GOVERNMENT OF WESTERN AUSTRALIA

Department of **Energy, Mines, Industry Regulation and Safety**

GUIDELINES

Exploration and Prospecting Rehabilitation Guidance

For Programmes of Work approved under the *Mining Act 1978*

Version 1

December 2023

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Version History

Version	Date	Changes
0.1	December 2022	Draft for consultation
1	December 2023	Updated to reflect stakeholder feedback

Purpose

The purpose of this document is to guide companies on how to undertake appropriate environmental management and rehabilitation of mineral exploration and prospecting activities regulated by the Department of Energy, Mines, Industry Regulation and Safety (DEMIRS) in Western Australia.

Scope

This guidance relates to rehabilitation of exploration and prospecting disturbances undertaken under the *Mining Act 1978*.

Legislation/Guidelines

Sections 46, 63, 70H, and 82 of the Mining Act require a tenement holder to submit a Programme of Work (PoW) in the prescribed manner, and obtain written approval from a prescribed official, prior to using ground disturbing equipment when exploring for minerals.

The Mining Act also requires tenement holders to fill in or otherwise make safe to the satisfaction of a prescribed official all holes, pits, trenches and other disturbances to the surface of the land made while exploring for minerals and in the opinion of the prescribed official, likely to endanger the safety of any person or animal.

Guidance for exploration and prospecting rehabilitation

1. Introduction

Exploration and prospecting are considered to be short term, transient activities which should not result in a lasting impact to the environment. Due to the scale of exploration and prospecting activities occurring in Western Australia, it is particularly important that environmental impacts are appropriately managed to reduce the cumulative impacts of the industry.

The overarching principle of this guidance is that the minimisation of clearing and/or disturbance and proactive rehabilitation should be some of the highest priorities for explorers and prospectors. Early identification and management of the potential environmental impacts of an exploration or prospecting operation can also provide cost benefits when meeting rehabilitation obligations.

2. Rehabilitation objectives

DEMIRS objective for exploration and prospecting rehabilitation is that all disturbances are temporary, and are rehabilitated as much as practicable to pre-disturbance conditions, being safe to humans and animals, non-polluting, and no permanent alteration of ecological function.

3. Rehabilitation timeframes

Tenement conditions imposed on all Mining Act tenements require that rehabilitation be completed within a specific timeframe unless otherwise approved in writing by DEMIRS. Failure to complete rehabilitation within specified timeframes constitutes a breach of tenement condition and may result in forfeiture action.

Standard tenement conditions for rehabilitation have been updated with the release of this guidance. Refer to DEMIRS Mineral Titles Online (MTO) system to see the conditions that apply to a particular tenement. It is important to note that the requirements of conditions can vary across different tenements as they will be aligned with the standard conditions that applied at the time of grant. This can include the timeframe by which rehabilitation must be completed.

The rehabilitation timeframe commences at the moment any particular activity occurs. The timeframe also applies on a 'per activity basis', not a 'per PoW' or 'per drilling campaign' basis. For example, if drill pad A is cleared on 1 January and drill pad B is cleared on 1 March, rehabilitation for drill pad A will be due two months prior to drill pad B.

4. Rehabilitation practices

Timely and progressive rehabilitation, particularly the direct return of topsoil and cleared vegetation, is likely to result in more successful rehabilitation and should be undertaken as a priority.

4.1 General rehabilitation requirements

During clearing activities, topsoil and vegetation should be managed as a resource to be used during rehabilitation.

Topsoil and vegetation should be respread over disturbed areas in order to aid in regrowth and habitat establishment. Fresh topsoil has been shown to produce significantly better rehabilitation outcomes than stockpiled topsoil.

In areas of high seasonal rainfall, rehabilitation should be prioritised and undertaken prior to seasonal rainfall in order to restore natural surface water flows, prevent concentration of water and minimise erosion risks.

As per standard tenement conditions imposed on all Mining Act tenements, all rubbish, plastic sample bags, abandoned equipment, and temporary buildings must be removed from the tenement prior to or at the termination of the exploration programme. Any rubbish and/or plastic samples bags must be removed before they begin to breakdown.

As per standard tenement conditions, all reasonable measures must be taken to ensure hydrocarbons, environmentally hazardous chemicals, process water, and other environmentally hazardous substances or waste are stored and managed in a manner to prevent discharges to the environment. Any spills must be contained and cleaned up within a timely manner, and disposed of appropriately.

4.2 Exploration Drilling

4.2.1 Drill hole rehabilitation

Appropriate rehabilitation of drill holes is crucial in managing the risk posed to fauna, groundwater contamination, and safety that open and un-rehabilitated drill holes pose. Drill holes must be temporarily plugged immediately after drilling is completed and remain as such until they are permanently plugged below ground.

Drill holes must be permanently plugged and fully rehabilitated within the approved rehabilitation timeframe. To meet the department's expectations, the plugging of drill holes needs to ensure the area is safe and does not subside or collapse. As a guide, the recommended process involves:

1. cutting the drill collar to a minimum depth of 400mm below the surface;
2. remove the cut collar;
3. inserting a conical plug so that it has a tight fit with the collar; and
4. backfilling the remaining void and mound over the backfilled hole (approximately 250mm high by 800mm wide) to facilitate water shedding away from the drill hole to the surface with low permeability material and then covering with topsoil.

See Figure 1 for a demonstration of the above procedure.

Mounding of drill holes (Figure 2) following permanent plugging is considered important to prevent water ponding at the location of the hole and causing subsidence.

More complex permanent plugging procedures may be required if the hole has intersected complex groundwater and/or hydrogeological systems. See Guidelines for the Protection of Surface and Groundwater Resources During Exploration Drilling for further details.

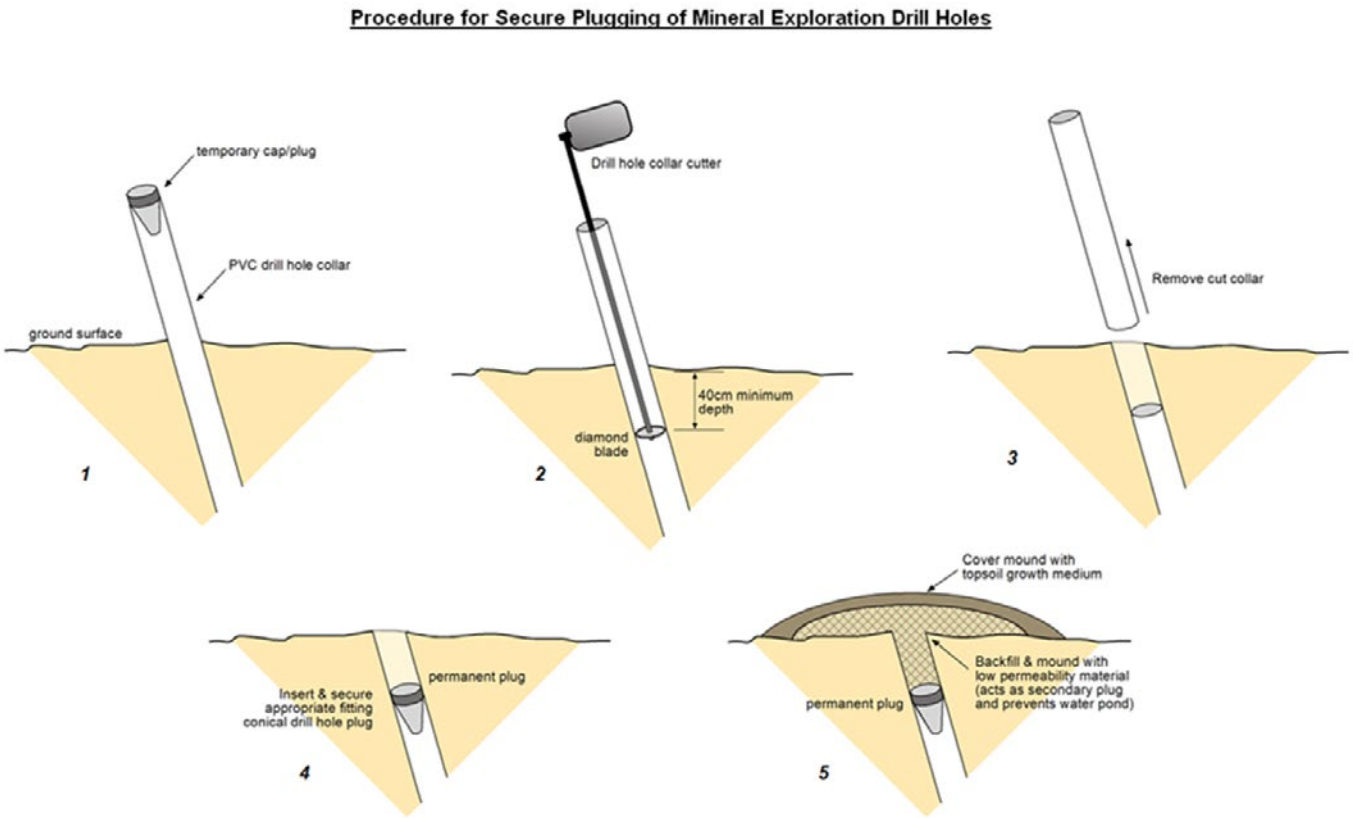

Figure 1

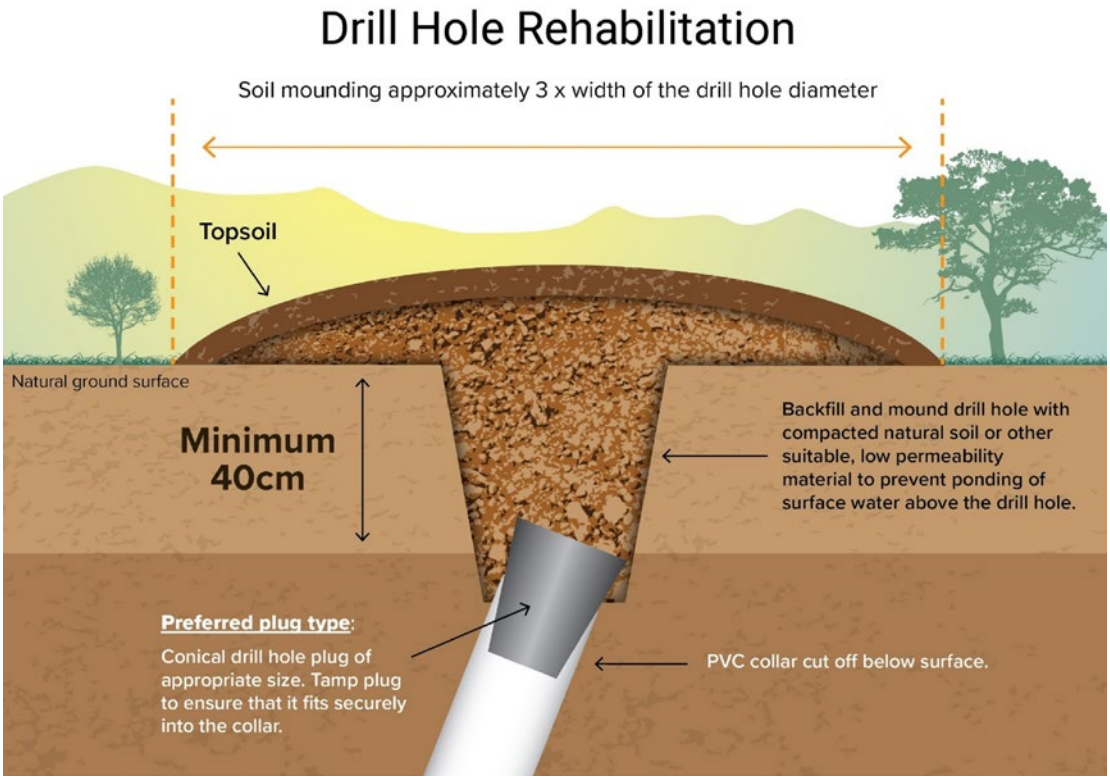

Figure 2

4.2.2 Large diameter drill holes

Water management and adequate rehabilitation are particularly important for larger diameter drill holes, which can pose a major safety hazard (e.g. bauer or mud rotary drilling).

Recommended practice for large diameter drill holes is to backfill to the surface and mound to a height of approximately 2m above the natural surface. Backfill material should be free flowing so backfilling occurs from the base of the hole, not the water level. Further measures, such as small drainage diversion bunds can be installed around the hole if necessary. Temporary signage should also be erected to advise of the presence of large diameter holes in the area. If additional fill material is required to backfill and mound the holes, approval will need to be sought from DEMIRS.

4.2.3 Hillside drilling

Pads and tracks constructed through cut and fill methods should be re-profiled back to a state consistent with the surrounding landscape. Prior to constructing pads and tracks on hillsides, consideration should be given to the ability to re-profile the disturbed ground acceptably. Erosion control measures such as ripping on the contour should also be implemented to prevent erosion and loss of rehabilitation material.

4.2.4 Management of drill samples

Drill samples should be emptied out of sample bags, preferably back down the drill hole, or into sumps or other approved excavations before backfilling. Alternatively, samples should be removed from site and disposed of at appropriately licensed facilities or stored at approved sample yards.

All sample bags must be removed from site and disposed of appropriately prior to them losing structural integrity or degrading and no later than the timeframe stipulated in the relevant tenement condition.

4.2.5 Sumps

As per standard tenement conditions imposed on all Mining Act tenements, at completion of drilling activities, sumps must be backfilled and all liners must be removed. This should occur as soon as possible, with sumps being rehabilitated by replacing the excavated material in the reverse order to which it was extracted (i.e. topsoil should be respread last).

4.2.6 Drill pads

At the completion of drilling, drill pads should be gently scarified to reintegrate topsoil, promote seed recruitment, and reduce water erosion. Deeper ripping may also be carried out for more significantly compacted areas to alleviate compaction and allow for the re-establishment of vegetation. Operators need to ensure however, that the scarifying/ripping of drill pads does not impact upon rehabilitated drill holes.

It is important that scarifying and/or ripping of sloping landscapes is conducted carefully and strictly on the contour to ensure that rip lines do not contribute to erosion gullying.

4.3 Excavations

At completion of activities, excavations (e.g. costeans, test pits, etc.) must be backfilled as soon as possible by replacing the excavated material in the reverse order to which it was extracted (i.e. topsoil should be respread last). Topsoil must be respread over the excavation to a depth similar to the surrounding environment. Topsoil should be returned as soon as practicable, as fresh topsoil has been shown to produce significantly better rehabilitation outcomes than stockpiled topsoil.

4.3.1 Bulk samples and borrow pits

In relation to bulk samples (removing material from the tenement) and borrow pits, it may not be possible to backfill the excavations to the natural surface as the excavated material has been removed from the area and/or utilised elsewhere. It is, however, unacceptable to leave behind an un-rehabilitated void.

DEMIRS therefore requires that excavations be battered down during rehabilitation to achieve a gentle slope, which is consistent with the surrounding natural landscape and provides for successful revegetation and fauna egress. Consideration should be given to minimising alterations to surface water flows in order to limit impacts to local ecosystems.

Topsoil must be respread over the area to a depth similar to the surrounding environment. Topsoil should be returned as soon as practicable, as fresh topsoil has been shown to produce significantly better rehabilitation outcomes than stockpiled topsoil.

4.3.2 Scrape and detect

Immediately upon completion of scrape and detecting, it is often possible to rehabilitate most, if not all disturbed areas. Progressive rehabilitation can achieve better rehabilitation outcomes and avoids the cost of re-mobilising machinery at a later date.

Scrape and detect areas should be gently scarified to reintegrate topsoil, promote seed recruitment, and reduce water erosion. Deeper ripping may also be carried out for more significantly compacted areas to alleviate compaction and allow for the re-establishment of vegetation.

It is important that scarifying and/or ripping of sloping landscapes be conducted carefully in order to prevent erosion caused by surface water flows.

4.4 Campsites

Campsite rehabilitation involves the removal of all infrastructure followed by standard rehabilitation works (e.g. respreading of topsoil and vegetation, and ripping of compacted areas). If concrete pads or buried infrastructure (such as pipelines or cables) have been used they must be disposed of appropriately.

Any hydrocarbon contaminated material and soil must be removed from site and disposed of at appropriately licensed facilities.

4.5 Tracks

If topsoil was stripped during construction of the track, it must be re-spread. Compacted areas should be contour ripped or scarified to relieve compaction and promote revegetation.

Once tracks have been rehabilitated, where practical, they should be blocked to prevent use by other vehicles and to allow vegetation to establish. Over time, revegetation should succeed in blocking access to rehabilitated areas however, in the immediate term, it is generally necessary to physically block the entrance to exploration tracks with cleared vegetation or other suitable material.

If access tracks will be used in the near future to support further exploration or prospecting activities, proponents can apply to defer the requirement to rehabilitate these areas for a reasonable period of time. Refer to section 7 for further information on the extension request process.

5. Activity and rehabilitation database or register

Failing to rehabilitate within required timeframes constitutes a breach of tenement conditions. Therefore, tenement holders should establish a register or system to track exploration/prospecting activities and progress towards meeting rehabilitation requirements.

In order to demonstrate compliance with all conditions and environmental management and rehabilitation commitments, tenement holders should maintain a record of all exploration/prospecting activities, and associated rehabilitation undertaken. These records will need to be provided to DEMIRS, should they be requested.

The collection of this data will also assist tenement holders with completing rehabilitation reports at the conclusion of an exploration or prospecting programme.

The specific format and type of data tracked will be at the discretion of the tenement holder, provided it can demonstrate compliance with the approved PoW, tenement conditions and environmental management and rehabilitation commitments.

As a guide, DEMIRS considers the following data useful for tenement holders to track in order to demonstrate compliance with rehabilitation tenement conditions (noting that data tracked will be proportionate to and dependent on the scale and nature of the exploration program):

- Tenement
- PoW number
- Date of approval
- PoW purpose (e.g. tracks, drill pads, sumps)
- Date disturbance commenced per activity
- Date activity area last used
- Disturbance area approved (ha)
- Area disturbed (ha)
- number of drill holes approved
- number of drill holes completed
- Rehabilitation completed (ha)
- Rehabilitation activities undertaken (e.g. holes plugged, collars cut, scarifying and topsoil respread)
- Date rehabilitation completed per activity
- Shapefiles of actual disturbance
- Shapefiles of rehabilitation
- Photos of work area pre-disturbance
- Photos of rehabilitation

A rehabilitation register should also record results of post-rehabilitation monitoring (see section 6.1).

6. Post-rehabilitation

6.1 Follow up inspections and monitoring of rehabilitation

DEMIRS considers it good practice to monitor and track the progress of rehabilitation. This is in order to ensure that rehabilitation is progressing successfully, identify if remedial work is required and confirm that rehabilitation is complying with tenement conditions and the requirements of the Mining Act. Where required, remedial work may include re-contouring or additional seeding and planting.

Monitoring of rehabilitation is also considered important in order to inform future rehabilitation activities (i.e. to identify if rehabilitation strategies are achieving the intended outcomes and whether any changes to rehabilitation practices are required).

It is particularly important to ensure that drill holes remain plugged (especially during the time between temporary and permanent plugging), large diameter drill holes have not subsided and rehabilitated hillside areas remain stable. It is important that any subsided drill holes are remediated and backfilled sufficiently to prevent further erosion.

Exploration and prospecting occurring in sensitive environments (e.g. Environmentally Sensitive Areas, Threatened Ecological Communities, DBCA managed land, etc.) or involving more extensive or higher risk activities (e.g. cut & fill, large diameter holes, large costeans, extensive exploration programmes, etc.) may be required to conduct more detailed monitoring programmes.

6.2 Rehabilitation reports

A rehabilitation report should be submitted to DEMIRS when rehabilitation works have been completed, or otherwise upon request by DEMIRS. Some tenements have conditions that explicitly require a rehabilitation report provided to DEMIRS. Progressive rehabilitation reports can also be submitted to DEMIRS when relevant.

A rehabilitation report can be completed using the template provided on DEMIRS website here. The template encourages the provision of supporting information to demonstrate compliance with all rehabilitation commitments. Useful supporting information includes a map or spatial data of activities and rehabilitation conducted, photographic evidence of rehabilitation, and photos of the rehabilitated area pre-disturbance, and other data collected in accordance with the tracking register outlined in section 5.

7. Rehabilitation extensions

In exceptional circumstances, such as the need to undertake environmental monitoring or re-access an area, an extension to rehabilitation timeframes specified in tenement conditions may be permissible. To obtain an extension to undertake rehabilitation, a written request must be sent to DEMIRS prior to the rehabilitation due date. Extension requests can be sent to POWP@dmirs.wa.gov.au. This written request must include:

- the relevant PoW Registration ID number(s);
- a revised timeframe in which the rehabilitation will be completed (e.g. an extension until a specific date); and
- a sufficient justification for the extension.

Additional information to support rehabilitation extension requests may include, but is not limited to:

- confirmation that all drill holes have been temporarily plugged (if applicable);
- clear description of the rehabilitation activities for which the extension is being requested (e.g. leaving access tracks open, delay in permanent plugging of drill holes below surface, drill pads to remain open, etc.);
- procedures to be implemented to ensure the area is appropriately managed during the extension (e.g. procedures to ensure holes remain plugged at the surface, regular inspections of disturbances, etc.);
- maps that clearly show the location and total area of disturbance to which the extension request applies; and
- a commitment to rehabilitate all other disturbed areas.

Requests for rehabilitation extensions should be submitted to the department as soon as practicable after it is identified that an extension is required, and must be prior to the expiry of the PoW or rehabilitation timeframe.

If an extension is being sought for many PoWs at a time, it is recommended that the above information be provided via an Excel spreadsheet. This will facilitate a more efficient and timely decision on the extension request.

Rehabilitation extensions are unlikely to be granted when the rehabilitation is already overdue at the time of request and there is a non-compliance as a result, or when rehabilitation has not been made a priority and there is no reasonable justification for why the rehabilitation has not been completed.

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