT

Donaldson Coal

Job No: **3003**

1 November 2010

PROJECT TITLE:	**DUST AND METEOROLOGICAL DATA SEPTEMBER 2010 REPORT**
JOB NUMBER:	**3003**
PREPARED FOR:	Phil Brown **DONALDSON COAL**
PREPARED BY:	Philip Henschke
QA PROCEDURES CHECKED BY:	Ronan Kellaghan
APPROVED FOR RELEASE BY:	Aleks Todoroski
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VERSION	DATE	PREPARED BY	REVIEWED BY
V1	1/11/2010	Philip Henschke	Ronan Kellaghan

Queensland Environment Pty Ltd trading as
PAEHolmes ABN 86 127 101 642

SYDNEY:
Suite 2B, 14 Glen Street
Eastwood NSW 2122
Ph: +61 2 9874 8644
Fax: +61 2 9874 8904

BRISBANE:
Level 1, La Melba, 59 Melbourne Street South Brisbane Qld 4101
PO Box 3306 South Brisbane Qld 4101
Ph: +61 7 3004 6400
Fax: +61 7 3844 5858

Email: info@paeholmes.com

Website: www.paeholmes.com

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1 INTRODUCTION

As part of their Air Quality Management Plan Donaldson Coal operate a dust monitoring network in the vicinity of the mining lease and a meteorological station on site. This report has been prepared in order to bring together the various data collected throughout the network during September 2010 and to summarise the information.

The dust network includes continuous monitoring, high volume air sampling and dust deposition monitoring. The continuous monitoring network consists of two DustTrak monitors measuring PM_{10} at two sites and an additional DustTrak monitor which is used for one week each quarter to measure $PM_{2.5}$.

There are two locations which use high volume air samplers to determine concentrations of PM_{10} and TSP. These operate on a six-day cycle in line with similar measurements made by the NSW Department of Environment, Climate Change and Water (DECCW) at other locations throughout the state.

In addition to concentration measurements, monthly levels of dust deposition are also measured using twelve gauges placed at various locations in the area of the mine. The locations of each of these monitors and gauges are shown in Figure 1.

Table 1 lists the monitors used and pollutants measured at these locations.

Table 1: Summary of monitoring locations and instruments

Monitoring Location	Instruments Used	Pollutant Monitored
Beresfield	HVAS	PM_{10}
Blackhill	HVAS	PM_{10}
	HVAS	TSP
	DustTrak	PM_{10}
	DustTrak (1 week per quarter)	$PM_{2.5}$
Weakleys Drive	DustTrak	PM_{10}
DG1 – DG12	Deposition Gauges	Dust Deposition

The meteorological station is situated at the site of the office buildings and measures the following parameters:

- wind speed
- wind direction
- temperature
- solar radiation
- rainfall

The data are downloaded at various intervals by Donaldson and then forwarded to PAEHolmes for processing.

2 HIGH VOLUME AIR SAMPLING

High Volume Air Sampling (HVAS) was carried out at Beresfield and Blackhill by Metford Laboratories. PM_{10} is measured at both sites while TSP is only measured at Blackhill. The data collected during September 2010 are summarised in **Table 2**. A graph consisting of all the data collected to date is shown in Figure 2.

Table 2: HVAS data from Beresfield and Blackhill for September 2010

Date	Beresfield PM_{10} ($\mu g/m^3$)	Blackhill PM_{10} ($\mu g/m^3$)	Blackhill TSP ($\mu g/m^3$)
4/09/2010	2	0	9
10/09/2010	4	1	14
16/09/2010	10	8	37
22/09/2010	17	15	28
28/09/2010	13	16	46
Annual average	**14**	**12**	**26**

These measurements will include all background sources relevant to that location, including contributions from the Donaldson mining operations.

On the days that the instruments were monitoring, the highest 24-hour average PM_{10} concentration recorded in September 2010 was 17 $\mu g/m^3$. This value was measured on the 22nd at the Beresfield site. On this occasion the measured PM_{10} concentration did not exceed the 50 $\mu g/m^3$ 24-hour DECCW goal.

TSP measurements from the Blackhill site show that concentrations were below the DECCW 90 $\mu g/m^3$ annual average TSP goal. It should be noted that the DECCW goal refers to an annual average and not a 24-hour average as measured by the high volume air sampler. The annual average TSP concentration for the 12 months to September 2010 was 26 $\mu g/m^3$.

Figure 2 shows a seasonal trend in PM_{10} concentrations, peaking during the warmer months and decreasing during autumn and winter. This is a common trend and is seen consistently in the Hunter Valley.

The annual average PM_{10} concentrations for Beresfield and Blackhill were 14 $\mu g/m^3$ and 12 $\mu g/m^3$ respectively for the 12 months to September 2010. These values are below the DECCW's annual average PM_{10} air quality criterion of 30 $\mu g/m^3$.

3 CONTINUOUS MONITORING

3.1 DustTrak Monitoring at Blackhill

Figure 3 shows a time series of the PM_{10} data collected from the DustTrak monitor at the Blackhill site. During the month of September, the DustTrak monitor located at the Blackhill site experienced a power failure. As a result DustTrak monitoring for the Blackhill site is available from the 2nd to 30th of September.

Of the available data, the measured 24-hour average PM_{10} concentrations did not exceed the DECCW goal of 50 µg/m^3. The maximum 24-hour average PM_{10} concentration was recorded on 27th of September at 31.7 µg/m^3.

3.2 DustTrak Monitoring at Weakleys Drive

A time series of the PM_{10} data collected from the Weakleys Drive site is shown in Figure 4. During the month of September, the DustTrak monitor located at the Weakleys Drive site experienced an internal calibration failure. The data recorded for the first two days of the month of September showed erroneous results that are not representative of the ambient air quality.

The monitor was recalibrated soon after and valid data is available from the 4th to 30th of September.

Of the available data, the measured 24-hour average PM_{10} concentrations did not exceed the DECCW goal of 50 µg/m^3. The maximum 24-hour average PM_{10} concentration was recorded on 29th of September at 18.4 µg/m^3.

3.3 DustTrak $PM_{2.5}$ Monitoring at BlackHill

DustTrak $PM_{2.5}$ monitoring was carried out between the 20th and 27th of September and the data are presented in Figure 5. The measurements show there are no occurrences above the 24-hour average DECCW advisory standard of 25 µg/m^3 during the period.

The 10-minute logged data for both PM_{10} and $PM_{2.5}$ show reasonable correlation, with peaks and troughs following the same trends. The average $PM_{2.5}$ fraction in the PM_{10} size range was calculated from the measurements as 97%. This suggest that the PM_{10} is predominantly fine particles.

4 DUST DEPOSITION MONITORING

Dust deposition monitoring is carried out each month via a network consisting of twelve (12) gauges. The results for September 2010 are shown in **Table 3**, in conjunction with results for the previous eleven months in order to provide an annual average for that period. A table showing the complete data set from September 2000 in provided in **Appendix A**.

Table 3: Dust deposition monitoring for the 12-month period to September 2010

Month	Monthly dust deposition rate (g/m^2/month)											
	DG1	**DG2**	**DG3**	**DG4**	**DG5A**	**DG6**	**DG7**	**DG8**	**DG9**	**DG10**	**DG11**	**DG12**
Oct-09$^+$	4.3	9$^\#$	5.2$^\#$	11.3$^\#$	3.2	3.8$^\#$	2.4$^\#$	6.8$^\#$	3$^\#$	2.2	3.2$^\#$	5.7$^\#$
Nov-09	0.8$^\#$	1.7$^\#$	1.4$^\#$	1.3$^\#$	0.7$^\#$	2.1$^\#$	1.3$^\#$	8.0$^\#$	*	1.0$^\#$	*	2.3$^\#$
Dec-09	1.4$^\#$	4.0$^\#$	1.6$^\#$	2.4$^\#$	1.7$^\#$	1.8	1.6	2.6$^\#$	1.7$^\#$	1.7$^\#$	2.2$^\#$	1.7
Jan-10	0.6$^\#$	0.8$^\#$	5.6$^\#$	1.2$^\#$	2.4$^\#$	1.2$^\#$	0.8	1.4	1.3$^\#$	0.8$^\#$	1.3$^\#$	1.1$^\#$
Feb-10	1.9$^\#$	11.3$^+$	1.9$^\#$	1.4$^\#$	1.5$^\#$	1.1$^\#$	1.2$^\#$	1.6$^\#$	1.1$^\#$	0.8$^\#$	1.8$^\#$	1.3$^\#$
Mar-10	0.6$^\#$	0.6$^\#$	3.2$^\#$	1$^\#$	4.1$^\#$	0.6$^\#$	0.6$^\#$	1.2	0.6$^\#$	0.2$^\#$	0.8$^\#$	1.1$^\#$
Apr-10	0.8$^\#$	1.8$^\#$	2.4$^\#$	0.7$^\#$	+	0.3	0.6$^\#$	0.9$^\#$	0.6$^\#$	0.4$^\#$	0.8$^\#$	0.8$^\#$
May-10	0.8	4.9$^\#$	3.0$^\#$	1.1	1.2	1.0	0.7	1.3$^\#$	1.0	0.5	1.1$^\#$	0.8
Jun-10	0.3	2.2$^\#$	3.0$^\#$	0.6$^\#$	0.2	1.2$^\#$	0.5	0.5$^\#$	0.6	0.7$^\#$	0.7$^\#$	0.4$^\#$
Jul-10	0.6$^\#$	1.1$^\#$	0.7$^\#$	0.7	0.5	0.3	0.5$^\#$	0.6$^\#$	0.7	0.2$^\#$	0.8	0.5
Aug-10	0.4	0.5$^\#$	1.9$^\#$	0.8$^\#$	0.2$^\#$	0.7$^\#$	0.5$^\#$	0.5$^\#$	0.6	0.5$^\#$	0.7$^\#$	0.4$^\#$
Sep-10	0.6$^\#$	2.6$^\#$	1.6$^\#$	1.0$^\#$	0.5$^\#$	1.1$^\#$	0.5$^\#$	1.0$^\#$	0.9$^\#$	0.6$^\#$	0.8$^\#$	0.9$^\#$
Annual Average	**0.8**	**2.9**	**2.4**	**1.1**	**1.3**	**1.0**	**0.8**	**1.8**	**0.9**	**0.7**	**1.1**	**1.0**

*Data supplied by Metford Laboratories. $^\#$ Insects/bird droppings reported. $^+$Invalid. * No recording, funnel damaged.*

The highest dust deposition measurement recorded in September 2010 was 2.6 g/m^2/month at DG2, the accompanying laboratory report showed the sample was contaminated with bird droppings and insects.

Readings considered invalid have been removed when calculating the annual average. The annual average deposition rates for the gauges in the network were low and significantly below the goal of 4 g/m^2/month, indicating nuisance dust in the vicinity of the mine is not an issue.

5 METEOROLOGICAL MONITORING

Monthly plots of the wind speed, temperature, solar radiation, and rainfall data collected in September 2010 are shown in Figure 6 and a windrose plot is shown in Figure 7.

The graphs shown in Figure 6 indicate that the instruments were recording appropriately. Data maxima and minima all appeared to be sensible for this site during September. Total rainfall for the month was 38.5 mm.

A windrose (see Figure 7) created from the available 30-minute average wind data shows that winds were predominantly from the west with some winds from the east-southeast. The site recorded calms (wind speed less than or equal to 0.5 m/s) for approximately 36.3% of the time. The relatively large fraction of clam winds may arise from the generally forested area and the specific location of the weather station.

APPENDIX A

Dust Deposition Data

Dust deposition (g/m²/month)												
Month	D1	D2	D3	D4	D5A	D6	D7	D8	D9	D10	D11	D12
May-00	0.4	0.4	-	0.7	0.9	0.6	3.6	1.6	0.5	1.8	-	-
Jun-00	0.7	0.5	0.5	0.7	0.8	0.4	3.8	3.2	0.5	0.7	-	-
Jul-00	0.4	0.4	0.5	0.7	0.8	0.5	0.8	1.5	0.4	0.4	-	-
Aug-00	0.9	0.6	1.0	1.2	1.1	1.0	3.4	0.7	0.7	0.6	-	-
Sep-00	0.8	0.9	1.1	0.9	1.3	1.0	2.2	1.0	1.0	0.8	-	-
Oct-00	0.4	0.6	1.1	0.9	0.9	0.8	5.3	0.9	0.6	0.5	-	-
Nov-00	5.2	0.7	1.4	0.8	1.0	0.4	24.1	9.4	1.1	0.6	-	-
Dec-00	2.8	1.4	1.9	1.3	1.1	0.8	2.1	2.5	0.9	0.9	-	-
Jan-01	0.7	1.7	1.4	1.8	0.7	1.3	1.1	2.4	1.1	0.6	-	-
Feb-01	0.9	3.1	2.0	0.5	0.9	0.7	0.7	6.7	1.3	0.5	1.0	-
Mar-01	0.8	2.1	1.3	0.6	0.7	0.6	0.6	5.5	0.6	0.6	1.5	-
Apr-01	0.8	0.7	1.3	0.5	0.7	0.4	0.3	5.1	0.7	0.6	0.8	-
May-01	0.2	0.2	0.4	0.4	0.3	0.3	0.6	1.8	0.6	0.8	0.9	-
Jun-01	0.5	0.4	0.5	1.0	1.0	0.4	0.4	8.8	0.7	0.6	0.6	-
Jul-01	0.5	0.3	1.8	0.5	0.8	-	16.3	4.9	0.9	0.7	0.7	-
Aug-01	0.4	0.4	0.8	0.8	1.0	1.7	1.0	-	1.0	1.8	1.1	-
Sep-01	0.7	1.0	1.7	1.1	1.7	0.7	-	6.0	1.1	1.3	1.7	-
Oct-01	1.1	0.6	4.6	0.9	0.7	0.9	1.2	1.9	0.9	0.6	1.7	-
Nov-01	0.9	1.0	1.1	1.1	0.8	1.1	6.0	5.5	1.3	1.9	2.3	-
Dec-01	4.9	0.9	4.2	0.9	1.3	1.9	1.2	3.1	1.2	9.7	1.8	-
Jan-02	0.8	1.0	1.5	1.3	1.1	1.4	1.3	1.5	1.1	0.9	1.5	-
Feb-02	1.1	1.1	0.9	0.3	0.4	0.5	3.1	5.1	0.5	0.5	0.9	-
Mar-02	1.7	2.1	1.6	0.7	0.7	0.8	1.0	18	1.0	0.9	1.7	-
Apr-02	1.0	0.4	1.0	0.8	0.8	0.6	0.9	10.1	0.5	0.7	1.0	-
May-02	0.6	0.6	6.0	0.7	0.4	1.2	0.9	3.1	0.7	0.2	1.0	-
Jun-02	1.4	0.4	1.7	0.6	0.5	0.8	0.6	2.1	0.6	0.5	1.0	-
Jul-02	0.7	0.7	-	0.8	0.8	0.7	1.2	-	1.1	0.5	1.0	-
Aug-02	1.3	0.8	1.4	1.2	1.1	1.2	1.5	-	1.5	0.9	1.6	-
Sep-02	0.5	1.2	1.1	0.8	0.5	0.7	5.1	9.3	1.6	0.6	1.0	-
Oct-02	2.2	1.4	5.2	1.5	1.5	1.4	1.4	3.4	-	1.5	3.1	-
Nov-02	2.8	1.8	3.7	1.6	0.1	1.8	2.1	3.5	2.1	2	1.9	-
Dec-02	2.0	-	2.5	1.5	3.0	1.5	1.8	4.1	1.6	1.2	1.9	-
Jan-03	2.1	1.5	2.7	1.5	1.0	1.9	2.2	2.5	1.1	1.0	1.6	-
Feb-03	1.4	1.1	2.6	1.1	0.9	1.2	1.7	5.9	1.2	1.0	1.5	-
Mar-03	0.8	0.5	1.2	1.2	0.6	2.1	1.5	3.4	-	3.6	9.5	-
Apr-03	0.5	1.0	0.6	1.0	0.7	0.5	1.1	8.0	-	2.0	1.0	-
May-03	0.5	0.4	0.6	0.2	0.2	0.6	1.3	1.6	0.5	0.8	1.2	-
Jun-03	0.5	0.6	0.8	0.8	0.4	0.6	0.8	0.7	0.9	0.7	0.7	-
Jul-03	0.3	0.4	0.4	0.6	0.4	0.5	0.7	0.5	0.5	0.5	0.7	-
Aug-03	0.8	0.2	0.7	1.1	0.5	1.3	1.8	2.1	1.3	0.7	0.9	-
Sep-03	0.6	0.7	1.1	0.7	0.8	1.7	1.4	1.3	2.5	0.9	1.3	-
Oct-03	-	0.9	1.4	0.9	0.7	1.9	1.0	1.4	0.6	0.8	1.3	-
Nov-03	2.6	0.8	1.0	1.1	0.4	1.3	1.5	1.5	-	0.8	1.3	-
Dec-03	1.0	1.0	1.4	1.3	1.1	1.5	1.6	2.0	1.8	0.9	1.4	-
Jan-04	8.5	1.5	2.1	1.5	1.3	2.6	1.4	2.2	1.7	1.5	1.7	-
Feb-04	1.2	1.0	1.7	1.4	0.7	3.1	1.6	2.2	-	1.5	2.3	-

Mar-04	0.4	0.6	6.6	1.2	0.7	1.9	1.1	12.1	4.8	1.5	1.1	-
Apr-04	0.6	1.0	0.8	0.8	0.6	1.9	0.8	1.4	0.9	1.2	1.1	-
May-04	0.2	0.9	2.2	0.9	0.8	0.7	0.9	1.4	1.2	0.9	1.5	-
Jun-04	0.4	0.6	0.7	0.9	0.6	1.4	1.0	0.9	1.0	1.0	0.8	-
Jul-04	0.4	0.6	5.3#	0.6	0.5	2.9	1.0	1.1	0.9	0.6	1.2	-
Aug-04	0.5	0.5	0.5	1.3	0.7	1.1	1.1	1.4	-	1.0	1.0	-
Sep-04	0.6	0.6	0.8	2.2	1.0	1.0	0.9	4.4	0.9	16.7	1.1	-
Oct-04	0.7	0.9	1.2	0.9	0.8	1.4	1.0	10.5	1.0	1.0	0.8	-
Nov-04	0.8	0.7	1.3	1.9	0.7	0.9	1.0	3.0	1.1	1.1	1.6	-
Dec-04	2.0	1.4	3.6	1.5	1.3	2.2	3.2	7.9	1.8	5.5	2.5	-
Jan-05	1.2	1.0	3.7	1.6	1.4	4.0	2.3	2.7	2.6	2.5	2.8	-
Feb-05	1.2	1.2	1.8	1.6	1.3	2.0	1.7	-	2.3	1.5	2.3	-
Mar-05	1.3	0.9	1.4	0.9	0.9	3.0	1.2	7.7	-	0.8	1.3	-
Apr-05	1.1	0.7	0.9	0.8	0.7	0.9	1.4	3.3	1.1	0.8	0.9	-
May-05	0.7	8.6	1.1	0.8	0.7	0.8	0.9	4.4	1.2	0.8	1.1	-
Jun-05	1.3	0.8	1.3	1.3	0.8	1.2	1.2	1.3	1.5	2.5	0.9	-
Jul-05	1.0	0.5	0.5	0.7	0.4	1.6	0.7	1.2	0.8	4.3	1.1	-
Aug-05	0.6	0.6	0.8	1.0	0.8	0.9	0.7	1.0	0.9	1.0	0.9	-
Sep-05	0.6	0.7	0.8	0.7	0.7	1.2	1.3	1.3	1.0	0.9	1.1	-
Oct-05	0.8	0.9	1.3	0.9	0.8	1.4	1.2	1.9	1.3	1.1	1.3	-
Nov-05	-	2.3	2.3	2.0	1.7	1.2	2.0	3.2	1.6	1.4	2.2	-
Dec-05	1.9	3.2	2.3	3.3	2.6	3.4	2.3	-	1.3	2.1	3.9	-
Jan-06	1.0	2.1	1.7	1.0	23.	3.5	-	2.7	1.1	-	1.5	-
Feb-06	2.2	1.0	0.9	1.2	1.1	1.7	1.1	2.9	-	2.3	1.8	-
Mar-06	0.7	0.6	2.3	0.7	0.6	0.9	1.0	1.4	0.7	0.8	1.5	-
Apr-06	0.6	0.7	1.1	0.8	0.6	1.1	0.8	1.0	1.0	1.8	1.5	-
May-06	1.0	3.1	1.0	-	1.1	1.4	1.1	4.1	-	7.0	1.5	-
Jun-06	0.4	0.3	0.7	0.5	0.4	0.6	0.7	0.8	0.6	0.9	0.9	-
Jul-06	0.3	0.3	1	1.3	0.4	0.7	0.7	2.7	-	0.6	0.6	-
Aug-06	0.9	0.6	0.8	0.7	0.7	0.8	0.7	1.7	-	3.7	0.9	-
Sep-06	1.6	0.7	1.1	1.7	0.7	1	0.9	1.3	1.2	0.8	1.6	-
Oct-06	2	1.4	1.6	1.8	0.9	1.8	1.2	1.8	1.5	1.8	1.9	-
Nov-06	4.3	2.2	3	2.3	2.3	5.3	2.4	3.3	2.3	2.3	2.9	-
Dec-06	1.2	3.4	1.9	2.3	2.3		2.1	2.1		4.9	3.9	-
Jan-07	2	0.9	1.5	0.7	0.7	1.7	1.1		1.2	1.7	0.9	-
Feb-07	1.7	0.9	1.6	0.7	0.6	1	1.8	1.7	1.1	1.2	1.7	-
Mar-07	1.3	0.9	1.7	0.8	1.2	0.6	2.2	1.7	1	0.9	1.7	-
Apr-07	0.5	0.7	0.9	0.6	4.8	1.2	0.5	2.7	0.5	0.8	0.9	-
May-07	0.8	0.5	0.6	1.2	0.6	0.6	0.7	1.9	0.5	0.7	0.8	-
Jun-07	0.6	0.5	0.7	1.1	0.1	0.5	0.1	0.5	0.1	0.4	0.3	-
Jul-07	0.5	0.4	0.6	2.1	0.5	0.8	0.6	0.6	0.4	0.5	0.7	-
Aug-07	1.5	0.4	0.7	1	0.7	0.7	0.5	1	0.6	0.6	0.7	-
Sep-07	1.3	0.5	1.8	1	0.7	0.9	0.9	1.3	1	0.7	1.6	-
Oct-07	4.2	0.9	1.1	1.4	1.1	1.7	1.8	1.7	1.6	1.4	2.2	-
Nov-07	0.8	0.8	1.1	0.9	1.1	1.1	1.1	1.7	0.6	0.8	1.5	-
Dec-07	1.3	0.8	3	0.7	0.5	0.8	0.5	1.1	0.3	0.8	0.6	-
Jan-08	2.6	0.8	3.7	0.5	0.5	0.5	0.4	2.2	0.8	0.3	0.8	-

Feb-08	0.4	0.1	14	0.1	0.1	0.3	0.1	0.3	0.2	0.2	0.3	-
Mar-08	4.5	0.6	9.2+	0.6	2.9	2.1	0.6	1.5	0.5	1	0.9	-
April-08	0.4#	0.4#	0.8#	0.4#	0.4#	0.8#	1.1#	1.7#	1.2	1.1#	1.1#	-
May-08	1.1	2.4#	0.9	1.4	0.9	0.9	0.7	2.7	1#	1.1	1.3#	-
June-08	0.2	0.4#	0.1	0.5	0.1#	0.1	0.3	0.5#	0.1	0.8	0.2	-
July-08	0.4	0.7#	1.3#	0.6	0.8#	0.9	0.8	1	0.7	0.5	1.1	-
Aug-08	1	0.5	0.7	0.6	0.5	1.9	0.8	1	1	0.9	1.4	-
Sep-08	0.6	1	1.3	0.7	0.6	0.9	0.6	0.9	0.9	0.9	1.8	-
Oct-08	1	0.5	1	1.3	1.3	1.2	1	1.4	0.8	1.6	1.8	-
Nov-08	0.8	1.4	2.7	2.5	0.9	1.2	0.8	2.4	1.1	1	1.7	-
Dec-08	0.4	0.4	0.6	0.5	0.3	1.1	0.6	15	0.9	0.7	1.2	-
Jan-09	1.1	3#	1.6	0.8	0.9	1.4	0.7	1.5	0.9	0.9	5+	-
Feb-09	0.4	4.4	1.5	1.1	0.9	1.6	0.8	1.2	1.4	2.5	1.2	-
Mar-09	2.8	5.8	2.7	2.4	1.9	2.1	2.5	2.4	2.3	5.7	2.7	-
Apr-09	2	0.8	0.8	0.6	0.6	3.2	1.1	1.1	1	0.6	0.9	-
May-09	0.6	1.6	0.8	2.4	0.9	5.6 +	1.4	1.1	1.3	0.7	1.5	-
Jun-09	0.4	1.3	0.8	0.5	0.5	3.3	0.9	0.6	1	3.4	0.7	-
Jul-09	0.2	1.0	0.6	0.4	0.3	3.8	0.5	0.6	0.6	0.3	0.6	-
Aug-09	0.8	3.6	0.8	1.2	1.0	1.8	0.8	1.8	1.3	0.8	1.0	-
Sep-09	1.0	1.8#	1.8	8.3 +	1	1.8	0.9#	1.8#	1.7#	0.7	1.4#	-
Oct-09+	4.3	9#	5.2#	11.3#	3.2	3.8#	2.4#	6.8#	3.0#	2.2	3.2#	5.7#
Nov-09	0.8#	1.7#	1.4#	1.3#	0.7#	2.1#	1.3#	8.0#	*	1.0#	*	2.3
Dec-09	1.4#	4.0#	1.6#	2.4#	1.7#	1.8	1.6	2.6#	1.7#	1.7#	2.2#	1.7
Jan-10	0.6#	0.8#	5.6#	1.2#	2.4#	1.2#	0.8#	1.4#	1.3#	0.8#	1.3#	1.1#
Feb-10	1.9#	11.3+	1.9#	1.4#	1.5#	1.1#	1.2#	1.6#	1.1#	0.8#	1.8#	1.3#
Mar-10	0.6#	0.6#	3.2#	1#	4.1#	0.6#	0.6#	1.2	0.6	0.2#	0.8#	1.1#
Apr-10	0.8#	1.8#	2.4#	0.7#	+	0.3	0.6#	0.9#	0.6#	0.4#	0.8#	0.8#
May-10	0.8	4.9#	3.0#	1.1	1.2	1.0	0.7	1.3	1.0#	0.5	1.1#	0.8
Jun-10	0.3	2.2#	3.0#	0.6#	0.2	1.2#	0.5	0.5#	0.6	0.7#	0.7#	0.4#
Jul-10	0.6#	1.1#	0.7#	0.7	0.5	0.3	0.5#	0.6#	0.7	0.2#	0.8	0.5
Aug-10	0.4	0.5#	1.9#	0.8#	0.2#	0.7#	0.5#	0.5#	0.6	0.5#	0.7#	0.4#
Sep-10	0.6#	2.6#	1.6#	1.0#	0.5#	1.1#	0.5#	1.0#	0.9#	0.6#	0.8#	0.9#

 # - sample contaminated

+ - sample invalid

**Broken funnel*

[Note: Samples for October 2009 have been considered invalid, due to a widespread dust storm experienced on 23rd September 2009.]

APPENDIX B

Figures

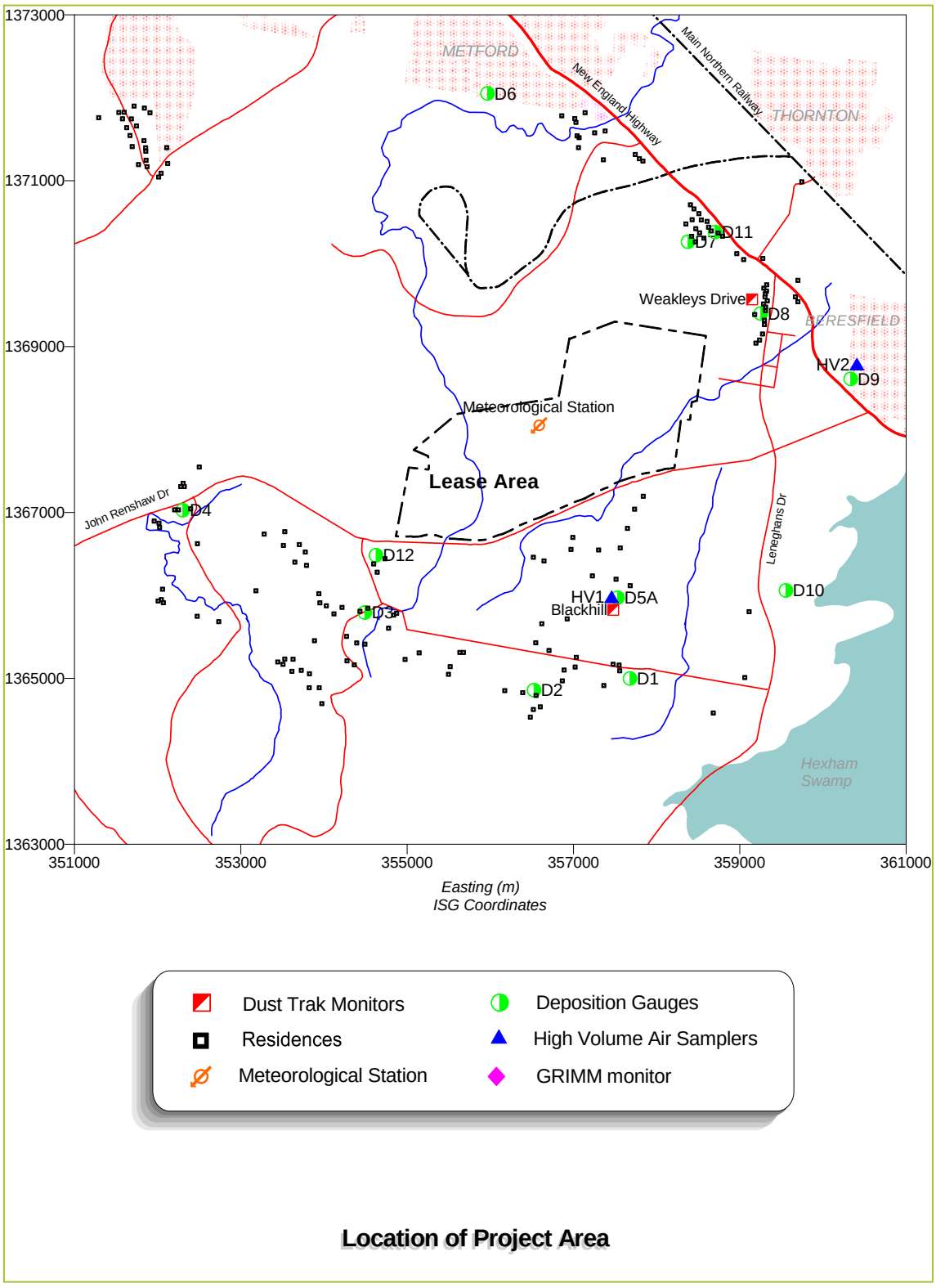

Figure 1: Project Location

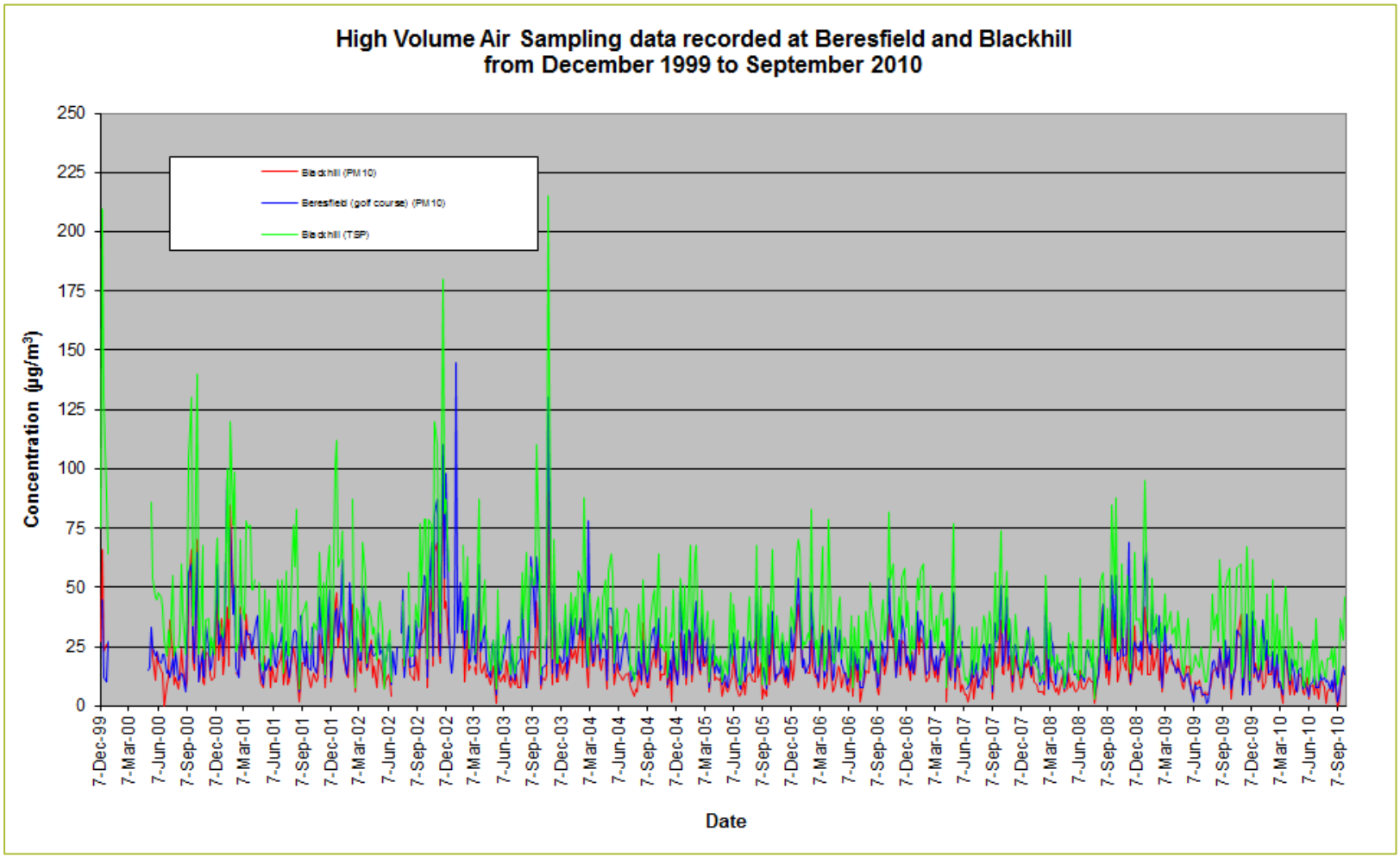

Figure 2: High Volume Air Sampling data

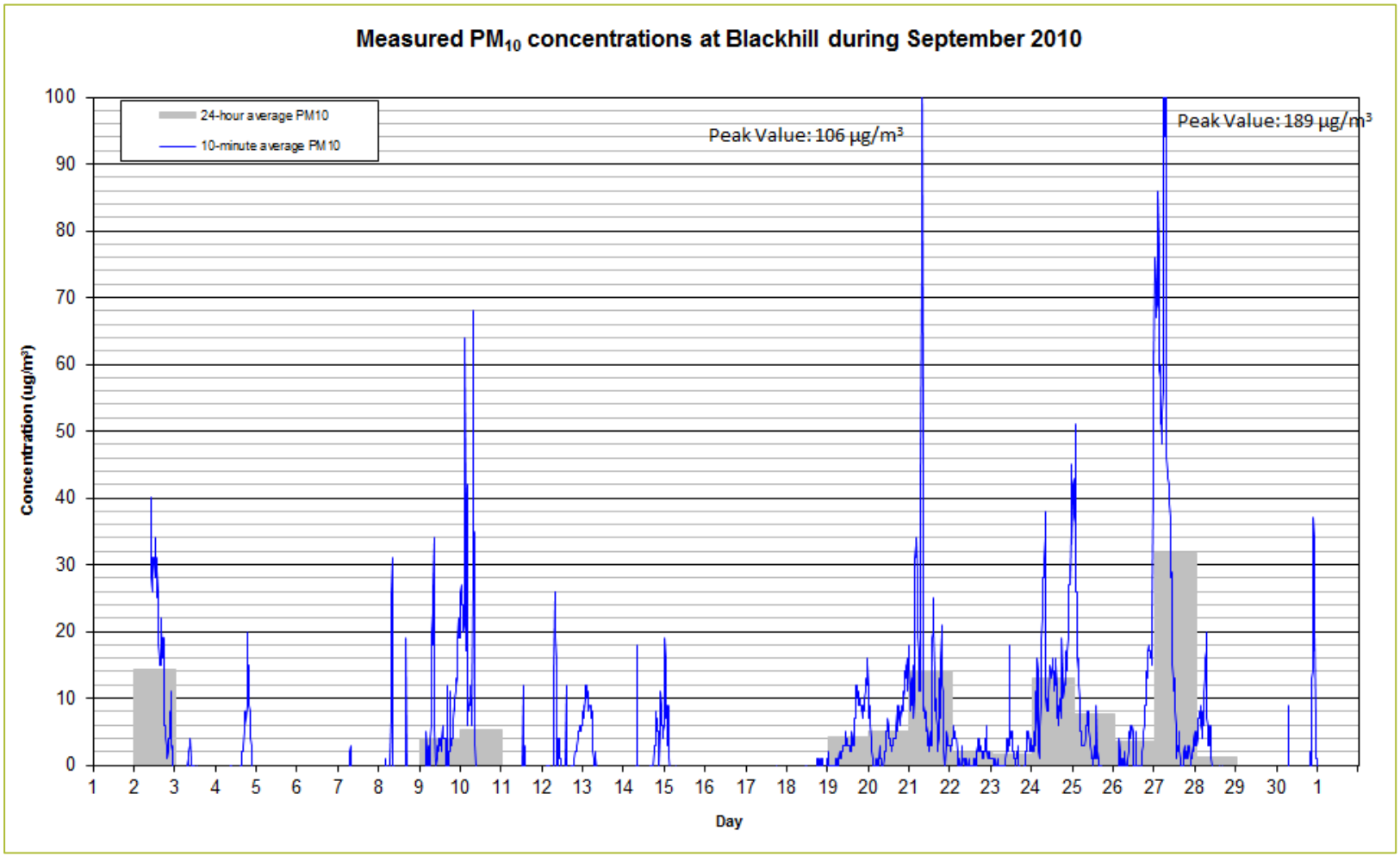

Figure 3: DustTrak sampling data, Blackhill site

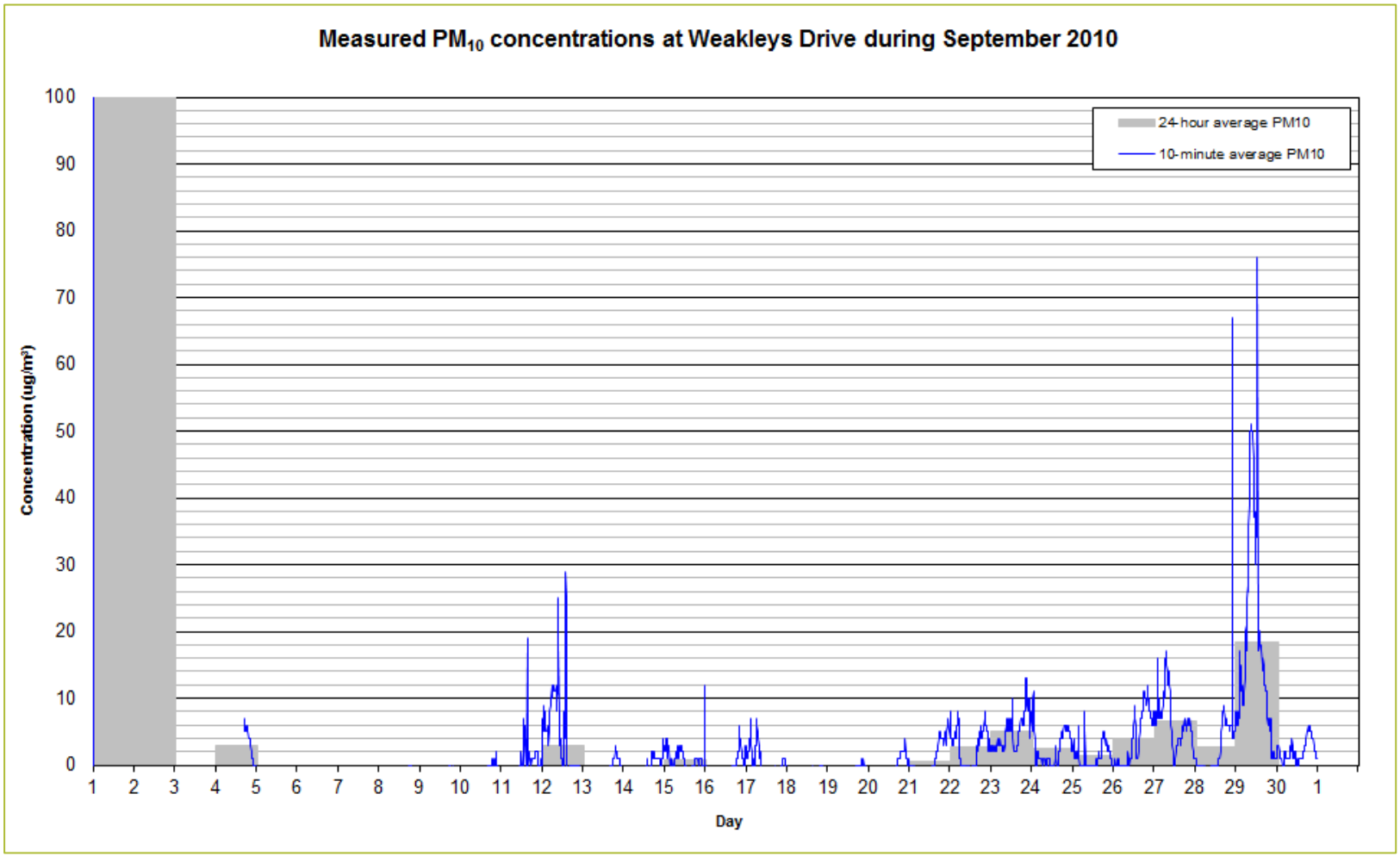

Figure 4: DustTrak sampling data, Weakleys Drive site

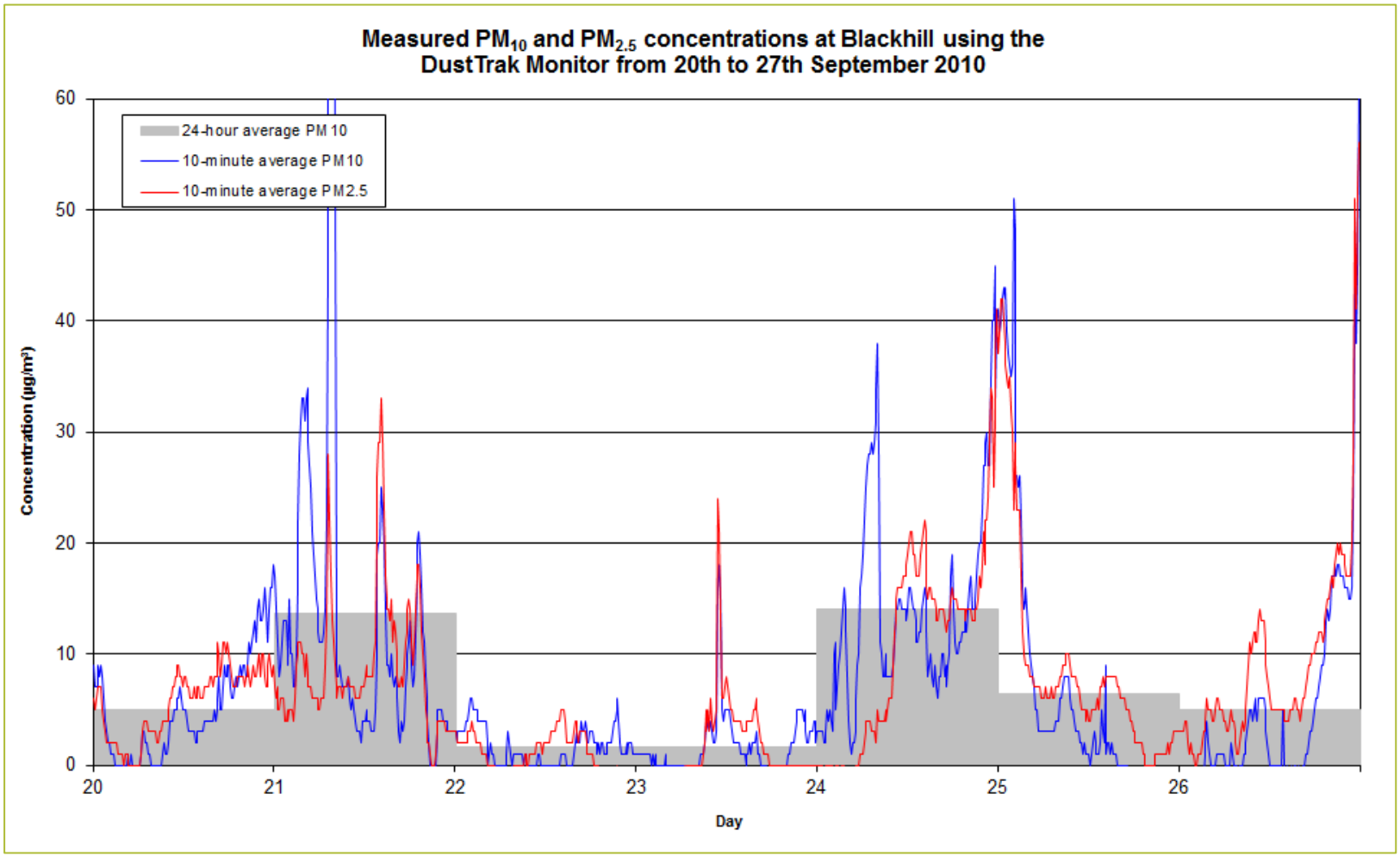

Figure 5: DustTrak $PM_{2.5}$ monitoring data

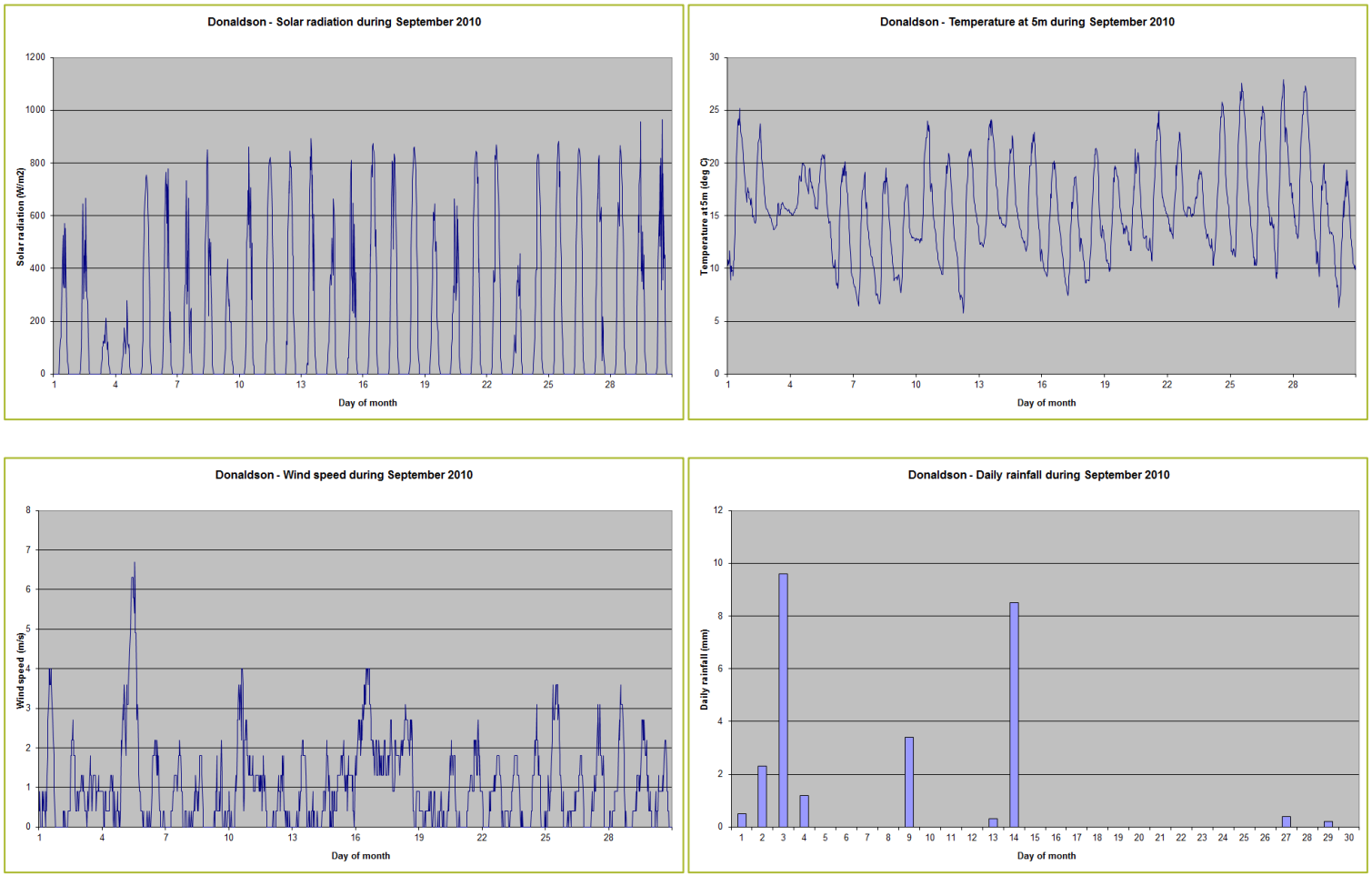

Figure 6: Meteorological conditions

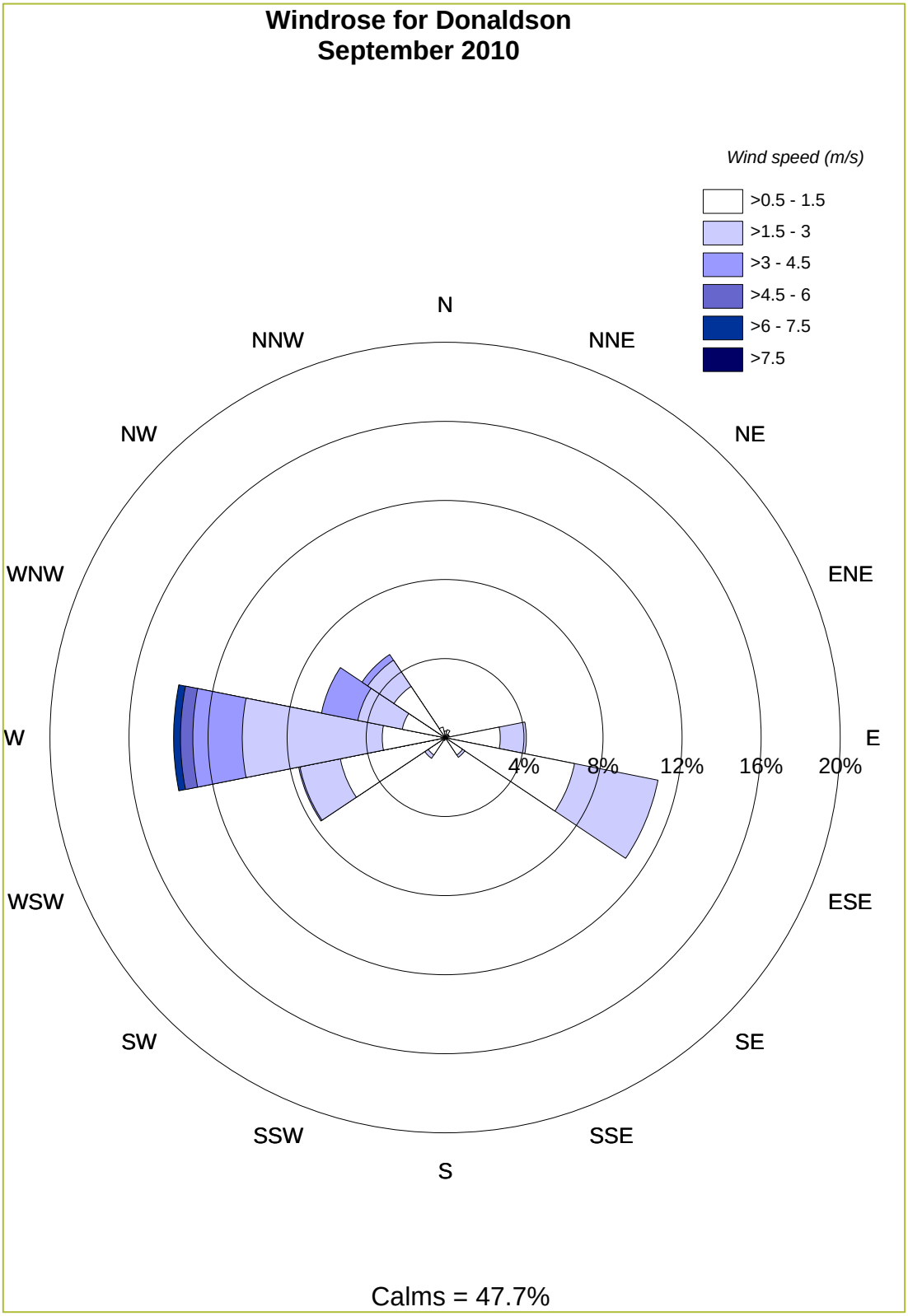

Figure 7: Windrose

DONALDSON MONITORING

DUST AND METEOROLOGICAL DATA
OCTOBER 2010 REPORT

Donaldson Coal

Job No: **3003**

23 December 2010

PROJECT TITLE:	**DUST AND METEOROLOGICAL DATA OCTOBER 2010 REPORT**
JOB NUMBER:	**3003**
PREPARED FOR:	Phil Brown **DONALDSON COAL**
PREPARED BY:	Philip Henschke
QA PROCEDURES CHECKED BY:	Ronan Kellaghan
APPROVED FOR RELEASE BY:	Aleks Todoroski
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VERSION	DATE	PREPARED BY	REVIEWED BY
DRAFT V1	23/12/2010	Philip Henschke	Ronan Kellaghan

Queensland Environment Pty Ltd trading as
PAEHolmes ABN 86 127 101 642

SYDNEY:
Suite 2B, 14 Glen Street
Eastwood NSW 2122
Ph: +61 2 9874 8644
Fax: +61 2 9874 8904

BRISBANE:
Level 1, La Melba, 59 Melbourne Street South Brisbane Qld 4101
PO Box 3306 South Brisbane Qld 4101
Ph: +61 7 3004 6400
Fax: +61 7 3844 5858

Email: info@paeholmes.com

Website: www.paeholmes.com

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1 INTRODUCTION

As part of their Air Quality Management Plan Donaldson Coal operate a dust monitoring network in the vicinity of the mining lease and a meteorological station on site. This report has been prepared in order to bring together the various data collected throughout the network during October 2010 and to summarise the information.

The dust network includes continuous monitoring, high volume air sampling and dust deposition monitoring. The continuous monitoring network consists of two DustTrak monitors measuring PM_{10} at two sites and an additional DustTrak monitor which is used for one week each quarter to measure $PM_{2.5}$.

There are two locations which use high volume air samplers to determine concentrations of PM_{10} and TSP. These operate on a six-day cycle in line with similar measurements made by the NSW Department of Environment, Climate Change and Water (DECCW) at other locations throughout the state.

In addition to concentration measurements, monthly levels of dust deposition are also measured using twelve gauges placed at various locations in the area of the mine. The locations of each of these monitors and gauges are shown in Figure 1.

Table 1 lists the monitors used and pollutants measured at these locations.

Table 1: Summary of monitoring locations and instruments

Monitoring Location	Instruments Used	Pollutant Monitored
Beresfield	HVAS	PM_{10}
Blackhill	HVAS	PM_{10}
	HVAS	TSP
	DustTrak	PM_{10}
	DustTrak (1 week per quarter)	$PM_{2.5}$
Weakleys Drive	DustTrak	PM_{10}
DG1 – DG12	Deposition Gauges	Dust Deposition

The meteorological station is situated at the site of the office buildings and measures the following parameters:

- wind speed
- wind direction
- temperature
- solar radiation
- rainfall

The data are downloaded at various intervals by Donaldson and then forwarded to PAEHolmes for processing.

2 HIGH VOLUME AIR SAMPLING

High Volume Air Sampling (HVAS) was carried out at Beresfield and Blackhill by Metford Laboratories. PM_{10} is measured at both sites while TSP is only measured at Blackhill. The data collected during October 2010 are summarised in **Table 2**. A graph consisting of all the data collected to date is shown in Figure 2.

Table 2: HVAS data from Beresfield and Blackhill for October 2010

Date	Beresfield PM_{10} ($\mu g/m^3$)	Blackhill PM_{10} ($\mu g/m^3$)	Blackhill TSP ($\mu g/m^3$)
4/10/2010	7	9	17
10/10/2010	9	7	16
16/10/2010	6	3	19
22/10/2010	18	14	33
28/10/2010	10	7	15
Annual average	**13**	**11**	**25**

These measurements will include all background sources relevant to that location, including contributions from the Donaldson mining operations.

On the days that the instruments were monitoring, the highest 24-hour average PM_{10} concentration recorded in October 2010 was 18 $\mu g/m^3$. This value was measured on the 22nd at the Beresfield site. On this occasion the measured PM_{10} concentration did not exceed the 50 $\mu g/m^3$ 24-hour DECCW goal.

TSP measurements from the Blackhill site show that concentrations were below the DECCW 90 $\mu g/m^3$ annual average TSP goal. It should be noted that the DECCW goal refers to an annual average and not a 24-hour average as measured by the high volume air sampler. The annual average TSP concentration for the 12 months to October 2010 was 25 $\mu g/m^3$.

Figure 2 shows a seasonal trend in PM_{10} concentrations, peaking during the warmer months and decreasing during autumn and winter. This is a common trend and is seen consistently in the Hunter Valley.

The annual average PM_{10} concentrations for Beresfield and Blackhill were 13 $\mu g/m^3$ and 11 $\mu g/m^3$ respectively for the 12 months to October 2010. These values are below the DECCW's annual average PM_{10} air quality criterion of 30 $\mu g/m^3$.

3 CONTINUOUS MONITORING

3.1 DustTrak Monitoring at Blackhill

Figure 3 shows a time series of the PM_{10} data collected from the DustTrak monitor at the Blackhill site. During the month of October, the DustTrak monitor located at the Blackhill site experienced a power failure and internal calibration failure. As a result, valid DustTrak monitoring data for the Blackhill site is available from the 1st to 9th of October.

Of the available data, the measured 24-hour average PM_{10} concentrations did not exceed the DECCW goal of 50 µg/m^3. The maximum 24-hour average PM_{10} concentration was recorded on 7th of October at 13.2 µg/m^3.

3.2 DustTrak Monitoring at Weakleys Drive

A time series of the PM_{10} data collected from the Weakleys Drive site is shown in Figure 4. During the month of October, the DustTrak monitor located at the Weakleys Drive site experienced a power failure and an internal calibration failure. Valid data is available from the 1st to the 11th October.

Of the available data, the measured 24-hour average PM_{10} concentrations did not exceed the DECCW goal of 50 µg/m^3. The maximum 24-hour average PM_{10} concentration was recorded on 9th of October at 4.4 µg/m^3.

3.3 DustTrak $PM_{2.5}$ Monitoring at Blackhill

$PM_{2.5}$ monitoring was scheduled for October 2010, during the monitoring period the PM_{10} monitoring failed to record sensible values that would be used to compare with the $PM_{2.5}$ results. Figure 5 presents a time series of the $PM_{2.5}$ data collected from the Blackhill site.

4 DUST DEPOSITION MONITORING

Dust deposition monitoring is carried out each month via a network consisting of twelve (12) gauges. The results for October 2010 are shown in **Table 3**, in conjunction with results for the previous eleven months in order to provide an annual average for that period. A table showing the complete data set from May 2000 in provided in **Appendix A**.

Table 3: Dust deposition monitoring for the 12-month period to October 2010

Month	Monthly dust deposition rate (g/m^2/month)											
	DG1	**DG2**	**DG3**	**DG4**	**DG5A**	**DG6**	**DG7**	**DG8**	**DG9**	**DG10**	**DG11**	**DG12**
Nov-09	0.8#	1.7#	1.4#	1.3#	0.7#	2.1#	1.3#	8.0#	*	1.0#	*	2.3#
Dec-09	1.4#	4.0#	1.6#	2.4#	1.7#	1.8	1.6	2.6#	1.7#	1.7#	2.2#	1.7
Jan-10	0.6#	0.8#	5.6#	1.2#	2.4#	1.2#	0.8	1.4	1.3#	0.8#	1.3#	1.1#
Feb-10	1.9#	11.3+	1.9#	1.4#	1.5#	1.1#	1.2#	1.6#	1.1#	0.8#	1.8#	1.3#
Mar-10	0.6#	0.6#	3.2#	1#	4.1#	0.6#	0.6#	1.2	0.6#	0.2#	0.8#	1.1#
Apr-10	0.8#	1.8#	2.4#	0.7#	+	0.3	0.6#	0.9#	0.6#	0.4#	0.8#	0.8#
May-10	0.8	4.9#	3.0#	1.1	1.2	1.0	0.7	1.3#	1.0	0.5	1.1#	0.8
Jun-10	0.3	2.2#	3.0#	0.6#	0.2	1.2#	0.5	0.5#	0.6	0.7#	0.7#	0.4#
Jul-10	0.6#	1.1#	0.7#	0.7	0.5	0.3	0.5#	0.6#	0.7	0.2#	0.8	0.5
Aug-10	0.4	0.5#	1.9#	0.8#	0.2#	0.7#	0.5#	0.5#	0.6	0.5#	0.7#	0.4#
Sep-10	0.6#	2.6#	1.6#	1.0#	0.5#	1.1#	0.5#	1.0#	0.9#	0.6#	0.8#	0.9#
Oct-10	0.9#	1.6#	0.9#	0.5#	0.4#	0.5	1.0#	1.3#	1.2#	2.0#	1.2#	0.4#
Annual Average	**0.8**	**2.8**	**2.3**	**1.1**	**1.2**	**1.0**	**0.8**	**1.7**	**0.9**	**0.8**	**1.1**	**1.0**

*Data supplied by Metford Laboratories. # Insects/bird droppings reported. +Invalid. * No recording, funnel damaged.*

The highest dust deposition measurement recorded in October 2010 was 2.0 g/m^2/month at DG10, the accompanying laboratory report showed the sample was contaminated with insects.

Readings considered invalid have been removed when calculating the annual average. The annual average deposition rates for the gauges in the network were low and significantly below the goal of 4 g/m^2/month, indicating nuisance dust in the vicinity of the mine is not an issue.

5 METEOROLOGICAL MONITORING

Monthly plots of the wind speed, temperature, solar radiation, and rainfall data collected in October 2010 are shown in Figure 6 and a windrose plot is shown in Figure 7.

The graphs shown in Figure 6 indicate that the instruments were recording appropriately. Data maxima and minima all appeared to be sensible for this site during October. Total rainfall for the month was 80.6 mm.

A windrose (see Figure 7) created from the available 30-minute average wind data shows that winds were predominantly from the east-southeast and east. The site recorded calms (wind speed less than or equal to 0.5 m/s) for approximately 48.0% of the time. The relatively large fraction of clam winds may arise from the generally forested area and the specific location of the weather station.

APPENDIX A

Dust Deposition Data

Dust deposition (g/m^2/month)												
Month	D1	D2	D3	D4	D5A	D6	D7	D8	D9	D10	D11	D12
May-00	0.4	0.4	-	0.7	0.9	0.6	3.6	1.6	0.5	1.8	-	-
Jun-00	0.7	0.5	0.5	0.7	0.8	0.4	3.8	3.2	0.5	0.7	-	-
Jul-00	0.4	0.4	0.5	0.7	0.8	0.5	0.8	1.5	0.4	0.4	-	-
Aug-00	0.9	0.6	1.0	1.2	1.1	1.0	3.4	0.7	0.7	0.6	-	-
Sep-00	0.8	0.9	1.1	0.9	1.3	1.0	2.2	1.0	1.0	0.8	-	-
Oct-00	0.4	0.6	1.1	0.9	0.9	0.8	5.3	0.9	0.6	0.5	-	-
Nov-00	5.2	0.7	1.4	0.8	1.0	0.4	24.1	9.4	1.1	0.6	-	-
Dec-00	2.8	1.4	1.9	1.3	1.1	0.8	2.1	2.5	0.9	0.9	-	-
Jan-01	0.7	1.7	1.4	1.8	0.7	1.3	1.1	2.4	1.1	0.6	-	-
Feb-01	0.9	3.1	2.0	0.5	0.9	0.7	0.7	6.7	1.3	0.5	1.0	-
Mar-01	0.8	2.1	1.3	0.6	0.7	0.6	0.6	5.5	0.6	0.6	1.5	-
Apr-01	0.8	0.7	1.3	0.5	0.7	0.4	0.3	5.1	0.7	0.6	0.8	-
May-01	0.2	0.2	0.4	0.4	0.3	0.3	0.6	1.8	0.6	0.8	0.9	-
Jun-01	0.5	0.4	0.5	1.0	1.0	0.4	0.4	8.8	0.7	0.6	0.6	-
Jul-01	0.5	0.3	1.8	0.5	0.8	-	16.3	4.9	0.9	0.7	0.7	-
Aug-01	0.4	0.4	0.8	0.8	1.0	1.7	1.0	-	1.0	1.8	1.1	-
Sep-01	0.7	1.0	1.7	1.1	1.7	0.7	-	6.0	1.1	1.3	1.7	-
Oct-01	1.1	0.6	4.6	0.9	0.7	0.9	1.2	1.9	0.9	0.6	1.7	-
Nov-01	0.9	1.0	1.1	1.1	0.8	1.1	6.0	5.5	1.3	1.9	2.3	-
Dec-01	4.9	0.9	4.2	0.9	1.3	1.9	1.2	3.1	1.2	9.7	1.8	-
Jan-02	0.8	1.0	1.5	1.3	1.1	1.4	1.3	1.5	1.1	0.9	1.5	-
Feb-02	1.1	1.1	0.9	0.3	0.4	0.5	3.1	5.1	0.5	0.5	0.9	-
Mar-02	1.7	2.1	1.6	0.7	0.7	0.8	1.0	18	1.0	0.9	1.7	-
Apr-02	1.0	0.4	1.0	0.8	0.8	0.6	0.9	10.1	0.5	0.7	1.0	-
May-02	0.6	0.6	6.0	0.7	0.4	1.2	0.9	3.1	0.7	0.2	1.0	-
Jun-02	1.4	0.4	1.7	0.6	0.5	0.8	0.6	2.1	0.6	0.5	1.0	-
Jul-02	0.7	0.7	-	0.8	0.8	0.7	1.2	-	1.1	0.5	1.0	-
Aug-02	1.3	0.8	1.4	1.2	1.1	1.2	1.5	-	1.5	0.9	1.6	-
Sep-02	0.5	1.2	1.1	0.8	0.5	0.7	5.1	9.3	1.6	0.6	1.0	-
Oct-02	2.2	1.4	5.2	1.5	1.5	1.4	1.4	3.4	-	1.5	3.1	-
Nov-02	2.8	1.8	3.7	1.6	0.1	1.8	2.1	3.5	2.1	2	1.9	-
Dec-02	2.0	-	2.5	1.5	3.0	1.5	1.8	4.1	1.6	1.2	1.9	-
Jan-03	2.1	1.5	2.7	1.5	1.0	1.9	2.2	2.5	1.1	1.0	1.6	-
Feb-03	1.4	1.1	2.6	1.1	0.9	1.2	1.7	5.9	1.2	1.0	1.5	-
Mar-03	0.8	0.5	1.2	1.2	0.6	2.1	1.5	3.4	-	3.6	9.5	-
Apr-03	0.5	1.0	0.6	1.0	0.7	0.5	1.1	8.0	-	2.0	1.0	-
May-03	0.5	0.4	0.6	0.2	0.2	0.6	1.3	1.6	0.5	0.8	1.2	-
Jun-03	0.5	0.6	0.8	0.8	0.4	0.6	0.8	0.7	0.9	0.7	0.7	-
Jul-03	0.3	0.4	0.4	0.6	0.4	0.5	0.7	0.5	0.5	0.5	0.7	-
Aug-03	0.8	0.2	0.7	1.1	0.5	1.3	1.8	2.1	1.3	0.7	0.9	-
Sep-03	0.6	0.7	1.1	0.7	0.8	1.7	1.4	1.3	2.5	0.9	1.3	-
Oct-03	-	0.9	1.4	0.9	0.7	1.9	1.0	1.4	0.6	0.8	1.3	-
Nov-03	2.6	0.8	1.0	1.1	0.4	1.3	1.5	1.5	-	0.8	1.3	-
Dec-03	1.0	1.0	1.4	1.3	1.1	1.5	1.6	2.0	1.8	0.9	1.4	-
Jan-04	8.5	1.5	2.1	1.5	1.3	2.6	1.4	2.2	1.7	1.5	1.7	-
Feb-04	1.2	1.0	1.7	1.4	0.7	3.1	1.6	2.2	-	1.5	2.3	-
Mar-04	0.4	0.6	6.6	1.2	0.7	1.9	1.1	12.1	4.8	1.5	1.1	-
Apr-04	0.6	1.0	0.8	0.8	0.6	1.9	0.8	1.4	0.9	1.2	1.1	-

May-04	0.2	0.9	2.2	0.9	0.8	0.7	0.9	1.4	1.2	0.9	1.5	-
Jun-04	0.4	0.6	0.7	0.9	0.6	1.4	1.0	0.9	1.0	1.0	0.8	-
Jul-04	0.4	0.6	5.3#	0.6	0.5	2.9	1.0	1.1	0.9	0.6	1.2	-
Aug-04	0.5	0.5	0.5	1.3	0.7	1.1	1.1	1.4	-	1.0	1.0	-
Sep-04	0.6	0.6	0.8	2.2	1.0	1.0	0.9	4.4	0.9	16.7	1.1	-
Oct-04	0.7	0.9	1.2	0.9	0.8	1.4	1.0	10.5	1.0	1.0	0.8	-
Nov-04	0.8	0.7	1.3	1.9	0.7	0.9	1.0	3.0	1.1	1.1	1.6	-
Dec-04	2.0	1.4	3.6	1.5	1.3	2.2	3.2	7.9	1.8	5.5	2.5	-
Jan-05	1.2	1.0	3.7	1.6	1.4	4.0	2.3	2.7	2.6	2.5	2.8	-
Feb-05	1.2	1.2	1.8	1.6	1.3	2.0	1.7	-	2.3	1.5	2.3	-
Mar-05	1.3	0.9	1.4	0.9	0.9	3.0	1.2	7.7	-	0.8	1.3	-
Apr-05	1.1	0.7	0.9	0.8	0.7	0.9	1.4	3.3	1.1	0.8	0.9	-
May-05	0.7	8.6	1.1	0.8	0.7	0.8	0.9	4.4	1.2	0.8	1.1	-
Jun-05	1.3	0.8	1.3	1.3	0.8	1.2	1.2	1.3	1.5	2.5	0.9	-
Jul-05	1.0	0.5	0.5	0.7	0.4	1.6	0.7	1.2	0.8	4.3	1.1	-
Aug-05	0.6	0.6	0.8	1.0	0.8	0.9	0.7	1.0	0.9	1.0	0.9	-
Sep-05	0.6	0.7	0.8	0.7	0.7	1.2	1.3	1.3	1.0	0.9	1.1	-
Oct-05	0.8	0.9	1.3	0.9	0.8	1.4	1.2	1.9	1.3	1.1	1.3	-
Nov-05	-	2.3	2.3	2.0	1.7	1.2	2.0	3.2	1.6	1.4	2.2	-
Dec-05	1.9	3.2	2.3	3.3	2.6	3.4	2.3	-	1.3	2.1	3.9	-
Jan-06	1.0	2.1	1.7	1.0	23.	3.5	-	2.7	1.1	-	1.5	-
Feb-06	2.2	1.0	0.9	1.2	1.1	1.7	1.1	2.9	-	2.3	1.8	-
Mar-06	0.7	0.6	2.3	0.7	0.6	0.9	1.0	1.4	0.7	0.8	1.5	-
Apr-06	0.6	0.7	1.1	0.8	0.6	1.1	0.8	1.0	1.0	1.8	1.5	-
May-06	1.0	3.1	1.0	-	1.1	1.4	1.1	4.1	-	7.0	1.5	-
Jun-06	0.4	0.3	0.7	0.5	0.4	0.6	0.7	0.8	0.6	0.9	0.9	-
Jul-06	0.3	0.3	1	1.3	0.4	0.7	0.7	2.7	-	0.6	0.6	-
Aug-06	0.9	0.6	0.8	0.7	0.7	0.8	0.7	1.7	-	3.7	0.9	-
Sep-06	1.6	0.7	1.1	1.7	0.7	1	0.9	1.3	1.2	0.8	1.6	-
Oct-06	2	1.4	1.6	1.8	0.9	1.8	1.2	1.8	1.5	1.8	1.9	-
Nov-06	4.3	2.2	3	2.3	2.3	5.3	2.4	3.3	2.3	2.3	2.9	-
Dec-06	1.2	3.4	1.9	2.3	2.3		2.1	2.1		4.9	3.9	-
Jan-07	2	0.9	1.5	0.7	0.7	1.7	1.1		1.2	1.7	0.9	-
Feb-07	1.7	0.9	1.6	0.7	0.6	1	1.8	1.7	1.1	1.2	1.7	-
Mar-07	1.3	0.9	1.7	0.8	1.2	0.6	2.2	1.7	1	0.9	1.7	-
Apr-07	0.5	0.7	0.9	0.6	4.8	1.2	0.5	2.7	0.5	0.8	0.9	-
May-07	0.8	0.5	0.6	1.2	0.6	0.6	0.7	1.9	0.5	0.7	0.8	-
Jun-07	0.6	0.5	0.7	1.1	0.1	0.5	0.1	0.5	0.1	0.4	0.3	-
Jul-07	0.5	0.4	0.6	2.1	0.5	0.8	0.6	0.6	0.4	0.5	0.7	-
Aug-07	1.5	0.4	0.7	1	0.7	0.7	0.5	1	0.6	0.6	0.7	-
Sep-07	1.3	0.5	1.8	1	0.7	0.9	0.9	1.3	1	0.7	1.6	-
Oct-07	4.2	0.9	1.1	1.4	1.1	1.7	1.8	1.7	1.6	1.4	2.2	-
Nov-07	0.8	0.8	1.1	0.9	1.1	1.1	1.1	1.7	0.6	0.8	1.5	-
Dec-07	1.3	0.8	3	0.7	0.5	0.8	0.5	1.1	0.3	0.8	0.6	-
Jan-08	2.6	0.8	3.7	0.5	0.5	0.5	0.4	2.2	0.8	0.3	0.8	-
Feb-08	0.4	0.1	14	0.1	0.1	0.3	0.1	0.3	0.2	0.2	0.3	-
Mar-08	4.5	0.6	9.2+	0.6	2.9	2.1	0.6	1.5	0.5	1	0.9	-
April-08	0.4#	0.4#	0.8#	0.4#	0.4#	0.8#	1.1#	1.7#	1.2	1.1#	1.1#	-
May-08	1.1	2.4#	0.9	1.4	0.9	0.9	0.7	2.7	1#	1.1	1.3#	-

June-08	0.2	0.4#	0.1	0.5	0.1#	0.1	0.3	0.5#	0.1	0.8	0.2	-
July-08	0.4	0.7#	1.3#	0.6	0.8#	0.9	0.8	1	0.7	0.5	1.1	-
Aug-08	1	0.5	0.7	0.6	0.5	1.9	0.8	1	1	0.9	1.4	-
Sep-08	0.6	1	1.3	0.7	0.6	0.9	0.6	0.9	0.9	0.9	1.8	-
Oct-08	1	0.5	1	1.3	1.3	1.2	1	1.4	0.8	1.6	1.8	-
Nov-08	0.8	1.4	2.7	2.5	0.9	1.2	0.8	2.4	1.1	1	1.7	-
Dec-08	0.4	0.4	0.6	0.5	0.3	1.1	0.6	15	0.9	0.7	1.2	-
Jan-09	1.1	3#	1.6	0.8	0.9	1.4	0.7	1.5	0.9	0.9	5+	-
Feb-09	0.4	4.4	1.5	1.1	0.9	1.6	0.8	1.2	1.4	2.5	1.2	-
Mar-09	2.8	5.8	2.7	2.4	1.9	2.1	2.5	2.4	2.3	5.7	2.7	-
Apr-09	2	0.8	0.8	0.6	0.6	3.2	1.1	1.1	1	0.6	0.9	-
May-09	0.6	1.6	0.8	2.4	0.9	5.6 +	1.4	1.1	1.3	0.7	1.5	-
Jun-09	0.4	1.3	0.8	0.5	0.5	3.3	0.9	0.6	1	3.4	0.7	-
Jul-09	0.2	1.0	0.6	0.4	0.3	3.8	0.5	0.6	0.6	0.3	0.6	-
Aug-09	0.8	3.6	0.8	1.2	1.0	1.8	0.8	1.8	1.3	0.8	1.0	-
Sep-09	1.0	1.8#	1.8	8.3 +	1	1.8	0.9#	1.8#	1.7#	0.7	1.4#	-
Oct-09+	4.3	9#	5.2#	11.3#	3.2	3.8#	2.4#	6.8#	3.0#	2.2	3.2#	5.7#
Nov-09	0.8#	1.7#	1.4#	1.3#	0.7#	2.1#	1.3#	8.0#	*	1.0#	*	2.3
Dec-09	1.4#	4.0#	1.6#	2.4#	1.7#	1.8	1.6	2.6#	1.7#	1.7#	2.2#	1.7
Jan-10	0.6#	0.8#	5.6#	1.2#	2.4#	1.2#	0.8#	1.4#	1.3#	0.8#	1.3#	1.1#
Feb-10	1.9#	11.3+	1.9#	1.4#	1.5#	1.1#	1.2#	1.6#	1.1#	0.8#	1.8#	1.3#
Mar-10	0.6#	0.6#	3.2#	1#	4.1#	0.6#	0.6#	1.2	0.6	0.2#	0.8#	1.1#
Apr-10	0.8#	1.8#	2.4#	0.7#	+	0.3	0.6#	0.9#	0.6#	0.4#	0.8#	0.8#
May-10	0.8	4.9#	3.0#	1.1	1.2	1.0	0.7	1.3	1.0#	0.5	1.1#	0.8
Jun-10	0.3	2.2#	3.0#	0.6#	0.2	1.2#	0.5	0.5#	0.6	0.7#	0.7#	0.4#
Jul-10	0.6#	1.1#	0.7#	0.7	0.5	0.3	0.5#	0.6#	0.7	0.2#	0.8	0.5
Aug-10	0.4	0.5#	1.9#	0.8#	0.2#	0.7#	0.5#	0.5#	0.6	0.5#	0.7#	0.4#
Sep-10	0.6#	2.6#	1.6#	1.0#	0.5#	1.1#	0.5#	1.0#	0.9#	0.6#	0.8#	0.9#
Oct-10	0.9#	1.6#	0.9#	0.5#	0.4#	0.5	1.0#	1.3#	1.2#	2.0#	1.2#	0.4#

 # - sample contaminated

+ - sample invalid

**Broken funnel*

[Note: Samples for October 2009 have been considered invalid, due to a widespread dust storm experienced on 23rd September 2009.]

APPENDIX B

Figures

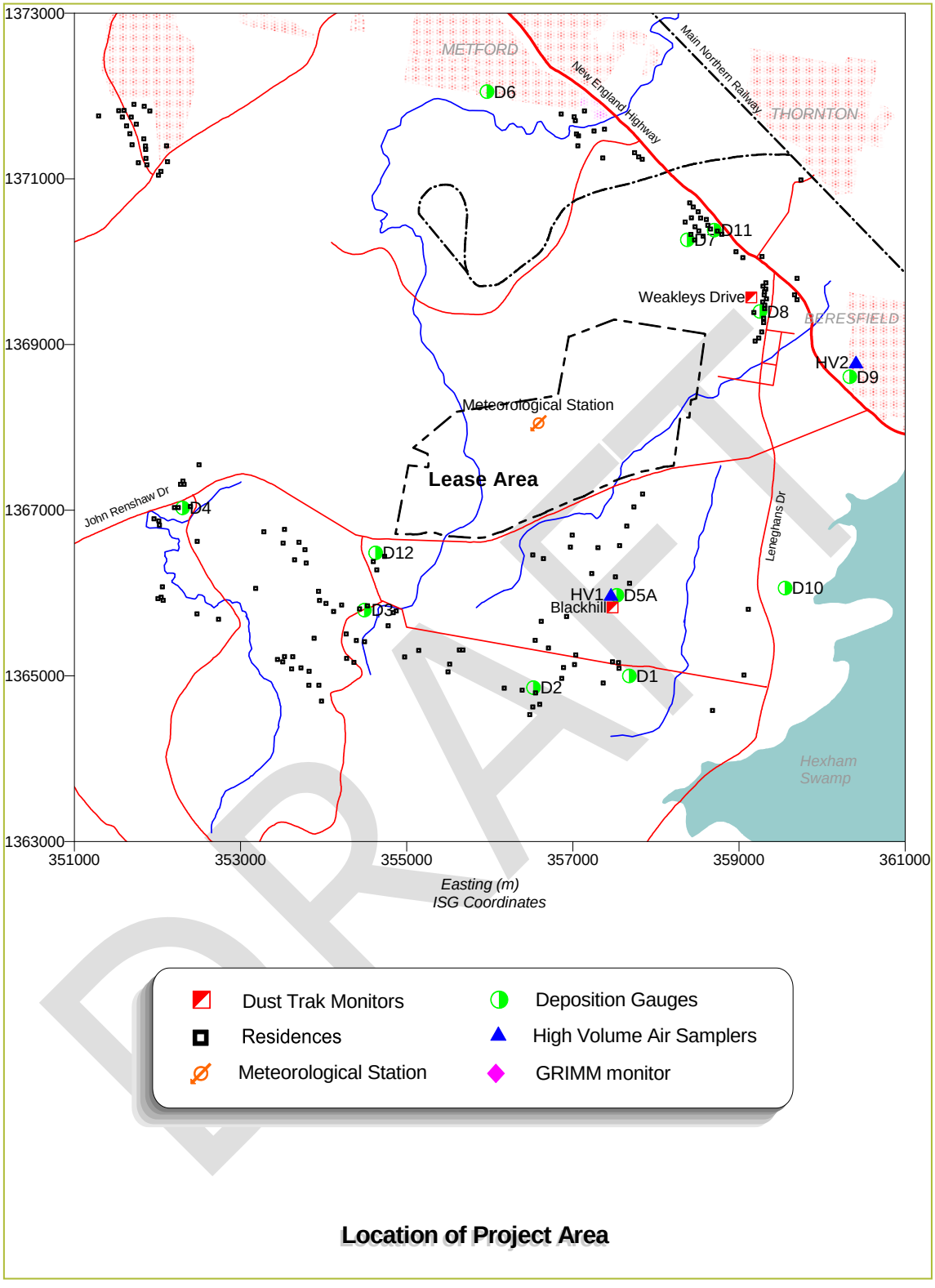

Figure 1: Project Location

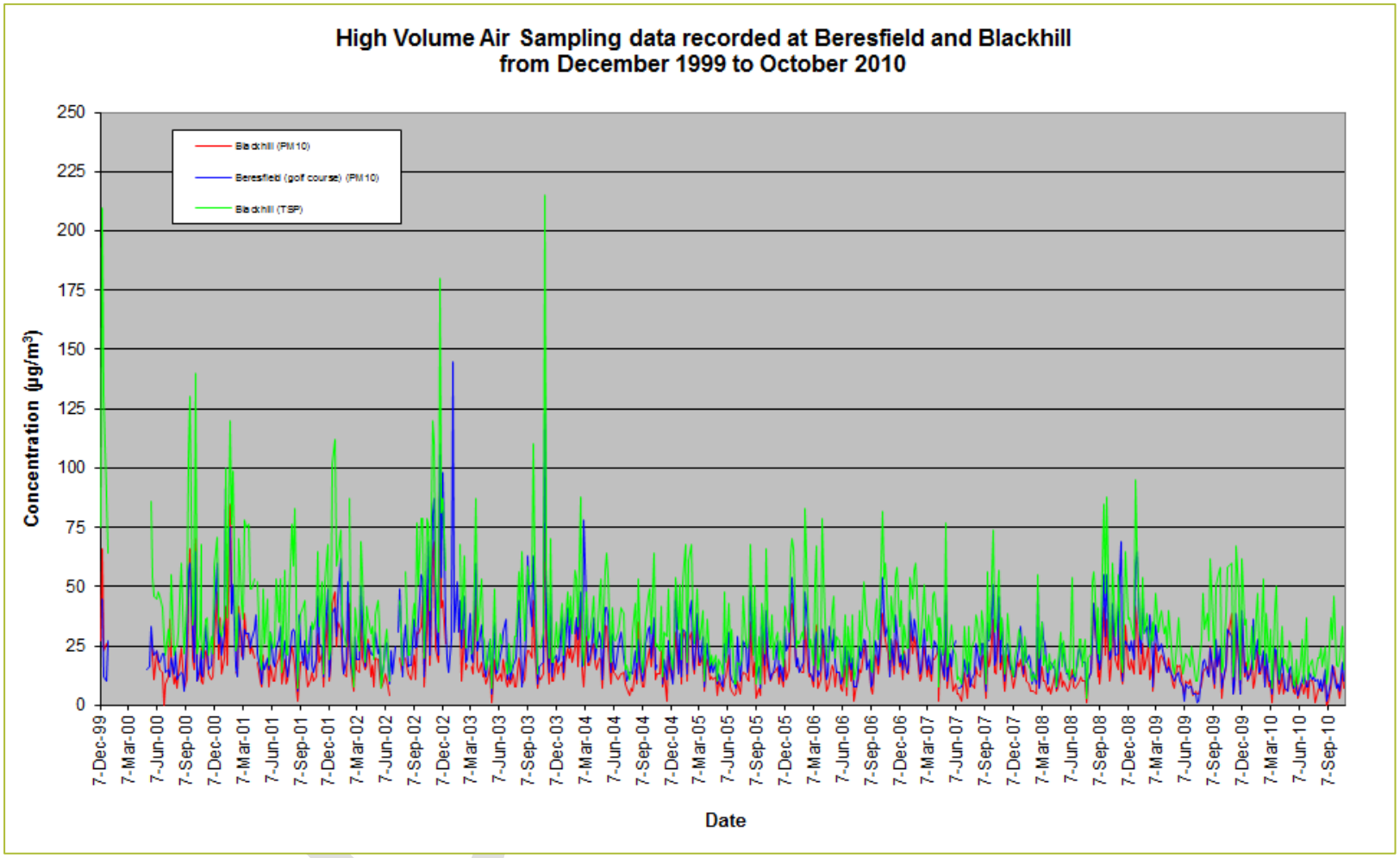

Figure 2: High Volume Air Sampling data

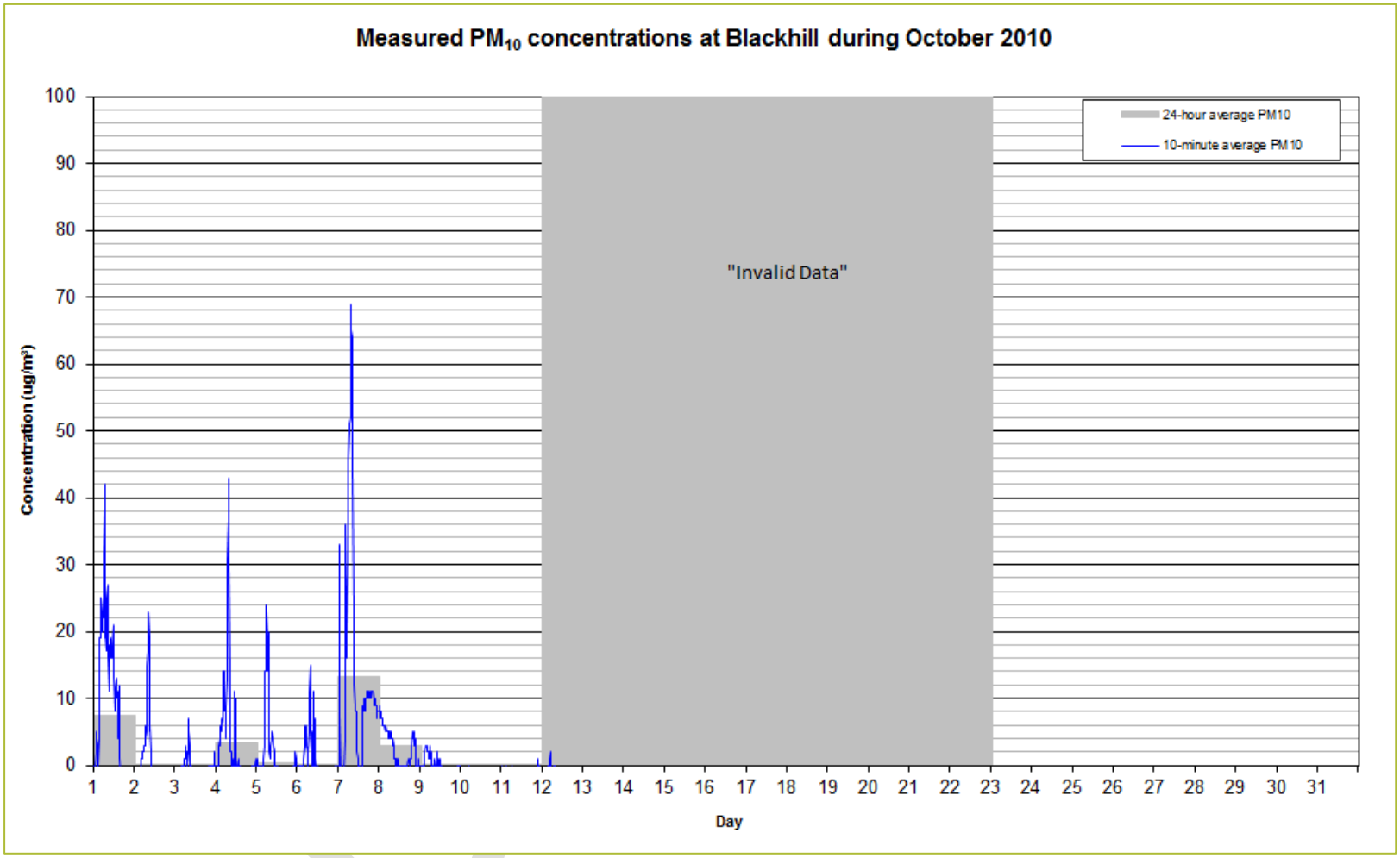

Figure 3: DustTrak sampling data, Blackhill site

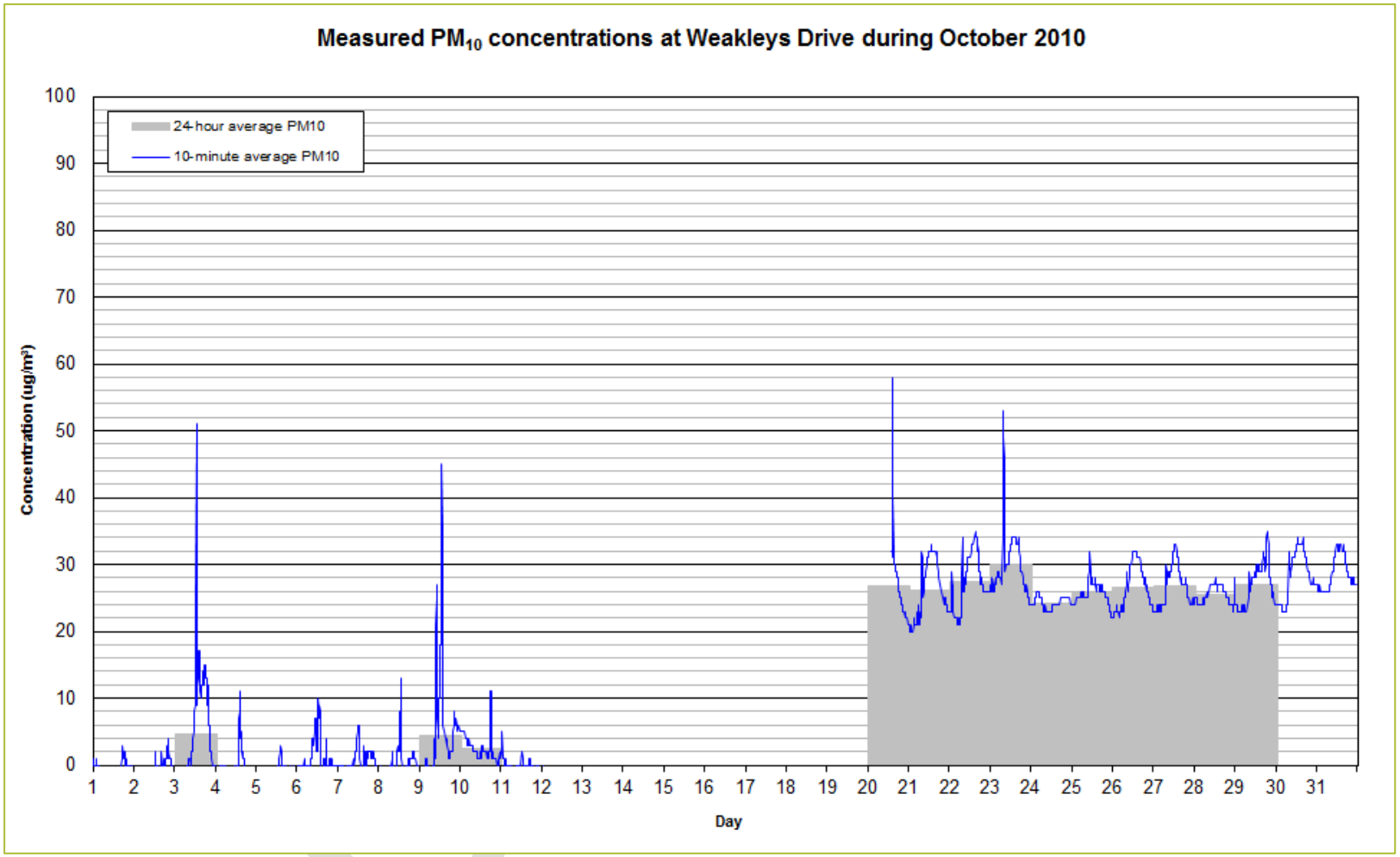

Figure 4: DustTrak sampling data, Weakleys Drive site

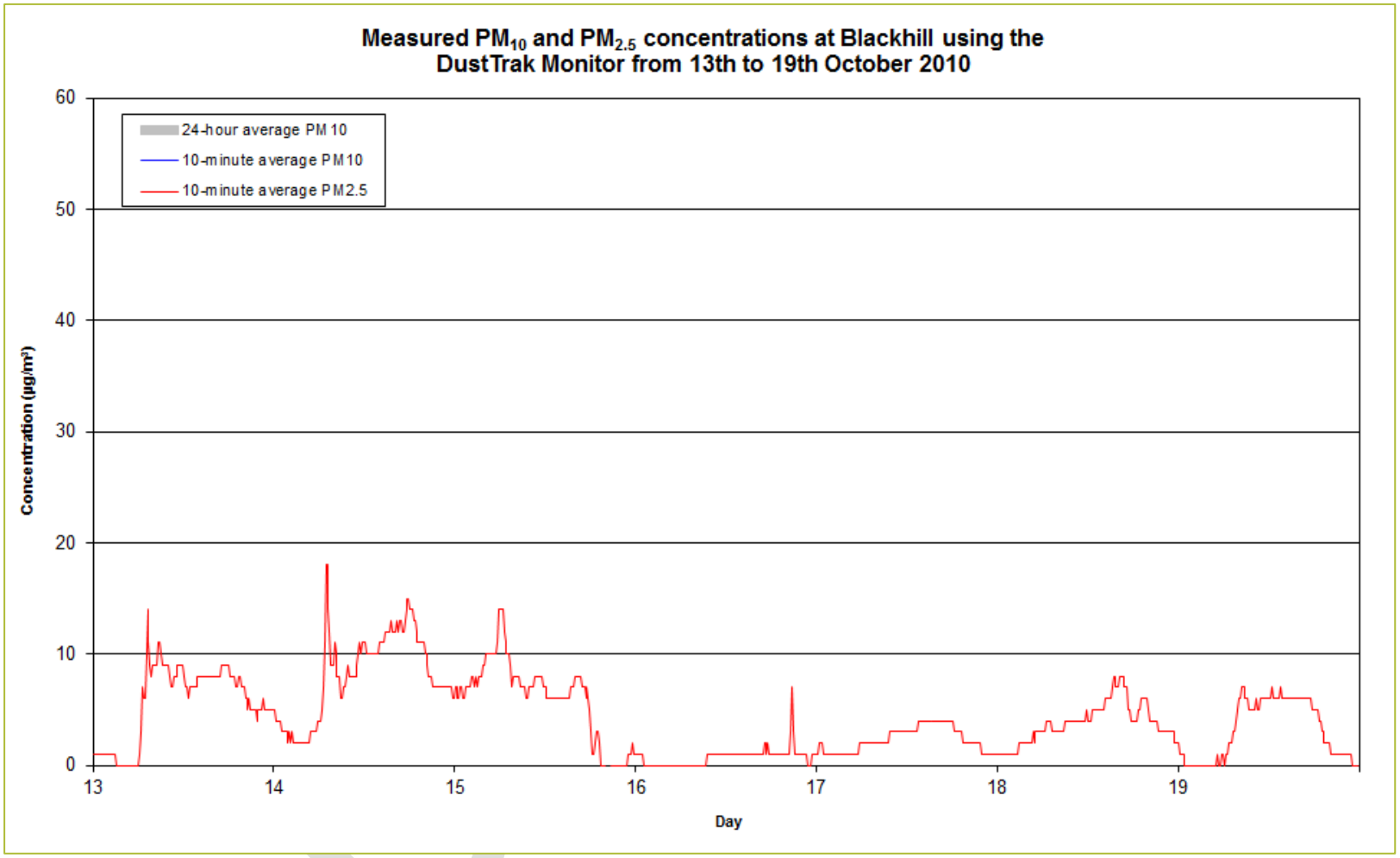

Figure 5: DustTrak $PM_{2.5}$ monitoring data

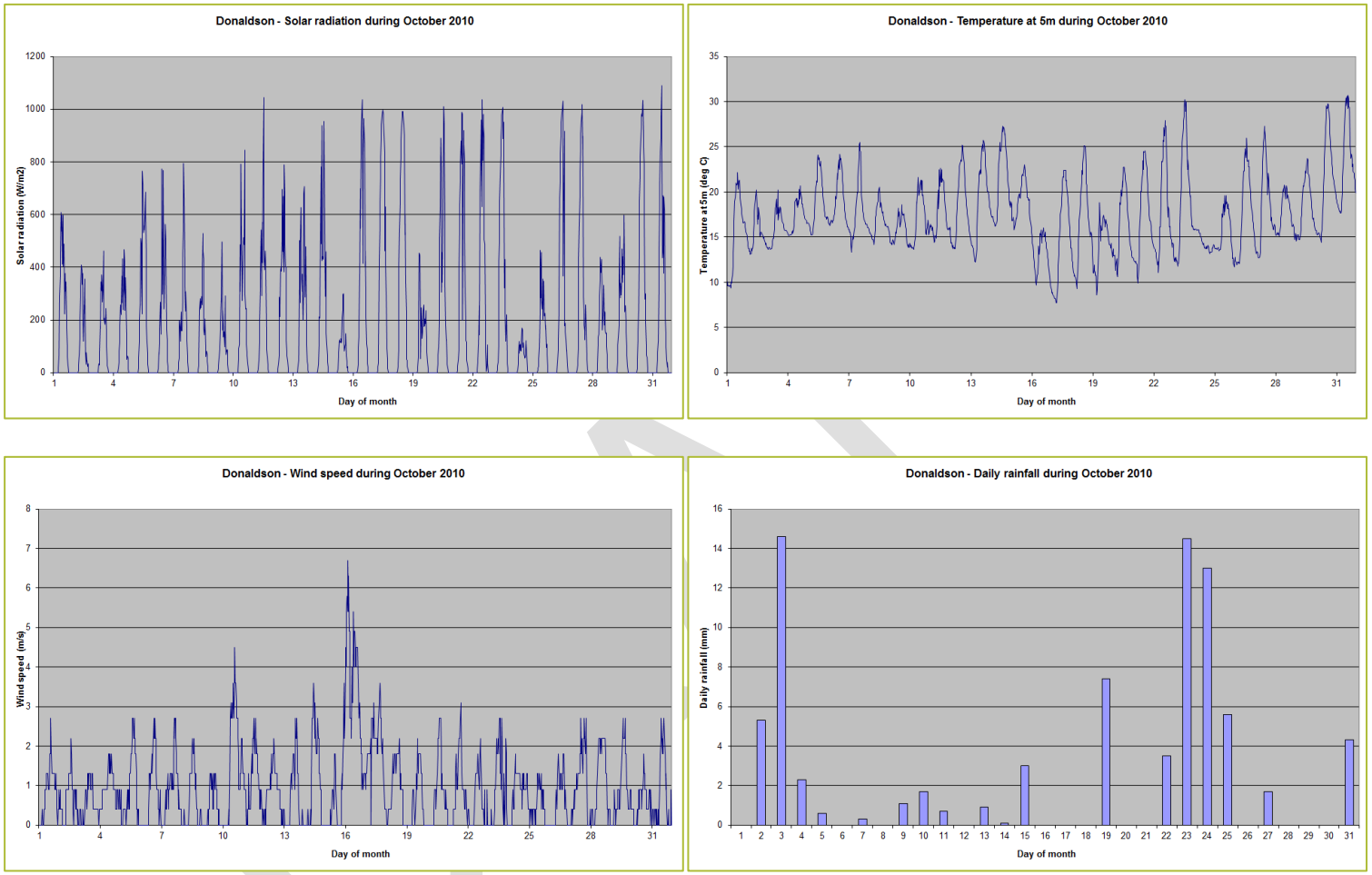

Figure 6: Meteorological conditions

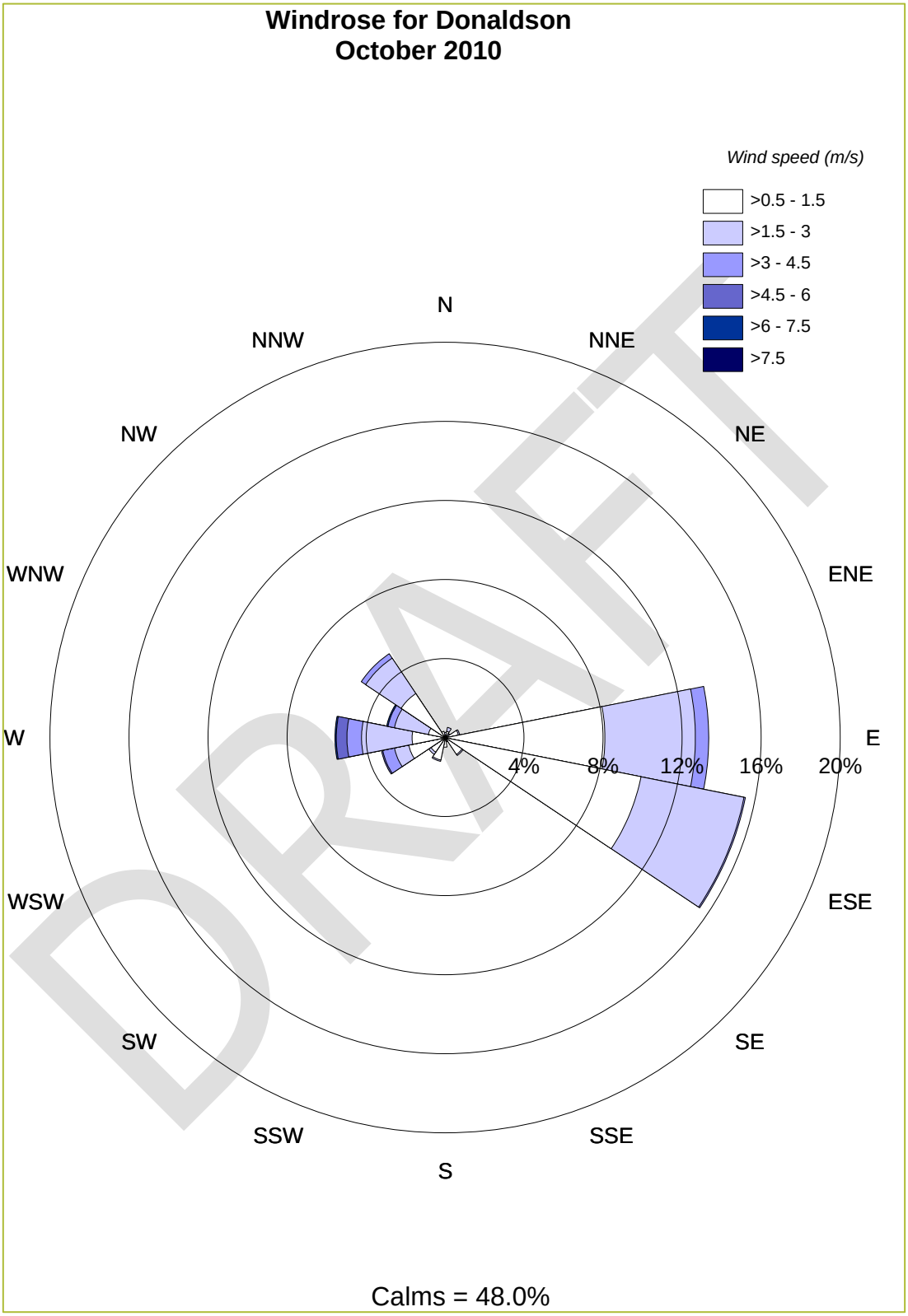

Figure 7: Windrose