

# **Environmental Monitoring Schedule**



**Mt Shamrock Quarry - Pakenham**

**18<sup>th</sup> January, 2008**

## Mt Shamrock Quarry – Pakenham Monitoring Schedule Summary

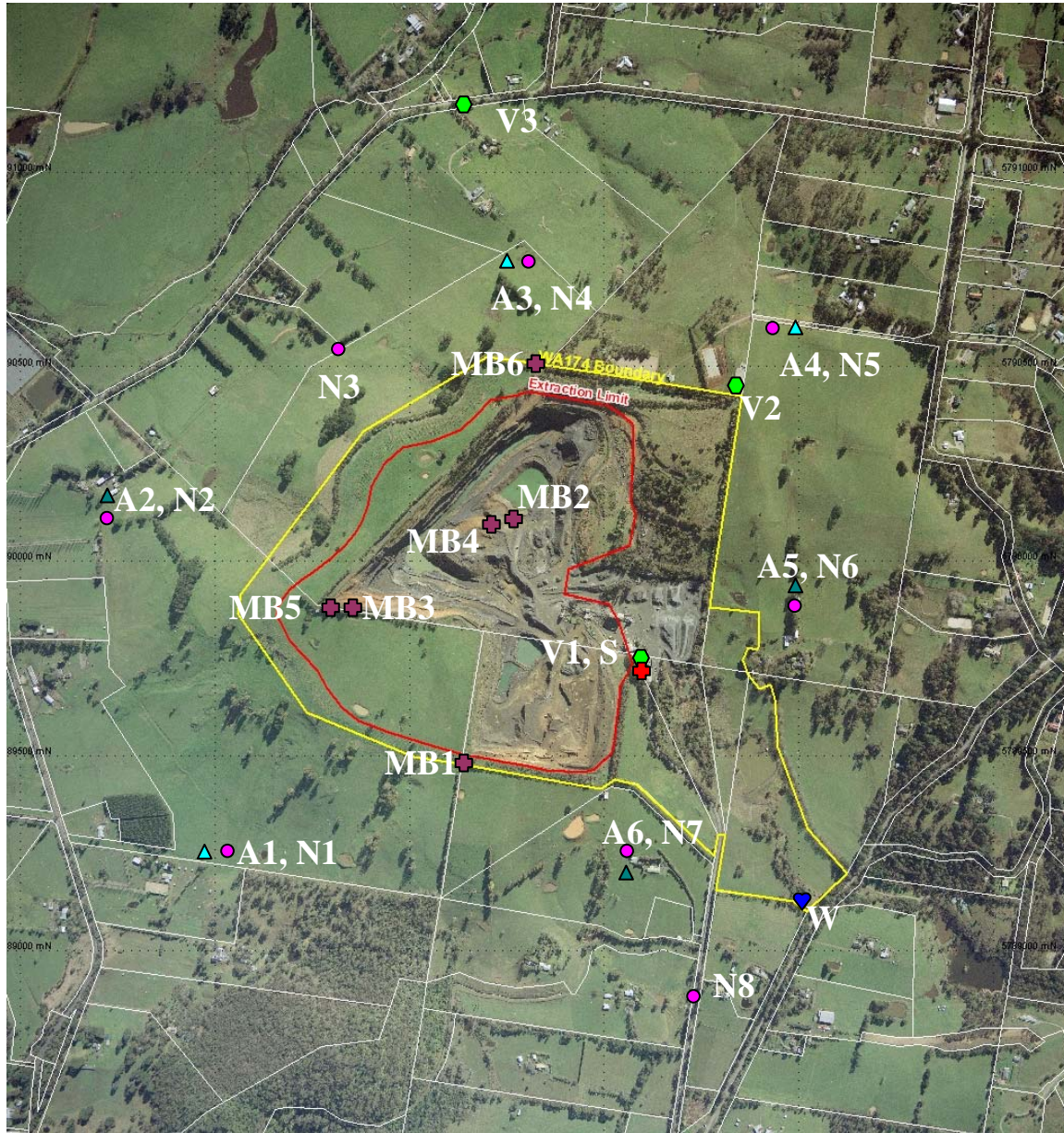
This document summarises the monitoring and testing requirements for the development and operation of the Rinker (Readymix) Pty Limited quarry located at Mt Shamrock, Pakenham. The accompanying Locality Plan (Figure 1) shows the monitoring and testing locations referred to by the various schedules. It is intended that the results of the monitoring will be reviewed at least annually and the schedule revised as necessary to ensure effective control of the impacts of the development and operations.

Wherever possible, monitoring will be conducted by trained Rinker (Readymix) Pty Limited personnel.

Item	Test	Done By	Frequency	Standard / Criteria
Airborne Dust	High Volume Deposition	Specialist consultants	Continuous Monthly	Planning Permit Conditions
Operating Noise	Noise Monitoring (hand-held)	Specialist consultants	Fortnightly Daily as required	State Environmental Protection Policy (Control of Noise from Commerce, Industry and Trade) No. N-1, 1989 (as amended)
Blasting	Air Blast Ground Vibration	Shot Firer / Manager / Specialist consultant	Each blast	Planning Permit Conditions
Surface Water	As per licence conditions	Readymix Personnel \ Specialist consultants	When discharging	EPA discharge licence DW/903
Ground Water	Level Gauging	Readymix Personnel Specialist consultants	3 monthly	URS Groundwater Report
Slope Stability	Visual assessment	Readymix Personnel & Specialist consultants as required	6-monthly, Annually	Planning Permit Conditions
Donazzan's Dam	Geotechnical Report	Specialist consultants	5 years	
Greenhouse Gases	Recording power usage	Readymix personnel	Annually	EPA Publication No. 824
Traffic Management	Visual assessment	Readymix personnel	Monthly	Planning Permit Conditions
Net Gain Offset Site	Management Audit	Specialist consultants	End of years 1, 2, 5, 7 & 10	Planning Permit Conditions & DSE Net Gain Guidelines
Fire Management	Inspections, AS1851	Readymix personnel	6-monthly, annually	Australian Standard
Rehabilitation & Vegetation	Landscape Report Status Report & Recommendation	Readymix Personnel Specialist consultants	Annually 5 Year	Work Authority Conditions

Note: See locality plan for legend to monitoring locations

**READYMIX, MOUNT SHAMROCK QUARRY PAKENHAM**  
**Figure 1: Environmental Monitoring Locations**

**LEGEND:**

- ▲ A = Air monitoring location ( ▲ signifies high volume compliance monitoring station at A2, A5, A6)  
 (Note: Background PM<sub>10</sub> monitoring also at address to be determined)
- N = Noise Monitoring location
- V = Blast Vibration and Noise Overpressure location
- ♥ W = Surface Water Sampling Point
- MB = Groundwater monitoring bores
- S = Weather Station

### MONITORING STATION LOCATIONS

Monitoring Station		Description	GPS Co-ordinates
A1	Air Monitoring	Continuous Airborne Fine Particles (Reactive Monitor), Deposition dust gauge	TBC
A2	Air Monitoring	Continuous Airborne Fine Particles (High Volume Compliance Monitor), Deposition dust	TBC
A3	Air Monitoring	Continuous Airborne Fine Particles (Reactive Monitor), Deposition dust gauge	TBC
A4	Air Monitoring	Continuous Airborne Fine Particles (Reactive Monitor), Deposition dust gauge	TBC
A5	Air Monitoring	Continuous Airborne Fine Particles (High Volume Compliance Monitor), Deposition dust	TBC
A6	Air Monitoring	Continuous Airborne Fine Particles (High Volume Compliance & Reactive Monitors), Deposition dust	TBC
N1	Noise Survey Point	Routine and Periodic Noise Monitoring	TBC
N2	Noise Survey Point	Routine and Periodic Noise Monitoring	TBC
N3	Noise Survey Point	Routine and Periodic Noise Monitoring	TBC
N4	Noise Survey Point	Routine and Periodic Noise Monitoring	TBC
N5	Noise Survey Point	Routine and Periodic Noise Monitoring	TBC
N6	Noise Survey Point	Routine and Periodic Noise Monitoring	TBC
N7	Noise Survey Point	Routine and Periodic Noise Monitoring	TBC
N8	Noise Survey Point	Routine and Periodic Noise Monitoring	TBC
V1	Vibration/ Overpressure Noise	Every Blast	TBC
V2	Vibration/ Overpressure Noise	Every Blast	TBC
V3	Vibration/ Overpressure Noise	Every Blast	TBC
MB1	Groundwater Bore	Quarterly	
MB2	Groundwater Bore	Quarterly	
MB3	Groundwater Bore	Quarterly	
MB4	Groundwater Bore	Quarterly	
MB5	Groundwater Bore	Quarterly	
MB6	Groundwater Bore	Quarterly	
W	V-notch Weir, Surface water discharge	Weekly during discharge	

**TBC = To Be Confirmed**

## 1. Airborne Dust

Item	Test	Responsibility	Frequency	Assessment Methodology	Acceptance Criteria
<p>Fixed Station Continuous Dust Monitoring.</p> <p>(Refer to Figure 1 for locations to be used.</p> <p>2x Compliance monitors will be in use at any one time on a rotational basis around the 3x sites)</p>	<p>Airborne Dust (fine particles (PM<sub>10</sub>))</p> <p>Deposition</p>	<p>Technical Officer (certified in accordance with the independent certification procedure)</p>	<p>Continuous (one in six day cycle)</p> <p>Monthly</p>	<p>AS3580.9.6-1990 Ambient Air - Determination of Suspended Particulate Matter PM<sub>10</sub> - High Volume sampler with Size Selective Inlet Gravimetric Method</p> <p>Size Selective Inlet Air Sampling: AS 2922-1987, Ambient Air- Guide For the Siting of Sampling Units</p> <p>AS/NZS 3580.10.1:2003 : Methods for sampling and analysis of ambient air - Determination of particulate matter - Deposited matter - Gravimetric method</p>	<p>PM<sub>10</sub> 60µg/m<sup>3</sup> 24-hour average;</p> <p>Dust deposition 4g/m<sup>3</sup>/month (no more than 2g/m<sup>3</sup>/month greater than background)</p>
<p>A series of locations near sensitive receptors identified based on EPA discussions. (Refer Figure 1 for locations</p>	<p>Airborne Dust (PM<sub>10</sub>) as µg/m<sup>3</sup></p>	<p>Quarry Manager</p>	<p>Continuous whilst quarry in operation</p>	<p>Real time dust monitoring with data logger and hourly averages.</p>	<p>PM<sub>10</sub> (1 hour ave.) – 64 µg/m<sup>3</sup> (ie80% of the SEPP AQM criteria of 80 µg/m<sup>3</sup> to enable</p>

4x Reactive monitors will be used on a monthly rotational basis across any of the Air monitoring locations specified.)				As there is no standard specified. A portable <i>DustTrak/ Osiris/ Airmetrics</i> type unit will be employed.	<i>reactive management of dust emission)</i>
A location representative of background conditions as identified in Figure 1.	Airborne Dust	Technical Officer (certified in accordance with the independent certification procedure)	Continuous (one in six day cycle)	AS3580.9.6-1990 Ambient Air - Determination of Suspended Particulate Matter PM <sub>10</sub> - High Volume sampler with Size Selective Inlet Gravimetric Method  Size Selective Inlet Air Sampling: AS 2922-1987, Ambient Air- Guide For the Siting of Sampling Units	N/A
Weather Station (Refer Figure 1 for Location)	Wind speed and direction	Technical Officer (certified in accordance with the independent certification procedure)	Continuous (hourly averages)	Wind Velocity: AS 2923-1987, Guide for the Measurement of Horizontal Wind for Air Quality Applications	N/A

## 2. Operating Noise

Item	Test	Responsibility	Frequency	Assessment Methodology	Acceptance Criteria
Routine noise monitoring at closest sensitive receptors surrounding the quarry. (see Figure 1)	Noise level at all Monitoring Locations	Technical Officer (independently certified)	Fortnightly	State Environmental Protection Policy (Control of noise from commerce industry and trade) No. N-1 1989 (as amended)	Day 0700-1800hrs 45 dB(A) $L_{Aeq}$
Periodic noise monitoring at commencement of change in quarry activities e.g. near surface extraction.	Noise level at all Monitoring Locations	Technical Officer (independently certified)	Daily until consistent compliance obtained	State Environmental Protection Policy (Control of noise from commerce industry and trade) No. N-1 1989 (as amended)	Day 0700-1800hrs 45 dB(A) $L_{Aeq}$
Periodic noise monitoring during noise attenuation mound construction works	Noise level at all Monitoring Locations	Technical Officer (independently certified)	Daily during mound works	State Environmental Protection Policy (Control of noise from commerce industry and trade) No. N-1 1989 (as amended)	Day 0700-1800hrs 68 dB(A) $L_{Aeq}$
Monitoring in response to a "justified complaint"	Noise level at Complainant's Residence	Technical Officer (independently certified)	As required	State Environmental Protection Policy (Control of noise from commerce industry and trade) No. N-1 1989 (as amended)	Day 0700-1800hrs 45 dB(A) $L_{Aeq}$

### 3. Blasting

Item	Test	Responsibility	Frequency	Assessment Methodology	Acceptance Criteria
Monitoring Stations V1, V2 and V3 (refer Fig 1) or as directed by an Inspector.	Peak Particle Velocity (PPV) (Ground Vibration)	Specialist Consultants	Every blast	Department of Primary Industries Environmental Guideline - Ground Vibration and Airblast Limits for Blasting in Mines and Quarries 2001 – New Sites	PPV 5mm/sec for 95% of blasts in 12 Month period.
	Air Blast (Air Vibration)	Specialist Consultants	Every blast		Peak Airblast of 115dBL for 95% of blasts in 12 Month.

#### 4. Surface & Ground water

Item	Test	Responsibility	Frequency	Assessment Methodology	Acceptance Criteria
Dams #1 and #2	Visual Inspection for sedimentation and algae.	Technical Officer (independently certified)	At least monthly	Direct Observation	N/A
Settlement Ponds #1 and #2	Visual Inspection for sedimentation and algae.	Technical Officer (independently certified)	At least quarterly	Direct Observation	N/A
Donazzan's Dam	Visual Inspection for spillway erosion, sediment build-up, algae or other objectionable matter.	Technical Officer (independently certified)	Following storm events	Direct Observation plus photo record	Non eroding spillway
V-notch Weir	Flow Rate (Volume, time, date and duration of each discharge event)	Technical Officer (independently certified)	Continuous whilst discharge occurs	Standard Spreadsheet calc.	Annual Volume (TBD by EPA)
EPA Sampling Point	Total Dissolved Solids (TDS) Total Suspended Solids (SS) pH Turbidity Visible floating oil,	Technical Officer (independently certified)	Weekly during discharge	EPA Licence Conditions; Certified Procedure	EPA Licence Conditions (Maximum) Turbidity = 30 NTU SS = 40 mg/L TDS = 650 mg/L pH 6.5 – 9.0 <i>(Note: 12 month median)</i>

Item	Test	Responsibility	Frequency	Assessment Methodology	Acceptance Criteria
	grease, scum, litter or other objectionable floating matter				<i>levels are also specified for turbidity and SS)</i>
Monitoring Bore MB1 to MB6	Level Gauging (Standing Water Height)	Quarry Personnel or Specialist consultant / technical officer	quarterly (January, April July, October)	AS5667.11:1998 or similar	Plot trends and any significant changes in groundwater levels, report in Site Environmental Management Program

## 5. Slope Stability

Item	Test	Responsibility	Frequency	Assessment Methodology	Acceptance Criteria <sup>#</sup>
Overburden Stockpiles, Crushed Stockpiles and Operating Faces	Visual inspection for changes in seepage conditions, cracking, movement (bulging or slips)	Technical Officer (independently certified)	Six monthly (or at completion of overburden placement or removal)  After heavy rain	Direct Aerial Observation  Walk-over	N/A
Rehabilitation of Operational Areas	Visual inspection for changes in seepage conditions, cracking or movement (bulging or slips)	Technical Officer (independently certified)	Annually	Direct Observation	N/A
Land Slips – Toomuc Valley, general	Visual Inspection of vegetation planting spring and land surface stability	Technical Officer & specialist consultants	Six monthly & after heavy rain	Direct Observation	N/A
Land Slips – Toomuc Valley, closest to blast	Visual Inspection of vegetation planting and land surface stability	Technical Officer (independently certified)	Following each blast	Direct Observation	N/A
New Planting or drainage works	Visual Inspection of vegetation planting and land surface stability	Technical Officer (independently certified)	Within 6 months following works	Direct Observation	N/A

## 6. Greenhouse Gases

Item	Test	Responsibility	Frequency	Assessment Methodology	Acceptance Criteria
Fuel usage	-	OIM	Annual	Usage per tonne	5% reduction
Electricity usage	-	OIM	Annual	KWh per tonne	5% reduction
Explosives usage	-	OIM	Annual	Tonne per tonne	5% reduction

## 7. Traffic Management

Item	Test	Responsibility	Frequency	Assessment Methodology	Acceptance Criteria
Construction of left hand turning lane	N/A	QM	6 monthly	Progress status report	On track to meet timing requirement
	VicRoads approval		At completion of works	N/A	To VicRoads or Council satisfaction
Truck wheels clean before entering public roadways	Visual inspection – wheels and roads	Technical Officer	Monthly	Housekeeping check <sup>+</sup>	No dirt tracked onto public roadways
Spillage of materials from vehicles leaving site	Visual inspection – vehicles and roads	Technical Officer	Monthly	Housekeeping check <sup>+</sup>	No materials spilled onto public roadways
Truck queuing during early morning movements	Visual inspection – vehicles	Technical Officer	Monthly	Housekeeping check <sup>+</sup>	No queuing of trucks during early morning movements (pre-7:00am)
<i>'Trucks must not use engine brakes on Mt Shamrock Road'</i> signage	Visual inspection	Technical Officer	Monthly	Housekeeping check	Sign is clearly visible to truck drivers leaving the quarry.

Note: + - any daily noted excursions are to be recorded within the incident register.

## 8. Nett Gain Offset Management Plan

Item	Test	Responsibility	Frequency	Assessment Methodology	Acceptance Criteria
Offset Site Management Audit	-	PM	End of years 1, 2, 5, 7 & 10	DSE, 2004 (reference 7)	Compliance with Permit and DSE Net Gain Guidelines (reference 6)

## 9. Fire Management

Item	Test	Responsibility	Frequency	Assessment Methodology	Acceptance Criteria
Fire/evacuation drill	Fire/evacuation alarm sounded without prior notice	Quarry Manager	annually	Quarry Emergency Procedures flip chart	All personnel safely evacuate in timely manner
Smoke detectors	Detector sounded (battery replaced)	Technical Officer	6 monthly	Manufacturer's specification	All units fully operational
Fire prevention works	Inspection	Technical Officer	Annually prior to "Fire Danger Period"	Visual observation	Completed as agreed with Responsible Authority/CFA
Fire fighting equipment – mobile	Equipment fully operational	Technical Officer	6 monthly	Manufacturer's specification	No faults
Fire fighting equipment – other	Systems and equipment fully operational	Technical Officer	AS1851	AS1851 – Maintenance of fire protection systems and equipment	No faults/failures

## 10. Dam Integrity

<b>Item</b>	<b>Test</b>	<b>Responsibility</b>	<b>Frequency</b>	<b>Assessment Methodology</b>	<b>Acceptance Criteria</b>
Dam Integrity Review	To be nominated by Specialist	Specialist Geotechnical Consultant	5 years	To be nominated by Specialist	Certification statement by specialist

## 11. Rehabilitation & Vegetation

Item	Test	Responsibility	Frequency	Assessment Methodology	Acceptance Criteria
Landscape & Rehabilitation Development	Status Report & Recommendation	Independent Expert	2 yearly or as required by DPI Inspector in consultation with Council	Approved Work Plan, Landscape and Rehabilitation Management Plan	Compliance to Work Plan, LRMP
		Rehab Manager	6 monthly	Work Plan, Landscape and Rehabilitation Management Plan	Compliance to Work Plan, LRMP
Litter (Work Authority boundaries and office/ operational areas)	Status Report & Recommendation	Rehab Manager	6 monthly	Work Plan, LRMP	Compliance to Working Plan, LRMP
Erosion & Sediment Control (Work Authority boundaries)	Visual inspection during stripping and earthworks	Rehab Manager	Weekly when stripping	Clear water, (suspended solids test if requested)	
Weed Control (Whole Work Authority Area)	Visual monitoring & Spraying Follow up Inspection & spraying	Rehab Manager	Twice yearly (October, December/ January)	LRMP	Absence of noxious weeds; Effective control achieved