Department for Energy and Mining

Determination

TERMS OF REFERENCE

006

Mineral mine lease/licence applications

Notice under section 36 of the Mining Act 1971

Note	Date
First gazetted	11 December 2020
Updated	18 March 2021

Acknowledgement of Country

The Department for Energy and Mining acknowledges Aboriginal people as the First Nations Peoples of South Australia. We recognise and respect the cultural connections as the traditional owners and occupants of the land and waters of South Australia, and that they continue to make a unique and irreplaceable contribution to the state.

Government of South Australia
Department for Energy and Mining

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MINING ACT 1971

SECTION 36

Terms of Reference for Mineral Mine Lease/Licence Applications

An application for a mining lease (ML) for the recovery of metallic and industrial minerals must be accompanied by:

- a proposal that complies with section 36 of the *Mining Act 1971*, regulations 46 and 47 of the *Mining Regulations 2020* and any determinations set out in this Terms of Reference; and
- information that complies with regulation 30 of the *Mining Regulations 2020* and any determinations set out in this Terms of Reference; and
- a declaration of accuracy that complies with regulation 84 of the *Mining Regulations 2020*; and
- the relevant application fee.

An application for a miscellaneous purposes licence (MPL) for the recovery of metallic and industrial minerals must be accompanied by:

- a proposal that complies with section 49 of the *Mining Act 1971*, regulations 46 and 47 of the *Mining Regulations 2020* and any determinations set out in this Terms of Reference; and
- information that complies with regulations 37 and 38 of the *Mining Regulations 2020* and any determinations set out in this Terms of Reference; and
- a declaration of accuracy that complies with regulation 84 of the *Mining Regulations 2020*; and
- the relevant application fee.

In accordance with section 36 of the *Mining Act 1971* this Terms of Reference will have effect from 1 January 2021.

FORM OF APPLICATION

In accordance with section 36(1)(a) of the *Mining Act 1971* an application for a mining lease ML for the recovery of metallic and industrial minerals must be made in the form and contain such information as set out in this Terms of References, unless otherwise specified by the Director of Mines or an authorised officer.

For the purposes of section 36(1)(a) of the *Mining Act 1971*, it is determined that an application for a ML must contain the information as follows:

- Applicant name(s) (company and/or individual and/or related body corporate) and each applicant's percentage share in the application
- Name of project
- Mineral type
- Mineral(s) to be authorised
- Primary mineral(s) sought
- Other mineral(s) sought
- Details of the tenement(s) giving authority to apply for the Mining Lease
- Native title land
- Details of relevant land ownership, notices, consents and agreements
- Declaration of accuracy
- Applicant(s) details including:
  - Name of Company and/or Individual ABN (if applicable)
  - ACN (if applicable) Registered address
  - Applicant contact details including:
    - Postal Address
    - Email
    - Website
    - Phone number(s)

- Contact Person details including:
  - Name
  - Position Title
  - Email
  - Phone number(s)
  - Consent to receive electronic correspondence (or otherwise)

In accordance with section 49(1)(a) of the *Mining Act 1971* an application for a miscellaneous purpose licence (MPL) ancillary to the recovery of metallic and industrial minerals must be made in the form and contain such information as set out in this Terms of References, unless otherwise specified by the Director of Mines or an authorised officer.

For the purposes of section 49(1)(a) of the *Mining Act 1971*, it is determined that an application for a MPL must contain the information as follows:

- Applicant name(s) (company and/or individual and/or related body corporate) and each applicants percentage share in the application
- Name of project
- Related applications/mining operations
- Location of proposed licence including a detailed map/plan (if required)
- Purpose of proposed licence
- Pegging details relating to proposed licence area
- Native title land
- Details of relevant land ownership, notices, consents and agreements
- Declaration of accuracy
- Applicant(s) details including:
  - Name of Company and/or Individual ABN (if applicable)
  - ACN (if applicable) Registered address
  - Applicant contact details including:
    - Postal Address
    - Email
    - Website
    - Phone number(s)
  - Contact Person details including:
    - Name
    - Position Title
    - Email
    - Phone number(s)
    - Consent to receive electronic correspondence (or otherwise)
  - Certification of correctness

An application for an ML and/or MPL must in accordance with section 36(1)(a) and 49(1)(a) of the *Mining Act 1971* be in the following form, unless otherwise specified by the Director of Mines or an authorised officer:

- an electronic version of the Proposal must be submitted in accordance with regulation 88 of the *Mining Regulations 2020*; hardcopies must be submitted upon request; the information in all must be identical;
- each page, plan or other separate sheet of the Proposal must include the mineral claim, retention lease or exploration licence number(s), date of the application submission and sequential page numbering; and
- the electronic version of the Proposal must be submitted in one single Acrobat PDF file or if requested by the Director of Mines or an authorised officer, Microsoft Word compatible files must be submitted.

PROPOSAL

An application for an ML and/or MPL must be accompanied by a proposal that complies with sections 36 and 49 of the *Mining Act 1971* and regulations 46 and 47 of the *Mining Regulations 2020*, and must comply with the following determinations of this Terms of Reference as set out below:

1. DESCRIPTION OF THE EXISTING ENVIRONMENT

In setting out an assessment of the environmental impacts of the proposed authorised operations in accordance with sections 36(1)(c)(ii)(A) and 49(1)(c)(ii)(A) of the *Mining Act 1971* and regulation 46(2) of the *Mining Regulations 2020*, the Minister determines in accordance with regulation 46(7)(e) of the *Mining Regulations 2020* that a proposal must include a description and assessment of the environment as set out in this Terms of Reference. Each of the elements of the existing environment (as defined in section 6(4) of the *Mining Act 1971*) listed in clauses 1.1-1.20 must be described only to the extent that they may need to be considered in assessing the potential impacts of the proposed mine operations. If the element is not likely to be impacted by the operation, a statement to that effect must be included.

1.1 Topography and Landscape

Provide a description and map (as per 5.1.1.1) of the topography and landscape, detailing the:

- application area; and
- general surroundings.

1.2 Climate

Provide:

- a summary of rainfall and temperature patterns, evaporation rates, and wind directions and speed (including maximum wind gusts); and
- details of the maximum average recurrence interval or annual exceedance probability rainfall event used for the operational and closure design of the project, and the justification for the value(s) selected.

1.3 Topsoil and Subsoil

Provide:

- a description of the soil profile (type and depth), and the characteristics and/or productivity of all soils on the application area (show this information on a map as per 5.1.1.2 if there is a variation in soils over the application area); and
- identify any soil characteristics, including (but not limited to) erodibility, acid sulfate, sodic or non-wettable soils, that may require control measures to reduce environmental impacts during operations or rehabilitation.

1.4 Geological Environment

Provide a description of the following, as a minimum:

- regional geology;
- local geology within the application area and geological map(s) (as per 5.1.1.2), including but not limited to;
  - location, dimensions and orientation (dip and strike), and extent of the mineral resource and ore reserve;
  - location and composition of all rock types and rock units that are proposed to be disturbed;
  - interpretation of the stratigraphy of the rocks hosting the deposit as well as any overlying and adjacent rock units;
  - and an indication of the potential for extension to the orebody;
- representative cross-sections and long section (as per 5.2.1.1) of the geology of the application area; and
- the exploration data on which the geological interpretation was based on.

1.5 Geochemistry and Geohazards

Provide:

- a geochemical assessment of all rock types that are proposed to be disturbed, based on representative sampling and analysis that includes the identification and quantification of, but not limited to, sulfide minerals that have the potential to generate acid or mobilise metals into the environment; and
- a mineralogical assessment of all the rock types that are proposed to be disturbed, based on representative sampling and analysis for the presence and quantification of (but not limited to) radioactive minerals, asbestiform minerals or minerals that have the potential to produce respirable silica.

Describe the potential for any of the following natural geohazards to be present in the application area and show on a map:

- structural instability, including slips, faults, karst features or geological discontinuities; and
- major seismic events (based on historical data).

1.6 Groundwater

If all proposed mining operations are to occur at least 3 m above the seasonally high water table, provide:

- a statement that all proposed mining operations are to occur at least 3 m above the seasonally high water table;
- a statement that the proposed mining operations will not /are unlikely to increase the seasonally high water table to within 3m of the mining operations anywhere within the lease application area;
- an assessment of the position of the seasonally high water table beneath the entire lease application area; and
- the drillhole, borehole and hydrogeological data and information the assessment is based on.

If any part of the proposed mining operations is likely to occur within 3 m of the seasonally high water table, or the proposed mining operations will/are likely to increase the seasonally high water table to within 3 m of the mining operations, or the proposed mining operations are likely to intersect aquifer unit(s), provide:

- a statement describing if the application area is within an area where the water resources are prescribed under the *Landscape South Australia Act 2019* and details on the current availability of groundwater resources within the prescribed area;
- a description of the local and regional hydrogeology, detailing both the stratigraphy and hydrostratigraphy;
- a detailed baseline description of the groundwater characteristics and flow dynamics for aquifers within the application area which includes:
  - static water levels and groundwater heads/groundwater elevations, including seasonal fluctuations for each aquifer;
  - baseline groundwater hydrochemistry and mineralogy, including any seasonal fluctuations and spatial variability for each aquifer;
  - aquifer properties including hydraulic conductivity, transmissivity, specific yield, storage coefficient, total porosity, effective porosity and aquifer thickness;
  - recharge and discharge mechanisms,
  - hydrogeological characteristics of confining strata, including hydraulic conductivity and thickness;
  - connectivity between the proposed mining aquifer and lateral, overlying or underlying aquifers and surface water;
  - conceptualisation of the hydrogeology: a summary of all above and a description of the hydrogeological setting considered important for impact assessment; and
  - a preliminary impact assessment/numerical model of groundwater flow (and contaminant transport model, if applicable), based on the conceptual hydrogeology.

- local and regional potentiometric surface/groundwater elevation map(s) (as per 5.1.1.3) for each aquifer within the application area;
- cross-section(s) (as per 5.2.1.2) of the hydrostratigraphy;
- the environmental value of each aquifer determined according to the Environment Protection (Water Quality) Policy 2015, or any subsequent updates;
- a description of the existence, location, condition and value of all aquatic, terrestrial and subterranean Groundwater Dependent Ecosystems (GDEs) within the application area and within and immediately surrounding the extent of predicted hydrogeological impact of the proposed mine operations; and
- an assessment of any current or historical use of local groundwater by the landowner(s) and other users which includes a baseline survey of bores, including depth to groundwater, groundwater quality, bore construction details, status and purpose and collar/ground elevations.

1.7 Surface water

Provide a topographic map (as per 5.1.1.1) and description of the current drainage patterns for the application area and water catchment including:

- location of watercourses, drains, dams and wetlands;
- surface water catchment boundaries;
- direction of drainage and discharge from the application area;
- a statement describing if the application area is within an area where the water resources are prescribed under the *Landscapes South Australia Act 2019*, and provide details on the current availability of water resources within the prescribed area;
- a statement if the application area is within a water protection area including areas under the *River Murray Act 2003*;
- a statement as to whether the application falls within the Murray Darling Basin; and
- groundwater—surface water interactions.

Provide water quality data for identified watercourses, where there is potential for discharge into that watercourse from the proposed operation (whether intentional or not). Should identified watercourses be ephemeral, and it is not possible to collect water samples, provide a characterisation of sediments sampled from the watercourse bed upstream and downstream of the application area.

If there is potential for changing a flow regime (including change in flow volume) or discharge into these watercourses from the proposed operations, an assessment of the use of this water by the landowner, downstream users and water dependent ecosystems must be included.

1.8 Vegetation, Weeds and Plant Pathogens

Provide:

- a description and map (as per 5.1.1.1) of existing flora (native and introduced) in the application area and surroundings,
- the State conservation status and habitat value of native vegetation present in the application area;
- a description of the presence of *Commonwealth Environment Protection and Biodiversity Conservation Act 1999*, listed species and ecological communities;
- a description of the extent the application area and adjoining land is affected or potentially affected by pathogens and declared weeds; and
- if known, a description of the history of land use to identify if the existing vegetation is the result of deliberate cultivation or natural regrowth arising from previous clearance.

1.9 Fauna

Describe the native and feral fauna that may be present in the application area noting State or Commonwealth conservation status of all species.

1.10 Caves

If the application area is within, or near to, known caves or significant limestone formations a survey for the presence of caves must be performed.

Provide a summary of the results of the survey and describe the presence of any caves in karst (limestone) areas within, or near to, the application area and show on a map (as per 5.1.1.5).

1.11 Local Community

Provide:

- a description of the local population, the economy, services and employment; and
- details of nearest town or urban areas, with a summary of the demographics of the local population.

1.12 Landowners and Land Use

Provide a description of:

- land ownership for all titles within and adjacent to the application area;
- land use (historical and current) for the application area and the surrounding areas;
- the zoning as defined by the Planning and Design Code or relevant council development plans;
- policies relevant to the application area, including region or council wide, zone specific and sub areas within a zone;
- known plans for potential future land use changes by other parties; and
- any other interests or restrictions on the application area, including:
  - public utility easements;
  - if the application is within land used for defence purposes, including (but not limited to) the Woomera Prohibited Area or the Cultana Army Training Area;
  - any overlapping or adjacent tenements under the *Mining Act 1971*, or *Petroleum and Geothermal Energy Act 2000*.

1.13 Proximity to Infrastructure and Housing

Provide information and a map (as per 5.1.1.4):

- identifying residences within and near the application area;
- identifying other human infrastructure such as (but not limited to) schools, hospitals, commercial or industrial sites, roads, sheds, bores, dams, ruins, pumps, cemeteries, scenic lookouts, roads, railway lines, fences, transmission lines, gas and water pipelines, and telephone lines (both underground and above ground); and
- identifying public roads to be utilised or affected as part of proposed operations, including an estimate of the existing traffic movements.

1.14 Exempt Land

Provide a description and map (as per 5.1.1.4) of any applicable exempt land under Section 9 of the *Mining Act 1971*.

1.15 Amenity

Provide a description of scenic or aesthetic values for the application area and immediate surrounds, including features of community, tourist or visitor interest.

1.16 Air Quality

Provide a description of the existing levels of dust and contributors to air quality including odour (both natural and anthropogenic).

1.17 Noise

Provide a description and measurement data of the existing levels of noise and contributors to noise (both natural and anthropogenic).

1.18 Heritage (Aboriginal, European, Geological)

Detail and show on a map (as per 5.1.1.1):

- any registered heritage sites in or adjacent to the application areas that are protected under legislation (in so far as may be permitted under the relevant legislation); and
- include a statement concerning whether or not an Aboriginal cultural heritage survey has been conducted by the proponent and if so, the results of the survey.

1.19 Proximity to Conservation Areas

Provide:

- information and a map (as per 5.1.1.1) showing proximity to national parks and reserves, private conservation areas, Commonwealth recognised conservation areas, heritage agreement areas and geological heritage sites; and
- a statement as to whether the application area falls within the Adelaide Dolphin Sanctuary, Adelaide International Bird Sanctuary or a Marine Park.

1.20 Pre-existing Site Contamination and Previous Disturbance

Provide information and a map (as per 5.1.1.1) showing:

- any known existing contamination of the site and of any disturbance by previous operations or other activities.

1.21 Tailings generation and management

If tailings generation and management is proposed, the standards set out in Minerals Policy MPOL007 must be used for baseline environmental data collection and material characterisation relating to tailings.

2. DESCRIPTION OF THE PROPOSED OPERATIONS

In specifying the nature and extent of the authorised operations that are proposed in accordance with sections 36(1)(c)(i) and 49(1)(c)(i) of the *Mining Act 1971*, the Minister determines in accordance with regulation 46(6)(e) of the *Mining Regulations 2020* that a proposal must include a description of the proposed operations as set out in this Terms of Reference. Each of the elements listed in clauses 2.1–2.10 must be described only to the extent that they apply to the proposed mine operation.

2.1 General Description and Maps/Plans of Operations

Provide a summary description of all elements of the proposed operation, including mining, processing and waste management (include maps/plans and cross sections as per 5.1.2 and 5.2.2).

2.1.1 Options

Provide a summary description of relevant options considered for mining, processing and mine waste management strategies, and provide justification for the chosen strategies, including a description of any elimination or substitution strategies that have been adopted to control a hazard in order to protect the environment.

If tailings generation and management is proposed, relevant tailings options (including TSF site locations) must be analysed using an appropriate multi-criteria assessment tool. The results of the multi-criteria assessment must be provided.

2.2 Reserves, Products and Market

2.2.1 Ore Reserves or Mineral Resources (or both)

Provide:

- a statement of the current Australasian Joint Ore Reserves Committee (JORC) compliant ore reserve or mineral resource estimates (or both) in the application area; and
- a statement of what reserve and/or resource forms the basis for the application; or (if a JORC compliant reserve or resource (or both) has not been reported
- an estimate of the resource to be mined and the basis of this estimate.

Provide steps that have been taken to ensure proposed mining operations will not sterilize/prevent future extraction of mineral resources.

2.2.2 Production Rate and Products

Provide:

- a statement of the relevant commodities that are proposed to be extracted, recovered, processed and sold, and the expected market or end use;
- a statement of any other commodities present in the application area that are not proposed to be recovered for sale, and the reasons for this decision;
- a quantitative estimate of production of mine gate product(s) for the life of mine, and a schedule of the annual production of mine gate product(s); and
- a statement if any extractive minerals (as defined by Section 6 of the *Mining Act 1971*) will leave the lease.

2.3 Exploration Activities

Provide information that details all exploration activities to be undertaken within the application area as a part of the proposed mining operation, including:

- purpose of the activities (i.e. resource drill-out or resource extension);
- types of drilling;
- geophysical techniques likely to be used;
- earthworks required to conduct exploration activities;
- equipment required to conduct exploration activities; and
- rehabilitation methods for exploration works (including that not yet rehabilitated from previous tenure).

2.4 Mining Activities

2.4.1 Type or Types of Proposed Mining Operation to be Carried Out

Provide a clear statement on the type or types of mining operation proposed to be carried out, such as:

- the mining method(s) to be adopted.

2.4.2 Open Pit

Describe proposed open pit workings, including (but not limited to):

- overall pit wall angles, bench height, berm width;
- dimensions and depth of pit;
- access ramps; and
- maps, plans and cross-sections (as per 5.1.2 and 5.2.2).

2.4.3 Underground Workings

Describe proposed underground workings, including (but not limited to):

- proposed stoping methods;
- potential surface disturbance resulting from underground mining;
- declines, shafts, tunnels, bore holes, ventilation intakes and exhausts; and
- maps, plans and cross-sections (as per 5.1.2 and 5.2.2).

Where underground fill is proposed, describe:

- type of fill to be used;
- the volume percentage of underground void to be filled;
- sequence of filling;
- source and proportion of fill; and
- maps, plans and cross-sections showing the proposed fill (as per 5.1.2 and 5.2.2).

2.4.4 Material Movements

Provide:

- expected life of mine (including scope for extension);
- annual mine production rates and mine production schedule of ore and waste rock over the life of mine; and
- life of mine and annual strip ratios.

2.4.5 Stockpiles

Describe for all ore, product, subsoil and topsoil stockpiles the:

- location, size, shape and height of all stockpiles;
- method of placement;
- method of stabilisation and erosion control of all stockpiles; and
- water movement through stockpiles.

The location, maximum height and extent of all stockpiles must be shown on a map (as per 5.1.2.1).

2.4.6 Use of Explosives

If explosives are proposed to be used, describe:

- type of explosives used on the site;
- proposed timing and frequency of blasting;
- size of blasts; and
- storage of explosives (amount, type, detailed location and method of storage).

2.4.7 Type of Mining Equipment

Provide a description of the equipment (fixed and mobile) proposed to be used in the mining operation in terms of:

- type, size and capacity of machines;
- approximate number of units;
- noise outputs;
- exhaust outputs; and
- fire ignition sources.

The location of fixed equipment must be shown on a map (as per 5.1.2.1).

2.4.8 Mine Dewatering

Provide:

- estimated inflows of groundwater, stormwater and water from any other mining activities into mine workings;
- details of proposed mine dewatering infrastructure, and mine water management and disposal;
- contingency measures for greater than planned water inflows into mine workings; and
- a mine water balance of water inflows and water outflows during operations and at completion (if not included in the water balance in clause 2.5.4).

2.4.9 Sequence of Mining and Rehabilitation Operations

Provide the following information on the sequence of operations in both text and map form (as per 5.1.2.2):

- description of the sequence of mining stages;
- proposed sequencing of progressive and final rehabilitation, including demonstration that progressive rehabilitation has been integrated with the mining plan;
- an estimation of the quantities of sulfide minerals that have the potential to generate acid or mobilise metals, or other hazardous minerals to be mined at each mining stage; and
- any mineral resource that may be sterilised from future mining by the proposed mining operations.

2.4.10 Rehabilitation Strategies and Timing

Describe all activities, strategies and designs relating to mine closure for rehabilitation of open pit and/or underground workings, stockpiles, explosives storage, mining equipment and mine dewatering infrastructure. Include timing of these activities and all opportunities for progressive rehabilitation. Include (but not limited to) the maximum area of land disturbed by proposed mining operations at any time, battering of mining faces and other earthworks, mine void backfilling, abandonment bunds, sealing of portals and ventilation shafts, soil management, revegetation and expected water infill rates.

2.4.11 Modes and Hours of Operation

State if the proposed mining operation will be worked on a continuous (24 hour, 7 days a week), regular periodical or campaign basis.

If the proposed mining operation is to be worked on a regular periodical basis, specify:

- proposed period(s) (daily, weekly and public holidays) to be worked; and
- proposed start and finish hours the site is to be worked per period. If the operation is to be worked on a campaign basis, specify:
- minimum hours the site is to be worked per year;
- the minimum time of each campaign;
- the maximum and minimum time between campaigns;
- define the beginning and end of each campaign;
- hours of mining operations during campaign;
- days of mining operations during campaign;
- determining factors for initiating and ceasing a campaign;
- maximum and minimum tonnage of each campaign; and
- maximum and minimum tonnage of production per year.

2.5 Crushing, Grinding, Processing and Product Transport

2.5.1 Crushing and Grinding Plant

Provide a description of the crushing/grinding plant including:

- area, size, type of construction and location;
- throughput rate;
- a description of ore preparation for processing;
- grind size of the ore;
- noise sources;
- dust sources and composition;
- fie ignition sources; and
- plans (as per 5.1.2.3)

2.5.2 Processing Plant

Provide a description of the processing plant including:

- the methods and details of processing and value adding proposed;
- number, location, area, size, type of construction (including lining and drainage systems, as appropriate) of processing plant;
- any ancillary plant and infrastructure to be used for processing the minerals on site; examples of associated structures are concrete batching plants, wheel wash facilities, silos, fuel tanks, water tanks, chemical storage/use, reverse osmosis plants and bore fields;
- if chemicals are to be used in the beneficiation or processing of ore, describe the nature and quantities of the chemicals to be used, their reactions with ore and their ultimate fate;
- noise sources;
- dust sources and composition;
- fire ignition sources;
- other potential air emissions (including odour) and their composition; and
- plans (as per 5.1.2.3).

2.5.3 Heap Leach

Provide a description of the Heap Leach Pad and process including:

- type, size and location of the Heap Leach Pad;
- construction and operating specifications for the Heap Leach Pad and process, including solution containment measures;
- geochemical and geotechnical assessment of the material placed on the Heap Leach Pad before and after leaching;
- method and rate of ore deposition and removal;
- chemical characteristics of the leach solution, pregnant liquor and raffinate solutions;
- solution application rates, and method of application;
- removal (where proposed) of the Heap Leach Pad at cessation of production and the method/location of disposal of leached material;
- method of stabilisation and erosion control of Heap Leach Pad;
- an assessment of the long term chemical and physical stability of the Heap Leach Pad post completion;
- the source, pathway and ultimate fate of any potential mobile contaminants; and
- plans (as per 5.1.2.4).

2.5.4 Process Water Management

Provide a water balance including:

- approximate water volumes required;
- a summary of the inputs and outputs (with consideration of any purge requirements);
- determination of net surplus or deficit; and
- process flowsheet showing all streams including stormwater management and mine dewatering where these are connected to the processing circuit.

Provide a description of all water ponds, including:

- size, capacity, layout and location of ponds;
- design and construction methods;
- chemical composition of the solution to be stored in each pond;
- minimum freeboard to be maintained; and
- plans (as per 5.1.2.1).

2.5.5 Type of Mobile Equipment

For mobile equipment to be used in crushing/grinding, processing ore and in transporting the mine product to the point of sale, describe:

- type, size and capacity of machines;
- approximate number of units;
- noise outputs;
- exhaust outputs; and
- fire ignition sources.

2.5.6 Conveyors and Pipelines

Provide a description of any conveyors or pipelines to be used for transporting material to or from the mine, processing facilities and the point of sale including:

- length, size (volumes to be transported), design and type of construction and location;
- the material being transported;
- noise sources;
- dust sources and composition;
- fire ignition sources; and
- plans (as per 5.1.2.1).

2.5.7 Hours of Operation

Describe the proposed hours of operation of crushing/grinding, processing and transport activities.

2.5.8 Rehabilitation Strategies and Timing

Detail all activities, strategies and designs relating to mine closure for removal, disposal and rehabilitation of processing facilities, and material transport systems, including timing of these activities.

2.6 Wastes

2.6.1 Waste Rock and Tailings Storage Facilities

The standards set out in Minerals Policy MPOL007 must be used for the planning, design and assessment of tailings generation and management relating to all aspects of the tailings lifecycle (i.e. construction, operation, rehabilitation, closure and governance).

For waste rock and tailings storage facilities (TSF) provide:

- the estimated tonnes and volumes of all waste rock and tailings to be stored;
- the reserve and any resource or potential resource that the estimated tonnes and volumes of waste rock and tailings is based on;
- the type, location, size, shape, height and method of construction of permanent and temporary waste storage facilities;
- a geochemical and geotechnical assessment of the waste rock and tailings based on the geochemical and geotechnical properties determined from the analysis of representative sampling of all waste rock types and tailings to be disposed;
- an assessment on the weathering and erosive potential of waste rock to be disposed;
- conceptual specifications, drawings and plans for the design, construction, operation and completion of all facilities (as per 5.1.2.5);
- the method and rate of waste rock/tailings disposal;
- where relevant, a description and plan (as per 5.1.2.5) of the placement and encapsulation of waste material deemed to be hazardous, including potentially acid forming material (PAF);
- the method of stabilisation and erosion control of waste storage facilities, both during operations and post completion;
- surface water runoff control on disturbed and rehabilitated areas;
- a geotechnical stability assessment and a factor of safety analysis;
- an assessment of seepage of liquids through the waste rock and tailings storage facilities;
- strategies for the containment of any seepage that has the potential to impact the environment;
- an assessment of the post completion chemical and physical stability of the structure following rehabilitation, including the expected extent of erosion;
- an assessment of the source, pathway and ultimate fate of any potential mobile contaminants; and
- a description of the governance arrangements for the design, construction, operation and closure including when it is proposed to use third party verification.

Include a water balance for the TSF (if not included in the water balance in clause 2.5.4).

2.6.2 Other Processing Wastes

Provide:

- the volumes and composition of all solid and liquid wastes produced;
- estimated volumes of waste processing water, reverse osmosis reject water, water content of solid wastes, and method of disposal or recycling;
- waste water composition;
- disposal and management of any hazardous material or contaminants within waste including radioactive, toxic, corrosive or flammable materials; and
- the source, pathway and ultimate fate of any potential mobile contaminants.

2.6.3 Industrial and Commercial Wastes

List any industrial and commercial wastes generated including, but not limited to:

- putrescible waste, including sewage;
- oils and other hydrocarbons; and
- tyres.

For each waste type, describe the method of disposal including:

- offsite disposal;
- on site waste disposal (including size, location on a plan (as per 5.1.2.1 and 5.1.2.7) and construction details);
- recycling (either on or offsite);
- the type, area and layout of sewage systems to be installed at the site; and
- describe what, if any approvals are required for the disposal of waste.

For each type of waste, describe any potential contaminants that may be generated from onsite storage, and the ultimate fate of those contaminants.

2.6.4 Rehabilitation Strategies and Timing

Detail all activities, strategies and designs relating to mine closure, including timing of these activities and all opportunities for progressive rehabilitation of waste rock and tailings and any other waste to be left on site.

The standards set out in Minerals Policy MPOL007 must be used for the planning, design and assessment of tailings generation and management relating to cover systems, rehabilitation, and closure.

2.7 Supporting Surface Infrastructure

2.7.1 Access and Roads

Describe:

- access route to the proposed operations and show on a map (as per 5.1.2.1 and 5.1.2.6);
- indicate if any new roads are to be constructed, or if existing roads or intersections (public and private) are to be upgraded;
- transport system(s) used to and from the proposed operations and the estimated number of vehicle movements per day; and
- airport/airstrips to be constructed.

2.7.2 Accommodation and Offices

Describe onsite personnel accommodation and offices, including (but not limited to):

- number, area, size, type of construction and location of accommodation, office, meals or laboratory buildings, caravans or camp, and associated structures to be used on site; and
- if temporary or permanent.

2.7.3 Public and Private Services and Utilities Used by the Operation

Describe:

- sources of services or utilities that are, or are to be supplied to the proposed site, including but not limited to power, water, telecommunications;
- if new connections to services and utilities are required, the proposed routes for connection; and
- the effects to any existing services or utilities that have been or may be affected by the proposed operations.

2.7.4 Visual Screening

Describe the type of screening, including existing or proposed vegetation (i.e. species and density of plantings) and show on a map (as per 5.1.2.1).

2.7.5 Fuel and Chemical Storage

For all fuels and chemicals proposed to be stored on site show the proposed location of storage on a map (as per 5.1.2.1) and provide detail on:

- types of bulk chemicals and the volumes of each; and
- proposed storage, bunding and containment for all chemical and fuel storage vessels.

2.7.6 Site Security

Describe and show on a map (as per 5.1.2.1) infrastructure and measures that will be adopted to prevent unauthorised access by the public, including but not limited to:

- fencing; and
- signage.

2.7.7 Erosion, Sediment and Silt Control

Describe and show on a plan (as per 5.1.2.1):

- location and design of silt management structures;
- management and disposal of silt;
- strategies to control runoff on disturbed and rehabilitated areas;
- storage, diversion and release of clean water (discharge water must comply with the current Environment Protection (Water Quality) Policy; and
- a whole of site stormwater balance, if not included in the water balance in clause 2.5.4.

2.7.8 Rehabilitation Strategies and Timing

Detail all activities, strategies and designs relating to mine closure for rehabilitation of supporting surface infrastructure. Provide details for timing of closure activities, including all opportunities for progressive rehabilitation.

2.8 Vegetation Clearance

2.8.1 Description of Vegetation Clearance

If clearing of native vegetation is proposed, a map (as per 5.1.2.2) and description of the vegetation present in the application area must be provided, showing:

- the extent of any proposed vegetation clearance; and
- the likelihood of the presence of threatened flora.

State the estimated quantum of significant environmental benefit (SEB) to be gained in exchange for the proposed clearance and describe how the SEB will be provided.

2.9 Completion

2.9.1 Description of Site at Completion

Provide a description, plans and cross sections (as per 5.1.2.7 and 5.2.2.2) of the site as it will be at completion after all rehabilitation and closure activities have been completed, including:

- potential land use options;
- landforms;
- proposed vegetation covers (including native vegetation that will not be disturbed due to proposed operations);
- natural contours of land not to be disturbed by proposed operations;
- any infrastructure that will remain on site and will become the responsibility of the landowner;
- location, description and management of waste disposal areas;
- location of reshaped and rehabilitated areas showing proposed surface contours and revegetation;
- mine voids (open pit and/or underground);
- location of stored and/or exposed PAF material and/or other hazardous materials;
- expected final water level and time to reach this level, and water quality of mine voids;
- location of surface water infrastructure including ponds and diversions; and
- representative plans and cross-sections (as per 5.1.2.7 and 5.2.2.2) that show:
  - pre-mining natural surface;
  - emplacement areas, waste disposal areas and disturbed areas; final rehabilitated surface;
  - where relevant, backfilled and remaining underground workings; predicted final groundwater elevations; and
  - interpreted geology including all rock types.

Provide a description of the proposed mechanism for transferring responsibility for any potential residual liability (i.e. ongoing maintenance or monitoring) subsequent to surrender of the tenement.

2.10 Resource Inputs

2.10.1 Workforce and local procurement

For the proposed workforce (for all operations including mining, processing, waste management and supporting surface infrastructure) describe:

- how operations on the site will be managed;
- number and workforce breakdown by job type;
- number of full-time employee positions that would be directly created by the proposal (not to include existing positions);
- the proportion of the workforce that would reside in the local community and the estimated impact on local employment;
- any programs to target and assist Indigenous or local employment at the quarry;
- training to be provided to employees and potential employees;
- approximate timelines for creation of the positions; and
- potential for local business participation, and procurement of local goods and services.

2.10.2 Energy Sources

For the proposed energy sources and usage provide:

- estimates of total annual energy usage (from all sources, including personnel transport and ore transport to point of sale);
- expected sources of energy;
- potential for efficiency gains;
- amount and percentage of zero emission energy to be utilised;
- equivalent annual CO^2 generated; and
- any carbon offsets proposed.

2.10.3 Water Sources

Provide details on the source(s) of water to be used at the mine, expected usage and any discharge, including:

- expected annual water usage by source;
- indicate if any water usage by source will be more than 5% of the total annual water withdrawal for that source;
- percentage of water that will be recycled; and
- water discharge by quality and destination.

3. CONSULTATION

In setting out the result of the consultation undertaken in connection with the proposed operations in accordance with sections 36(1)(c)(iv) and 49(1)(c)(iv) of the *Mining Act 1971* and regulation 47 of the *Mining Regulations 2020*, the Minister determines in accordance with regulation 46(7)(e) of the *Mining Regulations 2020* that a proposal must include:

A description of:

- the process undertaken for identifying stakeholders with an interest in, or stakeholders likely to be directly affected by the proposed operation;
- the process undertaken for the delivery of information to, gathering of feedback from, and responding to those identified stakeholders;
- if any individual or group of similar affected persons were not able to be consulted, what steps were taken to consult with them; and
- the extent to which the outcomes proposed in clause 4.2.2 have been developed in consultation with the landowner and any other person who may be directly affected by the proposed mine operations.

The results of the consultation undertaken with those identified stakeholders, including:

- the persons consulted;
- any concerns/issues raised; and
- the response and steps (if any) taken or proposed to address those concerns.

4. MANAGEMENT OF ENVIRONMENTAL IMPACTS

4.1 Assessment of Environmental Impacts

In setting out an assessment of the environmental impacts of the proposed authorised operations in accordance with sections 36(1)(c)(ii)(A) and 49(1)(c)(ii)(A) of the *Mining Act 1971* and regulation 46(2) of the *Mining Regulations 2020*, the Minister determines in accordance with regulation 46(7)(e) of the *Mining Regulations 2020* that a proposal must include an assessment of the environment as set out in this Terms of Reference.

4.1.1 Elements of the Environment

Describe the specific elements of the environment (the environment is defined in Section 6(4) of the *Mining Act 1971*) that may reasonably be expected to be impacted by the proposed operation during construction, operation, and indefinitely post completion.

For each element of the environment identified:

- provide a summary of any issues or considerations raised by stakeholders, and any relevant legislated or recognised standards in relation to the element of the environment;
- describe all potential environmental receptors; and
- undertake an impact assessment of how the element could be potentially impacted by proposed operations (during construction, operation and post completion) through the provision of the information listed in the following clause 4.1.2.

4.1.2 Potential Impact Events

Describe potential impact events associated with each phase of the proposed operations (construction, operation and post completion) and relevant to each element of the environment.

For the purpose of the impact assessment, a potential impact event is the combination of a source, a pathway and an environmental receptor.

The source, pathway and environmental receptor of each potential impact event must be described prior to the implementation of engineering or administrative control measures.

For each potential impact event identified in clause 4.1.2, provide:

4.1.2.1 Source

A description of the source of the potential impact event which alone or in combination has the potential to cause harm to an environmental receptor.

4.1.2.2 Pathway

A description of the potential pathway, means or route (with consideration of any natural barriers) by which an identified environmental receptor can be exposed to, or may reasonably be expected to be impacted by an identified source.

4.1.2.3 Environmental Receptor

A description of the environmental receptors that may reasonably be expected to be adversely impacted by the source, taking into account the considerations for the element of the environment described under 4.1.1.

4.1.2.4 Description of Uncertainty

Describe any significant degree of uncertainty pertaining to the evaluation of sources, pathways and environmental receptors, including (but not limited to) lack of site specific information, limitations on modelling and quality of data. Describe any assumptions connected with the identified uncertainty.

So far as is relevant, identify the sensitivity to change of any assumption that has been made, including whether a change in assumption may result in a new environmental impact.

4.1.2.5 Confirmation of Impact Events

For each potential impact event provide:

- an analysis of whether a source, pathway and receptor does exist (and if not, or if it remains uncertain, provide an explanation for the conclusion); and
- a description of the likely impact from the source on the environmental receptor.

4.2 Control and Management Strategies, Uncertainty Assessment, Statement of Environmental Outcomes and Criteria

For each impact event confirmed in clause 4.1.2.5, the information listed in clauses 4.2.1-4.2.4 must be provided:

4.2.1 Control and Management Strategies

In setting out an outline of the measures that the applicant intends to take to manage, limit or remedy environmental impacts as confirmed in clause 4.1.2.5 in accordance with sections 36(1)(c)(ii)(B) and 49(1)(c)(ii)(B) of the *Mining Act 1971* and regulation 46(3) of the *Mining Regulations 2020*, the Minister determines in accordance with regulation 46(7)(e) of the *Mining Regulations 2020* that a proposal must:

- Include a description of the strategies proposed to manage, limit or remedy each impact event;
- Demonstrate that the control and management strategies proposed are commensurate with the potential impacts, achieve compliance with other applicable statutory requirements and promote progressive rehabilitation;
- Include a description of any significant degree of uncertainty pertaining to the likely effectiveness of proposed control and management strategies, including (but not limited to) lack of site specific information, limitations on modelling and quality of data;
- Include a description of any assumptions connected with the identified uncertainty; and
- So far as is relevant, identify the sensitivity to change of any assumption that has been made and assess the likelihood of an outcome not being achieved if an assumption is later found to be incorrect.

4.2.2 Statement of Proposed Environmental Outcomes

Statements of the environmental outcomes that are expected to occur are required in accordance with sections 36(1)(c)(ii)(C) and 49(1)(c)(ii)(C) of the *Mining Act 1971* and regulation 46(4) of the *Mining Regulations 2020* and must be made for each impact event confirmed in clause 4.1.2.5. The Minister determines in accordance with regulation 46(7)(e) of the *Mining Regulations 2020* that a proposal must:

- Provide a statement of the proposed environmental outcome(s) (including completion outcomes assessed on a long term basis) for each impact event confirmed in clause 4.1.2.5.
- Ensure that the statement of environmental outcome(s) describe the likely consequence of the expected impact on the environment by the proposed mine operations subsequent to the implementation of the control measures described in clause 4.2.1.
- Provide a statement that demonstrates the environmental outcomes would be able to be achieved taking into consideration the effectiveness of the control strategies (clause 4.2.1) and description of uncertainty (clause 4.2.2).

4.2.3 Draft Measurement Criteria

In preparing a draft statement of the criteria to be adopted to measure each of the proposed environmental outcomes in accordance with sections 36(1)(c)(iii) and 49(1)(c)(iii) of the *Mining Act 1971* and regulation 46(5) of the *Mining Regulations 2020*, the Minister determines in accordance with regulation 46(7)(e) of the *Mining Regulations 2020* that the draft criteria must:

- as far as practical comply with the five elements set out in regulation 46(5) of the *Mining Regulations 2020*;
- include demonstration of the successful implementation for the significant environmental benefit, if native vegetation is proposed to be cleared and an on-ground off-set proposed;
- be developed separately for construction, operation and completion, as appropriate; and
- where appropriate, recognised industry standards, codes of practice or legislative provisions from other Acts should be used as criteria.

4.2.4 Draft Leading Indicator Criteria

Where there is a high level of reliance on control measures strategies to achieve an environmental outcome, provide a draft statement of leading indicator criteria that will be used to give an early warning that a control measure strategy may fail or be failing.

5. MAPS, PLANS AND CROSS SECTIONS

In preparing a proposal in accordance with sections 36(1)(c) and 49(1)(c) of the *Mining Act 1971* and regulation 46 of the *Mining Regulations 2020*, the Minister determines in accordance with regulation 46(7)(e) of the *Mining Regulations 2020* that all maps and plans must comply with the following requirements relating to the amount of detail or information to be provided:

- state and show the relevant datum (Australian Height Datum (AHD) is preferred);
- metric units;
- title, north arrow, scale bar, text and legend;
- date prepared and author;
- be of appropriate resolution and scale for represented information; and
- be legible in both the hardcopy and electronic versions of the submission.

All cross-sections must conform to the following standards:

- state and show the relevant datum (Australian Height Datum (AHD) is preferred);
- metric units;
- title, scale bar, text and legend;
- date prepared and author;
- be of appropriate resolution and scale for represented information; and
- be legible in both the hardcopy and electronic versions of the submission; and
- be accompanied by a map showing the orientation of the cross-sections.

5.1 List of Maps

5.1.1 Maps required for Description of the Existing Environment (as per clause 2)

5.1.1.1 Topographic Map showing:

- application area boundaries;
- existing surface contours;
- existing vegetation;
- location of watercourses, including ephemeral and permanent rivers, creeks, swamps, streams, wetlands and any man-made water management structures;
- surface water catchment boundaries;
- direction of drainage and discharge from the application area;
- location and extent of all previously disturbed areas associated with previous mining;
- location and extent of any known existing contamination; and
- location and extent of any adjacent conservation reserves, heritage sites (in so far as may be permitted by the relevant legislation) or any other significant areas.

5.1.1.2 Local Geological Map showing:

- application area boundaries;
- geology within the application area, including but not limited to location, dimensions and orientation (dip and strike), and extent of the mineral resource and ore reserve;
- topsoil/subsoil variation if there is a variation in soils over the application area; and
- natural geohazards in the application area.

5.1.1.3 Aquifer Potentiometric Surface Map(s) showing:

- application area boundaries;
- potentiometric surface contours/groundwater elevation contours and the time (or time period) the contours relate to;
- interpreted direction(s) of groundwater flow; and
- location of representative bores (where measurements were obtained of which the contours are based on) used to establish this information.

5.1.1.4 Land Access Map showing:

- application area boundaries;
- cadastral information for the Tenement (including land title(s) and ownership);
- any exempt land;
- location of residences within and near the application area; and
- human infrastructure as per 1.13.

5.1.1.5 Caves Map showing:

- application area boundaries; and
- location of the cave(s).

5.1.2 Map(s) and Plan(s) required for Description of Proposed Mine Operations (as per clause 3)

5.1.2.1 Site Layout Map showing all components of the proposed mine operation including (but not limited to):

- application area boundaries;
- location of surface water and sediment management infrastructure;
- location of process water dams;
- location of fuel and chemical storage areas;
- location of haul/access roads;
- location of fixed plant;
- location of mobile plant for stage 1 of mining;
- location of visual screening measures;
- location of fencing;
- location and extent of topsoil/subsoil and product stockpiles.
- location and extent of all areas proposed to be disturbed from mining including waste rock, silt/slime dams, mine infrastructure, processing plant, process water ponds, waste disposal facilities; and
- location and extent of open pit(s) and/or underground workings.
- location of key environmental features that are within or in close proximity to the Tenement and that are relevant to the design of the Site Layout Plan, including but not limited to housing and infrastructure, existing heritage sites, existing ephemeral and permanent rivers, watercourses, creeks or dams and/or existing native vegetation

5.1.2.2 Sequence of Mining and Progressive Rehabilitation Map showing:

- application area boundaries;
- staging of each progressive mining stage;
- proposed native vegetation clearance;
- location and applicable buffer zones for protection of native vegetation that will not be cleared; and
- conceptual staging of each progressive rehabilitation stage.

5.1.2.3 Crushing, Grinding and Processing Plant Plan

- application area boundaries
- layout of crushing, grinding and processing plant(s) and ancillary plant and infrastructure; and
- if required; including lining and drainage systems.

5.1.2.4 Heap Leach Pad Plan

- application area boundaries
- construction and design drawings of heap leach pad (including size and batters); and
- solution containment measures

5.1.2.5 Tailings Storage Facility (TSF) Plan

- application area boundaries
- drawings and plans for design, construction, operation and completion of all facilities;
- size, shape, height and method of construction; and
- location of any waste material deemed to be hazardous including potentially acid forming material.

5.1.2.6 Access Route Map showing:

- application area boundaries
- access route for heavy vehicles;
- exit route for heavy vehicles; and
- any road upgrades or new roads to be constructed.

5.1.2.7 Completion Map showing:

- application area boundaries
- conceptual final landforms (including rehabilitated and non-disturbed areas);
- proposed topographical contours of the entire site (including rehabilitated and non-disturbed areas);
- backfilled and remaining underground workings;
- location of waste disposal areas (including waste rock dumps, tailings storage facilities and paf encapsulation); and
- interpreted geology including all rock types

5.2 Summary of Cross-Sections and Long Sections

Following is a summary of all cross-sections and long sections required in the proposal:

5.2.1 Cross-Sections required for Description of the Existing Environment (as per clause 2)

5.2.1.1 Long Section and Geological Cross-Section(s) showing:

- a representation of the geological profile within the application area; and
- depth of the resource and any overlying overburden.

5.2.1.2 Hydrogeological Cross-Section(s) showing:

Include a series of hydrogeological cross-sections that represent the following at a regional scale and/or tenement application scale, as specified:

- application area boundaries;
- major geological units (regional scale);
- geological units showing aquifer and confining units (tenement scale);
- aquifer systems (regional and tenement scale) including any palaeochannels;
- interpreted hydrostratigraphy showing the known and inferred groundwater heads/groundwater elevations, interpreted groundwater flow direction, recharge and discharge mechanisms (if applicable);
- location of GDEs;
- interpreted faults (regional and tenement scale);
- mineralised zone (tenement scale);
- location of representative drill log sites from which geological information was obtained (regional and tenement scale); and
- location of representative monitoring bores from which baseline groundwater information was obtained.

5.2.2 Cross-Sections required for Description of Operations (as per clause 3)

5.2.2.1 Mining Operation Cross-Section(s) showing:

- pre-mining natural surface;
- proposed pit depth;
- proposed pit dimensions (length and width);
- proposed pit batters and benches;
- location of underground shafts and stopes; and
- stages of operation.

5.2.2.2 Completion Cross Section(s) showing:

- pre mining natural surface;
- proposed conceptual rehabilitated final batters and benches;
- location of underground backfill in shafts and stopes;
- predicted final groundwater elevations; and
- proposed conceptual final rehabilitated surface.

ADDITIONAL INFORMATION TO ACCOMPANY APPLICATION

An application for an ML and/or MPL must be accompanied by additional information as set out in regulations 30, 37 and 48 of the *Mining Regulations 2020*, and must comply with the following determinations of this Terms of Reference as set out below:

6. REASONABLE PROSPECT OF ACCESS TO LAND

In preparing a statement under regulation 30(1)(e)(i) of the *Mining Regulations 2020* that demonstrates that there is a reasonable prospect that the land in respect of which an ML is sought could be effectively and efficiently mined, the Minister determines in accordance with regulation 30(2) of the *Mining Regulations 2020* that this statement must be supported by the following evidence:

- A description of any waivers of exemption obtained, and/or information on the status of waivers of exemption yet to be negotiated/finalised under Section 9AA of the *Mining Act 1971*; and
- A description of any native title mining agreements obtained under the *Mining Act 1971* or Indigenous Land Use Agreements (ILUA) under the *Native Act 1993* (Cth).

7. DESCRIPTION OF CONTRIBUTIONS TO THE ECONOMY

For the purposes of regulation 30(1)(g) of the *Mining Regulations 2020*, the Minister determines that the following information must accompany an application for an ML:

Describe:

- goods and services used in the local community, state and external to state;
- wages and other employee benefits;
- economic benefits derived from local employment;
- approximate royalty payments and other direct state government taxes; and
- any other potential economic contributions proposed during the development of the mine, operation of the proposed mine and post completion.

8. RESERVES OR RESOURCES (OR BOTH)

Provide:

- a JORC compliant reserve or resource estimate (or both); and
- the accompanying JORC Public Report and competent person statement;

or (if a JORC compliant reserve or resource (or both) has not been reported)

- a detailed estimate of the resource to be mined, the basis of this estimate, and evidence that demonstrates that the resource can be economically mined at current market prices.

Dated: 15 March 2021

E. LOCK
A/Manager Mining Assessments
Mineral Resources Division
Department for Energy and Mining
Delegate of the Minister for Energy and Mining