



**CEMENT CONCRETE
& AGGREGATES AUSTRALIA**



Basic Raw Material Mining Proposal Guideline - Western Australia

Providing assistance with the application of the “*Guideline for Mining Proposals in Western Australia*”
Department of Mines, Industry Regulation and Safety, April 2016

February 2018

Foreword

Cement, Concrete and Aggregates Australia (CCAA) is the peak industry body for the Heavy Construction Materials industry in Australia, including the cement, pre-mixed concrete and extractive industries. CCAA members operate rock quarries, sand and gravel extraction sites, cement production and distribution facilities and concrete batching plants throughout Australia. There are approximately 2,200 quarries operating across the country that produce some 130 million tonnes of stone, limestone, gravel and sand (collectively referred to as Basic Raw Materials – BRMs) used to produce building and construction materials such as cement, concrete, bricks, tiles, pavers and roads paving.

This BRM guideline has been developed by CCAA Western Australia members and is designed to accompany the Department of Mines Industry Regulation and Safety (DMIRS) 2016; *Guideline for Mining Proposals in Western Australia April 2016*. The Department of Mines and Petroleum has since been renamed the Department of Mines, Industry Regulation and Safety (DMIRS) and in this document is referred to as “the Department”. This guideline has been developed in consultation with DMIRS and aims to provide more targeted advice for the specific guidance to the BRM sector (WA) for the preparation and submission of mining proposals. This guideline aligns with the requirements found in the *Guideline for Mining Proposals in Western Australia 2016* and *Mine Closure Guidelines 2015* and provides further detail on the BRM sector, which is generally less complex than the wider mining industry in Western Australia.

The structure of this BRM guideline is set out to align with the requirements of the *Guideline for Mining Proposals in Western Australia* to assist the efficiency of the online requirements for submission.

Mining Proposals specifically relating to basic raw materials will be referred to as BRM Mining Proposals.

Extensive consultations between the BRM representatives and consultants MWH Global (MWH) have ensured that the document is concise and specific whilst meeting requirements of both members of the CCAA and the Department.

Concrete, Cement and Aggregates Australia

Basic Raw Material Mining Proposal Guideline

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1. Purpose of Guideline

The purpose of this guideline is to demonstrate the difference between Basic Raw Materials (BRMs) extractive operations and the more traditional mining operations.

The BRM Industry is professional and responsible in its operation and environmental management of its sites. This document demonstrates that we operate less complex operations than the standard Mining operations. This document provides specific guidance to the BRM industry for the preparation and submission of a BRM Proposal, in conjunction with the risk assessment to satisfy the approvals requirements stipulated in the *Guideline for Mining Proposals in Western Australia*, and *Mine Closure Guidelines*.

This guideline has been developed to assist the proponents in preparing, and assist the assessing officers in reviewing, BRM proposals to enable them to understand the level or scope of an operation, determine a relevant or appropriate level of assessment for the associated risks in alignment with what the industry considers best practice. BRM activities generally pose less environmental risk than traditional mining operations due to the nature and scale of impacts from this activity.

2. Definition of Basic Raw Materials

Basic Raw Materials (BRM) are materials used in the construction industry and consist of materials such as sand, gravel, limestone and hard rock that are generally used in their raw un-processed state or are just crushed and screened. There is no separation, refining or purification of the materials contained within the raw materials.

In some instances the whole of the BRM is used to produce another product such as concrete, the firing of clay to produce bricks and tiles or the heating of limestone and gypsum to produce cement or lime.

Even so, under the *Mining Act 1978*, such materials "limestone, rock, gravel, shale (other than oil shale), sand (other than special sands such as mineral sands, garnet sands, etc), clay (other than kaolin, bentonite, attapulgite or montmorillonite)" are considered a "mineral" for the purpose of Act, where they occur on Crown land. As such, on Crown land, mining tenements and approval under the *Mining Act 1978* are required. The documentation required to enable extraction from Crown Land is the subject of this BRM Guideline.

Where the basic raw materials occur on private land they are not classified as a "mineral" and are extracted through Planning Approval (*Planning and Development Act 2005*) and Extractive Industries Licences (*Local Government Acts 1960, 1995*) obtained from the Local Authority.

The extraction of BRM is also a form of "mining" for safety purposes under the *Mines Safety and Inspection Act 1994*.

Quarries are similar to general mining in terms of the extraction methods undertaken, however there are a number of differences to mineral mining and a lack of refining, which result in the extraction and processing of BRM having lower potential environmental impacts.

Basic Raw Materials differ from mining in the following areas:

- mineral mining is driven by commodity prices - BRM extraction is driven by project demands (e.g. building of a road),
- mined minerals are typically for export – BRMs are mainly used by the local community to construct their housing and infrastructure,

- mines for minerals typically produce high value materials - quarries produce low value materials,
- mines for minerals can be in remote areas – BRM extraction must be as close as possible to the customer (project) because transport is a significant relative cost,
- mined minerals normally require subsequent refining or the separation of the valuable components – BRMs are used directly as fill, to produce concrete or as other construction materials,
- mining for many minerals such as gold requires the use complex chemical processes that are potentially polluting – BRM's are simply crushed and screened with the only liquid use being water. Mining for iron ore is similar to BRM in this respect,
- the extraction of the high value mineral during mining for minerals normally requires large waste dumps that must be stored in a safe manner and rehabilitated – With BRM's the whole product is removed and there are no or minor dumps of materials,
- mining for minerals produces more valuable products, enabling the mines to be deep, large or even underground – BRM extraction is normally conducted near the surface of the land from small excavations, and
- mining for minerals normally exposes deep unweathered rocks or minerals from below the water table that upon weathering may be at risk of breakdown, releasing acidic materials or pollutants – BRM extraction normally only removes near surface natural weathered materials or unweathered materials that have little or no risk of releasing acidic materials or pollutants.

Mining for minerals usually requires a large pit located in one place that is expanded over time that requires a large final closure effort – BRM's commonly are small shallow pits that progress across the landscape with rehabilitation following behind the pit as new ground is opened, leaving only a small final closure footprint.

Listed below (Table 2-1) are definitions of Basic Raw Material activities, these definitions are a guide to assist with the understanding of activities.

Table 2-1 Definitions of Basic Raw Material Activity

Word	Definition	Reference
Hard rock quarry	<p>Extraction of various rock types from typically hard rock (igneous or metamorphic) structures to supply aggregate in the form of crushed rock.</p> <p>Examples of hard rock include granite and dolerite. Hard rock deposits are typically blasted and can be further refined by crushing and screening processes. Crushed and screened aggregate are used in concrete, road bases and asphalt products.</p> <p>Depth and size of the pit may vary from small and shallow to a large open cut that requires benches.</p>	<p>http://www.planning.wa.gov.au/dop_pub_pdf/Basic_Raw_Materials_Bunbury.pdf</p>
Soft rock quarry	<p>Extraction of materials from softer or weathered rocks that do not require blasting and may require less crushing, such as sedimentary sandstone, shales for clay, limestone for road base or metamorphic schists for clay. Often this type of quarry excavates materials from the deep soil profile or "regolith".</p> <p>As the rocks are commonly layered or fractured and less hard, the mining methods used may differ with excavation possible by using a bulldozer or excavator, rock saws, or even a scraper or surface miner. A rock breaker may be used to manage harder or oversize rock.</p> <p>Pits are normally relatively shallow from 2 – 20 metres depth. Examples include Muchea Shales, Tamala Limestone and Donnybrook Sandstone.</p>	
Sand Operations	<p>Extraction of sand from a sand deposit for sale as a product. Sand is normally dug directly from the face using a loader.</p> <p>Most sand is used for fill with other sand product including specialised dried sands, limesand, concrete, bricklaying and plaster sand. Sands are also used in the production of concrete and construction materials.</p> <p>Sand pits are normally shallow from 2 – 5 metres but some larger pits occur where the sand may be over 10 metres thick.</p> <p>Examples include Bassendean Sand mining at Gnangara and Spearwood Sands.</p>	<p>Strategic Assessment of the Perth & Peel Regions – Draft Action Plan D: Basic Raw Materials.</p> <p>https://www.dpc.wa.gov.au/Consultation/StrategicAssessment/Documents/06-01-Action-Plan-D-BRM.pdf</p>
Gravel	<p>Naturally occurring, non-renewable resource that is suitable for use as base or sub base in road construction.</p> <p>The main source of gravel is lateritic gravel and crushed lateritic duricrust. Natural gravel is extracted using a loader, but harder duricrust falls into the category of a soft rock quarry.</p> <p>Some other types of gravel may include limestone, scree, coarse river sand and decomposed gravel.</p> <p>Pits are normally shallow at 1 – 4 metres depth. Examples include gravel from the Darling Scarp.</p>	<p>"State Gravel Supply Strategy" by Government of WA:</p> <p>https://www.mainroads.wa.gov.au/Documents/State%20Gravel%20Supply%20Strategy.PDF</p> <p>Basic raw material: WA Planning Commission – Statement of Planning Policy No.2.4 – Basic Raw Materials</p> <p>Lateritic gravel: http://www.planning.wa.gov.au/dop_pub_pdf/Basic_Raw_Materials_Bunbury.pdf</p> <p>Examples from: https://www.mainroads.wa.gov.au/Documents/Operational%20Guideline%209%20Searching%20For%20Gravel.RCN-D14%5E23168640.PDF</p>

Word	Definition	Reference
River Extraction	Removal of naturally lying materials such as sand and gravel from riverbeds. Examples include extraction from the Gascoyne and rivers in the Pilbara.	
Limestone	Sedimentary rock composed of calcium carbonate [CaCO ₃]. It is mostly formed by the accumulation and solidification of marine fossil debris. It is predominantly used for road maintenance and construction both commercial and residential use. The most common Western Australian limestone is the coastal Tamala Limestone.	http://minerals.statedevelopment.sa.gov.au/geoscience/mineral_commodities/limestone BRM: http://www.planning.wa.gov.au/dop_pub_pdf/Basic_Raw_Materials_Bunbury.pdf
Shale	Type of sedimentary rock formed of very fine grained particles that have been compacted to form a layered rock. The rocks usually have low permeability. Examples include clay for brickmaking such as the Muehea Shales.	http://www.dmp.wa.gov.au/Petroleum/Natural-gas-from-shale-and-tight-1591.aspx or http://www.dmp.wa.gov.au/Documents/Petroleum/WEB_Shale_and_Tight_Gas_Framework.pdf
Cement manufacturing	Process of producing a material that is a manmade powder using raw materials such as limestone, gypsum, shale, clay and sand. The correct mix of raw material is heated to very high temperatures (1500°C) in a rotary kiln where 'clinker' is formed. The clinker is rapidly cooled and stored and then ground with materials such as gypsum and limestone to produce grey powder known as cement. Cement is one of the main raw materials used in concrete manufacturing.	http://www.cement.org.au/AboutCement/CementManufacture.aspx
Concrete manufacturing	Concrete is produced by mixing the correct blend of raw materials that consist mainly of cement, aggregates of varying size (stone & sand) and water. Additives may also be used in the mix depending on the desired properties of the concrete.	http://www.ccaa.com.au/imis_prod/documents/Library%20Documents/CCAA%20Technical%20Publications/CCAA%20Briefings/Breifing%2011%20Materials_WEB.pdf

Illustrated below (Table 2-2) are typical images of Basic Raw Material activities, to assist with the understanding of the previously mentioned definitions.

Table 2-2 Images of Basic Raw Material Activity



HARD ROCK QUARRY

Hanson Red Hill Quarry, a larger quarry, operated with benches. Granite aggregates (to manufacture concrete) and road bases are extracted.



HARD ROCK QUARRY

Small hard rock quarry to extract granitic rocks for aggregates and roadbases. WA Limestone - Pilbara.



SOFT ROCK QUARRY

Limestone block cutting quarry on Adelaide Brighton Cement Ltd mining tenement at Nowergup. Limestone blocks are being cut with a saw.



SOFT ROCK QUARRY

Boral Bricks Western Australia Pty Ltd, Muchea Quarry, extracting sedimentary shale for brick making.



SOFT ROCK QUARRY

WA Limestone laterite gravel and duricrust crushing operation on a mining tenement at Pickering Brook



SOFT ROCK QUARRY

WA Limestone Flynn Drive limestone and sand operations at Neerabup which are large and multifaceted but restricted to 10 – 20 metres depth.

An example of sequential land use. BRMs were initially extracted before the development of the Industrial estate.



SOFT ROCK QUARRY

Flynn Drive limestone and sand quarry at Neerabup operated by WA Limestone.



SAND QUARRY

Hanson Construction Materials sand quarry on mining tenement at Ghangara.



LIMESAND EXCAVATION

Lime Industries, Enmic Pty Ltd, Boranup limesand pit for use in agriculture to neutralise acidic soils and improve crop yields.



BLOCK MANUFACTURE

WA Limestone, Limestone Building Blocks operation at Carabooda where limestone is excavated, and batched with cement to enable limestone reconstituted blocks to be manufactured. The blocks are used for structural works for subdivisions and retaining walls.



CONCRETE BATCHING

Hanson Construction Materials concrete batching plant that is located at the Byford hard rock quarry and uses aggregates sourced from that quarry.

2.1 What do these guidelines relate to / when should they be applied

These BRM Mining Proposal Guidelines are intended to assist the BRM industry and have been designed for proponents and regulators to define the level of information required to prepare approval related documentation to submit to the Department and other regulators.

The Department's *Guideline for Mining Proposals in Western Australia* has been developed for all BRM mining under the *Mining Act 1978* to help proponents define the existing environment surrounding their operation, identify potential environmental risks associated with common mining activities, and to develop management outcomes to ensure that these potential impacts are minimised. These BRM guidelines may also be used to assist with applications under the planning processes on private land.

The scale of an operation and the proximity to sensitive areas such as dwellings and significant biodiversity will influence the level of information required to be included with the submission documentation. For example a larger, long term operation (such as a large rock quarry) will require similar information to a traditional mining operation for excavation and closure, but is likely to not require the same detail on pollution risks.

To assist the Department to issue an approval for a BRM Mining Proposal, it is important to ensure that the Mining Proposal addresses the specific parts of the *Guideline for Mining Proposals in Western Australia* that may apply to the particular project as outlined in this guideline.

2.1.1 Submitting a BRM Proposal to support Mining

A BRM Proposal is required to be submitted to support an application for mining on a mining lease.

The *Mining Act 1978 Section 70(0)(1)* defines a Mining Proposal **as a document that:**

- a. Is in the form required by the guidelines
- b. Contains information of the kind required by the guidelines about the proposed mining operation in, on or under the land in respect of which a mining lease is sought or granted, as the case requires
- c. Contains a Mine Closure Plan

Section 70(0)(1) describes a Mine Closure Plan by (a) and (b) above.

A Mining Proposal may be submitted to support the application of a mining lease under *Section 74(1)(ca) of the Mining Act*. This must be submitted at the same time or within 14 days of application for the lease. However, if the proponent does not have secured access to the land, it may be difficult to complete a BRM Proposal that meets the requirements of the *Guideline for Mining Proposals in Western Australia*. In these circumstances, the Department recommends that the proponent uses a statement and mineralisation report to support the tenement application, as allowed under *Section 74(1)(ca) of the Mining Act* or initially applies for a Prospecting Licence or Exploration Licence.

For a Mining Proposal lodged in support of a mining lease, an officer will assess the BRM Mining Proposal and make recommendations to the Department's Mineral Titles Division regarding the grant of the mining lease. For further guidance contact DMIR's Environment Division on 08 9222 3333 or see the *Guideline for Mining Proposals in Western Australia*.

3. Content of a BRM Mining Proposal

For all proposals, be it for mining or BRM extraction, the document setup and content of the Mining Proposal should be structured in accordance with the Section 3 of the *Guideline for Mining Proposals in Western Australia*.

To assist users of this BRM guide, the format and titles of the *Guideline for Mining Proposals in Western Australia* are used in the commentary below. Specific BRM extraction considerations are listed below where appropriate, however in all cases the *Guideline for Mining Proposals in Western Australia* must be referred to for complete information. Where no additional BRM considerations are considered relevant, reference will simply be made to the relevant Section within the *Guideline for Mining Proposals in Western Australia*.

3.1 Cover Page

Refer Section 3.1 in the *Guideline for Mining Proposals in Western Australia*.

3.2 Mining Proposal Checklist

Refer Section 3.2 in the *Guideline for Mining Proposals in Western Australia*.

3.3 Third Party authorisation

Refer Section 3.3 in the *Guideline for Mining Proposals in Western Australia*.

3.4 Environmental Group Site details

Refer Section 3.4 in the *Guideline for Mining Proposals in Western Australia*.

3.5 Activity Details

All activities detailed within the BRM Mining Proposal must be recorded accurately for which the proponent is seeking approval and the area within which the activities will occur.

In some cases, not all activities are relevant to BRM, for example tailings storage facilities (TSF) and waste rock landforms (WRL) are generally not required, yet should be acknowledged to show that the Proponent has reviewed all activities and potential risk. An example when preparing the BRM Proposal is:

This Project will be accessing further reserves of (sand/hard rock) material to provide (sand/aggregate) to the construction industry, (COMPANY) is intending to expand the resource excavation area an additional (xx) ha and to increase the depth of the existing pit to (xx). This will result in the abstraction of (x) tonnes. No processing or construction of waste rock landforms will be required within this proposed disturbance footprint.

The various activities that may be conducted at the quarry will need to be documented into the various categories and the impacts assessed with respect to environmental risk. The photograph below shows an oblique overview of Limestone Building Blocks Company at Carabooda where limestone excavation and reconstituted block making take place.



WA Limestone, Limestone Building Blocks Company Operation at Carabooda

It is also important to acknowledge timings of activities as BRM activities are often subject to campaign or short term projects and this may affect the description of risk associated with activities.

Basic Raw Material operations are commonly staged or sequential operations, which should be identified in this Section of the document.

The photograph on the next page shows the WA Limestone Pickering Brook Pit at the Lakes with the progressive excavation, processing and rehabilitation. The processing area and stockpiles have no defined footprint because they are located near the face and move forwards as the face moves. In contrast to the WA Limestone, Limestone Building Blocks Company pit and operations above, it will not be possible to allocate a specific location for the processing and stockpile areas.



Staged excavation of laterite gravel and duricrust at WA Limestone Pickering Brook mining tenement showing sequential mining with rehabilitation following excavation

The sequential land use of quarries is an important consideration because quarries are often close to development centres. The extracted land can often be used for other forms of economic activity at the cost of one environmental disturbance, as depicted in the image below from Flynn Drive, Neerabup where the final land surface is being formed to enable the progressive development of an industrial estate.



Industrial Estate end use of the WA Limestone limestone quarry at Flynn Drive, Neerabup

The reduced environmental impact of staged extraction that often occurs in quarries should also be recorded, assuming that the entire site is not planned to be extracted without sequential rehabilitation. This reduced environmental impact that occurs because already extracted areas are rehabilitated while further extraction occurs on the adjacent site, is depicted in the image of Redhill quarry on the next page.



Progressive rehabilitation at Hanson Construction Materials Red Hill quarry

3.5.1 Disturbance envelopes for activities

When determining the disturbance footprint of a BRM operation, a staged approach of the design of the operation should be considered. Many of the BRM operations are dynamic and have a variation of activity types within the site. Locations of infrastructure can move throughout the life of the operation, for example location of stockpiles, mobile processing equipment and haulage routes can move seasonally or annually depending upon operational or market factors.

Environmental factors and impacts will need to be considered when designing site layout and movement of locations such as exclusion areas within which no activities will occur (eg. sensitive areas such as Aboriginal Heritage Sites, reserves, wetlands, waterways, prominent ridges).

The entire disturbance envelope will need to be assessed to determine all risks, through the life of the operation. It is recommended that the entire disturbance footprint be applied for up front if this fits with the planned operation.

3.5.2 Spatial Information

Refer Section 3.5.2 in the *Guideline for Mining Proposals in Western Australia*.

3.5.3 BRM Mine Activity Types

Activities associated with the extraction and management of BRM have been listed below. In most cases BRM extraction will not involve any key Mine Activities, with the possible exception of the depth of the pit.

Table 3-1 below is a simplified form of that contained in the *Guideline for Mining Proposals in Western Australia* and has been made more specific to reference activities associated with BRM.

Table 3-1 Activities associated with BRM

Mine Activity Type	Area (Ha)	Additional Comments	Other information requirements
Key Mine Activities			
Tailings or residue storage facility (class 1)	Ö	Not typically part of a BRM operation	Max. Height, Type/Design, Materials Characteristics
Waste dump or overburden stockpile (class 1)	Ö	For BRM this is normally formed from natural non polluting materials. See Miscellaneous Mine Activities below for BRM.	Max. Height, Type/Design, Materials Characteristics
Heap or vat leach facility	Ö	Not typically part of a BRM operation	Max. Height, Type/Design, Materials Characteristics
Evaporation pond	Ö	For BRM evaporation ponds do not normally contain chemicals or process materials.	Max. Height, Type/Design, Materials Characteristics
Dam – saline water or process liquor	Ö	For BRM evaporation ponds do not normally contain chemicals or process materials.	Max. Height, Type/Design, Materials Characteristics
Tailings or residue storage facility (class 2)	Ö	Not typically part of a BRM operation	Max. Height, Type/Design, Materials Characteristics
Waste dump or overburden stockpile (class 2)	Ö	For BRM this is normally formed from natural non polluting materials.	Max. Height, Type/Design, Materials Characteristics
Low-grade ore stockpile (class 1)	Ö	Not typically part of a BRM operation	Max. Height, Materials Characteristics
Plant site	Ö	BRM normally has a much lower risk footprint. See Miscellaneous Mine Activities below for BRM.	Type/Design
Mining void (depth greater than 5m – below groundwater)	Ö	Not typically part of a BRM operation	Max. Depth, Materials Characteristics
Mining void (depth greater than 5m – above groundwater)	Ö		Max. Depth, Materials Characteristics
Run-of-mine pad	Ö	Normally only required for large fixed hard rock pits	Materials Characteristics
Miscellaneous Mine Activities			
Fuel storage facility	x		No further specific information
Workshop	x		No further specific information
Landfill site	x		No further specific information
Diversion channel or drain	x		No further specific information
Dam – fresh water	x		No further specific information
Low-grade ore stockpile (class 2)	x	Not typically part of a BRM operation	No further specific information
Sewage pond	x	Not typically part of a BRM operation	No further specific information
Building (other than workshop) or camp site	x		No further specific information
Transport or service infrastructure corridor	x		No further specific information
Airstrip	x	Not typically part of a BRM operation	No further specific information
Laydown or hardstand area	x		No further specific information
Core yard	x	Not typically part of a BRM operation	No further specific information
Borrow pit or shallow surface excavation	x	Typically gravel or sand pit	No further specific information
Borefield	x	Not typically part of a BRM operation	No further specific information
Processing equipment or stockpile associated with basic raw material extraction	x		No further specific information
Land that is cleared of vegetation (other cleared land)	x		No further specific information
Topsoil stockpile	x		No further specific information

3.5.4 Site Plan

Refer Section 3.5.4 in the *Guideline for Mining Proposals in Western Australia*.

3.5.5 Design details of significant engineered structures

Refer Section 3.5.5 in the *Guideline for Mining Proposals in Western Australia*.

3.6 Environmental Legislative Framework

BRM operations typically require multiple approvals from different regulatory agencies. Within the BRM Mining Proposal the Proponent should describe the associated approvals that may be required by other regulatory agencies that provide additional assessment. If the Mining Proposal is an addition to an existing operation, all current approvals should be declared within the Mining Proposal. The Proponent should have a Legal Compliance Register as part of their Environmental Management System (EMS), refer Section 3.11 of the *Guideline for Mining Proposals in Western Australia*, which identifies the relevant Acts and commitments within the operation. For further information refer *Section 3.6 in the Guideline for Mining Proposals in Western Australia*.

3.6.1 Clearing Principles

Where it is appropriate, any proposed clearing with regard to the activities to be performed, a Proponent shall assess their Project/s on the 10 clearing principles as defined in *Appendix N – Addressing Native Vegetation Clearing Principles* via a Mining Proposal of the *Guideline for Mining Proposals in Western Australia*.

At the time of publishing a native vegetation clearing permit is still required to be submitted concurrently with a Mining Proposal, if it cannot be demonstrated that an exemption cannot be applied to clearing within a proposed operation.

For further reference to the native vegetation clearing permits, please refer to *Schedule 5 of the Environmental Protection Act 1986*.

3.7 Stakeholder Engagement

Due to the nature of BRM activities and the risks identified within the areas that operations are located, the need to provide continuous stakeholder consultation is still required.

The stakeholder engagement strategy should be regularly reviewed and be recorded in the companies Environmental Management System (refer to Section 3.7.3 of the *Guideline for Mining Proposals in Western Australia*) and should include a summary of all stakeholder engagement undertaken during the life of the project including any changes in the strategy.

The Proponent should refer to *Appendix I – Developing a stakeholder engagement strategy* contained in the *Guideline for Mining Proposals in Western Australia*, where an example of details of a stakeholder engagement strategy is provided and it lists the principles of stakeholder engagement to satisfy the Department that sufficient community and stakeholder engagement has been undertaken.

The stakeholder engagement should include events that have occurred and the timings with particular emphasis on how the proponent resolved any matters raised during the consultation.

The consultation does not need to record a strategy of stakeholder consultation within their register but it is acceptable to DMIRS for that to be recorded. DMIRS notes that the stakeholder engagement strategy is more appropriate in the proponent's environmental management system where stakeholder engagement is used to minimise environmental risk and assist closure. Refer Section 3.9 in the *Guideline for Mining Proposals in Western Australia*.

Stakeholder engagement must include both internal and external stakeholders who are likely to affect, be affected by, or to have an interest in the proposed BRM operations. In addition to the typical community engagement, consideration should also be given to stakeholders such as:

- for reserves and other land uses the proponent may require consent from either DMIRS (Minister for Mines and Petroleum) or the Department of Biodiversity Conservation and Attractions (Minister for Environment),
- for river sand mines within proclaimed surface water areas, the water Section of the Department of Water and Environmental Regulation should be considered, and
- if there are significant conservation issues associated with flora and fauna, the Department of Biodiversity Conservation and Attractions should also be considered and contacted, with the Commonwealth, under the *EPBC Act 1999*, possibly also required to be contacted for listed matters.

The length and type of the operation should be considered when undertaking stakeholder consultation, with all potential risks having been identified to enable the stakeholder to be aware of the impacts or issues that they have to respond to. Some considerations may include:

- location with respect to sensitive land uses - buffers,
- campaign or continuous operation,
- the excavation methods,
- active or temporary operation,
- statement if the operation is hard rock or soft rock,
- is blasting and its related impacts required,
- progressive closure as new ground is opened,
- physical and biological risks, and
- reserve and other land uses, heritage sites, or areas of significant flora and fauna that may require consent or advice will require input from the relevant manager, such as Department of Biodiversity Conservation and Attractions, Department of Water Environment Regulation, Forests Products Commission, Water Corporation, Department of Planning, Lands and Heritage, traditional owners.

Table 3-2 on next page is an example of the Project Stakeholder Engagement, with options to use this electronically or within an already operational management system. Also refer Appendix I and Table 11 of the *Guideline for Mining Proposals in Western Australia* for further information.

Table 3-2 Stakeholder Engagement Register (EXAMPLE)

Stakeholder Identity	Contact Details	Date of Engagement	Type of Engagement /Level of Consultation	Purpose of Consultation	Comments and Feedback Received by Stakeholder	Assessment of the merits of any issues raised	Proponent Response and Action	Stakeholder Response/ Acceptability to Proponent Action
Local Council			Letter/ Meeting	New operation started				
Local resident					Complaint – noise		Noise monitoring undertaken and follow up with resident	Happy with result

3.8 Baseline Environmental Data (Existing Environment)

Baseline environmental data must cover the following environmental aspects:

- climate,
- landscape,
- materials characterisation,
- biodiversity, flora, fauna and ecosystem, including short range or site specific fauna,
- hydrology, and
- environmental threats and other factors.

Refer to the EPA technical guidance documents associated with the above-mentioned aspects for survey requirements <http://www.epa.wa.gov.au/guidelines-and-procedures>

The above environmental aspects must be presented as distinct sub-sections in the baseline data Section of the document and ensure that there is an appropriate description and analysis of any baseline data that is required.

Factors within this Section should be considered in regards to the provision of a resource to the final market (i.e. a quarry placed near required market).

Describe any factors that define why a particular location or site of infrastructure was chosen for example, proximity to market, suitable transport infrastructure, and ability to reduce overheads such as cost of extraction or types of extraction in terms of the environmental impacts such as minimising carbon, reduction and if there is factors to consider such as Threatened Ecological Communities (TEC) or Priority Ecological Communities (PEC).

Town planning considerations for some operations may be required to be considered, for example: one larger quarry may have reduced impacts than the development of 5 smaller quarries.

3.8.1 Climate

Refer Section 3.8.1 in the *Guideline for Mining Proposals in Western Australia*.

3.8.2 Landscape

Refer Section 3.8.2 in the *Guideline for Mining Proposals in Western Australia*.

3.8.3 Materials Characterisation

Material characterisation to identify hostile materials, such as Potentially Acid Forming (PAF) or Acid Sulphate Soils (ASS) do not normally apply to quarries for construction materials. Typically within the industry, construction materials are inert and do not require chemical processing such as beneficiation to aid in extraction of product.

Nominally the presence of PAF or ASS are assessed on a risk basis and addressed in text, however typically in the context of BRM extraction, a geological assessment may suggest the likelihood is negligible.

Feed is usually raw feed through crushing plants and there are limited additional inputs, such as water.

BRM operations are usually small scale, often only interacting with natural surface or near surface materials, in the weathered profile of regolith and are geologically uncomplicated. For these reasons detailed geological and soil investigations are not typically undertaken or are not required for the development of the site. For example a geological model for minor river bed extraction or a gravel or sand pit, would generally not be required.

As such, the level of drilling and detailed investigation such as for Joint Ore Reserves Committee (JORC) reporting requirements, are not required for BRM.

Typically all materials extracted in a BRM operation normally have a marketable value and therefore no waste rock or materials are produced, alternatively excess materials are natural and used for land contouring and quarry closure.

For BRM operations, typically the **storage and stockpiling of topsoil** is addressed in a Mine Closure Plan. However the sites must determine that they retain a suitable quantity of materials for closure during the operational phases of their development and ensure the correct management of these stockpiles throughout the extraction. With regards to this Section, proponents can describe the average depth available onsite and the predicted availability of topsoil and overburden or backfill.

3.8.4 Biodiversity/flora/fauna/ecosystem

The level of information to be researched and provided will depend on the scale and nature of the BRM and the environment in which it operates. In some cases where BRM operates in degraded environments, summary information may only be required. However in situations where there are nearby ecologically sensitive areas, conservation estate or significant flora and fauna, robust field assessments and management may be required to be provided. A starting point is State NatureMap and Commonwealth EPBC, Protected Matters Search Tool, using a 10 – 20 km database radius search, depending on the nature and knowledge of the local environment.

3.8.5 Hydrology

BRM is typically **low risk for groundwater hydrological impacts** as they do not typically intersect groundwater. Risks are minimal and often the extraction operation ensures adequate separation from ground water for effective extraction. With proper management, BRM operations can successfully be undertaken within priority or sensitive water catchment areas; See Department of Water Environment Protection Guidelines for further information.

The level of information provided for the assessment of **ground water** should be consistent with the level of risk posed by the operation. It is important that any external guidelines referred to in the *Guideline for Mining Proposals in Western Australia* and Department of Water Environment Protection and DMIRS Guidelines are checked to ensure that all management of water is documented within the Proponents outcomes.

BRM may however introduce risks to surface water that will require addressing. The level of information provided for the assessment of **surface water** should be consistent with the level of risk posed by the operation. For example excavation within a river bed for sand or gravel may carry additional risks to riparian or fringing vegetation, water dependent flora and fauna, water quality, permanent pools, water source protection areas, flooding and campaign and final closure.

Where abstraction or dewatering is required a process of assessment and licensing exists that is managed by the Department of Water Environment Regulation (DWER).

The majority of sites will require licensing by the Department of Water Environment Regulation.

Given the nature and scale of BRM operations, and in an effort to reduce duplication, where the abstraction or dewatering of water is required, it may not be necessary to include detailed hydrological information in the Mining Proposal. The Department of Water Environment Regulation provides Guidelines for the extraction of basic raw materials with respect to the water tables and proximity to water bodies. The Department issues Works Approvals and Licences under *Part V of the Environmental Protection Act 1986* for crushing, screening and other processing as a Prescribed Premises Category 12 or 70. Such a Licence may include consideration of some or all of the water management on site.

3.8.6 Environmental Threats and other factors

Environmental threats are identified risks that may further impact on environmental factors as a result of BRM activities. Additional threats associated with BRM activities may include but are not limited to:

Physical Risks:

- dust,
- noise,
- air quality, and
- blasting.

Biological Risks:

- flora and fauna,
- weeds,
- dieback – pathogens, and
- wildfires.

The Physical Risks may also be addressed in, or in conjunction with, a Works Approvals and Licences under *Part V of the Environmental Protection Act 1986*. Where the operations are not classified as a Prescribe Premises, both the potential physical and biological risks are to be addressed.

3.9 Environmental Risk Management

As well as referencing Section 3.9 in the *Guideline for Mining Proposals in Western Australia*, also refer DMIRS Guidance Note 2018, *Environmental Risk Assessment for Mining Proposals and Mine Closure Plans*.

Environmental risk management will vary across operations and regions. During project planning and establishment, a risk assessment should be undertaken to ensure that all factors that may cause environmental impacts are managed appropriately.

Where we have factors that require BRM extraction to be in areas that the ALARP (as low as reasonably practicable) principles currently do not satisfy, such as quarries within the metropolitan or other sensitive areas, there may be factors such as the requirement to be close to market, that are at odds with the assessment under the ALARP principle.

Therefore when the Department is assessing the projects, there are considerations that will increase the acceptable regions for intolerability. Sometimes these may be addressed by controls and others may need to be holistically assessed on the relevance of the project to the region.

3.10 Environmental Outcomes and Reporting

Responsible industry operators are committed to achieving superior environmental outcomes to the satisfaction of the community & regulators. Mandatory reporting, committed to as part of the application process, must be followed to achieve best practice in the Basic Raw Material extractive industry.

3.11 Environmental Management System (EMS)

All sites should have some form of EMS to manage the environmental risks identified within the risk assessment. Once again dependent on the life and size of the operation, an EMS may vary between each operation and company. As a minimum the EMS should include documentation associated with but not limited to:

- procedures,
- checklists and forms,
- monitoring and reporting,
- training documentation, and
- non-compliance and corrective action.

Through effective EMS management, the quarrying industry can achieve admirable environmental outcome due to their typical operational methods of progressive extraction and rehabilitation, as shown in the examples contained in Table 3-3 below.

Table 3-3 Examples of Quarry Rehabilitation



REHABILITATION LATERITE GRAVEL QUARRY

Rehabilitation of WA Limestone laterite gravel and duricrust pit at Pickering Brook, showing progressive rehabilitation with maturing rehabilitation in the background.



REHABILITATION LIMESAND QUARRY

Rehabilitation of Lime Industries limesand quarry at Lancelin.



REHABILITATION HARD ROCK QUARRY

Progressive rehabilitation of Boral Resources Maddington hard Rock Quarry.

4. Mine Closure Plans

The 2010 amendments to the *Mining Act* require a Mine Closure Plan to be submitted to the Department for assessment and approval as part of Mining Proposal applications. Mining Proposals drafted in accordance with the *Guideline for Mining Proposals in Western Australia* must include a Mine Closure Plan prepared in accordance with the Departments *Guidelines for Preparing Mine Closure Plans 2015*, available on the DMIRS website.

Mine Closure Plans for BRM extraction will in many cases be less complex than for “mineral” type mines that can be much larger, may have acidic materials, excavations below the water table, large waste dumps, significant physical and chemical processing or other potentially significant activities that require detailed closure consideration.

On the other hand other aspects of mine closure will be similar to other mining operations, with large hard rock pits having the same requirements for closure as some mines for minerals. Other BRM extraction may also have unique closure situations that should be addressed, such as extracting sand from a river bed, or extraction within close proximity to the water table, wetlands or significant flora and fauna.

For BRM operations, especially those close to towns and development centres, reference to **sequential land use** as part of the Mine Closure Plan (MCP) is generally viewed favourably. Regulators typically recognise the benefits of reusing BRM extracted land for other forms of economic activity, at the cost of one environmental disturbance.

The closure of many BRM operations is progressive and carried out throughout the life of the operation. That is mine closure is sequential with the face, operating plant and rehabilitation of excavated land progressively following the opening of new ground. In this case the Mine Closure becomes in effect a methodology of closure obligations, consultations, actions, monitoring and remediation that might occur in small amounts each year or every few years. The mine closure methodology is then applied to all disturbed land that is no longer required.

For sequential or campaign operations, there will need to be a prescription for interim closure in addition to a prescription for final closure. At the end of a campaign, the site will need to be left safe with low environmental risk, in a manner that does not compromise future extraction.

The closure methodology is likely to require more than one methodology or additional actions added to the methodology for different parts of the operations. For example there may be a general prescription, plus closure criteria, that applies for all disturbed areas, but some parts of the operation such as hard stand will have additional procedures added to remove and remediate the hard stand to form a suitable substrate on which the rehabilitation can then be applied. Similarly for fuel storage or refuelling zones, the soils may have to be removed and remediated before commencing the rehabilitation.

There are also likely to be situations where the rehabilitation planting will be different from one location to another, such as a rocky ridge or backfilled face will need to be treated differently to a lower lying potentially wet area or water body. In these cases the rehabilitation methodology will likely have one or more completion criteria, rehabilitation and planting regimes.

Sequential land use MCPs and relinquishment can be more complex, therefore the following should be considered:

- improved related stakeholder engagement,
- clear documentation of the current and intended future use of the land,
- effective communication with the end-use landholders,
- demonstration that the end-use landholders are in agreement with how the land is proposed to be left at handover,
- different rehabilitation completion criteria and methodologies in different locations or points in time, and
- temporary or campaign closure may be required on an interim basis prior to full closure.

It is recommended that **campaign mine operation sites** are left in a stable, safe state at the end of each campaign, including suitable rehabilitation if required. Ideally when these sites are closed at the end of each mining season, care and maintenance should be undertaken to the extent that if the company does not return to the site, the only element that would be required for mine closure would be the rehabilitation of the tracks.



TEMPORARY CLOSURE

The limesand pit in the upper picture has been left in a natural condition, whereas the pit in the lower picture has been left with a vertical slope, and no signs or fencing.

5. Submission and Assessment

Whilst this guideline has been developed to assist with the assessment of BRM activities by the Department, it may also benefit the proponents that are not on traditional tenure such as freehold land administered by other regulatory processes.

5.1 Other Agencies Advice and Referrals

In undertaking the risk assessment, identification of any environmental risks within the document should be managed through the environmental outcome Section and the proponent should ensure that all other regulatory agencies have been advised or referred to for compliance. Other agencies are listed below and may include but not limited to:

- The Environmental Protection Authority (EPA)
- Native Vegetation Clearing Permits – DMIRS
- Department of State Development
- Department of Water, Environment Regulation
- Department of Biodiversity Conservation and Attractions
- Department of Lands, Planning and Heritage
- Traditional owners
- Commonwealth Government (Environment Protection and Biodiversity Conservation Act 1999)
- Local Shires or Councils
- Main Roads

6. Reference

Guideline for Mining Proposals in Western Australia; Department of Mines, Industry Regulation and Safety, April 2016

Guidelines for Preparing Mine Closure Plans Proposals in Western Australia; Department of Mines, Industry Regulation and Safety, 2015.

DMIRS Guidance Note, Environmental Risk Assessment for Mining Proposals and Mine Closure Plans. Department of Mines, Industry Regulation and Safety, 2018.

Western Australian Mining Act 1978.

NATIONAL OFFICE Level 10, Altitude Corporate Centre, 163-175 O'Riordan St, Mascot NSW 2020

POSTAL ADDRESS PO Box 124, Mascot NSW 1460 **T** (61 2) 9667 8300 **F** (61 2) 9693 5234

ADELAIDE **T** (02) 9667 8300 **F** (02) 9693 5234

BRISBANE Level 14, 300 Ann Street, Brisbane QLD 4000 **T** (61 7) 3227 5200 **F** (61 7) 3892 5655

MELBOURNE Suite 910/1 Queens Road, Melbourne VIC 3004 **T** (61 3) 9825 0200 **F** (61 3) 9825 0222

PERTH 45 Ventnor Avenue, West Perth WA 6005 **T** (61 8) 9389 4452 **F** (61 8) 9389 4451

TASMANIA PO Box 1441, Lindisfarne TAS 7015 **T** (61 3) 6491 2529 **F** (61 3) 9825 0222

ONLINE DETAILS www.ccaa.com.au **E** info@ccaa.com.au

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