



**NSW  
Resources  
Regulator**

**FWP0001271**

# **MARULAN SOUTH LIMESTONE MINE FORWARD PROGRAM**

Saturday 1 July 2023 to Tuesday 30 June 2026

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## Summary

### DETAIL

<b>Mine</b>	Marulan South Limestone Mine
<b>Reference</b>	FWP0001271
<b>Forward program commencement date</b>	Saturday 1 July 2023
<b>Forward program end date</b>	Tuesday 30 June 2026
<b>Forward program revision (if applicable)</b>	
<b>Contact</b>	Therese Thomas
<b>Mining leases</b>	ML 1857 (1992), CML 16 (1992)
<b>Project location</b>	Boral Cement Limited
<b>Date of submission</b>	Thursday 30 November 2023

## Important

The department may make the information in your program and any supporting information available for inspection by members of the public, including by publication on its website or by displaying the information at any of its offices. If you consider any part of your program to be confidential, please communicate this to the department via the message function on this submission within the NSW Resources Regulator Portal.

# Three-year forecast – surface disturbance activities

## Project description

Boral's Marulan South Limestone Mine has been operational since the 1860s, consisting of a limestone mine and processing plant. It is located directly to the north of Bungonia Gorge and approximately 35km east of Goulburn NSW, with lands covering 650 hectares of a significant limestone and granodiorite deposit. The mine produces up to 3.38 million tonnes (Mt) of limestone based products per year for the cement, steel, agricultural, construction and commercial markets. Development consent SSD 7009 was granted by the Department of Planning, Industry and Environment (DPIE) on 19 August 2021 to continue mining limestone at a rate of up to 4 million tonnes per annum for a period of up to 30 years.

## Description of surface disturbance activities

### Exploration activities

A program of six 150m RC drill holes is proposed in 2024 focusing on the north pit. Other Drilling of the Eastern Batters may be required at a later date.

### Construction activities

Replacement of the ageing primary crusher and associated equipment may occur toward the end of the 3 year period.

### Mining schedule

Mining development method and sequencing and general mine features.

Mining will proceed with extraction of limestone via drill and blast with overburden being extracted using conventional free dig excavation and drill and blast methods. Extraction is focusing on both on the east and western batters on both Eastern and middle limestone seams.

Areas identified for emplacements, the sequencing of emplacements, construction, and management.

Waste emplacements are located in the south pit (void backfill) and Western Overburden Emplacements (WOBE). The south pit will be filled to levels above the rim of current topography with final battering being shaped and rehabilitation commencing in the second and/or the third year. The WOBE will be expanded toward the current location of Marulan

South Rd with an Outer "Noise Wall" being constructed in the early stages and dumping inside this shell commencing after this point. Another waste emplacement activity will proceed in the north butting up against the neighbouring Boral Peppertree's waste emplacement. This is a cut and fill activity aimed at providing an operational area for the new Primary crusher as per the SSD stage 1.

Processing infrastructure activities and the location of tailings facilities and schedule for emplacement.

Plant is located in the north of the pit and there are no tailings produced.

Waste disposal and materials handling operations.

We will be installing a hydrocarbon land farm to supplement the current program of disposal by removal from site of hydrocarbon contaminated waste. The hydrocarbon land farm will be located within the footprint of the WOBE.

### Key production milestones

MATERIAL	UNIT	YEAR 1	YEAR 2	YEAR 3
<b>Stripped topsoil</b> <small>(if applicable)</small>	(m <sup>3</sup> )	67,000	50,000	20,000
<b>Rock/overburden</b>	(m <sup>3</sup> )	6,000,000	6,000,000	6,000,000
<b>Ore</b>	(Mt)	2,800,000	2,900,000	2,900,000
<b>Reject material<sup>1</sup></b>	(Mt)	0	0	0
<b>Product</b>	(Mt)	2,800,000	2,900,000	2,900,000

<sup>1</sup> This includes coarse rejects, tailings and any other wastes resulting from beneficiation.

# Three-year rehabilitation forecast

## Rehabilitation planning schedule

### Rehabilitation planning schedule

Over the next three years we are aiming to incorporate the nominated areas into the rehabilitation areas once final shaping of the waste material is complete. Dumping of waste will focus on areas such as the south pit and WOBE "Noise Wall" where final shaping can be achieved earlier in the program. These areas will have topsoil spread directly to a depth of 50mm with topsoil being sourced directly from new disturbance areas. Topsoil beyond the requirement of active rehabilitation will be stockpiled to a depth no greater than 3m for use in future rehabilitation areas. Once the growth media phase is complete new areas will be hydro mulched with Flexterra FGM with ryegrass and couch cover seed mix as well as a native seed mix relevant to the target ecological communities. Along with the existing immature rehabilitation areas, tube stock will be planted in rehabilitation areas where target species are lacking or absent.

### Stakeholder consultation

Quarterly Community Consultative Committee meeting will continue to be held with key community representatives include the Council, local residents and relevant local community groups. Typical agendas of these meetings include all environmental matters, production and rehabilitation activities as well as all compliance matters.

### Rehabilitation studies, risk assessments and/or design work

Our rehabilitation program is designed in accordance with the rehabilitation risk assessment and aims to meet the rehabilitation objectives. The performance of rehabilitation is assessed annually with the EFA reporting as required under the DPE approved biodiversity management plan.

## Rehabilitation research and trials

RRT NUMBER	PROJECT/TRIAL NAME	OBJECTIVE OF TRIAL/PROJECT	METHODOLOGY	EXPECTED DATE OF COMPLETION	STATUS
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## Rehabilitation maintenance and corrective actions

Ongoing monitoring of rehabilitation will be carried out to assess performance against the rehabilitation objectives. In the event that performance is not deemed satisfactory, remediation measures will be undertaken depending on the nature and extent of the problem. Maintenance and corrective actions may include in-fill tree planting, additional erosion control measures etc.

## Rehabilitation schedule

Dumping of waste will focus on areas such as the south pit and WOBE "Noise Wall" where final shaping can be achieved earlier in the program. The mine is beginning a phase of expansion with the implementation of the new SSD breaking new ground mid FY24. Waste emplacements have been planned to be build in accordance with the mining extraction program. The rehabilitation of these waste emplacements has been programmed such that at the completion of every lift stage of the emplacement, revegetation will take place to ensure that rehabilitation occurs as quickly as is reasonably practical.

## Subsidence remediation for underground operations

NA



## Progressive mining and rehabilitation statistics

### Three-yearly forecast cumulative disturbance and rehabilitation progression

FORECAST	UNIT	YEAR 1	YEAR 2	YEAR 3
A Total surface disturbance footprint	(ha)	383.65	461.98	472.23
B Total active disturbance	(ha)	306.88	381.11	383.07
P Total new area of land proposed for active rehabilitation	(ha)	4.79	8.89	17.18

### Rehabilitation key performance indicators (KPIs)

FORECAST	UNIT	YEAR 1	YEAR 2	YEAR 3
O Total new active disturbance area	(ha)	50.56	78.33	10.25
P Total new area of land proposed for active rehabilitation during the reporting period	(ha)	4.79	4.1	8.3
Q Annual rehabilitation to disturbance ratio		0.09	0.05	0.81

# Attachment 1 – Reporting Definitions

REPORTING CATEGORY	DEFINITION
<p><b>A</b> Total disturbance footprint – surface disturbance</p>	<p>All areas within a mining lease that either have at some point in time or continue to pose a rehabilitation liability due to surface disturbance activities.</p> <p>The total disturbance footprint is the sum of the total active disturbance, decommissioning, landform establishment, growth medium development, ecosystem and land use establishment, ecosystem and land use development and rehabilitation completion (see definitions below).</p> <p>Underground mining operations should not include the footprint of underground mining areas/subsidence management areas in the total disturbance footprint.</p>
<p><b>B</b> Total active disturbance</p>	<p>Includes on-lease exploration areas, stripped areas ahead of mining, infrastructure areas, water management infrastructure, sewage treatment facilities, topsoil stockpile areas, access tracks and haul roads, active mining areas, waste rock emplacements (active/unshaped/in or out-of-pit), tailings dams (active/unshaped/uncapped) and temporary stabilised areas (e.g. areas sown with temporary cover crops for dust mitigation and temporary rehabilitation).</p>
<p><b>C</b> Rehabilitation – land preparation</p>	<p>Includes the sum of all disturbed land within a mining lease that have commenced any, or all, of the following phases of rehabilitation – decommissioning, landform establishment and growth medium development.</p> <p>Refer to the glossary of terms in this document for the definition of these phases of rehabilitation.</p>
<p><b>D</b> Ecosystem and land use establishment</p>	<p>Includes the area which has been seeded/planted with the target vegetation species for the intended final land use. However, vegetation has not matured to a stage where it can be demonstrated that it will be sustainable for the long term and or require only a maintenance regime consistent with target reference/analogue sites.</p> <p>Typically, rehabilitation areas would be in this phase for at least two years (and usually more) before rehabilitation can be classified as being in the ecosystem and land use development phase. This phase does not apply to infrastructure areas that are being retained as part of final land use for the site.</p>

REPORTING CATEGORY	DEFINITION
O	The area of any new active disturbance that will be created during the next three years, as defined under definition A1 (definition A1 Table 5).
P	The sum of any new rehabilitation to be commenced in the next three years. These areas may be in the phases “Rehabilitation - Land Preparation” or the “Ecosystem & Land Use Establishment” (definitions C & D in Table 5).
Q	The rehabilitation to disturbance ratio (S / R) indicates how many hectares of new rehabilitation are undertaken for each hectare of land disturbed during the three years. A ratio of 1/1 indicates that the area of new rehabilitation and disturbance in that period are the same.

## Attachment 2 – Definitions

WORD	DEFINITION
<b>Active</b>	In the context of rehabilitation, land associated with mining domains is considered ‘active’ for the period following disturbance until the commencement of rehabilitation.
<b>Active mining phase of rehabilitation</b>	In the context of rehabilitation, the active mining phase of rehabilitation constitutes the rehabilitation activities undertaken during mining operations such as salvaging and managing soil resources, salvaging habitat resources, and native seed collection. This phase also includes management actions taken during operations to manage risks to rehabilitation and enhance rehabilitation outcomes such as selective handling of waste rock and management of tailings emplacements.
<b>Analogue site</b>	In the context of rehabilitation, an analogue site is a ‘reference site’ that represents an example of the defining characteristics (such as vegetation composition and structure or agricultural productivity) of the final land use. Characteristics of analogue sites can be assessed to develop the rehabilitation objectives and completion criteria for final land use domains.
<b>Annual rehabilitation report and forward program</b>	As described in the Mining Regulation 2016.
<b>Annual reporting period</b>	As defined in the Mining Regulation 2016.
<b>Closure</b>	A whole-of-mine-life process, which typically culminates in the relinquishment of the mining lease. It includes decommissioning and rehabilitation to achieve the approved final land use(s).
<b>Decommissioning</b>	The process of removing mining infrastructure and removing contaminants and hazardous materials.
<b>Decommissioning Phase of Rehabilitation</b>	Activities associated with the removal of mining infrastructure and removal and/or remediation of contaminants and hazardous materials. In the context of the rehabilitation management plan this phase of rehabilitation may also include studies and assessments associated with decommissioning and demolition of infrastructure or works carried out to make safe or ‘fit for purpose’ built infrastructure to be retained for future use(s) following lease relinquishment.

WORD	DEFINITION
<b>Department</b>	The Department of Regional NSW.
<b>Disturbance</b>	See Surface Disturbance.
<b>Disturbance area</b>	<p>An area that has been disturbed and that requires rehabilitation.</p> <p>This may include areas such as on-licence exploration areas, stripped areas ahead of mining, infrastructure areas, water management infrastructure, sewage treatment facilities, topsoil stockpile areas, access tracks and haul roads, active mining areas, waste emplacements (active/unshaped/in or out-of-pit), tailings dams (active/unshaped/uncapped), and areas requiring rehabilitation that are temporarily stabilised (i.e. managed to minimise dust generation and/or erosion).</p>
<b>Domain</b>	<p>An area (or areas) of the land that has been disturbed by mining and has a specific operational use (mining domain) or specific final land use (final land use domain). Land within a domain typically has similar geochemical and/or geophysical characteristics and therefore requires specific rehabilitation activities to achieve the associated final land use.</p>
<b>Ecosystem and Land Use Development</b>	<p>This phase of rehabilitation consists of the activities to manage maturing rehabilitation areas on a trajectory to achieving the approved rehabilitation objectives and completion criteria.</p> <p>For vegetated land uses this phase may include processes to develop characteristics of functional self-sustaining ecosystems, such as nutrient recycling, vegetation flowering and reproduction, and increasing habitat complexity, and development of a productive, self-sustaining soil profile.</p> <p>This phase of rehabilitation may include specific vegetation management strategies and maintenance such as tree thinning, supplementary plantings and weed management.</p>
<b>Ecosystem and Land Use Establishment</b>	<p>This phase of rehabilitation consists of the processes to establish the approved final land use following construction of the final landform.</p> <p>For vegetated land uses this rehabilitation phase includes establishing the desired vegetation community and implementing land management activities such as weed control. This phase of rehabilitation may also include habitat augmentation such as installation of nest boxes.</p>
<b>Exploration</b>	Has the same meaning as that term under the State Environmental Planning Policy (Mining, Petroleum Production and Extractive Industries) 2007.

WORD	DEFINITION
<b>Final landform and rehabilitation plan</b>	As defined in the Mining Regulation 2016.
<b>Final land use</b>	As defined in the Mining Regulation 2016.
<b>Form and way</b>	Means the form and way approved by the Secretary. Approved form and way documents are available on the Department’s website.
<b>Growth Medium Development</b>	<p>This phase of rehabilitation consists of activities required to establish the physical, chemical and biological components of the substrate required to establish the desired vegetation community (including short lived pioneer species).</p> <p>This phase may include spreading the prepared landform with topsoil and/or subsoil and/or soil substitutes, applying soil ameliorants to enhance the physical, chemical and biological characteristics of the growth media, and actions to minimise loss of growth media due to erosion.</p>
<b>Habitat</b>	Has the same meaning as that term under the <i>Biodiversity Conservation Act 2016</i> and the <i>Fisheries Management Act 1994</i> (as relevant).
<b>Indicator</b>	An attribute of the biophysical environment (e.g. pH, topsoil depth, biomass) that can be used to approximate the progression of a biophysical process. It can be measured and audited to demonstrate (and track) the progress of an aspect of rehabilitation towards a desired completion criterion (i.e. defined end point). It may be aligned to an established protocol and used to evaluate changes in a system.
<b>Land</b>	As defined in the <i>Mining Act 1992</i> .
<b>Landform Establishment</b>	<p>This phase of rehabilitation consists of the processes and activities required to construct the final landform.</p> <p>In addition to profiling the surface of rehabilitation areas to the approved final landform profile this phase may include works to construct surface water drainage features, encapsulate problematic materials such as tailings, and prepare a substrate with the desired physical and chemical characteristics (e.g. rock raking or ameliorating sodic materials).</p>
<b>Large mine</b>	As defined in the Mining Regulation 2016.
<b>Lease holder</b>	The holder of a mining lease.

WORD	DEFINITION
<b>Life of mine</b>	The timeframe of how long a mine is approved to mine, from commencement to closure.
<b>Mine rehabilitation portal</b>	<p>Means the NSW Resources Regulator’s online portal that lease holders must use (via a registered account) to:</p> <ul style="list-style-type: none"> <li>■ upload rehabilitation geographical information system (GIS) spatial data</li> <li>■ develop rehabilitation GIS spatial data (using online tracing functions)</li> <li>■ generate rehabilitation plans and rehabilitation statistics using the map viewer and Rehabilitation Key Performance Indicator functionalities.</li> </ul> <p>Data submitted to the mine rehabilitation portal is collated in a centralised geodatabase for use by the NSW Resources Regulator to regulate rehabilitation performance of lease holders.</p>
<b>Mining area</b>	As defined in the <i>Mining Act 1992</i> .
<b>Mining domain</b>	A land management unit with a discrete operational function (e.g. overburden emplacement), and therefore similar geophysical characteristics, that will require specific rehabilitation treatments to achieve the final land use(s).
<b>Mining land</b>	As defined in the <i>Mining Act 1992</i> .
<b>Native vegetation</b>	Has the same meaning as that term under section 60B of the <i>Local Land Services Act 2013</i> .
<b>Overburden</b>	Material overlying coal or a mineral deposit.
<b>Performance indicator</b>	An attribute of the biophysical environment (for example pH, slope, topsoil depth, biomass) that can be used to demonstrate achievement of a rehabilitation objective. It can be measured and audited to demonstrate (and track) the progress of an aspect of rehabilitation towards a desired completion criterion, that is, a defined end point. It may be aligned to an established protocol and used to evaluate changes in a system.

WORD	DEFINITION
<b>Phases of rehabilitation</b>	<p>The stages and sequences of actions required to rehabilitate disturbed land to achieve the final land use. The phases of rehabilitation are:</p> <ul style="list-style-type: none"> <li>■ active mining</li> <li>■ decommissioning</li> <li>■ landform Establishment</li> <li>■ growth medium development</li> <li>■ ecosystem and land use establishment</li> <li>■ ecosystem and land use development.</li> </ul>
<b>Progressive rehabilitation</b>	<p>The progress of rehabilitation towards achieving the approved rehabilitation completion criteria. This may be described in terms of domains, phases, performance indicators and rehabilitation completion criteria.</p>
<b>Rehabilitation Completion</b>	<p>The final phase of rehabilitation when a rehabilitation area has achieved the approved rehabilitation objectives and rehabilitation completion criteria for the final land use. Rehabilitation areas may be classified as complete when the NSW Resources Regulator has determined in writing that the relevant rehabilitation obligations have been fulfilled following submission of <i>Form ESF2 Rehabilitation completion and/or review of rehabilitation cost estimate</i> application by the lease holder.</p>
<b>Rehabilitation Completion criteria</b>	<p>As defined in the Mining Regulation 2016.</p>
<b>Rehabilitation cost estimate</b>	<p>As defined in the Mining Regulation 2016.</p>
<b>Rehabilitation management plan</b>	<p>As defined in the Mining Regulation 2016.</p>
<b>Rehabilitation objectives</b>	<p>As defined in the Mining Regulation 2016.</p>
<b>Rehabilitation risk assessment</b>	<p>As defined in the Mining Regulation 2016.</p>
<b>Rehabilitation schedule</b>	<p>The defined timeframes for progressive rehabilitation set out in the forward program.</p>



WORD	DEFINITION
<b>Relevant stakeholders</b>	<p>Means any persons or bodies who may be affected by the mining operations, including rehabilitation, carried out on the lease land, and includes:</p> <ul style="list-style-type: none"> <li>■ the relevant development consent authority</li> <li>■ the local council</li> <li>■ the relevant landholder(s)</li> <li>■ community consultative committee (if required under the development consent) or equivalent consultative group</li> <li>■ affected land holder(s)</li> <li>■ government agencies relevant to the final land use</li> <li>■ affected infrastructure authorities (electricity, telecommunications, water, pipeline, road, rail authorities)</li> <li>■ local Aboriginal communities, and</li> <li>■ any other person or body determined by the Minister to be a relevant stakeholder in relation to a mining lease.</li> </ul>
<b>Risk</b>	The effect of uncertainty on objectives. It is measured in terms of consequences and likelihood (AS/NZS ISO 31000:2009).
<b>Secretary</b>	The Secretary of the Department.
<b>Security deposit</b>	An amount that a mining lease holder is required to provide and maintain under a mining lease condition, to secure funding for the fulfilment of obligations under the lease (including obligations that may arise in the future).
<b>Surface disturbance</b>	Includes activities that disturb the surface of the mining area, including mining operations, ancillary mining activities and exploration.
<b>Tailings</b>	A combination of the fine-grained solid material remaining after the recoverable metals and minerals have been extracted from the mined ore, and any process water <sup>2</sup> .
<b>Waste</b>	Has the same meaning as that term under the <i>Protection of the Environment Operations Act 1997</i> .

<sup>2</sup> Commonwealth of Australia (DITR), 2007. *Tailings Management*.

## Attachment 3 – Plans

MSL Plan 2A 2023.pdf

MSL Plan 2B 2023.pdf

MSL Plan 2C 2023.pdf

Forward Program (LARGE MINE) v2.1