NAMOI MINING PTY. LTD.

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Namoi Mining Pty Ltd

Air Quality Monitoring Program

for the

Sunnyside Coal Mine

Incorporating an

Air Monitoring Protocol

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ACRONYMS USED THROUGHOUT THIS REPORT

AEMR	-	Annual Environmental Management Report
AQMP	-	Air Quality Monitoring Program
CCC	-	Community Consultative Committee
CHPP	-	Coal Handling and Preparation Plant
DECC (EPA)	-	Department of Environment and Climate Change (Environment Protection Authority)
DoP	-	Department of Planning
DPI-MR	-	Department of Primary Industries - Mineral Resources
EA	-	Environmental Assessment
EMS	-	Environmental Management Strategy
GSC	-	Gunnedah Shire Council
INP	-	Industrial Noise Policy
ISO	-	International Standards Organisation
PA	-	Project Approval
ROM	-	Run of Mine
WCMPL	-	Whitehaven Coal Mining Pty Ltd
NMPL	-	Namoi Mining Pty Ltd

1 INTRODUCTION

The Sunnyside Coal Mine is located approximately 15km west of Gunnedah and 2km north of Oxley Highway (see **Figure 1**). The mine site is approximately 234 ha and is located entirely within the property known as "Sunnyside". The mine is being developed by Namoi Mining Pty Ltd (NMPL) as an open cut mining operation. NMPL is a 100% subsidiary company of Whitehaven Coal Ltd.

The mine site is located within the area covered by Mining Lease (ML 1624), granted by the Minister on the 5th November 2008. Sunnyside Coal Mine operates under Project Approval (PA 06_0308), granted by the Minister on the 24th September 2008, and Environment Protection Licence (EPL 12957).

A Final Statement of Commitments was compiled in a Response to Submissions to the Environmental Assessment for the project. These commitments are designed to effectively manage, mitigate, guide and monitor the mine from initial construction through to full production and eventually rehabilitation of the mine site. Activities and operations at the mine include:

Site Establishment

- Installation and/or construction of mine site infrastructure and services, e.g. power supply, water management structures and internal access roads.
- Establishment of site facilities such as offices, workshops, amenities, coal loader, etc.
- Construction of purpose built roads and upgrades to existing roads as part of a coal transport route.

Operations

- Coal mining by open cut and (potential) auger mining methods over an area of approximately 80-100ha.
- Crushing, screening and stockpiling of coal.
- Transportation of coal from the mine via a purpose built road parallel to and northeast of the existing Coocooboonah Lane, upgrading intersections and road shoulder surfaces on an established route along the Oxley Highway, Blackjack Road, Quia Road and Torrens Road, and use of this route to the Whitehaven Coal Handling and Preparation Plant (CHPP) and rail Loading Facility at the Whitehaven Siding.
- Final Rehabilitation of the areas of disturbance within the Mine Site following completion of the Mine.

It is recognised that the operation of the mine has the potential to impact on the air quality within and beyond the boundaries of the mine site. In order to manage the potential impacts on local air quality, and in compliance with *Condition 3(19)* of PA 06_0308, the following Air Quality Monitoring Program (AQMP) has been prepared.

The AQMP presents the relevant conditions of the PA 06_0308 (see **Section 2**) and includes an Air Monitoring Protocol (AMP) to evaluate compliance with the air quality criteria identified by PA

06_0308 (see **Section 3**). **Section 4** presents the specific features of the AQMP including monitoring locations, parameters measured and frequency of monitoring.

The AQMP has been prepared with reference to relevant legislation and guidelines and is consistent with the commitments in the following documentation which was prepared prior to the granting of PA 06_0308.

- Air Quality Assessment – included as Part 5 of the Specialist Consultant Studies Compendium accompanying the *Environmental Assessment* for the Sunnyside Coal Project.
- *Environmental Assessment* – specifically Section 4B.5.
- Final Statement of Commitments – specifically commitments 11.1 to 11.35.

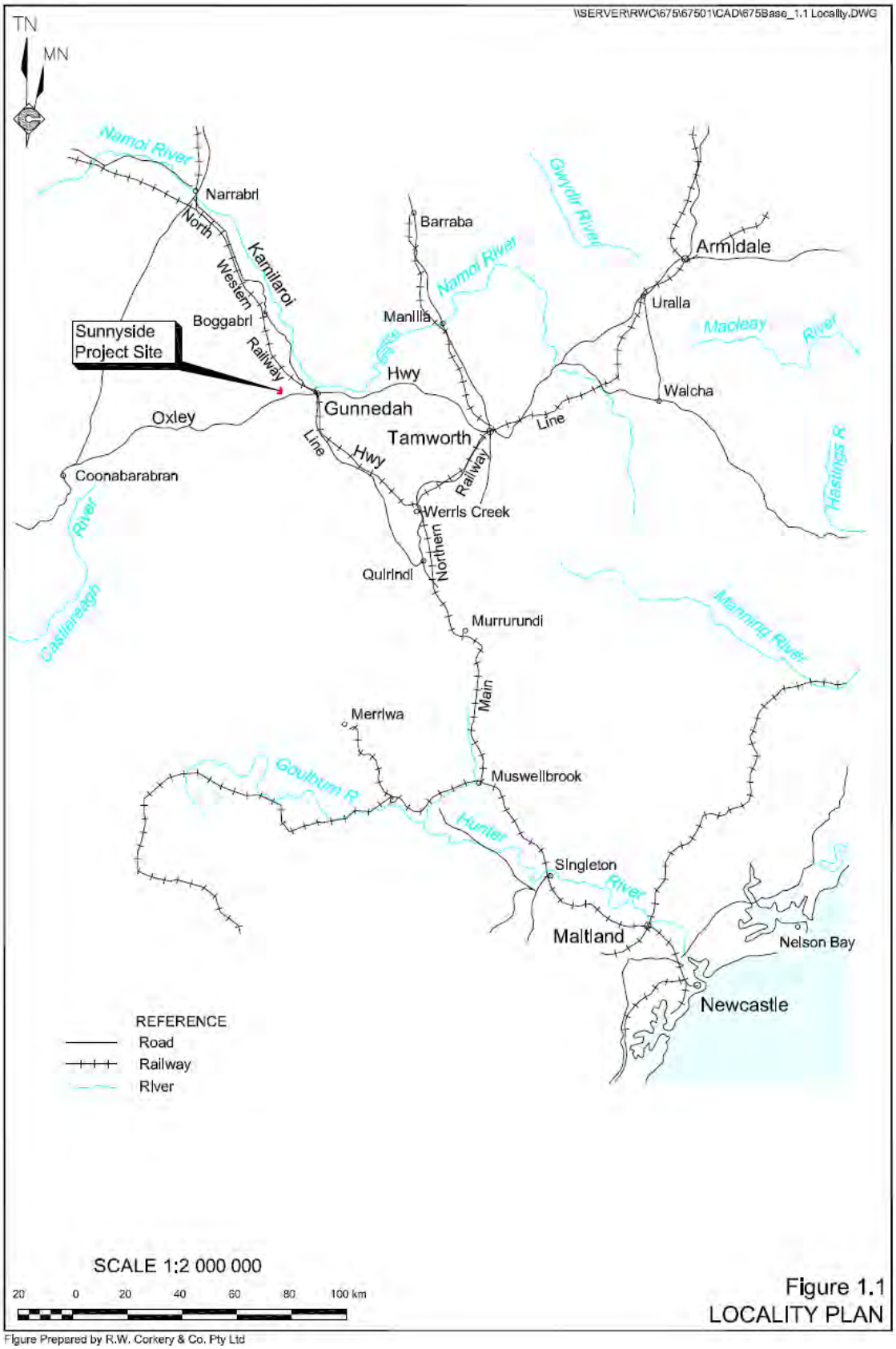

Figure 1 - Locality Plan

2 REQUIREMENTS OF PA 06_0308

PA 06_0308 incorporates two conditions relating to air quality management and air quality monitoring. These conditions are consistent with the conditions set out in EPL 12957 and are presented in full below.

AIR QUALITY

Note: These conditions must be read in conjunction with Section 11 of the Statement of Commitments.

Impact Assessment Criteria

18 The Proponent shall ensure that dust emissions generated by the project do not cause additional exceedances of the criteria listed in Tables 7 to 9 at any residence on privately owned land, or on more than 25 percent of any privately-owned land.

Table 7: 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 8: 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 9: 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, 1991, AS/NZS 3580.10.1-2003: Methods for Sampling and Analysis of Ambient Air - Determination of Particulates - Deposited Matter - Gravimetric Method.

Monitoring

19 The Proponent shall prepare and implement an Air Quality Monitoring Program for the project to the satisfaction of the Director-General. This program must:

(a) be submitted to the Director-General prior to the commencement of construction activities;
(b) be prepared in consultation with the DECC; and
(c) use a combination of high volume samplers and dust deposition gauges to monitor the performance of the project.

Box 1 – Project Approval Air Quality Conditions

3 AIR MONITORING PROTOCOL

3.1 Introduction

The Air Monitoring Protocol (AMP) has been prepared with reference to relevant legislation and guidelines to address the following matters relevant to the management of air pollutants produced by activities on the mine site.

- Air quality compliance criteria (see **Section 3.2**).
- Air quality controls and management procedures (see **Section 3.3**).
- Community consultation (see **Section 3.4**).
- Management of complaints (see **Section 3.5**).
- Monitoring methods and programs (see **Section 3.6**).
- Response to air quality compliance criteria exceedance (see **Section 3.7**)

3.2 Air Quality Compliance Criteria

Air quality compliance criteria for the operation of the mine, as incorporated in *Condition 3(18)*, have been established using relevant DECC guidelines and conditional requirements recommended by the DECC for inclusion in PA 06_0308. NMPL will ensure that dust and other particulate matter generated on the mine site does not result in exceedances of the criteria listed in **Table 1** at any residence on privately owned land, or on more than 25 percent of any privately-owned land.

Table 1 - Air Quality Impact Assessment Criteria

Pollutant	Criterion		Averaging Period
Total suspended particulate matter (TSP)	90μg/m^3		Annual mean
Particulate matter <10μm (PM_{10})	50μg/m^3		24-hour maximum
	30μg/m^3		Annual mean
Deposited dust	**Maximum increase in deposited dust level**	**Maximum total deposited dust level**	
	2.0g/m^2/month	4.0g/m^2/month	Annual mean
Note: Deposited dust is assessed as insoluble solids as defined by Standards Australia, 2003, AS 3580.10.1:2003: Methods for Sampling and Analysis of Ambient Air - Determination of Particulates - Deposited Matter - Gravimetric Method.			
Source: Modified after PA 06_0308 – Tables 7 to 9			

3.3 Air Quality Controls and Management Procedures

NMPL will adopt a range of design and operational safeguards and operational procedures for the mine to ensure that the effectiveness of the air quality controls are optimised throughout all stages of the mine's development and operation.

The controls have been selected largely based on their proven effectiveness at other mines.

Vegetation Clearing, Soil Stripping and Rehabilitation

- Fence off all land which is not to be disturbed to encourage natural regeneration.
- Establish ground cover on disturbed areas and emplacement areas as soon as possible.
- Minimise clearing ahead of construction and operational activities.
- Soil stripping will be undertaken at a time when there is sufficient soil moisture to prevent significant dust lift-off.
- NMPL will avoid stripping soil in periods of high winds.
- Dust suppression by water application will be used to increase soil moisture during periods of low soil moisture.

Drilling and Blasting Activities

- Drill rigs will utilise water injection or alternatively, be fitted with dust collectors.
- Blast hole stemming aggregates will be used to prevent venting of explosive gasses.
- Blasting will be conducted both before the establishment, and after the break-up of low-level atmospheric temperature inversions.

Overburden Ripping and Placement

- Ripping of softer overburden material will be avoided during periods of high wind.

Coal Mining

- Low moisture coal will be sprayed with water prior to excavation to raise moisture content to >6%.

Roads and Hardstand Area Construction

- Clearing ahead of road and construction activities will be minimised.
- Where appropriate, cleared areas will be watered regularly during construction.
- Truck speeds on roads under construction will be restricted to <50kph.

Coal Processing Area

- Water will be applied to the coal at the feed hopper, crusher and at all conveyor transfer and discharge points.
- All conveyors will be fitted with appropriate cleaning and collection devices to minimise the amount of material falling from the return of conveyor belts.
- Some flexibility will exist to temporarily cease operation in the event of protracted dry periods, high winds, or significant dust generation and dispersal towards the surrounding residences.

Wind Erosion of Open Cut Stockpiles

- The extent of clearing/site preparation in advance of mining will be minimised.
- Progressive rehabilitation of areas of disturbance, including topsoil and subsoil stockpiles will be undertaken.
- Bund walls and windbreaks will be constructed as required (SoC 11.22).

Internal Transport

- All access or haul roads will be clearly defined and vehicles and equipment will be restricted to those roads.
- The road for the transportation of coal product between the mine facilities area and mine entrance will be sealed.
- Internal roads will be regularly watered and chemical dust suppressant will be utilised if required.
- Earthmoving equipment and on-site vehicles will:
    - Be fitted with exhaust controls which satisfy NSW DECC emission requirements;
    - Be properly maintained and any mobile equipment which does not comply with NSW DECC guidelines will be removed; and
    - Have the exhausts of all equipment directed upwards or to the side so as not to cause dust lift-off.

External Transport

- All trucks carrying product coal from the mine will have the load covered with approved covers and the tailgates will be securely fixed to prevent windblown dust emission or spillages.

Blasting

- The following factors contributing to non-ideal detonation behaviour and higher emission (principally NO_2) concentrations will be avoided whenever possible.

- Weak overburden which reduces the necessary explosive confinement will be ripped in preference to blasting.
- Water infiltration.
- Long explosive columns.
- Explosive pre-compression, caused by hole-to-hole shock propagation due to wet overburden and clay veins.

The controls and management procedures will be reviewed in response to the results of air quality monitoring, complaints or comments identified through NMPL's consultation effort. Any changes made will be noted as part of annual environmental reporting (in the Annual Environmental Management Report (AEMR)).

3.4 Community Consultation

NMPL will maintain a positive dialogue with all members of the local community to avoid any adverse air quality impacts and/or misunderstandings arising from its activities. Consultation will be undertaken in several ways.

1. Formal and informal meetings with landowners / residents of land surrounding the site and other members of the local community with the greatest potential to be impacted by mine operations.
2. Quarterly Community Consultative Committee (CCC) meetings as required by *Condition 5(9)* of PA 06_0308. The CCC operates in general accordance with the Guideline for Establishing and Operating Community Consultative Committees for Mining Projects (Department of Planning, 2007), or its latest version.

3.5 Management of Complaints (Complaints Management Protocol)

Whilst all endeavours will be made by NMPL to avoid adverse air quality impacts on local landowners / residents, it is acknowledged that from time to time such impacts may occur. In order for NMPL to ensure an appropriate and consistent level of reporting, response and follow-up to any complaints, the following complaints management protocol will be adopted and followed.

- A publicly advertised telephone complaints line is in place to receive complaints during operating hours and record complaints at other times.
- Each complaint received will be recorded on a Complaints Register which will include the following details for air quality complaints:
  - The date and time of complaint.
  - Any personal details the complainant wishes to provide or if no such details are provided a note to that effect.
  - The nature of the incident that led to the complaint, including the time of the dispersal and its duration.
  - The action taken by NMPL in relation to the complaint, including any follow-up contact with the complainant.

  - If no action was taken by NMPL, the reason why no action was taken.

- The Environmental Manager will be responsible, in consultation with the Project Manager, for ensuring that an initial response is provided within 24 hours of receipt of a complaint (except in the event of complaints recorded when the mine is not operational).
- Data from the site weather station will be obtained for the time applicable to the complaint for use in determination of cause and identification of future remedial actions.
- Additional measures will be undertaken as required to address the complaint. This may include visiting the complainant, or inviting the complainant to the mine site.
- Once the identified measures are undertaken, the Environmental Manager will sign off on the relevant complaint within the Complaints Register.
- If necessary, follow-up monitoring will take place to confirm the source of the complaint is adequately mitigated.
- A copy of the Complaints Register will be kept by NMPL and made available to the CCC and the complainant (on request). A summary of complaints received every 12 months (if any) will be provided to DoP, GSC, DECC, DPI (MR) and the CCC through the AEMR.

Based on the nature of individual complaints, specific contingency measures may be implemented to the (reasonable) satisfaction of the complainant. The Environmental Manager retains ultimate responsibility to ensure that complaints received are properly recorded and addressed appropriately.

3.6 Monitoring Methods and Programs

Section 5 presents the air quality monitoring methods and procedures including details on monitoring locations, methods, frequency, parameters and reporting.

3.7 Response to Air Quality Criteria Exceedance

Conditions 3 & 4 of Schedule 5 of the Project Approval identify actions required in the event of an exceedance in Air Quality criteria. These requirements are as follows:-

- Notification to the Department of Planning and other relevant agencies within 24 hours of detecting an exceedance of the limits/performance criteria in the approval, or the occurrence of an incident that causes or may cause material harm to the environment.
- Within 6 days of the initial notification to the Department of Planning and other relevant agencies, provide a written report to the Department of Planning and other relevant agencies describing:
  - the date, time and nature of the exceedance;
  - the cause, or likely cause of the exceedance;
  - what action has been taken to date;
  - the proposed measures to address the exceedance.

In addition to the above notification protocol, the following response protocol is to be followed. It is noted that the response to an exceedance will vary depending on whether it is an exceedance of dust deposition or PM_{10}/TSP criteria.

1. Confirmation of Exceedance

The analysing laboratory will be contacted to ensure no error has been made in storing, analysing or recording the sample or result. Should this investigation conclude the treatment, analysis and result recording for the sample are satisfactory, NMPL will proceed to response point 2.

2. Notification (of exceedance)

Monthly dust deposition exceedance (4.0g/m^2/month)[1]: The Project Manager will be notified.

Exceedance of 24 Hour PM_{10} criteria (50µg/m^3): In the event that the PM_{10} level recorded for a single 24 hour period exceeds 50µg/m^3, the Environmental Manager will notify the DoP and DECC as to the nature of the exceedance(s) and all relevant records of activities and weather conditions during the 24 hour period. A single exceedance may be considered anomalous, however, repeated exceedances will require the preparation of a corrective action plan. PM_{10} monitoring will include observations of general dust conditions, additional sources of dust generation, and a copy of the relevant weather details as obtained from the site weather station.

Annual Average exceedance of dust deposition (4.0g/m^2/month) or PM_{10} (30µg/m^3) or TSP (90µg/m^3): In the event that the annual average dust deposition recorded at any off-site monitoring location exceeds 4.0g/m^2/month, or PM_{10} exceeds 30µg/m^3, or TSP exceeds 90µg/m^3 the Environmental Manager will notify the DoP and DECC as to the nature of the exceedance(s). Exceedance of the annual average levels will require the preparation of a corrective action plan.

3. Corrective Action Plan

In the event of an exceedance, NMPL will prepare a corrective action plan to reduce dust generation and thereby reduce dust deposition and/or PM_{10} concentrations around the mine site and return the operation to compliance. Preparation of the plan may require the assistance of a specialist air quality consultant. Details on the preparation of the corrective action plan will be included in the relevant AEMR and Environment Protection Licence Annual Return and to the DECC prior to implementation.

[1] It should be noted that the criteria for dust deposition is an annual average value and therefore a dust deposition value greater than the maximum criteria for any given month is not strictly an exceedance, rather an indication that should there be no change to dust generating or suppression activities then the probability of an exceedance once the annual average is calculated is high.

4. Re-assessment

Dust Deposition: In the event the annual average dust deposition level is exceeded in any calendar year, particular attention will be paid during the following 12 months to achieve compliance. The corrective action plan discussed above will be the main control designed to lower the annual average dust deposition level.

In the event that the annual average does not comply in a second year, a revised corrective action plan (of Step 3) will be required, this time requiring the input of a specialist air quality consultant.

PM_{10}/TSP: Compliance with PM_{10}/TSP concentration compliance criteria will be reassessed following the completion of the corrective action plan. In the event that a repeated non-compliant result is recorded, a revised corrective action plan (Step 3) will be implemented, this time requiring the input of a specialist air quality consultant.

5. Notification (of compliance)

NMPL will notify the DoP and DECC and other relevant government agency(ies) and local stakeholder(s) of the return to compliance following the successful completion of Step 4.

6. Independent Review and Land Acquisition

If NMPL fails to establish compliance with the air quality criteria at surrounding residences, or on 25% of privately-owned land, or following a legitimate complaint from a resident / land owner of criteria exceedance, NMPL will, following instruction from the Director-General, commission a suitably qualified person to conduct an independent review.

7. Reporting

The recorded exceedance, corrective actions and reassessment will be reported to the CCC and included in each relevant AEMR.

3.8 Responsibilities and Accountabilities

Throughout the mine's operational life, the Project Manager will have overall responsibility for ensuring contractors, employees and service providers comply with all laws, regulations, licences, and approvals.

All persons undertaking any form of work on the site will be required to attend a site-specific induction at which they will be instructed in the environmental rules, procedures and processes applicable to their activities whilst they are on the site.

4 MONITORING AND REPORTING

4.1 Introduction

NMPL will undertake sufficient monitoring to assess air quality impacts from its activities. Air quality compliance criteria are provided in Section 3.2. The Air Quality Monitoring Program will target the main pollutants provided in **Table 1**.

4.2 Parameters Measured

Various activities on the mine site will emit dust in various forms, namely total suspended particulate matter (TSP), particulate matter with aerodynamic diameters less than 10μm (PM_{10}) and deposited dust, which is assessed as insoluble solids as defined by Standards Australia, 2003, AS 3580.10.1:2003: Methods for Sampling and Analysis of Ambient Air - Determination of Particulates - Deposited Matter - Gravimetric Method.

Table 1 presented the approved criteria in relation to the concentrations or deposition rates (in the case of deposited dust) that must not be exceeded at any residence on, or on more than 25 percent of, any privately-owned land. Monitoring will assess the project compliance with these criteria on land and at residences surrounding the mine site.

A record of site activities undertaken and meteorological records during the period of recording would also be retained.

Direct TSP monitoring is not proposed to be undertaken as PM_{10} concentrations are considered of greater significance given its synergies with health-related issues. It is also recognised that the PM_{10} particle size fraction is typically in the order of 50% of the TSP mass in rural areas *(Heggies, 2007)* and as a consequence, the achievement of the PM_{10} annual average goal will ensure the annual TSP goal is achieved. Reporting against TSP criteria will therefore be based on a calculation, multiplying the recorded PM_{10} results by a factor of 2.

4.3 Monitoring Locations

Figure 2 presents the locations of the six dust deposition gauges and two PM_{10} HVAS. The locations of the sites have been selected taking into account local meteorological conditions, the proximity of surrounding residences and the locations of likely dust emission sources from the mine site.

Additional dust gauges will be established at residences more distant to the existing gauges in the event the gauges exhibit regular exceedances attributable to the mine's operation.

It should be noted that the location of the monitoring equipment is subject to negotiation with the landowner and monitoring sites may change if permission to operate equipment is refused.

Table 2 presents a summary of the air quality monitoring sites included in the AQMP.

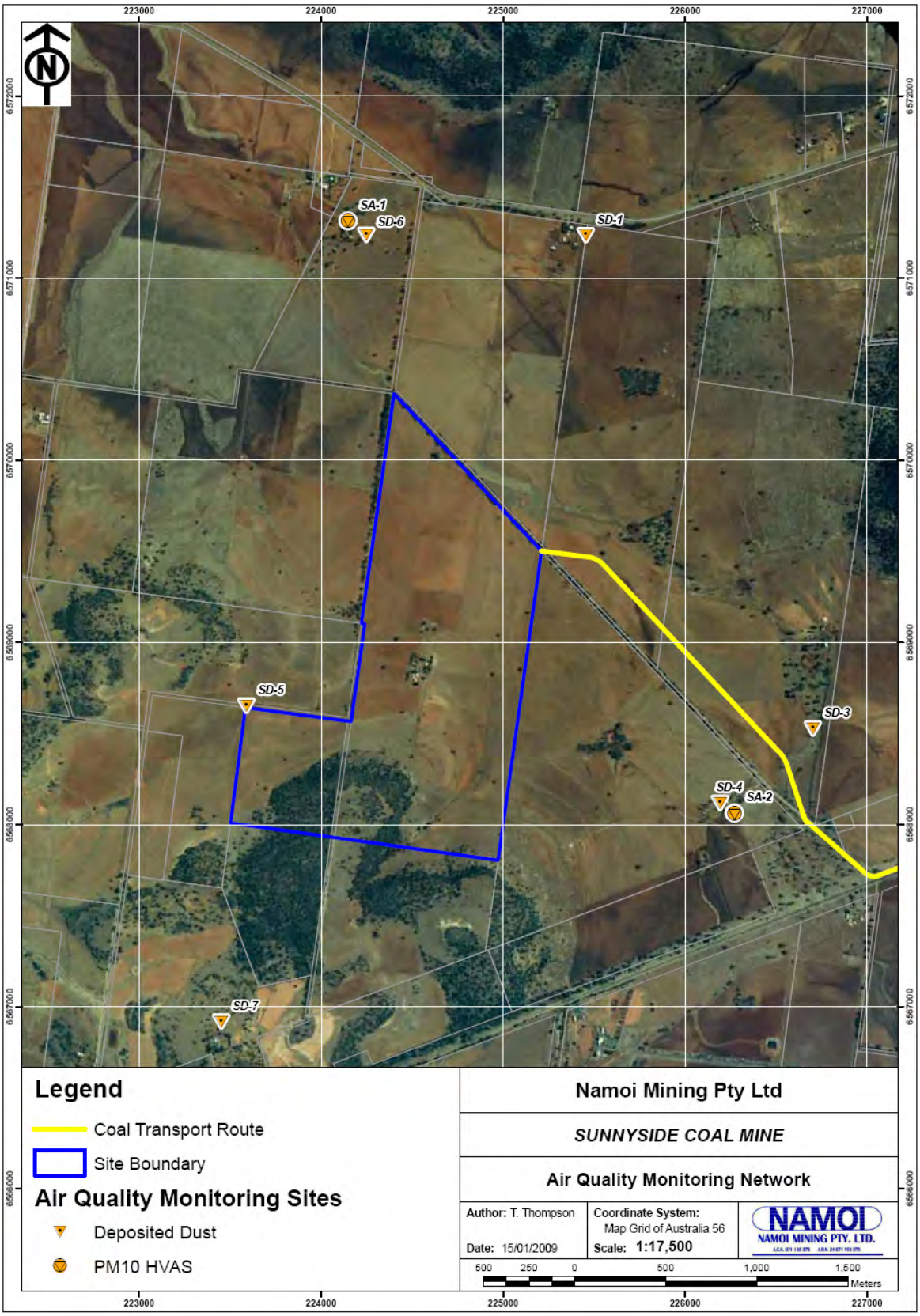

Figure 2 - Air Quality Monitoring Network

Table 2 - Air Quality Monitoring Locations

Reference	EPL ID #	Location			Parameters	
		Easting (MGA 56)	Northing (MGA 56)	Property/ Residence	Deposited Dust	PM_{10}
SD-1	1	225458	6571235	*"Ferndale"*	✓	--
SD-3	2	226706	6568527	*"Plainview"*	✓	--
SD-4	3	226196	6568119	*"Lilydale"*	✓	--
SA-2	8	226271	6568063		--	✓
SD-5	4	223593	6568653	*"Ivanhoe"*	✓	--
SD-6	5	224252	6571237	*"Illili"*	✓	--
SA-1	7	224148	6571313		--	✓
SD-7	6	223455	6566918	*"Innisvale"*	✓	--

4.4 Monitoring Frequency

Monitoring of deposited dust will be undertaken monthly in accordance with AS/NZS 3580.10.1-2003.

Monitoring of PM_{10} will be undertaken for 24 hours once every 6 days in accordance with the DECC state schedule for PM_{10} monitoring.

5 DATA REPORTING AND RECORDING

5.1 Data Recording

For each deposited dust monitoring location, once each month the glass container used to capture the deposited dust will be removed, replaced and sent to a NATA accredited laboratory for analysis. For each PM_{10} HVAS, after each monitoring event, the pre-weighed filter will be removed, replaced and sent to a NATA accredited laboratory for analysis. The filters will be sent to the laboratory for analysis on a weekly basis, and will coincide with the filters papers being sent from other Whitehaven related projects. The laboratory will be requested to provide immediate advice on the determination of an exceedance in the 24hr criteria to enable immediate on-site measures to be taken to reduce the potential for future exceedance.

The following information will be recorded at each deposited dust monitoring location:

- Date and time of removal and replacement.
- Condition of the dust gauge.
- Notable ground disturbances or activities ongoing in the general activity (not associated with the activities on the mine site).
- Any other notable activities or conditions at or around the monitoring location.

The following information will be recorded at each PM_{10} HVAS monitoring location:

- Date of operation
- PM_{10} HVAS location and ID
- Filter paper number
- The flow (m^3/hr) and run-time reading for the start and end of a monitoring event, along with total run time.
- Any notable activities or conditions at or around the monitoring location.

5.2 Data Reporting

The results of all air quality monitoring will be made publicly available at the GSC office and at WCMPL's Gunnedah office. In accordance to PA 06_0308 *Condition 5(11)*, monitoring results will be provided on the Whitehaven website. These results will be updated at least every three months.

Each year, the results of air quality monitoring program will be summarised and presented in the AEMR together with reference to the prevailing meteorological data and site activities during the measurement period(s). Reporting will also include an analysis of the monitoring results against the criteria listed in **Table 1**, previous monitoring results and predictions made in the EA. Based on these results, trends in the air quality levels will be identified and any non-compliance noted.

The recording of an exceedance of air quality criteria identified in **Table 1** will trigger the implementation of contingency measures described in **Section 3.7** of the AQMP.

6 RELATED DOCUMENTS

Monitoring of dust deposition and data recording will be undertaken in accordance with:

- AS 3580.1.1:2007 "Methods for sampling and analysis of ambient air – Guide to siting air monitoring equipment" (NSW DEC Method AM-1); and
- AS 3580.10.1-2003 "Methods for Sampling and Analysis of Ambient Air - Determination of Particulates - Deposited Matter - Gravimetric Method" (NSW DEC Method AM-19).

Monitoring of PM_{10} and data recording will be undertaken in accordance with:

- "Approved Methods for the Sampling and Analysis of Air Pollutants in New South Wales", DEC 2005;
- AS 3580.1.1:2007 "Methods for sampling and analysis of ambient air – Guide to siting air monitoring equipment" (NSW DEC Method AM-1);
- AS/NZS 3580.9.6 - 2003 "Methods for sampling and analysis of ambient air – Determination of suspended particulate matter – PM_{10} high volume sampler with size-selective inlet – Gravimetric Method" (NSW DEC Method AM-18); and
- AS/NZS 3580.9.3 – 2003 "Methods for sampling and analysis of ambient air – Determination of suspended particulate matter – Total Suspended Particulate Matter (TSP) – High volume sampler gravimetric method".