



# Guidance Note – Environmental Outcomes for Mining Proposals

## PURPOSE

The purpose of this document is to provide practical guidance relating to the preparation of site specific environmental outcomes for inclusion in Mining Proposals being prepared in accordance with the 'Guideline for Mining Proposals in Western Australia, April 2016' (the 2016 MP Guideline).

## OBJECTIVES

The objectives of this guidance note are to provide advice on:

- what constitutes the scope of a site specific environmental outcomes over the mine life cycle;
- writing performance criteria that are specific, measurable, achievable, relevant and time bound (SMART);
- the relevance of monitoring in an adaptive management framework;
- avoiding duplicate environmental outcomes; and
- worked examples of environmental outcomes and performance criteria which are used to track progress toward meeting the environmental outcomes and achieving closure objectives.

## SCOPE

This guidance note specifically relates to environmental outcomes and is applicable to proponents preparing environmental risk assessments and environmental outcomes for inclusion in Mining Proposals submitted under the 'Guideline for Mining Proposals in Western Australia, April 2016' (the 2016 MP Guideline).

**This guidance note is non-statutory and should be read in conjunction with the statutory 2016 MP Guideline, which stipulates requirements for environmental outcomes.**

Please note the examples provided in this guidance may not be applicable to all sites. It is important to consider site-specific conditions when undertaking the risk assessment.

## DOCUMENT HIERARCHY

The following hierarchy outlines the regulatory framework that governs the assessment and approval of Mining Proposals and Mine Closure Plans. This guidance note has been highlighted to demonstrate where it fits within the framework.

### Mandatory – Legislation and Statutory Guidelines:

- Relevant Legislation; regulations and conditions – *Mining Act 1978* and Mining Regulations 1981
- ['Guideline for Mining Proposals in Western Australia, April 2016'](#) (the 2016 MP Guideline – mandatory for all new project sites from 1 January 2017)
- ['Guidelines for Mining Proposals in Western Australia, February 2006'](#).
- ['Guidelines for Preparing Mine Closure Plans, May 2015'](#) (MCP Guidelines).

### Policy:

- [Environmental Regulatory Strategy](#)

### Technical Guidance:

- [Guidance note – fauna egress matting and ramps](#)
- [Guidance note – environmental risk assessment for mining proposals and mine closure plans](#)
- Guidance note – environmental outcomes for mining proposals (this document)

It is important to distinguish this guidance note from the 'statutory guidelines' for Mining Proposals and Mine Closure Plans that are formally approved under the *Mining Act 1978*. A Mining Proposal and a Mine Closure Plan submitted to the Department of Mines, Industry Regulation and Safety (DMIRS) for assessment and approval must be in the form required by the relevant statutory guideline, and contain information of the kind required by that guideline (see Section 700 of the *Mining Act 1978*). These 'statutory guidelines'<sup>1</sup> are listed in the 'mandatory' section of the above hierarchy.

## **GUIDANCE**

Appropriate site-specific environmental outcomes should be developed based on the results of the risk assessment. DMIRS' assessment will take into account if the environmental outcomes:

- have considered the DMIRS's environmental objectives (refer to 2016 MP Guideline),
- include performance criteria which are specific, measurable, achievable, relevant and time bound (SMART),
- are suitable to act as site-specific conditions that are enforceable,
- are significant enough to warrant reporting any exceedance to DMIRS; and,
- are significant enough for an exceedance to be considered a breach of tenement conditions.

The above bullet points should be taken into account when considering whether an outcome is necessary.

## **1. Scope of environmental outcomes**

### **1.1 When is an outcome required?**

The environmental risk assessment should be used to determine which environmental risk pathways need to have site-specific environmental outcomes. Environmental outcomes are the acceptable level of impact that must not be exceeded, or a level of protection/performance/result that must be achieved, for the mine site to be considered compliant. Environmental outcomes must be achievable and measurable to provide certainty for the proponent, DMIRS and stakeholders that particular outcomes will be achieved. The purpose of setting outcomes is to provide agreement between the proponent and DMIRS as to the level of environmental impact that is predicted and considered acceptable and to monitor performance of the site against these.

The 2016 MP Guideline states that outcomes only need to be set for those risk pathways that present a moderate to extreme risk (pre-treatment). This is a recommendation only. Depending on the risk assessment methodology and site specific conditions, not all moderate risks will necessarily require an outcome. The key objective of the environmental outcomes section is to set site-specific outcomes relating to any environmental risks that are important enough to warrant regular monitoring against specific and measurable performance criteria. In determining whether a particular outcome is required, it is important to consider whether the issue warrants targeted monitoring and reporting to DMIRS (over and above the routine monitoring and management undertaken under the site's internal environmental management system and protocols). It is important to remember that an exceedance of an environmental outcome provided in an approved Mining Proposal would constitute a breach of tenement conditions, and hence should be limited to the higher risk issues.

In situations where a treatment is applied which adequately eliminates the risk, then the environmental impacts may be avoided and an outcome may not be required.

It should be recognised that the issue of whether a particular environmental outcome is required can be quite subjective, and may require discussion between the proponent and DMIRS on a case-by-case basis.

DMIRS has developed a flow chart to assist with determining when an outcome is required (Figure 1).

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<sup>1</sup> This list is correct as of the date this guidance was published. It is always advisable to refer to DMIRS's website for any updates or changes to these guidelines.

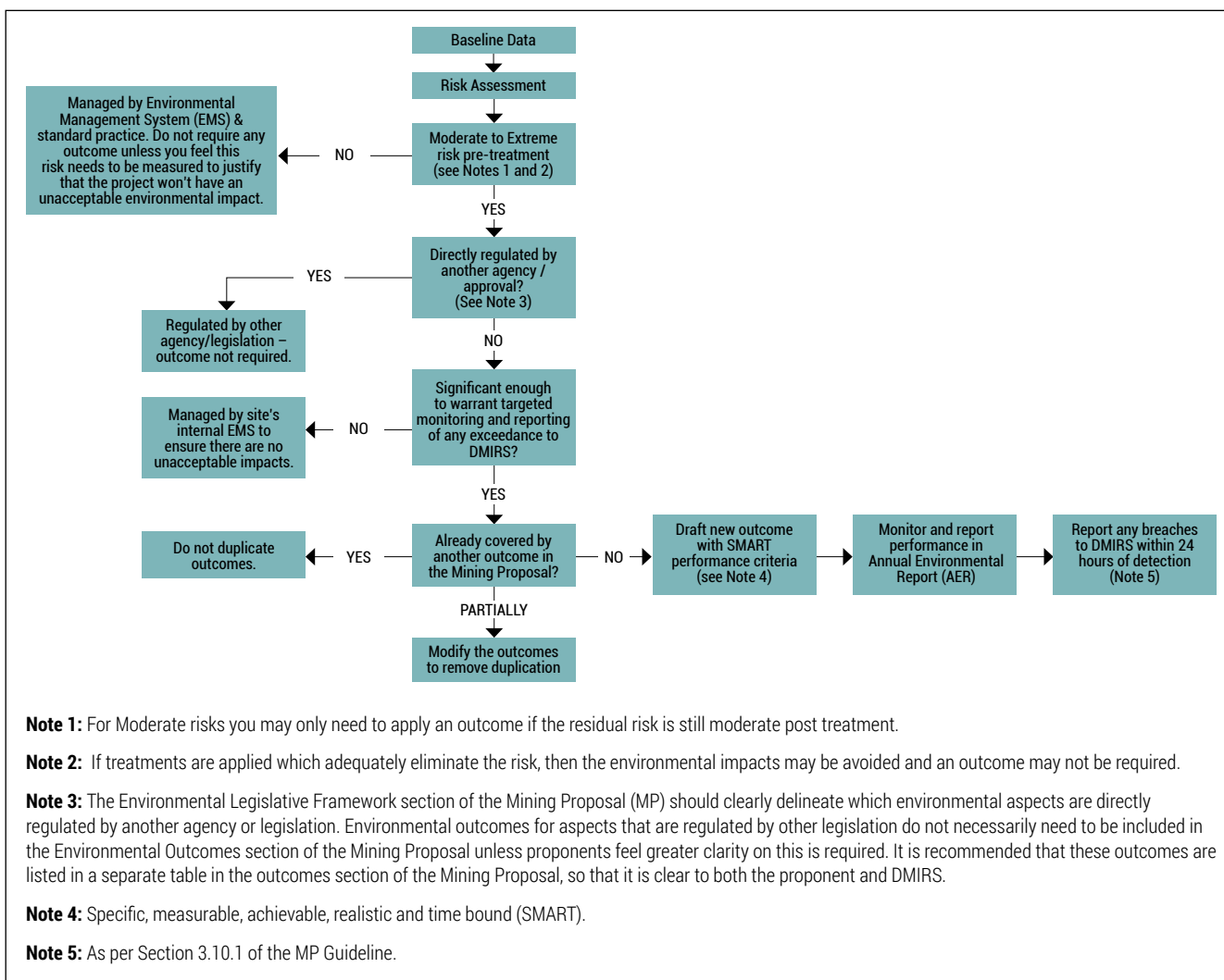


Figure 1 – Determining when an outcome is required.

## 1.2 Outcomes that are regulated by another agency

The Environmental Legislative Framework section of the Mining Proposal should clearly delineate which environmental factors are directly regulated by another agency or legislation which is not administered by DMIRS (e.g. ministerial conditions issued under Part IV of the *Environmental Protection Act 1986*, or licence conditions issued under Part V of the *Environmental Protection Act 1986*). Environmental outcomes that are regulated by other legislation do not necessarily need to be included in the Environmental Outcomes and Reporting section of the Mining Proposal unless proponents feel greater clarity on these is required. If environmental outcomes regulated by another agency/legislation are going to be included in the Mining Proposal, it is recommended these be listed in a separate table from that detailing the outcomes regulated by DMIRS.

For each approval or statutory requirement, it is important to state the specific environmental factor(s) that this will regulate. This will enable DMIRS's assessment to focus on the factors that are not directly regulated by another agency or covered by another regulatory requirement.

In some instances the approvals or requirements of other legislation may only be regulated during specific project phases or circumstances (e.g. only during operations) and may not be directly applicable to mine closure or care and maintenance. If potential impacts to environmental factors are also applicable during care and maintenance or post closure (e.g. groundwater level and quality) the outcomes are required to be included in the table regulated by DMIRS.

## 2. Writing Environmental Outcomes for assessment and approval

Environmental outcomes must be proposed by the proponent and will be agreed by DMIRS when the Mining Proposal is approved. The collection of baseline data is essential in understanding the current site-specific condition and how best to define and measure an appropriate outcome relevant to the impacts of the proposed action. Baseline data provides the benchmark which outcomes and performance criteria are compared to over the life of an approval.

An outcome should:

- be adapted to the specific environmental risks of the project site.
- be expressed in the form of a specific outcome. Outcomes should consider:
  - an impact that will be avoided (e.g. no new weed species introduced by mining activities)
  - a level of impact that will not be exceeded (e.g. no clearing outside of the approved disturbance envelope or no impact to surface or groundwater acidity beyond the range of natural variability as a result of potentially acid forming material)
  - a level of protection that will be achieved (e.g. no impact to corridor vegetation)
- be capable of objective monitoring, measurement and reporting.

## 3. Writing SMART performance criteria for assessment and approval

Environmental performance criteria form the basis on which performance in achieving the agreed environmental outcomes is measured and reported to DMIRS. Performance criteria are used to determine compliance and must be specific, measurable, achievable, realistic and time bound (SMART) and must consider site specific conditions. The performance criteria state the targets to be achieved and define the limits for monitoring and environmental reporting.

**Specific:** specify an outcome to be achieved.

**Measurable:** include quantifiable performance measures and that can be readily compared over time.

**Achievable:** realistic when compared with baseline performance and resources available.

**Relevant:** to the objectives that are being measured and the risks being managed and flexible enough to adapt to changing circumstances without compromising objectives

**Time-bound:** include specific timeframes for the completion of the outcome so that the criteria can be monitored over an appropriate time frame to ensure the results are robust.

Performance criteria are the measures used to track progress toward meeting the environmental outcomes and achieving closure objectives. Where completion criteria<sup>2</sup> focus on the end outcome, performance criteria provide milestones, which can be used independent of the completion criteria, to assess whether the long-term closure objectives are likely to be achieved. Performance criteria can include activities undertaken during operations which support the achievement of closure objectives.

The purpose of the performance criteria is to make sure that environmental outcomes are measurable and demonstrate that the acceptable level of impact will not be exceeded or a level of protection/performance/result is being achieved. As far as practicable, performance criteria should be specific, measurable, achievable, relevant, and time bound (SMART) and should be informed by baseline data results or industry standards. Both outcomes and performance criteria form part of a proponent's approval commitments. When wording outcomes and performance criteria, proponents should ensure these are practical and achievable for the site. An example of writing SMART criteria is provided in Appendix 1.

Performance criteria should allow for the timely identification, appropriate resolution and the adaptive management of potential problems that may arise through the course of a project that could compromise the achievement of outcomes.

Monitoring and reporting site performance against the performance criteria specified in the Mining Proposal is necessary in order to determine the success in achieving outcomes. Any breach of an environmental outcome or performance criteria in the approved mining proposal must be reported to the Executive Director, Environment Division within 24 hours of the lessee becoming aware of the occurrence of the incident.

In most circumstances, actions/management measures should not be listed in the performance criteria to allow for adaptive management as required.

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<sup>2</sup> Completion criteria are necessary to provide the basis on which successful rehabilitation and mine closure and achievements of closure objectives are determined.

In situations where there is a long lag-time between environmental management actions and a potential impact (for example the management of topsoil, or materials with the potential to leach contaminants over the long-term) the performance criteria can be staged. Staged criteria could consider each phase of mining and its impact on the end outcome. Staged criteria for the management of materials with the potential to leach contaminants over the long-term could include:

- ongoing characterisation of mined materials (*ongoing throughout operations*)
- segregation and storage of problematic materials before adequate encapsulation (*ongoing throughout operations*)
- encapsulation of problematic materials according to design provided in Appendix X (*rehab/closure*).

In situations where the criteria refers an internal procedure or management plan (e.g. Materials Handling Plan), these procedures/plans should be included as Appendices to the Mining Proposal or Closure Plan. In these circumstances, adherence to the procedure or plan will become an indicator of compliance.

#### 4. Monitoring

Monitoring is undertaken to determine whether performance criteria in the Mining Proposal and completion criteria in the Mine Closure Plan are being met and if remedial action is required. Useful monitoring requires the establishment of baseline data and reference sites and regular monitoring after the commencement of activities. Monitoring may include the location of monitoring sites, reference sites, parameters, frequency, timing and methods for data collection and analysis.

Specific monitoring is required for each performance criteria at an agreed schedule. Monitoring should be sensitive enough to detect early changes in the environmental conditions on site, so that corrective or preventative actions can be implemented well in advance of an environmental outcome being breached. Trigger activities should be implemented before performance criteria are breached.

#### 5. Avoiding duplicate outcomes

Outcomes should not be duplicated (Table 1). Several outcomes can be broadly covered by one well- worded outcome (Table 2). For example, the outcome “Hypersaline water used in dust suppression results in death or a decline in health of vegetation.” could be used to cover the examples listed below:

**Table 1 – Outcomes are duplicated**

Environmental Factor	DMIRS Objective	Risk Pathway	Environmental Outcome	Performance Criteria	Monitoring
<b>Biodiversity/Flora /Fauna/Ecosystem</b>	To maintain representation, diversity, viability and ecological function at the species, population and community levels.	Hypersaline water used in dust suppression results in death or a decline in health of vegetation,	Overspray of hypersaline water does not significantly impact surrounding vegetation	Dust suppression activities are limited to target areas  No hypersaline water is released into the surrounding vegetated areas or any undisturbed areas	Visual (photo) assessment of roadside vegetation will be conducted monthly to confirm there are no visible impacts to vegetation.  Vegetation health quadrats will be monitored monthly at the locations shown on Figure XX.  Annual vegetation health surveys will be conducted and include photo point, quadrat and analogue/ reference sites
<b>Biodiversity/Flora /Fauna/Ecosystem</b>	As above	As above	Decline in health of vegetation resulting from hypersaline water leaks is minimised	No hypersaline water is released into adjacent areas, vegetated areas or any undisturbed areas	As above

**Table 2 Outcomes from Table 1 have been consolidated to avoid duplication**

Environmental Factor	DMIRS Objective	Risk Pathway	Environmental Outcome	Performance Criteria	Monitoring
<b>Biodiversity/Flora /Fauna/Ecosystem</b>	To maintain representation, diversity, viability and ecological function at the species, population and community levels.	Hypersaline water used in dust suppression results in death or a decline in health of vegetation,	Hypersaline water use will not result in impacts to biological diversity and ecological function.	Dust suppression activities are limited to transport corridors and operational areas.  No hypersaline water is released into vegetated areas or any areas outside of the approved disturbance areas.	Visual (photo) assessment of roadside vegetation will be conducted monthly  Vegetation health transects will be monitored monthly at the locations shown on Figure XX.  Annual vegetation health surveys will be conducted and include photo point, quadrat and analogue/ reference sites.

**Administrative outcomes are not required**

While DMIRS acknowledges the importance of maintaining administrative procedures, the purpose of setting outcomes in the Mining Proposal is to provide agreement between the proponent and DMIRS as to the level of environmental impact. Administrative outcomes such as those in Table 3 are not required.

**Table 3 Administrative outcomes are not required**

Environmental Factor	DMIRS Objective	Risk Pathway	Environmental Outcome	Performance Criteria	Monitoring
<b>Systems and Approvals</b>	N/A	Failure to have required regulatory permits, licences or approvals in place.	All works undertaken in accordance with approvals.	No reportable regulatory non-compliances recorded.	Annual compliance audits and monthly site environmental inspections.
		Ineffective operational implementation of Project EMS, plans and procedures.	All required environmental outcomes identified.  Compliance with all conditions of approval.	Any reportable incidents recorded.	Annual compliance audits and monthly site environmental inspections.

**6. Commencement**

This guidance note is to take effect from 31 January 2018.

**7. Review**

This guidance note is to be reviewed no later than as soon as practicable following the third year of its commencement.

## Appendix 1 – Writing Smart Performance Criteria

**Specific** enough to reflect a unique set of environmental, social and economic circumstances. Is the goal explained with enough detail that it can be well understood by those involved in its completion and by any stakeholders?

**Measurable** to demonstrate that goals are trending towards analogue indices. How will those involved in completing the goal know it has been accomplished and how will stakeholders determine its success?

**Achievable** or realistic so that the criteria being measured are attainable.

**Relevant** to the outcomes that are being measured and the risks being managed and flexible enough to adapt to changing circumstances.

**Time-bound** so that the criteria can be monitored over an appropriate timeframe to ensure the results are robust and trending toward or meeting the outcome.

Environmental Factor	DMIRS Objective	Risk Pathway	Environmental Outcome	Performance Criteria	Monitoring
<b>Landforms</b>	Mining will not result in appreciable land degradation or the contamination or pollution of soils.	Contamination of soils as a result of hydrocarbon leakages or spillages.	No contamination of soils as a result of hydrocarbon spills/leaks.	No hydrocarbon spills outside of bunded/contained areas greater than 1,000 litres in one incident.  All hydrocarbon spills are controlled, contained and cleaned up within 24 hours.	<ul style="list-style-type: none"> <li>• Site spills reporting, remediation and auditing procedure.</li> <li>• Environmental Incident Management System reviewed monthly and confirms that there has been no spills above criteria limit.</li> <li>• Daily inspections of plant and workshops for spills.</li> <li>• Groundwater monitoring in accordance with the Groundwater Management Plan</li> <li>• Surface water monitoring in accordance with the Surface Water Management Plan.</li> </ul>

**Specific:** Yes, the objective of “No contamination of soils resulting from hydrocarbon spills/leaks” is clear, well defined and unambiguous.

**Measurable:** Yes, no spills outside contained facilities greater than 1,000 litres. All spills are cleaned up within 24 hours.

**Achievable:** Yes, it is up to the proponent to determine what is achievable.

**Relevant:** Yes, again it is up to the proponent to determine what is relevant, although justification for any specifics will need to be detailed and explained to DMIRS. Remember that all outcomes and performance criteria need to be agreed to by DMIRS.

**Time-bound:** Yes, spills cleaned up within 24 hours.

## Example Environmental Outcomes, Performance Criteria and Monitoring

Environmental Factor	DMIRS Objective	Risk Pathway	Environmental Outcome	Performance Criteria	Monitoring
<b>Biodiversity/Flora /Fauna/Ecosystem</b>	To maintain representation, diversity, viability and ecological function at the species, population and community levels.	Unauthorised clearing / ground disturbing activities resulting in the removal of conservation significant flora species outside of the disturbance envelope.	No unauthorised clearing of conservation significant flora species.	No clearing of native vegetation outside of the disturbance envelope.	GPS survey of disturbance areas on a quarterly basis for inclusion with AER/MRF.
<b>Landforms</b>	Mining will not result in appreciable land degradation or the contamination or pollution of soils.	Improper encapsulation of potentially acid forming (PAF) material during operations leading to acid metalliferous drainage (AMD).	No contamination of land or soil caused by AMD as a result of mining activities.	PAF cell is constructed as per design specifications in Attachment X.  No PAF materials within the WRL are present outside the PAF containment cell.	PAF cell as-built report.  Sulphur content monitoring of waste material.
<b>Mine Closure</b> <b>Note: this row is the equivalent of the closure objectives and completion criteria required in the MCP. They can be included in both the MP and MCP; or included in the MCP only.</b>	Mines are closed in a manner to make them (physically) safe to humans and animals, (geotechnically) stable, (geo-chemically) non-polluting/non-contaminating, and capable of sustaining an agreed post-mining land use, and without unacceptable liability to the State.	Exposure of sodic / dispersive materials in the waste dump leading to increased gully erosion and tunnelling, resulting in an unstable landform that disperses sediment into the surrounding environment.	All waste landforms and Tailings Storage Facilities (TSF) are safe, stable, non-polluting and non-contaminating.  <b>Note: this is the closure objective in the MCP.</b>	Final landforms have been constructed according to approved design specifications including slopes, surface water and drainage design parameters, and erosion rates. <sup>3</sup> Erosion rates on rehabilitated landforms within X% of the modelled erosion rates identified in 'Landform Modelling Report (Appendix Z).  <b>Note: this is the completion criteria in the MCP.</b>	Audit of constructed landforms for compliance with design specifications/ required standards.  Annual monitoring of erosion rates on rehabilitated landforms.  <b>Note: this is the measurement tool in the MCP.</b>

<sup>3</sup> Where referring to management via an internal procedure or design (e.g. Materials Handling Plan, Design Specifications) these should be included as Appendices.



**Regulated by other agency**

Environmental Factor	DMIRS Objective	Risk Pathway	Environmental Outcome	Performance Criteria	Monitoring
<b>Water Resources</b>	To maintain the hydrological regimes and quality of groundwater and surface water so the existing and potential uses, including ecosystem maintenance, are protected.	Discharge of dewater into Blackadder Creek leading to increased salinity, turbidity and heavy metal levels within creek and broader catchment, resulting in negative impacts to the ecological function of the creek.	Water quality within Blackadder Creek is not adversely impacted.	Adherence to Department of Water and Environmental Regulation (DWER) Licence Conditions	Monthly water quality monitoring at agreed locations in accordance with DWER licence requirements.

4 Where referring to management via an internal procedure or design (e.g. Materials Handling Plan, Design Specifications) these should be included as Appendices.