June 2011

MEGA LAKE MAITLAND PTY. LTD.

Lake Maitland Background Ambient Air Quality Monitoring

Submitted to:
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REPORT

This document is issued in accordance with NATA's accreditation requirements. The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards.

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Golder Associates

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1.0 INTRODUCTION

Golder Associates was commissioned by Mega Lake Maitland Pty. Ltd. to prepare an Air Quality Monitoring Plan (AQMP) for the Lake Maitland Uranium Project (LMUP). The objective of the AQMP was to describe the methodology for determining background ambient air quality data at Lake Maitland, located in the Western Australian Eastern Goldfields region, approximately 80 km north-east of Leinster. The resultant data forms the basis for mathematical modelling to assist in evaluating the environmental impact of proposed mining operations.

The potential air quality impacts associated with uranium mining were anticipated to be principally associated with particulate matter emissions to air. Consequently ambient air quality monitoring was conducted for the following size fractions:

- Total suspended particulate matter (TSP) (nominally particles with an equivalent aerodynamic diameter less than 50 microns), principally for the measurement of alpha radioactivity
- Particulate matter with an equivalent aerodynamic diameter less than 10 microns (PM_{10})
- Particulate matter with an equivalent aerodynamic diameter less than 2.5 microns ($PM_{2.5}$)
- Insoluble solids deposition.

Selected TSP samples were also analysed to determine metals content.

The AQMP nominated the following sampling schedule:

$TSP/PM_{10}/PM_{2.5}$

- 1 in 6 day sampling for a period of 24 hours

Insoluble solid deposition

- monthly

The AQMP further noted that, during various project phases, the sampling frequency for TSP, PM_{10} and $PM_{2.5}$ may be increased to a 1 in 2 day or 1 in 3 day frequency, and to fortnightly for insoluble solids deposition, to increase data availability.

Background ambient air quality monitoring commenced on 3rd June 2010, however the sample frequency specified in the AQMP was not achieved by Lake Maitland Pty. Ltd. due to staff availability and the constraints of operation in a remote location. Sample periods for TSP monitoring were also increased to greater than 24 hours to enable collection of sufficient sample for alpha radiation determination. Consequently an additional round of TSP monitoring was conducted, with samples collected over the 24 hour period required by Australian Standard AS/NZS 3580.9.3 "*Methods for Sampling and Analysis of Ambient Air - Determination of Suspended Particulate Matter – Total Suspended Particulate Matter (TSP) – High Volume Sampler Gravimetric Method*". This occurred between 18th March 2011 and 18th April 2011.

The following report describes the LMUP background ambient air quality monitoring test procedures and the available results for the period 3rd June 2010 to 18th April 2011. The results include TSP, PM_{10} and $PM_{2.5}$ concentrations only. Alpha radiation data is reported elsewhere.

Your attention is drawn to the document – "Limitations", which is included in Appendix A of this report. The statements presented in this document are intended to advise you of what your realistic expectations of this report should be. The document is not intended to reduce the level of responsibility accepted by Golder, but rather to ensure that all parties who may rely on this report are aware of the responsibilities each assumes in so doing

1.1 Total Suspended Particulate Matter (TSP)

Total suspended particulate matter (TSP) nominally consists of particles with an equivalent aerodynamic diameter less than 50 microns. TSP particles can result from the combustion of fuels, motor vehicles, burning of vegetation and natural causes such as windblown dust. Small particles are of concern to health and may affect visibility. Larger particles are a source of nuisance as they soil buildings, vehicles and structures. Sampling for TSP was conducted utilising a high volume sampler (HVS).

1.2 PM_{10}

Particles with equivalent aerodynamic diameters of 10 µm and less (PM_{10}) are classified as respirable and hence may affect health. PM_{10} emission sources include fuel combustion, burning of vegetation and natural causes such as windblown dust and salt laden air. Sampling for PM_{10} was conducted utilising a dichotomous sampler.

1.3 $PM_{2.5}$

Particulate matter with an equivalent aerodynamic diameter less than 2.5 microns ($PM_{2.5}$) has been statistically associated with certain human health end points, including daily mortality, hospital admissions and exacerbation of asthma. $PM_{2.5}$ emission sources are similar to those for PM_{10} however combustion processes tend to contribute more than non-combustion sources. Important anthropogenic sources of $PM_{2.5}$ include domestic wood heaters and motor vehicles. Sampling for $PM_{2.5}$ was conducted utilising a dichotomous sampler.

1.4 Deposited Dust (Insoluble Solids)

Particulate matter sampled by this method are predominantly dust particles which, because of their size, rapidly settle from the air. Nuisance and aesthetic impacts associated with dust deposition are the most common causes of complaint. Aesthetic impacts include the soiling of vehicles, building paintwork and home furnishings. Some common sources of such particles are minerals processing, bulk materials handling, surface mining operations, unsealed roads and natural causes such as wind-blown dust. Although particles up to 100 µm can enter the respiratory system during breathing, only particles smaller than 10 µm reach the lower regions of the lungs. The principal impacts of larger particles are therefore high concentrations of dust causing physical discomfort, for example skin, eye and throat irritation. Sampling for insoluble solids deposition was conducted utilising a dust deposit gauge.

2.0 LOCATIONS

Dust deposit gauges (insoluble solids) and dichotomous samplers (PM_{10} & $PM_{2.5}$) were located at Barwidgee Pastoral Station (LMCG11) and the Lake Maitland Exploration Camp (LMCG08) during the period 3rd June 2010 to 18th April 2011. The HVS (TSP) location was varied, as shown in Table 1 and Figure 1.

Barwidgee Pastoral Station and Lake Maitland Exploration Camp were selected as sampling locations as they represent the closest sensitive receptors to the proposed LMUP mine and mineral processing facility.

TSP sampling locations were selected to enable the variability of background alpha radioactivity to be assessed.

Table 1: HVS Monitoring Locations

Site Name	Description	Latitude	Longitude
LMCG01	North-West of LM	27.14916	121.0556
LMCG03	West of LM	27.16766	121.0551
LMCG05	North, NW of LM	27.13192	121.0385
LMCG06	South West of LM	27.17802	121.0757
LMCG07	South of LM	27.19647	121.0872
LMCG08	North (Exploration Camp)	27.13533	121.0898
LMCG09	East of LM	27.15792	121.1101
LMCG10	South East of LM	27.19956	121.1268
LMCG11	Barwidgee Pastoral Station	27.03402	120.9236
LMCG12	South Clay Pan	27.18520	121.0557
LMCG13	SW Heritage Site	27.24367	121.0647

2.1 Site Selection

Monitoring sites were selected based on the requirements of Australian Standard AS/NZS 3580.1.1 "*Guide to Siting Air Monitoring Equipment*". AS/NZS 3580.1.1 notes six requirements for site compliance, as follows:

- A height above ground level of 2 m
- Greater than 25 m from the source under investigation
- A clear sky angle greater than 120^{o}
- Unrestricted airflow
- Greater than 10 m from the drip line of trees
- No extraneous sources.

As observed by Golder Associates staff during an audit in November 2010, Lake Maitland Exploration Camp complied with the above criteria. Barwidgee Pastoral Station was observed to be within 10 m of the drip line of the closest tree and was therefore non-compliant. The dichotomous sampler and dust deposit gauge were subsequently moved to an adjacent location with full compliance.

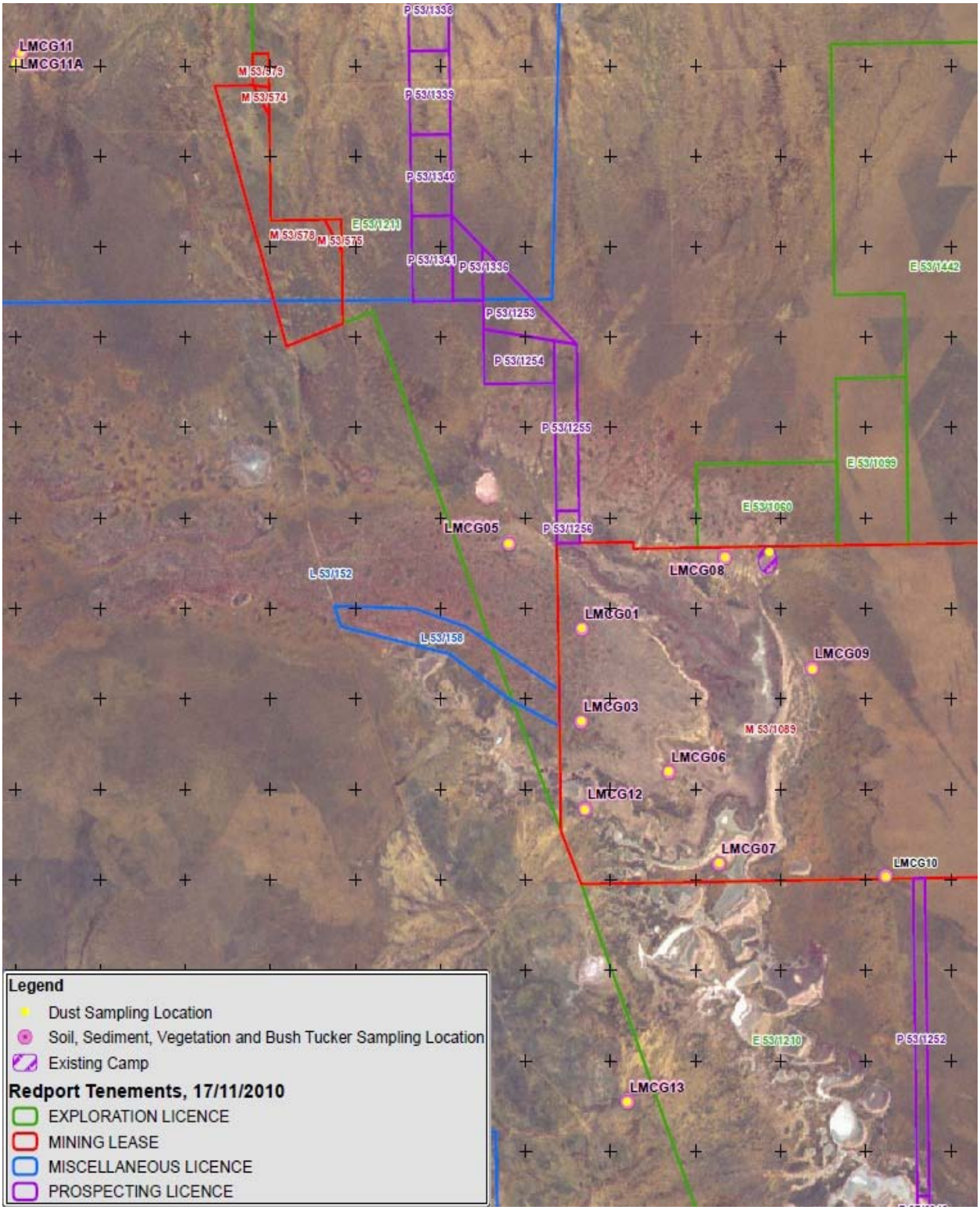

Figure 1: Ambient Air Quality Monitoring Locations

3.0 TEST METHODS

The test methods used in the conduct of the LMUP ambient air quality monitoring programme are described in the following sections.

3.1 High Volume Sampler (TSP)

Sampling for TSP was conducted in accordance with Golder Associates Method H3 "*High Volume Sampler (HVS) Operation: TSP, $PM_{2.5}$ and PM_{10} Determination - In Ambient Air*", based on Australian Standard AS/NZS 3580.9.3 "*Determination of Suspended Particulate Matter— Total Suspended Particulate Matter (TSP) - High Volume Sampler Gravimetric Method*".

Filters were conditioned for 24 hours in a temperature and humidity controlled environment, pre and post sampling, prior to weighing:

- temperature 15 - 30°C (variability of no more than ± 5°C)
- relative humidity ≤ 50% (variability of no more than ± 5%).

Field blank samples were collected at a minimum frequency of 10% of samples taken.

The weight change of the filter media was determined using a Mettler four figure balance. The balance was calibrated in accordance with NATA requirements (NATA Calibration Report No. 40276 – 8/04/2010). The measurement uncertainty for the gravimetric determination was ± 1 mg.

The exposed portion of the filter was divided and sent to ALS Laboratory Group (NATA Laboratory Accreditation No. 825) for metals analysis.

3.2 Dichotomous Sampler (PM_{10} and $PM_{2.5}$)

Sampling for PM_{10} and $PM_{2.5}$ was conducted in accordance with Australian Standard AS/NZS 3580.9.7, "*Determination of Suspended Particulate Matter – Dichotomous Sampler PM_{10}, Coarse PM and $PM_{2.5}$ – Gravimetric Method*".

Filters were conditioned for 24 hours in a temperature and humidity controlled environment, pre and post sampling, prior to weighing:

- temperature 20 – 23°C (variability of no more than ± 2°C)
- relative humidity 30 - 40% (variability of no more than ± 5%).

Field blank samples were collected at a minimum frequency of 10% of samples taken.

Sample filters were weighed using a 6-figure microbalance. The balance was calibrated in accordance with NATA requirements (NATA Calibration Report No. BE1103 – 18/01/2010). The measurement uncertainty for the gravimetric determination was ± 15 µg.

3.3 Dust Deposit Gauge (Insoluble Solids)

Insoluble solids deposition sampling was conducted in accordance with Golder Associates Method D2 "*Dust Deposit Gauges - Sampling and Analysis*", based on Australian/New Zealand Standard AS/NZS 3580.10.1 "*Determination of Particulate Matter - Deposited Matter - Gravimetric Method*".

The weight change of the filter media was determined using a Mettler four figure balance. The balance was calibrated in accordance with NATA requirements (NATA Calibration Report No. 40276 – 8/04/2010).

4.0 MEASUREMENT UNCERTAINTY

The procedures used to calculate test method measurement uncertainty are based on the requirements of International Organization for Standardization (ISO) Guide 98 "*Guide to the Expression of Uncertainty in Measurement*". The estimated uncertainty is an expanded uncertainty using a coverage factor of 1.96, giving a confidence level of 95% (U95).

4.1 High Volume Sampler (TSP)

The test method measurement uncertainty for the determination of TSP by HVS is ± 5 µg/m^3 U95.

4.2 Dichotomous Sampler (PM_{10} and $PM_{2.5}$)

The test method measurement uncertainties for the determination of PM_{10} and $PM_{2.5}$ by dichotomous sampler are ± 5 µg/m^3 U95 and ± 1 µg/m^3 U95 respectively.

4.3 Dust Deposit Gauge (Insoluble Solids)

The test method measurement uncertainty for the determination of insoluble solids deposition by dust deposit gauge is ± 0.3 g/m^2/month.

5.0 RESULTS

The results of the LMUP background ambient air quality monitoring programme are provided in the following sections.

5.1 TSP

TSP concentration results for sample periods of extended duration (greater than 24 hours) are presented in Table 2. TSP concentrations determined over a 24 hour period at Lake Maitland Exploration Camp (Site No. LMCG08) during the period 18th March 2011 to 18th April 2011 are presented in Table 3.

Table 2: TSP Concentration Data (>24 h Sample Period)

Start Date	End Date	Sample No.	Filter No.	Site No.	TSP Concentration (µg/m³)[1]
3/06/2010	6/06/2010	10-1193	6012	LMCG08	4.2
17/06/2010	23/06/2010	10-1194	6013	LMCG01	3.9
18/06/2010	23/06/2010	10-1196	6015	LMCG03	4.5
23/06/2010	27/06/2010	10-1197	6016	LMCG09	4.6
23/06/2010	27/06/2010	10-1199	6018	LMCG10	3.9
10/07/2010	14/07/2010	10-1596	6022	LMCG12	7.8
10/07/2010	13/07/2010	10-1597	6019	LMCG06	6
13/07/2010	19/07/2010	10-1598	6023	LMCG13	7.2
14/07/2010	19/07/2010	10-1599	6025	LMCG07	4.4
31/07/2010	6/08/2010	10-1600	6026	LMCG05	22
31/07/2010	6/08/2010	10-1601	6046	LMCG11	6.6
5/12/2010	9/12/2010	10-2249	6050	LMCG09	13
9/12/2010	13/12/2010	10-2250	6061	LMCG10	11
12/01/2011	17/01/2011	11-48	6064	LMCG07	23
4/02/2011	8/02/2011	11-196	6749	LMCG13	30
11/02/2011	15/02/2011	11-197	6766	LMCG05	15
11/02/2011	15/02/2011	11-198	6767	LMCG11	8.5
26/02/2011	1/03/2011	11-379	6765	LMCG08	11
19/03/2011	24/03/2011	11-380	6750	LMCG03	4.9

NOTES:
1. micrograms per cubic metre expressed at 0°C and 101.3 kPa

Table 3: TSP Concentration Data (24 h Sample Period)

Start Date	End Date	Sample No.	Filter No.	TSP Concentration (µg/m³)[1]
18/03/2011	19/03/2011	11-382	6946	12
19/03/2011	20/03/2011	11-383	6947	8.4
20/03/2011	21/03/2011	11-384	6948	6.9
21/03/2011	22/03/2011	11-385	6949	4.2
22/03/2011	23/03/2011	11-386	6950	4.5

Start Date	End Date	Sample No.	Filter No.	TSP Concentration (µg/m³)[1]
23/03/2011	25/03/2011	11-387	6951	6.2
25/03/2011	26/03/2011	11-388	6952	5.1
26/03/2011	27/03/2011	11-389	6953	13
27/03/2011	28/03/2011	11-390	6954	7.7
28/03/2011	29/03/2011	11-391	6955	9.5
29/03/2011	30/03/2011	11-392	6956	12
30/03/2011	31/03/2011	11-393	6957	11
31/03/2011	1/04/2011	11-394	6958	9.1
1/04/2011	2/04/2011	11-395	6959	12
5/04/2011	6/04/2011	11-396	7055	7.9
6/04/2011	7/04/2011	11-397	7056	11
7/04/2011	8/04/2011	11-398	7057	13
8/04/2011	9/04/2011	11-399	7058	14
9/04/2011	10/04/2011	11-400	7059	13
10/04/2011	11/04/2011	11-401	7060	12
11/04/2011	12/04/2011	11-402	7061	12
12/04/2011	13/04/2011	11-403	7062	14
13/04/2011	14/04/2011	11-404	7063	16
14/04/2011	15/04/2011	11-405	7064	12
15/04/2011	16/04/2011	11-406	7065	6.6
16/04/2011	17/04/2011	11-407	7066	5.5
17/04/2011	18/04/2011	11-409	7070	11
18/04/2011	19/04/2011	11-410	7071	9.2
Maximum Concentration				16

NOTES:
1. micrograms per cubic metre expressed at 0°C and 101.3 kPa

5.2 PM_{10}

Table 4: PM_{10} Concentration Data (24 h Sample Period)

Date	Sample No.	Site No.	PM_{10} Concentration (µg/m³)[1]
3/06/2010	10-1230	LMCG08	6.6
5/06/2010	10-1239	LMCG11	1.5
17/06/2010	10-1229	LMCG08	2.8
18/06/2010	10-1242	LMCG11	2.6
23/06/2010	10-1228	LMCG08	5.8
24/06/2010	10-1243	LMCG11	4.2
26/06/2010	10-1241	LMCG11	10
28/06/2010	10-1457	LMCG08	5
4/07/2010	10-1459	LMCG08	5.2
10/07/2010	10-1461	LMCG08	6.4

Date	Sample No.	Site No.	PM_{10} Concentration ($\mu g/m^3$)[1]
13/07/2010	10-1443	LMCG11	5.9
16/07/2010	10-1463	LMCG08	3.9
22/07/2010	10-1465	LMCG08	4.3
28/07/2010	10-1467	LMCG08	7.7
1/08/2010	10-1445	LMCG11	8.1
2/08/2010	10-1447	LMCG11	13.8
3/08/2010	10-1449	LMCG11	9.8
4/08/2010	10-1451	LMCG11	5.4
5/08/2010	10-1453	LMCG11	6
9/08/2010	10-1665	LMCG11	4.7
9/08/2010	10-1651	LMCG08	6.5
15/08/2010	10-1653	LMCG08	6.4
21/08/2010	10-1655	LMCG08	9.9
21/08/2010	10-1667	LMCG11	10.6
27/08/2010	10-1657	LMCG08	7.7
2/09/2010	10-1659	LMCG08	1.6
8/09/2010	10-1661	LMCG08	7.2
19/09/2010	10-1873	LMCG11	8.3
19/09/2010	10-1887	LMCG08	9.2
30/11/2010	11-42	LMCG11	19.4
3/12/2010	11-32	LMCG08	3.1
6/12/2010	11-44	LMCG11	9.6
9/12/2010	11-34	LMCG08	6.9
9/12/2010	11-46	LMCG11	7.5
19/01/2011	11-206	LMCG08	9
20/01/2011	11-207	LMCG08	12.5
20/01/2011	11-218	LMCG11	9.8
21/01/2011	11-208	LMCG08	14.5
22/01/2011	11-209	LMCG08	11.4
23/01/2011	11-210	LMCG08	15.1
9/02/2011	11-219	LMCG11	4.5
10/02/2011	11-220	LMCG11	2.9
11/02/2011	11-221	LMCG11	4.5
12/02/2011	11-222	LMCG11	5
26/02/2011	11-342	LMCG08	6.9
27/02/2011	11-352	LMCG11	5.5
2/03/2011	11-353	LMCG11	6.1
2/03/2011	11-343	LMCG08	5.9
5/03/2011	11-344	LMCG08	4.7

Date	Sample No.	Site No.	PM_{10} Concentration ($\mu g/m^3$)[1]
8/03/2011	11-345	LMCG08	5
11/03/2011	11-346	LMCG08	2
14/03/2011	11-347	LMCG08	6.1
Maximum Concentration			**19.4**

NOTES:
1. micrograms per cubic metre expressed at 0°C and 101.3 kPa

5.3 $PM_{2.5}$

Table 5: $PM_{2.5}$ Concentration Data (24 h Sample Period)

Date	Sample #	Site No.	$PM_{2.5}$ Concentration ($\mu g/m^3$)[1]
3/06/2010	10-1223	LMCG08	1.9
5/06/2010	10-1232	LMCG11	<1
17/06/2010	10-1218	LMCG08	1.1
18/06/2010	10-1235	LMCG11	1.3
23/06/2010	10-1219	LMCG08	2.2
24/06/2010	10-1236	LMCG11	2.7
26/06/2010	10-1234	LMCG11	4.3
28/06/2010	10-1456	LMCG08	1.4
4/07/2010	10-1458	LMCG08	1.5
10/07/2010	10-1460	LMCG08	1.4
13/07/2010	10-1442	LMCG11	2.2
16/07/2010	10-1462	LMCG08	1.3
22/07/2010	10-1464	LMCG08	1.8
28/07/2010	10-1466	LMCG08	1.2
1/08/2010	10-1444	LMCG11	4.3
2/08/2010	10-1446	LMCG11	9.8
3/08/2010	10-1448	LMCG11	5.8
4/08/2010	10-1450	LMCG11	3
5/08/2010	10-1452	LMCG11	3.1
9/08/2010	10-1664	LMCG11	1.6
9/08/2010	10-1650	LMCG08	1.9
15/08/2010	10-1652	LMCG08	1.3
21/08/2010	10-1654	LMCG08	<1
27/08/2010	10-1656	LMCG08	<1
27/08/2010	10-1668	LMCG11	3.1
2/09/2010	10-1658	LMCG08	<1
8/09/2010	10-1660	LMCG08	1.3
19/09/2010	10-1872	LMCG11	2.4

Date	Sample #	Site No.	$PM_{2.5}$ Concentration ($\mu g/m^3$)[1]
19/09/2010	10-1886	LMCG08	<1
30/11/2010	11-29	LMCG08	<1
30/11/2010	11-41	LMCG11	17.3
3/12/2010	11-31	LMCG08	<1
6/12/2010	11-43	LMCG11	1.7
9/12/2010	11-33	LMCG08	1.8
9/12/2010	11-45	LMCG11	3.3
19/01/2011	11-200	LMCG08	1.2
20/01/2011	11-201	LMCG08	1.4
20/01/2011	11-212	LMCG11	5.1
21/01/2011	11-202	LMCG08	1.8
22/01/2011	11-203	LMCG08	1.3
23/01/2011	11-204	LMCG08	2.1
9/02/2011	11-213	LMCG11	1.8
10/02/2011	11-214	LMCG11	1.4
11/02/2011	11-215	LMCG11	1.0
12/02/2011	11-216	LMCG11	2.6
26/02/2011	11-335	LMCG08	1.1
27/02/2011	11-349	LMCG11	2.7
2/03/2011	11-350	LMCG11	2
2/03/2011	11-336	LMCG08	<1
5/03/2011	11-337	LMCG08	<1
8/03/2011	11-338	LMCG08	<1
11/03/2011	11-339	LMCG08	<1
14/03/2011	11-340	LMCG08	<1
Maximum Concentration			17.3

NOTES:
1. micrograms per cubic metre expressed at 0°C and 101.3 kPa

5.4 Deposited Dust (Insoluble Solids)

Table 6: Insoluble Solids Deposition Data (1 Month Sample Period)

Start Date	End Date	Sample No.	Site No.	Insoluble Solids Deposition (g/m^2/month)
7/12/2010	18/01/2011	11-47	LMCG08	1.8
18/01/2011	18/02/2011	11-189	LMCG08	3.2
18/01/2011	18/02/2011	11-190	LMCG11	4.3

Start Date	End Date	Sample No.	Site No.	Insoluble Solids Deposition (g/m^2/month)
18/02/2011	20/03/2011	11-312	LMCG08	2.5
18/02/2011	20/03/2011	11-313	LMCG11	0.64

5.5 Metals

Table 7: TSP Metal Concentration Data (>24 h Sample Period)

	Metal Concentration ($\mu g/m^3$)[1]			
Sample No.	10-1598	10-1600	10-1601	10-2246
Magnesium	<5	<5	<5	<7
Phosphorus	<0.1	<0.1	<0.1	<0.2
Mercury	<0.0001	<0.0001	<0.0001	<0.0002
Aluminium	<20	<20	<20	<20
Barium	<0.2	<0.2	<0.2	<0.2
Boron	<4	<4	<4	<5
Beryllium	<0.0001	<0.0001	<0.0001	<0.0002
Cadmium	<0.0001	<0.0001	<0.0001	<0.0002
Cobalt	<0.0005	<0.0005	<0.0005	<0.0007
Chromium	<0.02	<0.02	<0.02	<0.02
Copper	<0.002	<0.002	<0.002	<0.003
Molybdenum	<0.0005	<0.0005	<0.0005	<0.0007
Nickel	<0.002	<0.002	<0.002	<0.003
Lead	<0.002	<0.002	<0.002	<0.003
Antimony	<0.0004	<0.0003	<0.0004	<0.0005
Selenium	<0.0009	<0.0009	<0.0009	<0.002
Thallium	<0.0001	<0.0001	<0.0001	<0.0002
Vanadium	<0.007	<0.007	<0.007	<0.01
Zinc	<0.1	<0.1	<0.1	<0.2
Strontium	<0.3	<0.3	<0.3	<0.4
Uranium	<0.0004	<0.0004	<0.0004	<0.0005

NOTES:
1. micrograms per cubic metre expressed at 0°C and 101.3 kPa

6.0 SUMMARY

6.1 TSP

TSP monitoring results for the period 3rd June 2010 to 19th March 2011 (greater than 24 hour sample periods) are presented in Figure 2.

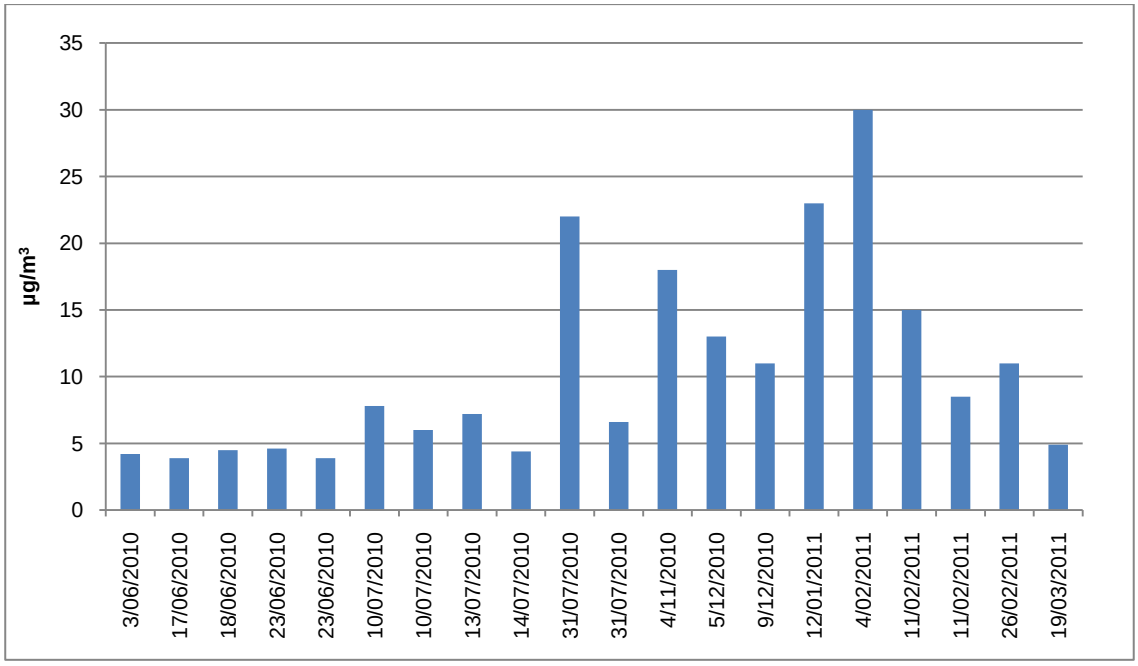

Figure 2: TSP Concentrations

TSP monitoring results for the period 18th March 2011 to 18th April 2011 (24 hour sample periods) are presented in Figure 3.

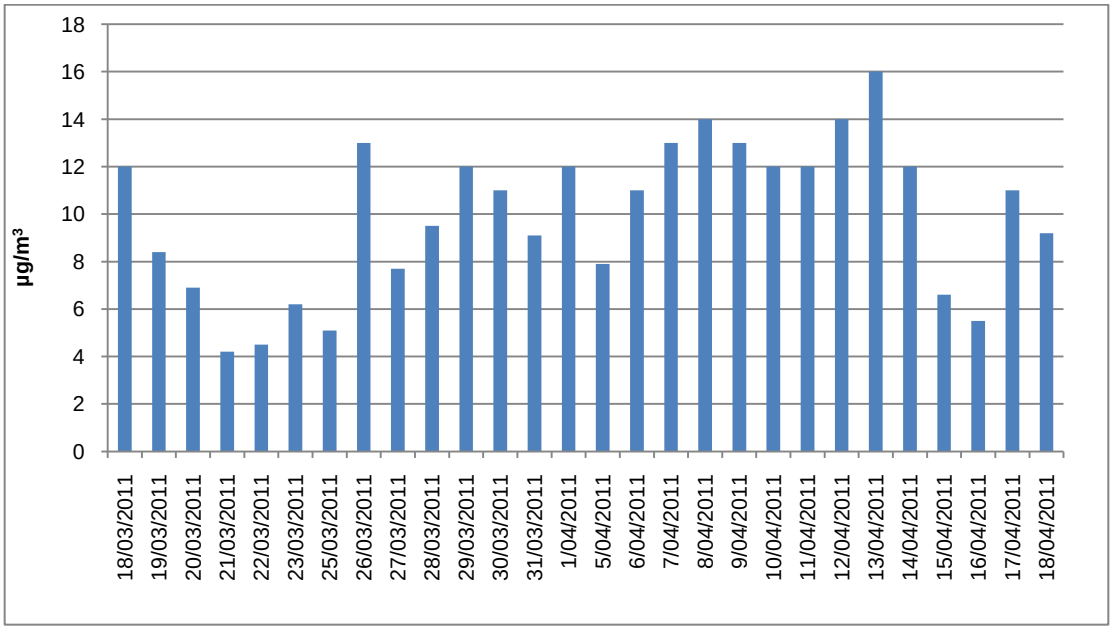

Figure 3: TSP (24h) Concentrations

6.2 PM_{10}

PM_{10} monitoring results for the period 3rd June 2010 to 14th March 2011 (principally 24 hour sample periods) are presented in Figure 4.

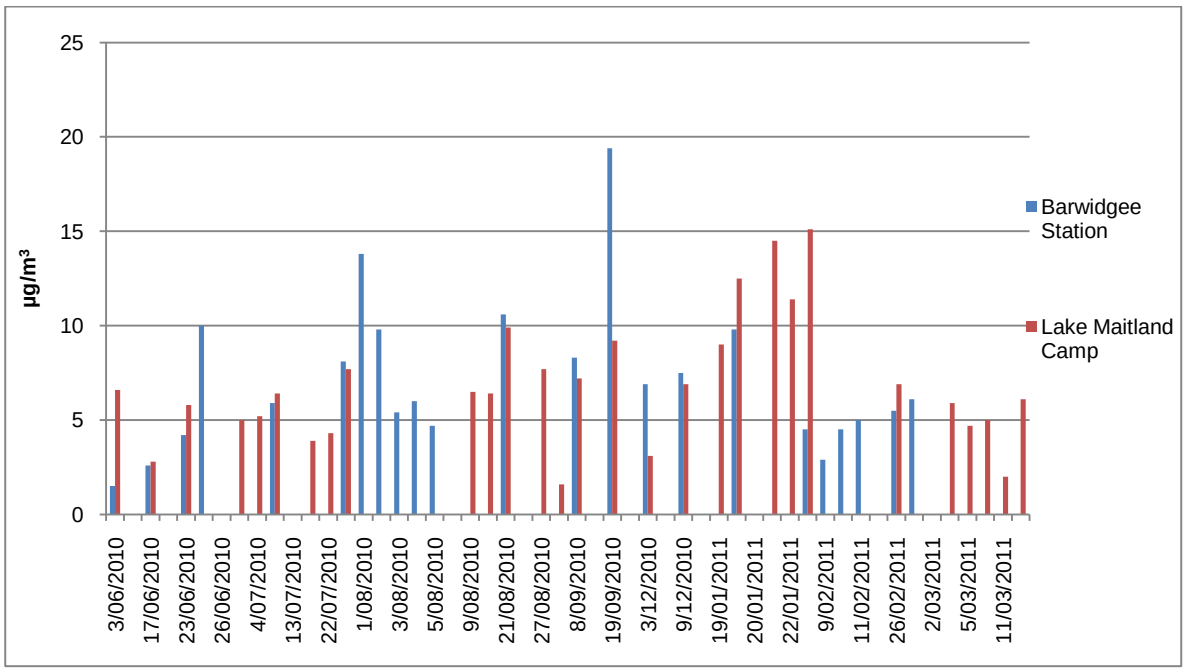

Figure 4: PM_{10} Concentrations

6.3 $PM_{2.5}$

$PM_{2.5}$ monitoring results for the period 3rd June 2010 to 14th March 2011 (principally 24 hour sample periods) are presented in Figure 5.

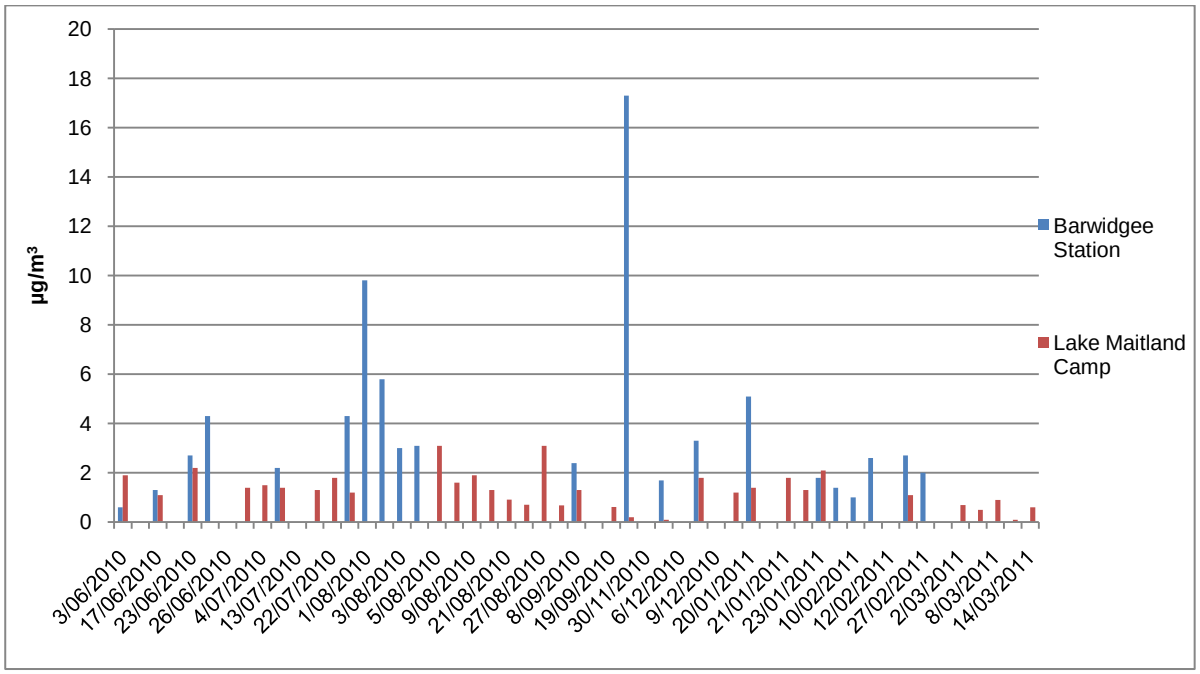

Figure 5: $PM_{2.5}$ Concentrations

6.4 Deposited Dust Results Summary

Limited dust deposition monitoring has been conducted at the Lake Maitland Exploration Camp (Site No. LMCG08) and Barwidgee Pastoral Station (Site No. LMCG11) with results ranging from 0.64 – 4.3 g/m^2/month.

6.5 Metals Results Summary

All TSP metal concentration results were less than their respective test method limits of detection.

7.0 CONCLUSIONS

When sufficient ambient air quality data is available, the 70th percentile concentration is normally selected as the background concentration for the purposes of an air quality impact assessment. In this instance, given the limited amount of data, it has been conservatively assumed that the maximum measured PM_{10} and $PM_{2.5}$ concentrations represent the LMUP 24 hour average background concentrations. The annual average $PM_{2.5}$ background concentration is the average concentration measured during the period 3rd June 2010 to 14th March 2011.

Given the limited dust deposition monitoring conducted at Lake Maitland, the background insoluble solids dust deposition rate is assumed to be 2.0 g/m^2/month, based on the Victorian Department of Health suggested maximum rate for rural areas.

The maximum measured TSP concentration of 30 µg/m^3 occurred on 4th February 2011, with a sample period of 4 days. In order to estimate the worst case background concentration, the measured concentration was adjusted to a 24 hour average concentration, based on the time ratio raised to the power of 0.2.

The assumed LMUP background ambient air quality concentrations are summarised in Table 8.

Table 8: LMUP Background Ambient Air Quality Data

Atmospheric Contaminant	Criteria	Averaging Period	Source	Background Concentration/Rate
TSP	90 µg/m^3	24 hours	EP (Kwinana) Regs.	39 µg/m^3 *
PM_{10}	50 µg/m^3	24 hours	Air NEPM	19 µg/m^3
$PM_{2.5}$	25 µg/m^3	24 hours	Air NEPM	17 µg/m^3
	8 µg/m^3	Annual average	Air NEPM	2.3 µg/m^3
Insoluble solids deposition	4 g/m^2/month	1 month	Mining PEM (EPAV)	2.0 g/m^2/month

*** Adjusted value from 4 day average**

Report Signature Page

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APPENDIX A

Limitations

LIMITATIONS

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