

Greening Australia Response - Public Consultation - Operational Rehabilitation Reforms

The mining lease conditions relating to rehabilitation have been reviewed to improve clarity and enforceability of rehabilitation outcomes. This Amendment Regulation will prescribe mining lease conditions relating to rehabilitation through amending the Regulation under the Mining Act 1992. The new mining lease conditions will support best practice mine site rehabilitation and ensure NSW has a sustainable minerals industry.

The new conditions will require lease holders to develop, implement and achieve rehabilitation outcomes and implement a forward program to ensure progressive rehabilitation across mines in NSW.

We have developed guidelines to support the new rehabilitation standard conditions and associated requirements. These guidelines are intended to help the leaseholder comply with the conditions and mandatory requirements and do not contain any additional mandatory requirements.

The documents now available for comment are the following six guidelines:

- [Guideline 1: Rehabilitation Risk Assessment](#)
- [Guideline 2: Rehabilitation Records](#)
- [Guideline 3: Rehabilitation Controls](#)
- [Guideline 4: Mine Rehabilitation Portal](#)
- [Guideline 5: Rehabilitation Objectives and Rehabilitation Completion Criteria](#)
- [Guideline 6: Achieving Rehabilitation Completion \(Sign-Off\)](#)¹

¹ <https://www.resourcesregulator.nsw.gov.au/about-us/have-your-say/operational-rehabilitation-reforms>

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Greening Australia Submission in Response to Public Consultation - Operational Rehabilitation Reforms

About Greening Australia

Formed in 1982, Greening Australia is the leading environmental enterprise creating healthy and productive landscapes where people and nature thrive. We provide science led, practical on ground environmental solutions.

With teams in 20 locations around the country and more than 170 knowledgeable and expert staff, we are having a measurable and lasting impact on Australia's unique environment through our programs, services and partnerships.

Greening Australia strongly supports the NSW Resource Regulators effort to improve mine site rehabilitation through the development of the six draft guidelines. We value the opportunity to provide a response to this issue that needs to be supported by a both a long term strategy and a sustainable native seed sector.

Recommendations

Our overarching recommendation is that it is essential that planning and procurement for the supply of native seed and plants commences early within the design and planning stages of any rehabilitation plan and is reviewed regularly over the life of the project. Doing so will increase supply confidence and therefore risk of non-compliance at the mine project level.

Greening Australia is pleased to provide the following recommendations to support and/or enhance the development of the draft Guidelines.

Guideline Name	No#	Recommendation
Rehabilitation Risk Assessment	1	Ineffective seed planning and subsequent lead time to collect, produce, store and treat seed should be included as a key project life cycle risk
Rehabilitation Records	2	Seed collection data should be a standard item within Rehabilitation records and flow into Completion Criteria
Rehabilitation Controls	3	Seed collection, availability and seed informed design plans should be developed in consultation with suitably experienced practitioners.
Rehabilitation Controls	3	Seed collection plans should be implemented with a minimum 3-year lead time, depending upon staging this may result in a rolling collection program.
Rehabilitation Controls	3	Mine rehabilitation plans must consider the science of climate change when identifying provenance ranges for seed.
Rehabilitation Controls	3	Mine rehabilitation plans must consider the science of climate change when identifying provenance ranges for seed.
Rehabilitation Objectives and Rehabilitation Completion Criteria	5	Seed collection data should be a standard item within Rehabilitation Completion Criteria
Achieving Rehabilitation Completion (Sigh-Off)	6	Seed collection data should be a standard item within Rehabilitation Completion Criteria

Project Phoenix Activities

The 2019/2020 bushfire season produced unprecedented levels of destruction across Australian landscapes. Within the 17 million hectares of landscape destroyed by the fires, a significant loss of life occurred which has never been witnessed before. This included the loss of human, animal and plant life. An article published in January 2020 by The Conversation announced that of all the loss of threatened species populations (flora and fauna), the decline of plant life was by far the most significant.

A study by the CSIRO reaffirmed this by stating that 272 native plant species were affected by the fires, with 22 of those now listed as critically endangered and 47 suffering a habitat loss of 80% or more. Many of these native plant populations were already under stress as a result of land clearing for agricultural, infrastructural or mining purposes.

Following the fire season, communities, organisations, and governments pulled together quickly to support a range of restoration and recovery activities. This involved providing financial support and protective measures for many of the readily observable losses such as that of residential land, farmland, tourism, animal habitat and national parks. A key restorative solution yet to receive wide-spread support and investment, however, is that of building our native seed and plant capacity. This is what will underpin our ability to respond to future events.

The successful building of a sustainable native seed and plant industry can be linked to the success of broader restorative objectives and provide insurance for Australian landscapes against current and future threats.

Ten-Year Landscape Restoration and Native Seed Strategy

Concurrent to the NSW Resource Regulators consultation Project Phoenix will deliver 30 Projects on landscape restoration and the seed sector by the 30 June 2021. They have relevance to the work of the NSW Resource Regulator submission and will be made publicly available on the Greening Australia website mid-year:

www.greeningaustralia.org.au/projects/projectphoenix/

One of the major outcomes of Project Phoenix is the development of a Ten-Year Landscape Restoration and Native Seed Strategy. Initial workshops are currently taking place and we envisage that the project reports will inform the public consultation period scheduled for June – July 2021.

We encourage the Regulator to read the draft Strategy and to make a submission as the mining sector is one of the major purchasers of seed in Australia. The Ten-Year Landscape Restoration and Seed Strategy will for the first time provide a direction towards a sustainable, viable and vibrant sector native seed sector in Australia.

Operational Rehabilitation Reforms – Draft Guidelines Review

Guideline No#	Guideline Name	Purpose	Document Reference/Location	Comments	Recommendations
1	Rehabilitation Risk Assessment	The purpose of this guideline is to assist lease holders to identify and evaluate the potential risks to achieving the final land use and identify the specific measures to be implemented to mitigate those risks by undertaking a rehabilitation risk assessment.	Page 5: Ensure the rehabilitation risk assessment is undertaken by <u>appropriately skilled</u> people representing a cross section of the workforce.	Seed is specifically mentioned during 6. Ecosystem and land use establishment phase of rehabilitation , and only obliquely considered in earlier stages, for instance in the 2. Active mining phase of rehabilitation - Biological resource salvage and maintenance...	Ineffective seed planning and subsequent lead time to collect, produce, store and treat seed should be included as a key project life cycle risk.
			<p>Page 7: 6. Ecosystem and land use establishment phase of rehabilitation Lack of availability and quality of target seed resources, including genetic integrity.</p> <ul style="list-style-type: none"> • Poor seed viability, seed dormancy. • Ant and insect predation of seed. • Damage to seed through revegetation process. • Poor quality tube stock. • Weed infestation associated with both introduction and control (or lack thereof). • Adopting inappropriate or inadequate rehabilitation techniques, including equipment fleet. • Inappropriate revegetation species mix for targeted final land use. • Weather and climatic influences (e.g., drought; intense rainfall events; bushfire and climate change). • Availability of areas for revegetation in optimal seasonal conditions. Habitat structures for colonization or use. 	<p>Ineffective seed planning and subsequent lead time to collect, produce, store and treat seed should be included as a key project life cycle risk.</p> <p>An effective seed procurement strategy, developed and delivered in consultation with regional experts/practitioners can mitigate many of the identified risks such as poor seed viability, inappropriate species, or planning for future climate through the consideration of seed transfer zones.</p> <p>There is alignment between the risks presented and many of the activities being undertaken by Project Phoenix, which will inform the subsequent Ten-Year Landscape Restoration and Seed Strategy including but not limited to:</p> <ul style="list-style-type: none"> • Reviewing the complexity that exists in regulatory, licencing and land access provisions across different states and territories. • Exploring options for the development of a National Code of Practice and accreditation which may include setting standards for seed testing, training and tracking of seed. • Investigating Seed Transfer Zones (STZ) to explore where seed can be geographically transferred with little disruption of genetic patterns or loss of local adaptation to support better restoration outcomes, especially in the context of a changing climate. 	

Guideline No#	Guideline Name	Purpose	Document Reference/Location	Comments	Recommendations
2	Rehabilitation Records	The purpose of this guideline is to assist lease holders to identify the types of rehabilitation records that should be kept and maintained.	<p>Page 4 & 7: Records of the salvage of all rehabilitation resources including suitable capping materials, top soils / subsoils, <u>seeds</u>, habitat structures (e.g. tree hollows and rocks) for use in rehabilitation.</p> <p>Page 5 & 7: Records of methodologies used to rehabilitate the site (e.g. species utilized, <u>how they were applied</u> (i.e. as seed or plant), fertilizer rate, details of ripping and scarifying, timing of sowing, sowing rates, seedling planting density, <u>origin of seed</u>, rainfall).</p>	<p>No difference in requirements between a small and large mine as defined by the Mining Regulation 2016. Agree with this.</p> <ul style="list-style-type: none"> Seed appears to be encompassed in the holistic statement: <i>All records associated with the rehabilitation management plan.</i> This document, does appear to cover seed planning reasonably well. Refers to origin of collection, but does not mention viability/germinability, purity etc. Collection Licence Number etc. There are a range of quality control measures/metrics that could be included that would provide incentive for seed industry improvements while improving outcomes for the end user. <p>Project Phoenix is exploring seed origination, tracking and handling to maximise restoration outcomes including but not limited to:</p> <ul style="list-style-type: none"> Reviewing the complexity that exists in regulatory, licencing and land access provisions across different states and territories Exploring options for the development of a National Code of Practice and accreditation &; Investigating available seed data management systems that could be utilized for the development of a national database and tracking system for native seed sales. 	Seed collection data should be a standard item within Rehabilitation records and flow into Completion Criteria

Guideline No#	Guideline Name	Purpose	Document Reference/Location	Comments	Recommendations
3	Rehabilitation Controls	The purpose of this guideline is to assist lease holders to identify and evaluate the rehabilitation processes, controls and techniques that should be considered and used by lease holders for inclusion in a rehabilitation management plan (large mines only) and implementation of progressive rehabilitation in accordance with a forward program (small and large mines).		<p>There seems to be a lack of clarity between roles and plan hierarchy.</p> <p>Roles: Mine operator - set the targets, establishes the quality standards expected and ensures that there is sufficient time and resourcing to meet requirements. Collector - has the knowledge, technical expertise and resourcing to appropriately plan and collect the seed.</p> <p>Currently, it would appear that the mine operator or a consultant in their employment would input into the technical aspects of the collection. This is unnecessary and unlikely to benefit the project. This, then, flows into planning. There is a need for a Seed Strategy that sets the goals, quality standards and parameters required to support rehabilitation requirements well in advance of rehabilitation cycles. A seed collection plan is the doing document.</p>	<p>Seed collection plans should be developed in consultation with suitably experienced practitioners.</p> <p>Seed collection plans should be implemented with a minimum 3-year lead time, depending upon staging this may result in a rolling collection program.</p>
			<p>Before ground disturbance works</p> <p>Page 5: Native revegetation activities in rehabilitation areas should <u>use local provenance seed</u> for direct seeding or tube stock propagation. Where permissible, should adverse seasonal conditions (e.g., drought) affect the availability of local provenance seed, supplementation with non-local provenance seed may be required.</p>	<p>How is provenance to be determined? This is important in determining collection ranges and should factor in changing climate models (is possibly covered in other guidelines).</p> <p>Following on from this, assuming access to sufficient source sites and with appropriate lead times and planning, there should be no reason sufficient seed, from diverse species cannot be secured. This would seemingly be covered by the later mentioned seed collection program, but perhaps a collection plan sits within a higher-level seed strategy.</p> <p>Alignment with Project Phoenix:</p> <ul style="list-style-type: none"> Project Phoenix is investigating Seed Transfer Zones (STZ) to explore where seed can be geographically transferred with little disruption of genetic patterns or loss of local adaptation to support better restoration outcomes, especially in the context of a changing climate. 	<p>Mine rehabilitation plans must consider a changing climate when identifying provenance ranges for seed.</p>

Guideline No#	Guideline Name	Purpose	Document Reference/Location	Comments	Recommendations
				<ul style="list-style-type: none"> Investigating available seed data management systems that could be utilized for the development of a national database and tracking system for native seed sales. Further, we are investigating a cross-sectoral model among conservation seedbanks, the tertiary sector, and industry to support innovation and inform research. Improved research capacity will over time provide greater clarity and certainty for end users of seed. 	
			<p>Page 5: Identify sufficient pre-disturbance and surrounding areas that can be used as seed or propagation resources.</p>	<p>The identification of sufficient resources can be supported through enhanced knowledge of a regions seed network i.e., the businesses and infrastructure that can advise and provide requisite seed. Project Phoenix is engaging with the industry, seeking to identify and map:</p> <ul style="list-style-type: none"> The national seed collector network The national native nursery network The national seed production area network <p>Other Project Phoenix activities such as reviewing the complexity of regulatory, licencing and land access provisions across different states and territories can also assist in this determination.</p>	
			<p>Page 5: Identify techniques to establish key species – seed, asexual propagation, transplant, topsoil seed, specialist propagation. This should include quantifying the requirements for seed and plant material for use in rehabilitation, or identifying threatened plants to be translocated, and areas where they may be moved.</p>	<p>Project Phoenix is investigating a cross-sectoral model among conservation seedbanks, the tertiary sector, and industry to support innovation and inform research. The Mining industry has a role to play in increasing support for such research, enhancing mine site rehabilitation outcomes and reducing rehabilitation risk.</p>	
			<p>Page 5: Plan seed harvesting and collection of plant material in advance of clearing.</p>	<p>For large projects seed planning and rolling collection should ideally commence 3 years in advance - this would enable all supply options to be explored including Seed Production Areas where appropriate. There is risk if collecting early but not storing seed properly or leaving collection late, in which case seasonal variations could place at risk targets collection for all or some species.</p>	<p>Seed collection plans should be implemented with a minimum 3-year lead time, depending upon staging this may result in a rolling collection program.</p>

Guideline No#	Guideline Name	Purpose	Document Reference/Location	Comments	Recommendations
			<p>Page 6: Develop a seed collection program to maximize the amount of viable seed of local provenance for use in rehabilitation and revegetation activities. The program should include:</p> <ul style="list-style-type: none"> • A seed calendar that contains information relating to fruiting and seed collection times for key native species. • Data on seed collection including species, collection location and date of collection. • Seed assessment of native vegetation within the proposed disturbance areas to allow for seed collection prior to or immediately following clearing. • Required volumes of seed to be collected to enable adequate supply of native seed for reuse. • Appropriate treatment and storage to maintain viability. • Suitably qualified and experienced selectors. • Using record sheets and a Geographic Information System (GIS) database to track collection, storage and use of the seed resource. 	<p>Seed testing is essential, and results should accompany batches. This should be a requirement from the mine operator (purchaser) upon the collector (seller). This may increase supply costs, but is offset through increased restoration success (avoiding under sowing or use of poor quality seed) and minimizing seed wastage (avoiding over sowing).</p> <p>Sellers should be able to trace seed via unique batch codes, whether for direct use of seed or for supply to a nursery.</p> <p>Alignment with Project Phoenix:</p> <ul style="list-style-type: none"> • Exploring options for the development of a National Code of Practice and accreditation which may include seed testing standards. • Investigating available seed data management systems that could be utilized for the development of a national database and tracking system for native seed sales. <p>Project Phoenix is also undertaking a review of existing training and skills acquisition packages related to seed collection, handling and management. Providing a means to embed best practice standards to ensure ethical collection, improve handling and management or provide sector wide data and to enable practitioners to demonstrate their knowledge, expertise and alignment with best practice standards.</p>	
			<p>Page 6: <u>Include soil seed bank evaluation</u> as part of the topsoil characterization process where native vegetation is being cleared to maximize opportunities for salvage or identify need for supplementation – to include native and weed species.</p>	Supported.	
		During rehabilitation (revegetation – native ecosystem)			
			<p>Page 24: Where permissible, should revegetation be delayed due to unsuitable seasonal conditions, undertake temporary stabilization measures (e.g. sterile cover crops, erosion and sediment controls) to avoid erosion and further land degradation.</p>	Sterile cover crops could be replaced with regionally appropriate “native cover crops” to initiate ecological succession processes and mitigate the risk of non-sterile cover crop species establishing as weeds on the site. Include procurement of the cover crops in the Seed	Sterile cover crops should be a last resort only, with preference given to sourcing and utilising native 'cover crops' suitable to the regional context

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				Strategy and with suitable planning and lead time, access to seed should be achievable. This would benefit the native seed industry and create a better ecological outcome.	
			Page 26: Native revegetation activities in rehabilitation areas should preferentially use local provenance seed for direct seeding or tube stock propagation.	<p>Noted previously re. defining what provenance is or isn't. Climate adjusted etc.</p> <p>Project Phoenix is investigating Seed Transfer Zones (STZ) to explore where seed can be geographically transferred with little disruption of genetic patterns or loss of local adaptation to support better restoration outcomes, especially in the context of a changing climate.</p>	
			Page 26: Use of seed orchards or onsite nurseries should be considered to ensure an appropriate stock is maintained for rehabilitation works.	<p>This needs to be considered during the Rehabilitation Risk Assessment period and implemented in the 'during rehabilitation' stage. Seed Production Areas and nursery establishment require significant resourcing and lead times. These considerations should be included in the Project Seed Strategy.</p> <p>Project Phoenix is engaging with the industry, seeking to identify and map:</p> <ul style="list-style-type: none"> • The national seed collector network • The national native nursery network • The national seed production area network 	
			Page 26: Where adverse seasonal conditions (e.g., drought) or other factors affect the availability of local provenance seed and supplementary non-local provenance seed is required, seed stock should be purchased from reputable suppliers with quality control processes including seed viability testing. (It is good practice to record the name of the supplier and batch of seed being applied. Recording such details may assist in prevention/management of misidentified seeds).	<ul style="list-style-type: none"> • Noted provenance prior. • Excellent that seed testing is listed here, this should apply to all seed sourced for a project not just that purchased if stocks are short of requirement. 	
			Page 26: Undertake treatment of seed in terms to address issues such as seed dormancy and insect predation. Timing of treatment is to be aligned to timing of	<p>Supported.</p> <p>Any measure to reduce the risk of seed wastage is support by Project Phoenix. The development of a robust industry and seed marketplace, supported</p>	

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			application with a focus on reducing the storage time of treated seed.	by appropriate lead times for planning and collection can further maximise impact.	
			Page 26: Confirm the availability of seed and plant material and amend the seed mix or schedule of revegetation based on material supply.	Supply of seed for most species should be possible provided sufficient lead time is provided (min 3-years). Gaps that may occur due to extended poor seasons, lack of availability etc may be in part mitigated through accessing the existing industry network. Project Phoenix is engaging with the industry, seeking to identify and map: <ul style="list-style-type: none"> • The national seed collector network • The national native nursery network • The national seed production area network 	
			Page 27: Where direct seeding is to be used, consider inclusion of a sterile and non-invasive cover crop to establish a temporary ground cover to minimize the potential for erosion, maintain soil moisture and protect native germinants.	Sterile cover crops could be replaced with “regionally appropriate pioneer groundcover species”. If part of a Seed Strategy provision of such seed should be achievable. This would benefit the native seed industry and provide a better ecological outcome.	Sterile cover crops should be a last resort only, with preference given to sourcing and utilising native 'cover crops' suitable to the regional context.
4	Mine Rehabilitation Portal	<p>The purpose of this guideline is to assist lease holders with the submission of spatial data via the mine rehabilitation portal.</p> <p>Conditions of a mining lease granted under the Mining Act 1992 require the lease holder to:</p> <ul style="list-style-type: none"> • Prepare a rehabilitation management plan (large mines only) in the form and way approved by the Secretary. This includes the submission of a final landform and rehabilitation plan via the mine rehabilitation portal. • Prepare an annual rehabilitation report (small and large mines) in the form and way approved by the Secretary. This includes (for large mines) the submission of spatial data relating to disturbance areas, rehabilitation status and achievement of established rehabilitation during the reporting period in accordance with Plan 1 – 		Refers to forward planning for rehabilitation and disturbance, in particular reference to a three-yearly forecast of cumulative disturbance and rehabilitation progression. Whilst this Guideline is referring to spatial records, a three-year rolling seed plan would provide a reasonable timeframe within which seed collection and management can be planned. Include in Seed Strategy document. Procurement aligned with this assessment and timeframe would enable collectors to manage seasonal variability and resource allocation.	

Guideline No#	Guideline Name	Purpose	Document Reference/Location	Comments	Recommendations
		<p>Status of mining and rehabilitation at completion of annual reporting period.</p> <ul style="list-style-type: none"> • Prepare a forward program (small and large mines) in the form and way approved by the Secretary. This includes (for large mines) the submission of spatial data relating to a three-yearly forecast of cumulative disturbance and rehabilitation progression that is planned over this three-year period in accordance with the submission of Plan 2 – Mining and rehabilitation three-year forecast. 			
5	Rehabilitation Objectives and Rehabilitation Completion Criteria	The purpose of this guideline is to assist lease holders with the preparation of rehabilitation objectives and rehabilitation completion criteria.		<p>Provides examples only of Rehabilitation Objectives and Rehabilitation Criteria. There is no mention on where genetic material is sourced.</p> <p>As part of the Completion Criteria, there should be a requirement upon the mine to report upon the provenance of seed and plant material used within rehabilitation. Such reporting places rigor around aforementioned seed procurement processes and would incentivize the operator to effectively plan and source appropriate seed.</p>	Seed collection data should be a standard item within Rehabilitation Completion Criteria.

Guideline No#	Guideline Name	Purpose	Document Reference/Location	Comments	Recommendations
6	Achieving Rehabilitation Completion (Sigh-Off)	The purpose of this guideline is to assist lease holders to identify, track and verify achievement of regulatory obligations under the Mining Act 1992 to achieve rehabilitation completion before mining lease relinquishment.	<p>Page 7:</p> <ul style="list-style-type: none"> • Develop and implement a rehabilitation management plan (for large mines only) that <u>manages risks to rehabilitation</u> and sets out the approach for how rehabilitation obligations are fulfilled. • <u>Develop and implement a forward program that provides a schedule of mining activities and the spatial progression of rehabilitation activities for the next three years.</u> • Undertake progressive rehabilitation over the life of the mine and submit an annual rehabilitation report and forward program to us demonstrating how rehabilitation is progressing against the approved performance measures and timeframes. <p>Page 14: Notes: consultation and 'sign off' from the Environment, Energy and Science Group within the Department of Planning, Industry and Environment regarding matters relevant to the mining lease area relating to Aboriginal heritage impact permits, biobanking agreements, biodiversity offsets, heritage permits, plant / <u>species licences</u>, etc.</p>	Sign off criteria in relation to rehab objectives appear to be covered off under other approvals. This process appears to be a confirmation that such compliance has been obtained and/or does not go into specifics as this would be on a case by case basis. As long as seed/provenance etc is covered effectively within rehabilitation management plans it should be covered i.e. Achieved the rehabilitation completion criteria - as noted above does not specifically mention seed sourcing and provenance in examples.	Seed collection data should be a standard item within Rehabilitation Completion Criteria.