

Decommissioning & Rehabilitation Plan (DRP)

A guideline for the Tasmanian mining industry

A Decommissioning and Rehabilitation Plan (DRP) is a plan approved by the Director, Environment Protection Authority (EPA), that formally recognizes and sets out an agreed documented environmental management strategy for the decommissioning and rehabilitation (D&R) of an activity (e.g. mine) prior to and after the cessation of the activity.

The EPA acknowledges the Australian Government Department of Resources, Energy and Tourism's '*Leading Practice Sustainable Development Program For The Mining Industry*' (LPSDP) series of handbooks, specifically; 'Mine Closure and Completion (2009)' and 'Mine Rehabilitation (2006)' as suitable documents for developing a Mine Closure Plan.

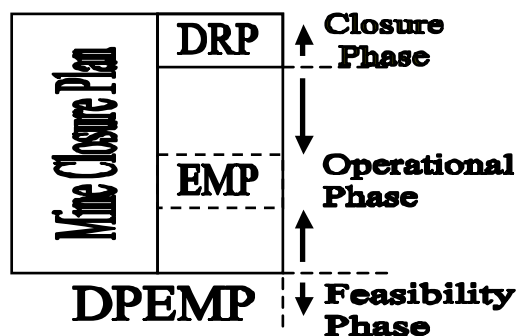
The DRP is intended to expand upon the aspects of a Mine Closure Plan relating to D&R, not to reproduce them.

A Mine Closure Plan:

- Is a key strategy that all operating companies should have from commencement of operation and should be incorporated in the Development Proposal & Environmental Management Plan (DPEMP), as part of the operating framework;
- Should provide recognition of the future requirements for closure;
- Provides the operator the opportunity to demonstrate how they will minimise environmental harm due to the activity and allows for forward planning in respect of estimated potential closure/rehabilitation costs;
- Enables an operator to forward budget for rehabilitation works;
- Should be regularly updated, e.g. yearly but as a minimum triennially; and
- Should be developed in accordance with the LPSDP

While the Environmental Management Plan (EMP) covers the environmental performance during the operational phase of a mine, (typically in three to five yearly periods), the Decommissioning Rehabilitation Plan (DRP) covers it during the closure phase.

The Mine Closure Plan should be considered a living document and adapted during the operational life of the mine. The figure below shows how a DRP fits with a Mine Closure Plan.



DRP Development

- The DRP is to be developed by the operator on the basis of the guidelines provided in this document, in consultation with the EPA, but may also include consultation with other relevant government departments, local government and community interest groups. Operators may find it beneficial in the development of the DRP to undertake early and regular consultation with interested stakeholders.
- While the format of a DRP should closely follow these guidelines, they are only intended to determine the minimum requirements. Where additional requirements are identified, be they environmental rehabilitation, or occupational health and safety matters not included in the guidelines, then these also should be included in the DRP.
- In addition to the DRP guidelines, it is recommended that the operator also takes into consideration, Australian and International experience. Broadly-based research will help to

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ensure Accepted Modern Technology (AMT), Best Practice Environmental Management (BPEM) and the precautionary principle is implemented in undertaking the D&R of the site.

- As the DRP is intended to be a publicly available document to allow for consultation and objective assessment of the proposed works to be carried out over an agreed timeframe to set final objectives it should be drafted in a manner that can be understood by non-technical readers. Any information or data of a technical and/or complex nature should be provided in appendices.
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- It may be convenient to include in the DRP the detail or a statement of how other decommissioning or rehabilitation regulatory obligations are being discharged such as OHS and public health and safety matters.

Requirement for a DRP

- While the requirement for a DRP is not specifically included in the *Environmental Management and Pollution Control Act 1994* (EMPCA), the principles behind its implementation, that of prevention of environmental harm and adoption of Best Practice Environmental Management (BPEM) standards are fundamental to the Act, and hence provide the basis for the requirement and implementation of a DRP upon cessation of activities.
- The person responsible for the activity must submit the DRP to the Director, EPA for approval, in accordance with the requirements of the permit or Environment Protection Notice (EPN) or within a set timeframe of receiving a request by the Director to provide the DRP.
- The DRP should clearly set out the financial provisioning for mine closure and rehabilitation.
- The DRP should form the basis for providing management plans, which should include, but not be limited to: rehabilitation; infrastructure removal; weeds, vegetation & *Phytophthora cinnamomi*; contaminated sites; acid rock drainage; final land form development; tailings dams; surface & ground water, waste, fire and safety.
- The DRP should show provision for Planned Closure, Sudden Closure and Temporary Closure.
- At closure, each management plan will have clear commitments, which will then need to be reported annually to the EPA Division, while the DRP itself should be subject to EPA review every three years.

Information required in a DRP

1. Summary

An executive summary of the contents of the DRP should be provided to give a short overview of the operation and the potential environmental impacts, along with the measures that will be taken to avoid or minimise the potential impacts.

2. Introduction

2.1 Background

2.2 Objectives

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Performance objectives should be developed which may include statements such as:

- Full compliance with all applicable environmental standards; and
- Site to be decommissioned and rehabilitated to a standard suitable for an identified end use.

3. Policies, Permits Standards & Legislation

General information relating to the requirement for its development including: relevant State/National legislation, company environmental policies, standards and codes of practice.

The operator will need to consider if:

- They have set a reasonable time to have the DRP approved in relation to starting the work plan;
- The planned DRP activities are in accordance with the requirements of the Planning Authority (Council) Land Use Permit (Permit)/EPN and applicable environmental standards and legislation. The Permit/EPN conditions also set out some basic requirements of the DRP, which should be addressed and implemented in accordance with BPEM standards and AMT;
- The Planning Authority may require an application for a Land Use Permit or building permit for decommissioning works to proceed;
- An application for a building permit may be required prior to decommissioning and demolition works; and
- The land use zone may change in the future, which may impact on planning permit requirements.

4. Stakeholder consultation process

The DRP should describe the consultative process to be developed and undertaken with relevant stakeholders.

Stakeholder consultation will help define the future use of the site; this must include a wide range of organisations with a vested interest in the process being successfully carried out. The consultative process ideally should be undertaken via a consultative committee including representatives of all interest groups with regular meetings and feedback to all parties.

Relevant organisations may include:

- Company representatives;
- Department of Primary Industries, Parks, Water and Environment (DPIPWE);
- Department of Infrastructure, Energy & Resources (DIER);
- Mineral Resources Tasmania (MRT);
- Workplace Standards Tasmania (WST);
- Division of Roads and Public Transport (DRPT);
- Department of Economic Development (DED);
- Department of Health & Human Services (DHHS);
- Forestry Tasmania;
- Tasmanian Minerals Council;
- Hydro Tasmania;
- Relevant planning authorities (Councils);
- Community groups;
- Relevant Non-Government Organisations; and
- Other lease operators on the mining lease.

5. Background Studies

Background studies may include studies carried out prior to commencing operations or identifying future company responsibilities, which may include the following:

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- Hydro-geological and geochemical investigations (especially in respect of tailings dams and waste rock dumps in relation to acid and metalliferous drainage management);
- Waste management to identify all key waste streams, rehabilitation of waste dumps, waste handling and separation of waste materials due to demolition, recycling of materials, disposal options for materials, volumes of wastes to be produced, land fill requirements, tailings dams management and sewage systems;
- Engineering considerations and feasibility (e.g. tailings dam stability/closure options and their implications);
- Rehabilitation/revegetation requirements;
- Safety considerations;
- Heritage considerations (including former and current workings, equipment and buildings);
- Site wide soil sampling, outlining existing contamination levels, including brief details of locations, parameters etc. and comparison with soil contamination assessment criteria; and
- Weed and fire management issues.

6. Environmental Management Strategies

Environmental management strategies should be based on the outcomes of the background studies, consultations and include priority tasks. Strategies should identify:

- All priority areas for the D&R;
- Future uses for the site, including resource sterilisation issues; and
- Any risks and opportunities and how these are to be addressed.

7. Management Plans

Management plans should be developed from the background studies and strategies and form the core of the DRP. Management plans are a mechanism that should identify how targets are met and the person/group responsible for implementing the plan. Such management plans should include as a minimum:

Rehabilitation

Rehabilitation should consider the long term land use for the site, control of weeds, visual aspects and stabilising the landform to reduce potential for erosion and/or the discharge of pollutants from the site by:

- Undertaking activities that include grading, leveling, re-contouring, of both current disturbed and previous disturbed areas not rehabilitated;
- Using recognised guidelines for earth works, vehicle wash down and weed control. References include the "Tasmanian Washdown Guidelines for Weed and Disease Control : Machinery, Vehicles & Equipment Edition 1", prepared by the Department of Primary Industries, Water and Environment, Forestry Tasmania and the Agricultural Contractors Association of Tasmania, and "Keeping it clean : A Tasmanian field hygiene manual to prevent the spread of freshwater pests and pathogens", prepared by Natural Resource Management South and dated April 2004; and
- Revegetating using plant species native to the local area, unless otherwise approved.

Tailings Storage Facilities (TSF)

Development of suitable closure designs for tailings storage facilities needs to consider existing operational strategies and guidelines.

As a minimum closure planning for tailings storage facilities needs to consider:

- Inclusion of a statement of materials disposed of in the tailings dam;

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- An analysis of the risks derived from the contents of the dam;
- Long term structural integrity of the storage structure;
- Environmental impacts of seepage;
- Rehabilitation;
- Hydrogeological and geochemical investigations in relation to long term acid rock drainage management;
- Post-closure land use;
- The risk of the potential impact on the surrounding environment in the event of a failure of the structure should be considered in planning for decommissioning and closure of tailings areas; and
- Surface treatments of tailings storage facilities needs to be designed to optimise the following:
 - Immobilisation of the surface material;
 - Reduction of capillary action;
 - Control of infiltration;
 - Enhancement (diversion and treatment) of run off;
 - Diversion of uncontaminated surface water;
 - Control of erosion;
 - Enhancement of revegetation; and
 - Minimisation of any potential toxicity.

Pit Void

Developing suitable closure scenarios for pits (open & underground) should be based on operational strategies, standards and guidelines.

Evidence of consideration of options including back filling and the infilling of pits during operations is required. Consideration of these options may provide cost effective solutions to post-closure impacts. The closure planning for pit voids needs to be supported by final contour plans and/or cut and fill balances.

D&R for pit voids needs to consider:

- Structural integrity of pit walls;
- Public health and safety;
- On-site and off-site environmental impacts;
- Rehabilitation;
- Water quality and quantity;
- Potential for ARD;
- Soil salinity and alkalinity;
- Post-closure land use, e.g. waste disposal, water storage, recreational lake etc;
- Geochemistry and geology and waste rock; and
- D&R for pit voids may also include the development of a hydrogeological model to determine:
 - Overall project water balance;
 - Pit lake water quality and quantity
 - Final ground water levels;
 - Contribution of surface water to final void; and
 - Potential for saline water body and subsequent regional impact.

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Waste Rock, ROM and Overburden Stockpiles

To maximise the efficiency in handling materials, consideration needs to be given to the location and design of waste rock dumps, run of mine (ROM) pads and overburden stockpiles and to the uses of this material in decommissioning activities.

D&R for these stockpiles needs to consider:

- Surface and structural integrity of the stockpiles;
- Potential ARD;
- Potential for spontaneous combustion;
- Geochemistry and geology and waste rock;
- Immobilisation of surface material;
- Environmental impact of erosion and run off;
- Impact of erosion on local watercourses;
- Surrounding land forms and topography;
- Visual values;
- Cover treatments and rehabilitation; and
- Contamination from leaching and fragmentation of ore.

The geochemistry of waste material should be considered when planning rehabilitation treatments, to ensure material with toxic or saline properties is adequately encapsulated.

Water Management Systems

The end use of water management systems such as supply dams and settlement ponds should be considered, particularly in arid and/or remote areas where access to stock or potable water supply is limited.

During the D&R of water management systems consideration needs to be given to:

- Removal of associated infrastructure e.g. pipelines, culverts etc;
- Remediation requirements;
- Post-closure maintenance requirements;
- The maintenance and decommissioning of ground water bores;
- The installation of new monitoring bores;
- Long term stability and safety requirements for dams;
- Long term impact of facilities on flora and fauna; and
- Short and long term water quality and quantity.

Registered or Known Contaminated Sites

Registered or known contaminated sites typically represent sources of soil and ground water contamination. A site history should be undertaken, identifying areas of probable contamination, followed by a site assessment and remediation plan, if required (including consideration of ground water).

D&R for registered or known contaminated sites needs to consider:

- Relevant standards for assessment and for remediation;
- Extent and severity of contamination;
- Timeframe for implementation of remediation strategies; and
- Removal or treatment of contaminated infrastructure or material.

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Waste Management

The management of waste must be in accordance with the hierarchy of waste management (avoidance, re-use, recycling, treatment and disposal).

Any existing or potential controlled waste should be identified. The source, nature, quantity, and method of treatment, storage and disposal for each controlled waste should be described.

Where disposal is required, preference is given for disposal of waste to recognised landfill sites. It is acknowledged that some sites, particularly those in remote locations have solid waste land fill facilities associated with the operation.

D&R planning for solid waste management needs to consider:

- Site selection of waste management facilities including hazardous waste;
- Design, bunding and sealing of waste facilities;
- Regulatory guidelines for operation and closure of waste management facilities; and
- Post-closure management of facilities in particular leachate and capping integrity.

Infrastructure Decommissioning

The retention or demolition of site infrastructure presents a significant cost and should be considered at the purchasing, investment and planning stages. The market value will change over the life of the operation and the degree to which the infrastructure is maintained during the operational period should reflect the intended post-closure use. The decommissioning phase should be considered during planned upgrades of equipment and infrastructure, with the aim to remove upon closure.

The following should be provided in relation to decommissioning infrastructure:

- A list of the areas and equipment that require decommissioning;
- A description of the decommissioning strategy, timing, and the techniques chosen to remove and dispose of equipment, structures and associated waste material, unless they are considered by the Director to be beneficial to a future use of the land;
- A description of any special procedures or precautions to be used to ensure safety during decommissioning, e.g. removal and treatment of contaminated materials, procedures for making safe and sealing openings to underground workings;
- Requirements of stakeholders in regards to retention of infrastructure;
- Opportunities to divest redundant equipment during operation; and
- Implications of lowering maintenance costs during operation on the long term economic return on equipment.

Roads, Rail, Airstrips and Other Drainage Inhibitors

Roads, railway lines, airstrips and the like often intercept natural drainage lines potentially causing localised or regional impacts.

D&R for drainage inhibitors needs to consider:

- Removal of core infrastructure (e.g. culverts) and associated infrastructure (e.g. car parks);
- Post-closure maintenance of retained infrastructure;
- Rehabilitation strategies/methods; and
- Ongoing impact on localised and regional drainage lines.

8. Monitoring and Reporting

Identify ongoing/verification monitoring regimes in compliance with existing Permit/EPN requirements and those relevant to the DRP agreed by the EPA. Monitoring programs should be developed to be able to show long term improvement in environmental conditions, leading to eventual stability and self-sustainability of ecosystems. A quality assurance program should justify the monitoring and reporting. The reporting requirements should also be outlined in respect to monitoring and other requirements in a tabular format.

9. Timetable

A timetable should be provided, which identifies the required timeframes to develop the DRP, gain all relevant approvals, and implement the various components of the DRP. Ideally the plan should be developed a minimum of 2 years prior to the target date for mine closure and extend 5 to 10 years post closure.

10. Commitments

A summary of the key commitments of the DRP should be presented in tabular form.

The Environmental Commitments made by the proponent in the DRP should be clearly defined and separately listed. The listed commitments should also include monitoring and reporting commitments, and should identify:

- What is to be done;
- When it is to be done;
- Who has responsibility for undertaking the work; and
- Who has responsibility for determining that the work done is satisfactory.

All commitments made in the DRP should be numbered and summarised in this list.

11. Costing

The costs for implementing the DRP should be specified in sufficient detail in the Plan or in appendices to the Plan to cover all aspects of the D&R.

12. Other

Sources of Information and Consultation

Sources of information utilised in the DRP should be referenced as well as the results of any public consultation undertaken as part of the process.