ENVIRONMENTAL MONITORING PROGRAM

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ACRONYMS USED THROUGHOUT THIS DOCUMENT

DP&E	-	Department of Planning and Environment
EMP	-	Environmental Monitoring Program
EPA	-	Environment Protection Authority
LALC	-	Local Aboriginal Land Council
NGERS	-	National Greenhouse and Energy Reporting Scheme
NMPL	-	Namoi Mining Pty Ltd
PA	-	Project Approval

1 INTRODUCTION

This Environmental Monitoring Program (EMP) has been prepared in accordance with Schedule 5, Condition 2 of Project Approval (PA) 06_0308 for the Sunnyside Coal Project (Sunnyside). Sunnyside is operated by Namoi Mining Pty Ltd (NMPL), a subsidiary company of Whitehaven Coal Limited. Mining operations at Sunnyside were suspended in late November 2012 and recommenced in late 2017.

As illustrated in Figure 1, Sunnyside is located approximately 15km west of Gunnedah. The project layout is shown in Figure 2.

The purpose of the EMP is to consolidate the various monitoring requirements in Schedule 3 of PA 06_0308 into a single document. Aspect specific management plans should be referred to for more detail on requirements.

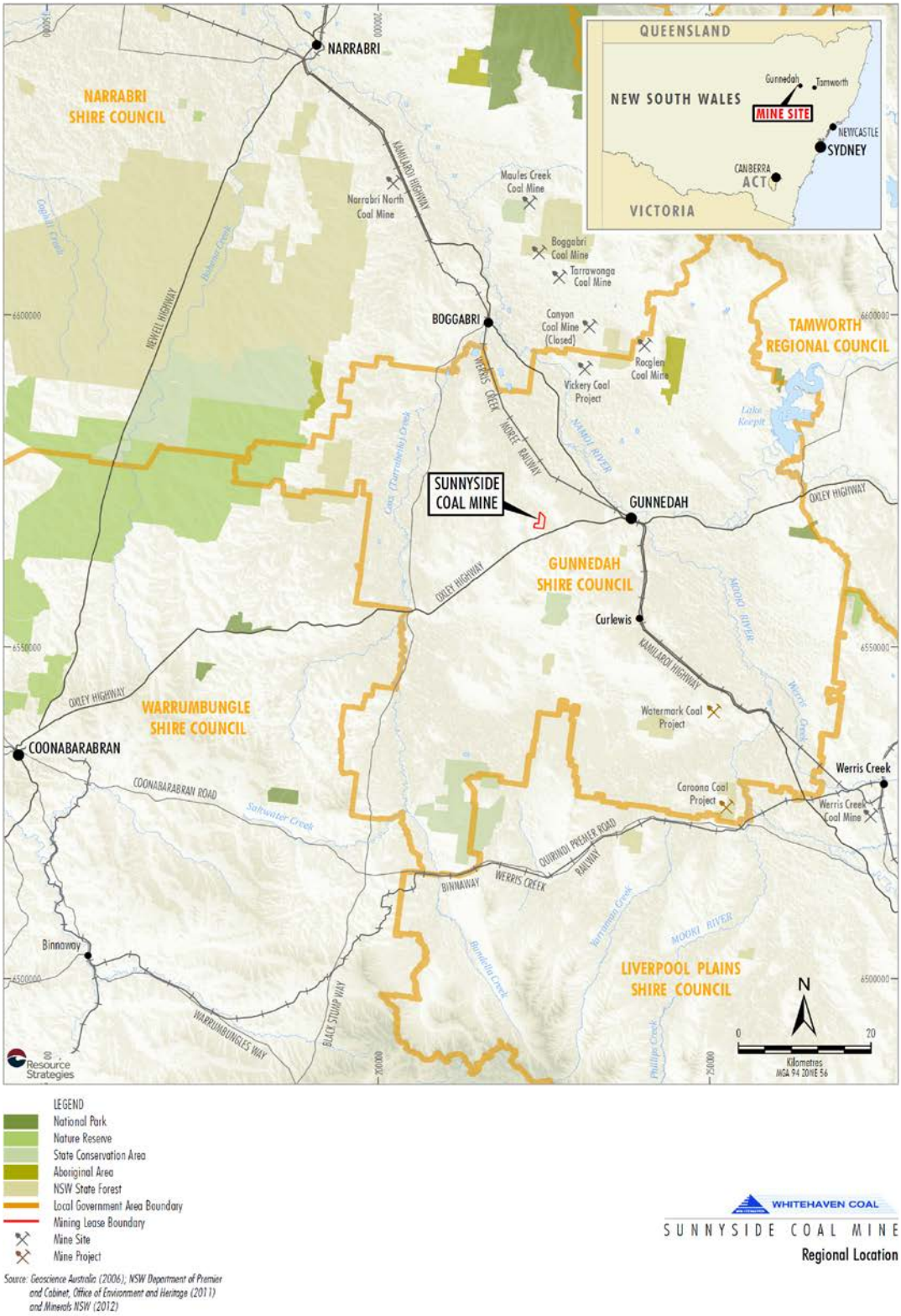

Figure 1 - Regional Location

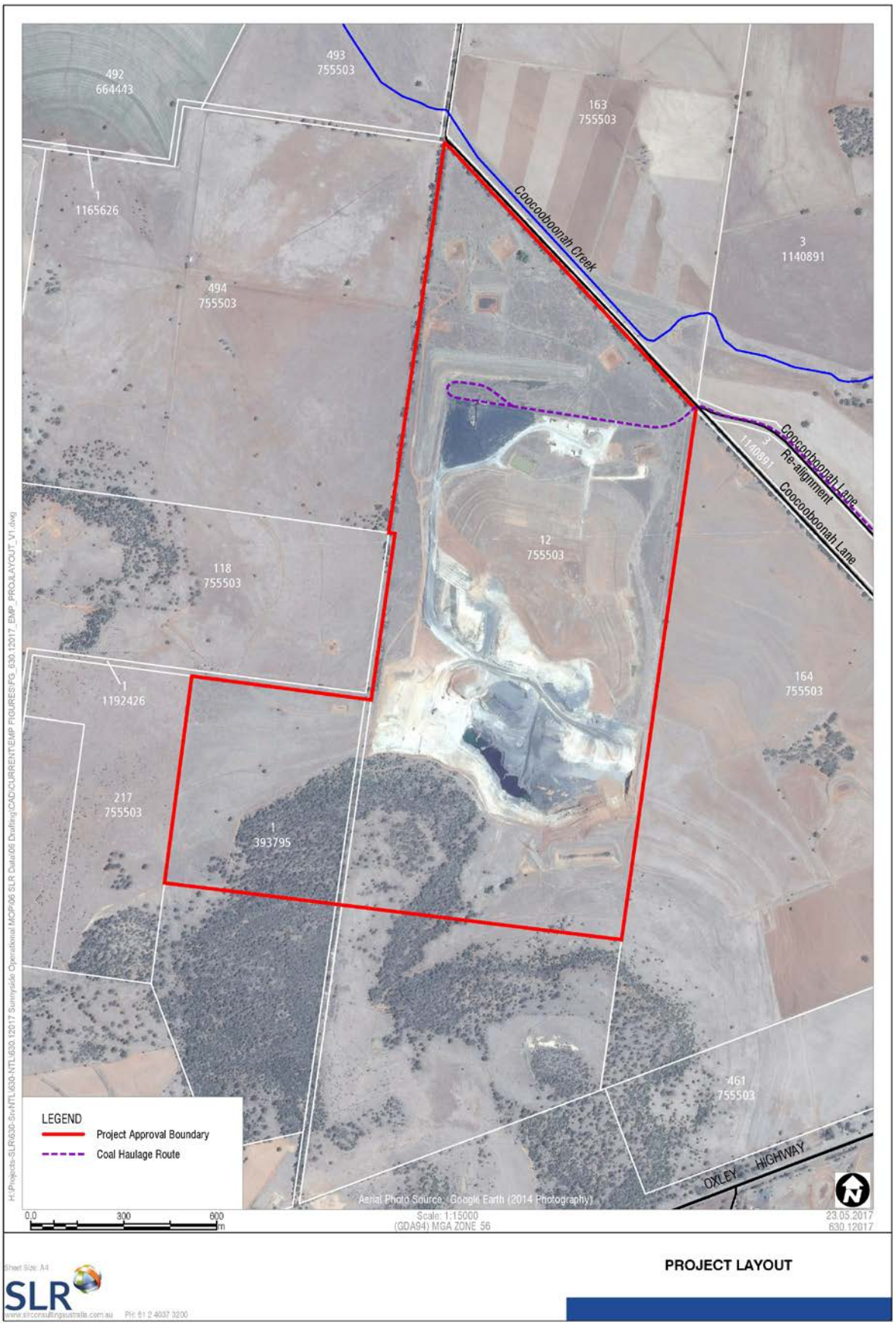

Figure 2 - Project Layout

2 MONITORING REQUIREMENTS

2.1 Air Quality

The air quality criteria, as per Condition 3(18) of PA 06_0308, is detailed in Table 1.

Table 1 – Air Quality Criteria

Pollutant	[d] Criterion		Averaging Period
Total suspended particulate matter (TSP)	[a] 90µg/m^3		Annual
Particulate matter <10µm (PM_{10})	[a] 50µg/m^3		24 hour
	[a] 30µg/m^3		Annual
[c] Deposited dust	**Maximum increase in deposited dust level**	**Maximum total deposited dust level**	
	[b] 2.0g/m^2/month	[a] 4.0g/m^2/month	Annual

Notes:
a Total impact (ie. incremental increase in concentrations due to the development plus background concentrations due to all other sources);
b Incremental impact (ie. incremental increase in concentrations due to the development on its own);
c Deposited dust is to be 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; and
d Excludes extraordinary events such as bushfires, prescribed burning, dust storms, sea fog, fire incidents or any other activity agreed by the Secretary.

Monitoring is to be conducted at the residences listed in Table 2.

Table 2 – Air Quality Monitoring Locations

Property	Deposited Dust	PM^{10}
SD1 - Ferndale	✓	
SD3 - Plainview	✓	
SD5 - Ivanhoe	✓	
SD6 - Illili	✓	
SA1 - Illili		✓
SD7 - Innisvale	✓	

2.2 Blasting

The airblast overpressure and ground vibration blasting criteria, as per Conditions 3(10) and 3(11) of PA 06_0308, is detailed in Table 3.

Table 3 - Blasting Criteria

Location	Airblast overpressure (dB(Lin Peak))	Ground vibration (mm/s)	Allowable exceedance
Residence on privately-owned land	115	5	5% of the total number of blasts in a 12 month period
	120	10	0%

However, these criteria do not apply if Sunnyside has a written agreement with the relevant landowner to exceed the criteria, and has advised the Department in writing of the terms of this agreement.

Monitoring is to be conducted at the residences listed in Table 4.

Table 4 – Blast Monitoring Locations

Property
Innisvale
Ivanhoe
Illili
Plainview
Ferndale

2.3 Noise

The noise criteria, as per Schedule 3, Conditions 2, 3, 4 and 6 of PA 06_0308, is detailed in Table 5, which should be read in conjunction with the full conditions in PA 06_0308.

Table 5 - Noise Criteria

Location	Day/Evening			
	Construction Noise	Operational Noise	Land Acquisition	Traffic Noise
	$L_{A10(15\ minute)}$	$L_{Aeq(15\ minute)}$	$L_{Aeq(15\ minute)}$	$L_{Aeq(1\ hour)}$
Any residence on, or more than 25% of, any privately owned land (except at “Lilydale”)	40	35	40	
Any residence adjacent to Torrens Road				55

These criteria do not apply if there is a written agreement with the landholder of any affected land, and a copy of the agreement has been provided to DP&E and EPA. Further, “Lilydale” is now mine owned.

Monitoring is to be conducted at the properties listed in Table 6.

Table 6 - Noise Monitoring Locations

Property
Illili
Ferndale
Plainview
Glendower
Torrens Lane (for road noise)

2.4 Water

Table 7 presents the surface water monitoring schedule to be implemented.

Table 7 - Surface Water Monitoring Schedule

Location	Parameter	Frequency
Storage Dams SD3 and SD4	Electrical Conductivity, pH, Total Suspended Solids, Oil and Grease, Total Organic Carbon	Once when discharging water
Pit Void water	Electrical Conductivity, pH, Total Suspended Solids, Oil and Grease, Total Organic Carbon, Total Metals, Nutrients	Annually Prior to discharge into underground workings
Upstream and downstream of the Project Site's runoff into Coocooboonah Creek.	Electrical Conductivity, pH, Total Suspended Solids, Oil and Grease, Total Metals, Nutrients, Total Organic Carbon.	Once discharging from the site

Total Metals will include Iron (Fe), Copper (Cu), Zinc (Zn), Lead (Pb), Arsenic (As), Cadmium (Cd), Aluminium (Al), Mercury (Hg), Molybdenum (Mo), Manganese (Mn) and Nickel (Ni). Nutrients will include Total Phosphorus and Total Nitrogen.

Bores are measured for Standing Water Level (SWL), field pH and electrical conductivity (EC) on a quarterly basis. Groundwater samples are collected on a six monthly basis and analysed for major ions (TDS, Na, K, Ca, Mg, Cl, HCO3, NO3, SO4 and hardness) and selected filtered (0.45μm) metals including Iron (Fe), Copper (Cu), Zinc (Zn), Lead (Pb), Arsenic (As), Cadmium (Cd), Aluminium (Al), Mercury (Hg), Manganese (Mn), Boron (B), Barium (Ba), Beryllium (Be), Cobalt (Co), Chromium (Cr), Nickel (Ni), Selenium (Se), Vanadium (V), at a NATA registered laboratory.

Table 8 - Groundwater Monitoring Program

Location	Parameters
Coocooboonah Ck Alluvium Bores P1 and P2	Manual SWL, field pH, EC Detailed Analysis
Hoskisson Coal Seam Bore P3	Manual SWL, field pH, EC
	Detailed Analysis
Shallow Marine Facies and Melville Seam Bores P7 and P8	Manual SWL, field pH, EC
	Detailed Analysis
Potential Drawdown Bore intake above Hoskisson Seam Bore 3709 Ivanhoe	Manual SWL, field pH, EC
	Detailed Analysis
Potential drawdown intake within Hoskisson seam Bores 22497 Coocooboonah and 44677 (and production bore) “Werona”	Manual SWL, field pH, EC
	Detailed Analysis
Potential drawdown intake beneath Hoskisson seam or within Melville seam Bores 44884 and 6249 “Lilydale”	Manual SWL, field pH, EC
	Detailed Analysis
Bores 27356, 45061, and 901460	Manual SWL, field pH, EC
	Detailed Analysis

2.5 Rehabilitation

Rehabilitation monitoring will be undertaken in accordance with requirements of the Mining Operations Plan.

2.6 Aboriginal Cultural Heritage

The coverage of the identified site by matting will be checked prior to the resumption of blasting on site and quarterly thereafter to ensure it remains secure.

NMPL will invite nominated representatives from the Red Chief LALC and Bigundi Biame Gunnedarr Traditional People to monitor all soil stripping and ground disturbance work, in areas not already disturbed by mining, throughout the life of the mine.

2.7 Energy

Diesel use by plant and equipment is recorded and energy use will be monitored via NGERS reporting requirements.

2.8 Waste

Records will be retained on all wastes transported from site for recycling or disposal. Records of disposal of tyres with the pit footprint, in terms of number and location, will be maintained.

2.9 Koalas

A sightings register will be maintained onsite.

3 DOCUMENT REVIEW

This document will be reviewed in accordance with the requirements of Condition 5(5A) of PA 06_0308.