

Liddell Coal Operations Pty Limited

Liddell Colliery
Air Quality Monitoring Program

January 2008



Liddell Colliery Air Quality Monitoring Program

Prepared by

Umwelt (Australia) Pty Limited

on behalf of

Liddell Coal Operations Pty Limited

Project Director:	Michelle Kirkman	
Project Manager:	Allison Sharp	
Report No.	2492/R03/V3/Final	Date: January 2008



2/20 The Boulevard
PO Box 838
Toronto NSW 2283

Ph: 02 4950 5322
Fax: 02 4950 5737
Email: mail@umwelt.com.au
Website: www.umwelt.com.au

TABLE OF CONTENTS

1.0	Scope.....	1
2.0	Air Quality Criteria.....	1
2.1	Impact Assessment Criteria	1
2.2	Land Acquisition Criteria.....	2
3.0	Monitoring Standards	3
4.0	Monitoring Equipment and Locations.....	3
5.0	Monitoring Protocol	3
5.1	Review.....	4
5.2	Corrective Action.....	4
5.3	Complaints.....	5
5.4	Acquisition.....	5
6.0	Reporting	5
7.0	Accountability.....	6
8.0	Auditing and Review	7
9.0	References	7

FIGURES

4.1	Environmental Monitoring Locations – Dust and Meteorological	3
------------	---	----------

1.0 Scope

This Air Quality Monitoring Program outlines the air quality monitoring required to be undertaken by Liddell Coal Operations Pty Ltd (Liddell Coal) to ensure compliance with statutory requirements at Liddell Colliery. The program addresses the requirements contained in the development consent (DA-305-11-01) and the general terms of approval issued by the Department of Environment and Climate Change (DECC) in relation to the required Environmental Protection Licence (EPL).

This Air Quality Monitoring Program has been developed to satisfy Schedule 3, Condition 19, of development consent DA-305-11-01 which is reproduced below.

19. The Applicant shall prepare and implement a Air Quality Monitoring Program for the development to the satisfaction of the Director-General. This program must be submitted to the Director-General by 31 January 2008, and must include a combination of high volume samplers and dust depositions gauges to monitor the dust emissions of the development; and an air quality monitoring protocol for evaluating compliance with the air quality impact assessment and land acquisition criteria in this approval.

2.0 Air Quality Criteria

This Air Quality Monitoring Program has been developed to assist Liddell Colliery in managing impacts on air quality from its operations. This program assists Liddell Colliery in evaluating compliance with the air quality impact assessment criteria and land acquisition criteria specified in the development consent (DA 305-11-01) and outlines the reporting requirements for the site.

2.1 Impact Assessment Criteria

Schedule 3, condition 16, of the development consent contains the Air Quality Impact Assessment Criteria and is outlined below.

16. The Applicant shall ensure that the dust emissions generated by the development do not cause additional exceedances of the air quality impact assessment criteria listed in Tables 5, 6 and 7 at any residence on, or on more than 25 percent of, any privately owned land.

Table 5 - Long Term Impact Assessment Criteria for Particulate Matter

Pollutant	Averaging Period	Criterion
Total suspended particulate (TSP) matter	Annual	90 µg/m ³
Particulate matter < 10 µm (PM ₁₀)	Annual	30 µg/m ³

Table 6 - Short Term Impact Assessment Criteria for Particulate Matter

Pollutant	Averaging Period	Criterion
Particulate matter < 10 µm (PM ₁₀)	24 hour	50 µg/m ³

Table 7 - Long Term Impact Assessment Criteria for Deposited Dust

Pollutant	Averaging Period	Maximum Increase in Deposited Dust Level	Maximum Total Deposited Dust Level
Deposited dust	Annual	2 g/m ² /month	4 g/m ² /month

Note: Deposited dust is assessed as insoluble solids as defined by Standards Australia, AS/NZS 3580.10.1:2003: Methods for Sampling and Analysis of Ambient Air – Determination of Particulate Matter – Deposited Matter – Gravimetric Method.

2.2 Land Acquisition Criteria

Schedule 3, condition 17, of the development consent contains the Air Quality Land Acquisition Criteria and is outlined below.

17. If the dust emissions generated by the development exceed the criteria in Tables 8, 9 and 10 at any residence on, or on more than 25 percent of, any privately owned land, the Applicant shall, upon receiving a written request for acquisition from the landowner, acquire the land in accordance with the procedures in conditions 10-12 of Schedule 4.

Table 8 - Long Term Land Acquisition Criteria for Particulate Matter

Pollutant	Averaging Period	Criterion
Total suspended particulate (TSP) matter	Annual	90 µg/m ³
Particulate matter < 10 µm (PM ₁₀)	Annual	30 µg/m ³

Table 9 - Short Term Land Acquisition Criteria for Particulate Matter

Pollutant	Averaging period	Criterion	Percentile ¹	Basis
Particulate matter < 10 µm (PM ₁₀)	24 hour	150 µg/m ³	99 ²	Total ³
Particulate matter < 10 µm (PM ₁₀)	24 hour	50 µg/m ³	98.6	Increment ⁴

¹ Based on the number of block 24 hour averages in an annual period.

² Excludes extraordinary events such as bushfires, prescribed burning, dust storms, sea fog, fire incidents, illegal activities or any other activity agreed by the Director-General or in consultation with the Department of Environment and Climate Change.

³ Background PM₁₀ concentrations due to all other sources plus the incremental increases in PM₁₀ concentrations due to the mine alone.

⁴ Incremental increase in PM₁₀ concentrations due to the mine alone.

Table 10 - Long Term Land Acquisition Criteria for Deposited Dust

Pollutant	Averaging Period	Maximum Increase in Deposited Dust Level	Maximum Total Deposited Dust Level
Deposited dust	Annual	2 g/m ² /month	4 g/m ² /month

Note: Deposited dust is assessed as insoluble solids as defined by Standards Australia, AS/NZS 3580.10.1:2003: Methods for Sampling and Analysis of Ambient Air – Determination of Particulate Matter – Deposited Matter – Gravimetric Method.

3.0 Monitoring Standards

Air quality monitoring will be undertaken in accordance with all relevant Australian Standards, legislation and DECC approved methods for sampling. The Australian Standards and DECC approved methods relevant to the Air Quality Monitoring Program are listed below:

- all sampling and analysis will be undertaken in accordance with the Protection of the Environment Operations (Clean Air) Regulation 2002 and the guidelines specified in the DECC publication 'Approved Methods for the Sampling and Analysis of Air Pollutants in New South Wales (2005)';
- all dust deposition gauges will be sampled monthly for insoluble solids in accordance with AS/NZS 3580.10.1:2003: Methods for Sampling and Analysis of Ambient Air – Determination of Particulate Matter – Deposited Matter – Gravimetric Method; and
- high volume air samplers (HVAS) will measure and analyse total suspended particulate (TSP) and PM₁₀ in accordance with the guidelines specified in 'Approved Methods for the Sampling and Analysis of Air Pollutants in NSW (2005)', with samples analysed according to Australian Standard AS 2724.3-1984.

4.0 Monitoring Equipment and Locations

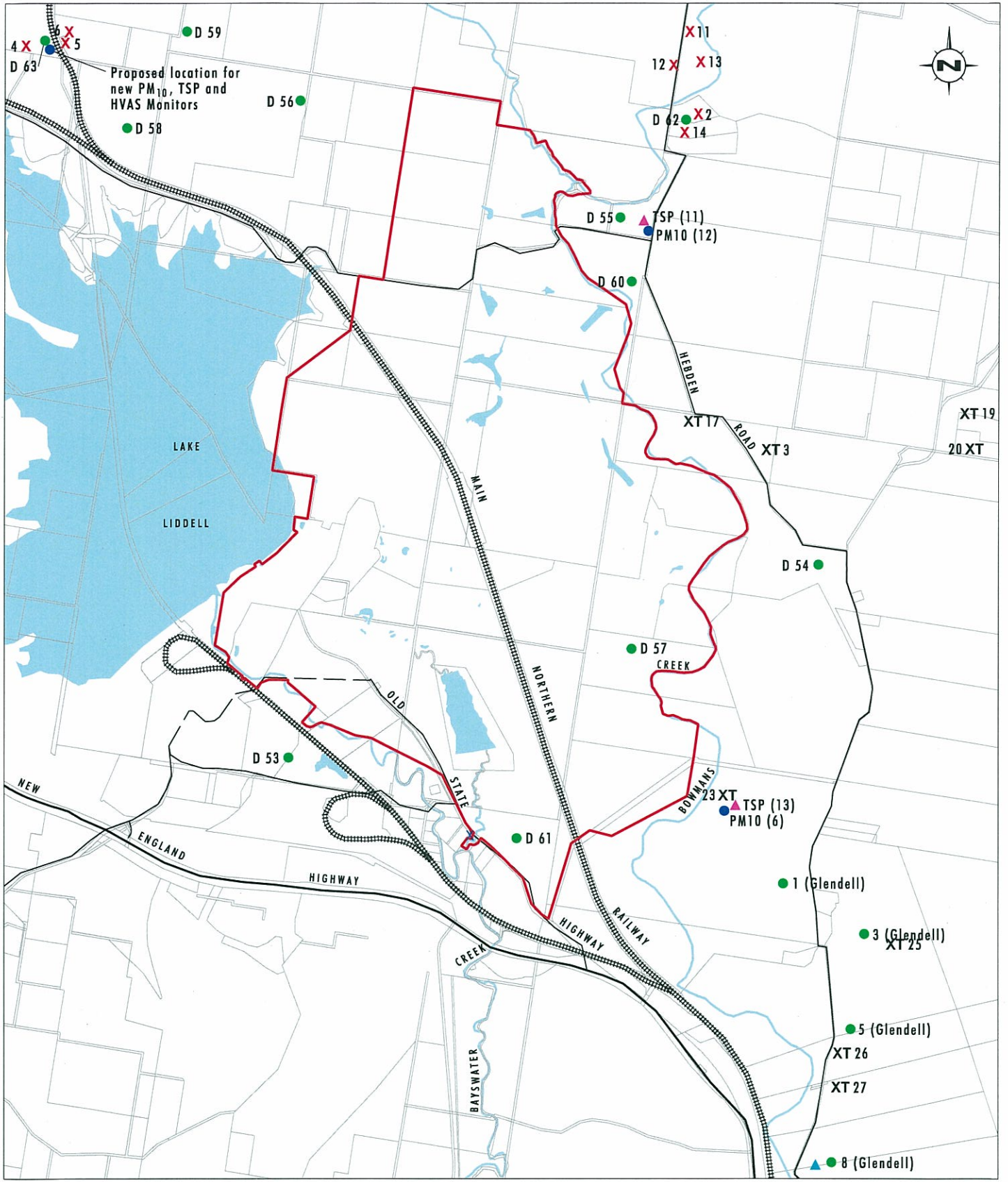
The existing Liddell Colliery air quality monitoring network comprises eleven depositional dust gauges and four high volume air samplers (HVAS), including two TSP samplers and two PM₁₀ samplers. The locations of the monitoring equipment are shown in **Figure 4.1**. In accordance with the Response to Submissions for the Liddell Colliery Modification to Development Consent (Umwelt, 2007) Liddell Coal will establish additional high volume air samplers for TSP (HVAS 1) and PM₁₀ (HVAS 2) at a location which is representative of residences 4, 5 and 6 (refer to **Figure 4.1**). These monitors will be installed following the approval of this monitoring program by the Director-General and once landowners consent has been obtained.

5.0 Monitoring Protocol

The air quality monitoring to be undertaken at Liddell Colliery is detailed in **Table 5.1** below.

Table 5.1 – Liddell Colliery Air Quality Monitoring Program

Site No.	Parameters Monitored	Units of Measure	Averaging Period	Frequency	Sampling Method ¹
D53	Deposited dust Ash	g/m ² /month percent	Month, annual	Monthly	AM-19
D54	Deposited dust Ash	g/m ² /month percent	Month, annual	Monthly	AM-19
D55	Deposited dust Ash	g/m ² /month percent	Month, annual	Monthly	AM-19
D56	Deposited dust Ash	g/m ² /month percent	Month, annual	Monthly	AM-19



Source: Liddell Coal

0 1.0 2.0 2.5 km
1:50 000

Legend

- Liddell Colliery DA Boundary
- Depositional Dust Monitoring site
- ▲ Ravensworth Weather Station
- ▲ High Volume Air Sampler (HVAS) Monitoring - TSP Location
- High Volume Air Sampler (HVAS) Monitoring - PM10 Location
- X Private Residences
- X Mine Owned Residences
- X Chain of Ponds Hotel
- ▲ Existing Dams

FIGURE 4.1

**Environmental Monitoring Locations
Dust and Meteorological**

Table 5.1 – Liddell Colliery Air Quality Monitoring Program (cont)

Site No.	Parameters Monitored	Units of Measure	Averaging Period	Frequency	Sampling Method ¹
D57	Deposited dust Ash	g/m ² /month percent	Month, annual	Monthly	AM-19
D58	Deposited dust Ash	g/m ² /month percent	Month, annual	Monthly	AM-19
D59	Deposited dust Ash	g/m ² /month percent	Month, annual	Monthly	AM-19
D60	Deposited dust Ash	g/m ² /month percent	Month, annual	Monthly	AM-19
D61	Deposited dust Ash	g/m ² /month percent	Month, annual	Monthly	AM-19
D62	Deposited dust Ash	g/m ² /month percent	Month, annual	Monthly	AM-19
HVAS11	TSP	µg/m ³	24 hour, annual	24 hours, every 6 days	AM-15
HVAS13	TSP	µg/m ³	24 hour, annual	24 hours, every 6 days	AM-15
HVAS 1 ²	TSP	µg/m ³	24 hour, annual	24 hours, every 6 days	AM-15
HVAS6	PM ₁₀	µg/m ³	24 hour, annual	24 hours, every 6 days	AM-18
HVAS12	PM ₁₀	µg/m ³	24 hour, annual	24 hours, every 6 days	AM-18
HVAS 2 ²	PM ₁₀	µg/m ³	24 hour, annual	24 hours, every 6 days	AM-18

Note: DD = Depositional Dust monitoring location, HVAS = High Volume Air Sampler.

¹ NSW DEC, 2005, Approved Methods for the Sampling and Analysis of Air Pollutants in NSW.

² Gauges to be installed, refer to **Section 4.0**.

5.1 Review

Liddell Coal will regularly review the air quality monitoring data to assess compliance with air quality criteria provided in **Section 2.0**.

5.2 Corrective Action

Where an exceedance of the criteria is recorded, an investigation will be undertaken to determine possible causes of the exceedance.

In the event that the investigation determines that dust from Liddell Colliery operations is likely to be responsible for any exceedance of the air quality criteria at nearby privately owned residences or any privately owned land (except where this is predicted in the Environmental Assessment for the Liddell Colliery Modification to Development Consent (EA) (Umwelt, 2006) and except where a negotiated agreement has been entered into in relation to that impact) Liddell Coal will:

-
- notify the Director-General and the affected landowners and/or existing or future tenants (including tenants of mine owned properties) in accordance with schedule 4, condition 2 of the development consent. Liddell Coal will provide quarterly monitoring results to each of these parties until the results show that Liddell Coal is complying with the air quality criteria
 - review mitigation measures which would prevent the exceedance from re-occurring;
 - report the exceedance to the Liddell Colliery Community Consultative Committee (CCC) and in the Liddell Colliery Annual Environmental Management Report (AEMR).

5.3 Complaints

A procedure for handling complaints has been implemented as part of the Liddell Colliery Environmental Management System (EMS) to ensure a consistent approach to handling any complaint. All legitimate complaints will be thoroughly investigated by the Liddell Coal Environment and Community Coordinator. Feedback to the complainant will be provided within 48 hours of receiving the complaint. Details of complaints and outcomes from any investigations will be provided to mine planning and production personnel, to assist in the improvement of dust management practices.

In addition to the regular monitoring outlined in **Table 5.1**, if Liddell Colliery receives a complaint regarding air quality at a particular receiver location, specific monitoring may be undertaken to demonstrate compliance with air quality criteria outlined in **Section 2.0** or to investigate possible sources.

In accordance with schedule 4, condition 4 of the development consent, if a landowner considers the development to be exceeding the air quality criteria, except where this is predicted in the EA (Umwelt, 2006) then he/she may request an independent review of the impacts of Liddell Colliery on his/her land. Should this occur, Liddell Coal will undertake the process in accordance with schedule 4, conditions 4 to 8 of the development consent.

5.4 Acquisition

Should air quality impacts generated by Liddell Colliery operations exceed the land acquisition criteria outlined in **Sections 2.1** and **2.2**, and upon receiving a written request for acquisition from the affected landowner, Liddell Coal will acquire the land in accordance with schedule 3, conditions 2 and 4 (land acquisition criteria) and schedule 4, conditions 10 to 12 (land acquisition) of the development consent.

6.0 Reporting

All monitoring records required to be kept by Liddell Coal will be:

- in a legible form, or in a form that can readily be reduced to a legible form;
- kept for at least four years; and
- produced in a legible form to any authorised officer of DECC who asks to see them.

The following records will also be kept in respect of air quality monitoring undertaken:

- the dates on which the monitoring was undertaken;
- the times at which the monitoring was undertaken;
- the point at which the monitoring was undertaken; and
- the name of the person who undertook the monitoring.

Air quality monitoring results will be reported monthly to Liddell Colliery management, in accordance with the Liddell Colliery procedure for environmental reporting. All results and analysis of air quality monitoring will be reported to the CCC and will be incorporated into the AEMR.

7.0 Accountability

The relevant Liddell Colliery personnel accountabilities for the implementation of this Air Quality Monitoring Program are provided in **Table 7.1**.

Table 7.1 - Accountabilities for the Air Quality Monitoring Program

Position	Responsibility
Operations Manager	Provide adequate resources to assist the implementation of the Air Quality Monitoring Program
Environment and Community Coordinator	Ensuring the implementation of the monitoring program Undertake a review air quality monitoring results on a monthly basis Engage a suitably qualified consultant to undertake air quality monitoring and/or relevant investigations where required Ensure monitoring results are provided to the CCC and in the AEMR Report any exceedances for which Liddell Colliery is responsible to the Director-General and the relevant landholder(s)
External Consultant	Undertake air quality monitoring in accordance with the Air Quality Monitoring Program and associated standard and procedures as outlined in the program.

8.0 Auditing and Review

This Air Quality Monitoring Program is to be reviewed in consultation with the Director-General at least every three years. The review will reflect changes in environmental expectations, technology and operational procedures.

Auditing of this Program will also occur in accordance with the Liddell Colliery procedure for environmental auditing or as otherwise directed by the Director-General.

9.0 References

NSW Department of Environment and Climate Change (2005) Approved Methods for the Sampling and Analysis of Air Pollutants in New South Wales

Standards Australia (2003) AS/NZS 3580.10.1:2003 Methods for Sampling and Analysis of Ambient Air – Determination of Particulate Matter – Deposited Matter – Gravimetric Method

Liddell Colliery EMS Procedure – Environmental Monitoring and Evaluation

Liddell Colliery EMS Procedure – Environmental Reporting

Liddell Colliery EMS Procedure – Community Complaints and Environmental Incident Report

Liddell Colliery EMS Procedure – Environmental Auditing

Umwelt (Australia) Pty Limited (2006) Environmental Assessment for the Liddell Colliery Modification to Development Consent

**Umwelt (Australia) Pty Limited
2/20 The Boulevard
PO Box 838
Toronto NSW 2283**

**Ph. 02 4950 5322
Fax 02 4950 5737**