

18 October 2021

Dr Sara Staunton
Senior Environmental Officer (Assessment), Minerals
Minerals and North Queensland Compliance
Department of Environment and Science

Your reference: EPML00392513; 101/0008114

Dear Sara,

Re Information Request Notice Response for PRC Plan for ML10279 and EPML00392513

We refer to the information request notice received 11 June 2021 requiring further information to be supplied to assess the application for a Progressive Rehabilitation and Closure Plan (PRC Plan) and Schedule. The following information is provided as a full response to that request and following discussions and correspondence on the preparation of the supplied information.

The following link has been provided via DropBox
(<https://www.dropbox.com/sh/9hw5xcdrpx5hzhu/AAAcWgQRGubGT7fi6EVUpUoka?dl=0>):

- A revised PRC Plan Planning Part A document (PRCP_REV2_211018_formal response to DES_Markup version) with a version distinguishing inserted or amended text in red and a version without highlighted amendment (PRCP_REV2_211018_formal response to DES_FINAL). Changes to table and figure numbers have not been highlighted throughout the text.
- A resubmission of Appendix 7 to the PRC Plan Part A document being the only appendix with additional materials.
- A combined PRC Plan Planning Part with all appendices included.
- A revised PRC Plan Schedule document (211018_PRCP SCHEDULE_REVISED_AGP008_Mark up) with inserted or amended text in red and a version without highlighted amendment (211018_PRCP SCHEDULE_REVISED_AGP008_FINAL).

We have not resubmitted the spatial information as none of the information requested required amendment to those data.

For your ease of reference, we attach a response identifying where each point of information requested has been addressed within the document and some context around the response and for those matters which were resolved without the need for insertions in the documents, the explanation for that course of response.

We trust this submission allows for the assessment and approval of the Conjuboy Diatomaceous Earth Project PRC Plan.

Yours faithfully,

A handwritten signature in dark ink, appearing to read 'M Harris', is shown on a light-colored background.

Margaret Harris

Principal Consultant

Attachment to PRCP Information Request Response

POINT 1: Further detail regarding rehabilitation methodologies and sourcing of rehabilitation materials

Further detail on methods of sourcing soils

Context of Response

The site plan (Figure 4 of soils from PRCP) illustrates the boundary of soil types. Furthermore the physical description of those soil units (as described in Appendix 3 and reproduced in [Table Table 2](#) below) will be used to dictate the depth of topsoil to be stripped prior to disturbance for pit development. The volumes have been presented by soil type and disturbance footprint to demonstrate that soils can be yielded in sufficient quantities to achieve rehabilitation milestones.

Proposed Insertion: *Insert into section 1.1.8 of PRCP before Figure 4*

Table 2 Topsoil stripping depth by soil type

Soil Unit	Topsoil depth (m)	Topsoil attributes	Subsoil colour
A1	0.1	Very dark brown clay loam	Soil becomes red brown
A2	0.1	Very dark brown clay loam	Soil becomes red brown
B1	0.3	Very dark greyish brown/Black cracking clay	Colour change is difficult to judge. Use total depth as indicator.
C1	0.15	Light greyish brown to greyish brown clay silt	Diatomaceous earth (white)
D1	0.3	Very dark brown to reddish brown clay	Colour change is difficult to judge. Use total depth as indicator.
E1	0	Greyish brown silt loam over white diatomaceous earth	Not to be striped and stored

Topsoil is stripped to depth (using above guidance) using a dozer or loader.

The polygons for each soil type have been measured and the recommended stripping depth applied to determine whether soil availability will meet topsoil rehabilitation cover estimate.

Proposed Insertion: *Insert table and text into section 5.1.3 of PRCP before Table 9*

Table 9 Topsoil yield by soil type for disturbance footprint

Class	AREA (ha)	AREA (m2)	Depth of soil type (m)	Yield (m3)
A1	13.596	135,959	0.10	13,595.90
A2	18.819	188,191	0.10	18,819.10
C1	0.453	4,533	0.15	679.95

D1	20.723	207,231	0.30	62,169.30
E1	3.179	31,792	0	0
B1	24.188	241,877	0.30	72,563.10
All soil total				167,827.35

When the yield total is compared with the topsoil requirement to achieve a minimum 15cm cover over all disturbances (Table 10 of the PRC Planning Part), this exceeds the demand.

Table 10 Topsoil required for site surface disturbance

Site	Area (ha)	Area (m2)	Thickness (m)	Volume (m3)
Footprint excl roads, area between current & new stockpiles	75.34	753,419.8	0.15	113,013.0
Area between stockpile footprints	46.80	46,800.2	0.15	7,020.0
Total	122.14			120,033.0

Proposed Insertion: *Insert following Table 9 of PRCP*

Sequence of soil preparation and how it is achieved

1. Topsoil to be stripped over surface and stockpiled separately from subsoil storage.
2. Stored topsoil to be kept to a minimum height (<2m)
3. Stored free from traffic and erosive agents.
4. Stockpile to be sown with cover grass seed from revegetation mix and maintained weed free until use in backfilling and surface revegetation.
 - Topsoil stockpiles should be used in order of creation, that is oldest stockpiles should be used first.
 - Initial pit areas to be removed to stockpile area (Figure 4 from current Plan of Operations) to be used in backfilling sequence.
 - Later topsoil yield can be applied directly to backfilled pit areas and sown with revegetation mix directly.
 - A minor stockpile to be maintained from final pit (Pit 5) to use in that pit's backfilling and surface revegetation.

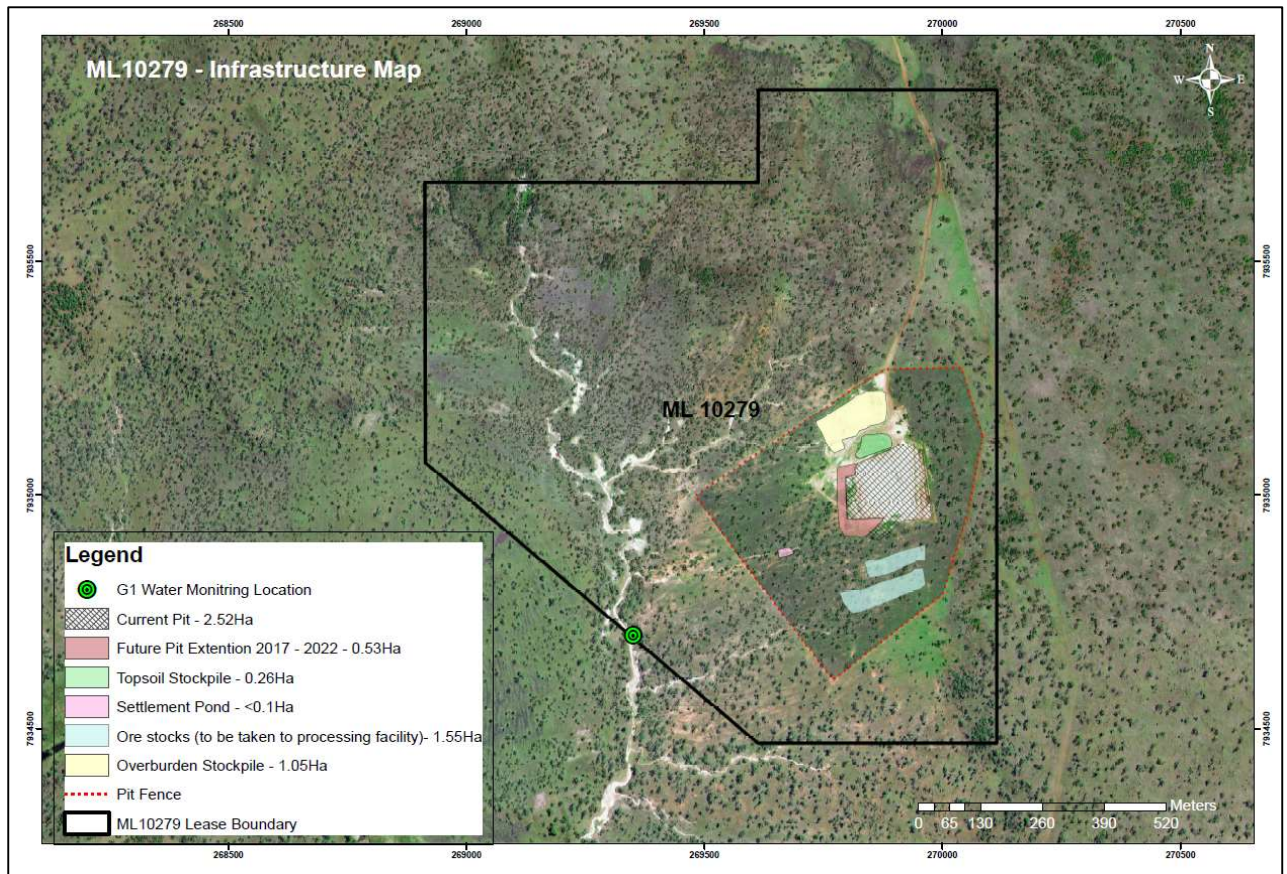


Figure 1 Topsoil and Overburden stockpiles from initial pit development (Plan of Operations)

Subsequent management techniques to achieve a stable condition

Sodic subsoils may be encountered in any of the five pits based on soil survey results. Application of gypsum prior to spreading of topsoil will be assessed via either a field assessment method for dispersion ([FieldGuide.pdf \(jcu.edu.au\)](#)) or by laboratory analysis to confirm effective application rate.

Upslope diversions installed for operational activities will remain in place following backfilling to reduce risk of erosion on newly established surfaces.

Slopes will be contour ripped following topsoil application and prior revegetation seeding.

Sediment controls will be applied on slopes at intervals of 30-60m depending on final grade while vegetation cover is establishing.

Sediment controls may be reinstalled following any slow establishment or reseeding if indicated at the 12-month post-seeding.

POINT 2: Further information relating to PRC Plan Guideline Section 3.6.1 for landform design

(e) slope profile design and length

Context of Response

Figures 17, 18, 19 of the PRC Plan as submitted showed the final landform cross-sections through all pits which included slope lengths and angles, however the details were omitted from the text in Section 5.1.5 including the measures to address stability risks of the formed slopes.

Proposed Insertions: Insert into section 5.1.5 of PRCP

Slope lengths for backfilled pits range from 8 degrees for over 125 metres to <5 degrees for over 300m.

Slopes will include contour berms at 45 to 60m intervals respectively to reduce erosion potential. Contour berms will be within the design length of 1500m as per [soilconguide3echapter7.pdf](#) to reduce risk of failure.

Stability risks

The primary risks associated with the slope length relate to the early establishment of vegetation and erosion rates. By reducing the velocity of water on the bare slopes using contour banks and placed sediment controls, the chance of improved vegetative cover is increased. A grassed drain will be installed to divert runoff from eroding the reprofiled landform before the revegetation milestones can be achieved. The drain will need to maintain function for at least 4 years until the rehabilitated landform reaches the vegetation cover milestones. The drain will discharge via level spreader onto adjacent undisturbed land within the ML.

POINT 2: Further information relating to PRC Plan Guideline Section 3.6.1 for General Rehabilitation Practices

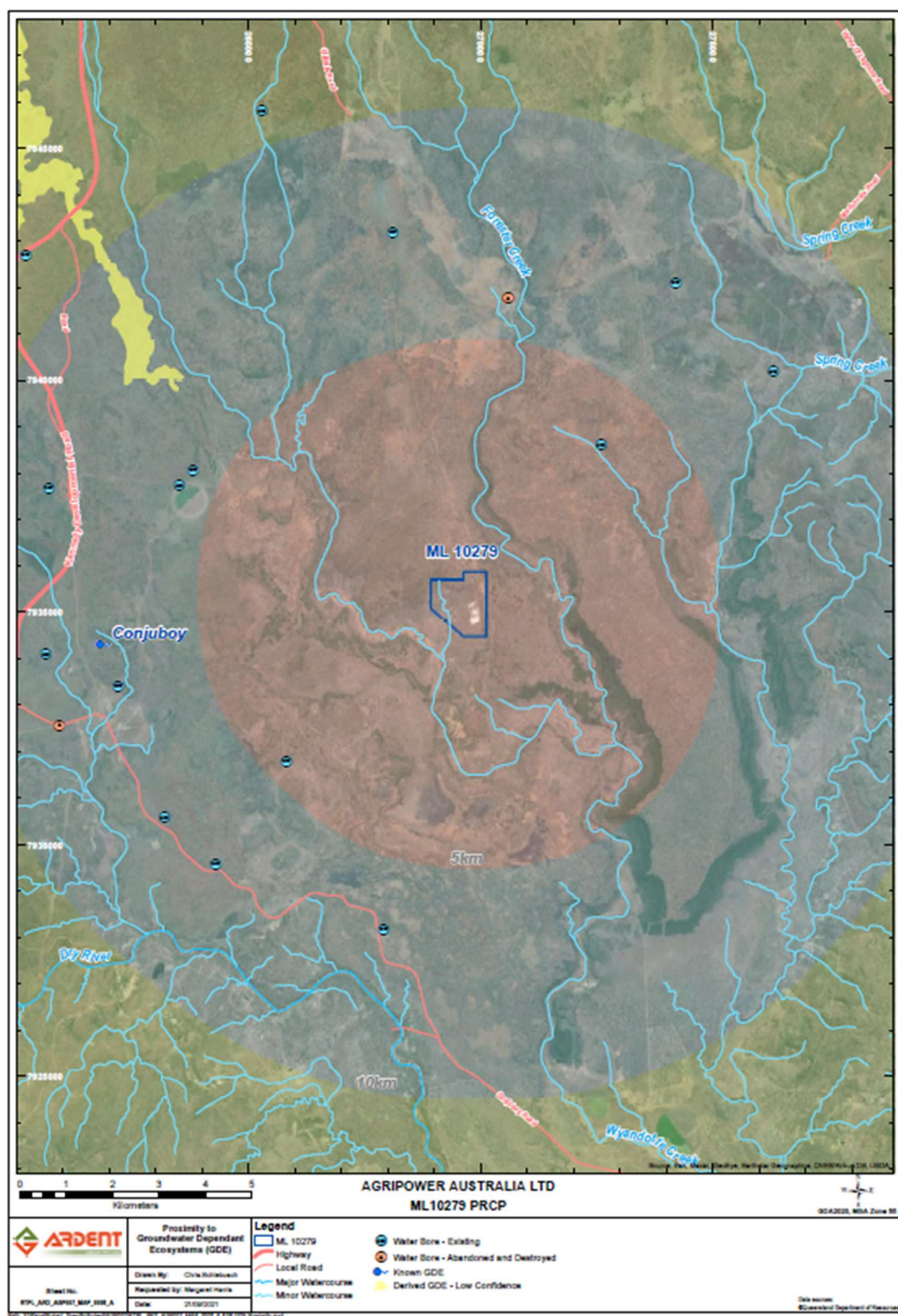
(a) potential interaction with groundwater

Proposed Insertions: Insert into section 5.1.1 including Figure

The target ore zone has been characterised as an aquitard. The backfilled material will be largely within C6 ore zone (i.e. diatomaceous earth) at least 2 metres from the ore zone floor. It is not expected that there will be vertical infiltration through the backfilled material into the underlying basalt aquifer but will behave consistent with the other surrounding basaltic overburden material.

Figure 11 shows the nearest groundwater dependent ecosystem (GDE) of record is 7.45km west of the pit extent at an elevation of 521m. The pit development and rehabilitation will not have an effect on this location due to the aquifer divides that occur between the pits and this location. Adjacent landholder bores for agricultural supply are more likely to have effect on the mapped GDE area.

Model of post-rehabilitation ponding shows that it is not likely to have surface water accumulating on the backfilled pit area (refer Figure 12).



(c) sodic and dispersive soils

Proposed Insertions: Insert into Section 5.1.3 of PRCP before Table 8

The out of pit storage of overburden which includes potentially sodic material (in the 30cm-1m interval of B1 and D1 soils) is only a factor in the early stages of development (i.e. Pit 1 and 2). As the backfilling program progresses at the rate of pit development, overburden, including potentially sodic material will be returned to pit for reprofiling. The highest ESP for sub soils was 17.9% which was at a single location. This falls in the light to moderate range of sodicity hazard ([4. SODIC SOILS AND THEIR MANAGEMENT \(fao.org\)](http://www.fao.org/4/sodic-soils-and-their-management)).

The LongPaddock subsoil dispersibility report (included in Appendix 3 of the PRCP) for the location that includes the ML area is mapped as non-dispersive. The proposed management of encountered sodic subsoils is separate stockpiling from topsoil, deep placement within backfilled pit areas and if present, treatment with gypsum prior to the application of topsoil.

(h) conservation classifications for listed species

Context of Response

The current section in the PRCP described the pre-disturbance survey outcomes. In respect of the 2003 survey results, the nature of the bettong or fox observation in the field is unable to be confirmed. WildNet searches have been undertaken and the results indicate that neither species has been recorded in the Mining Lease vicinity. The reports have been attached to Appendix 7 of the PRC Planning Part.

As the post-mining land use is grazing, the milestone criteria mentioning pre-disturbance fauna has been removed from RM5.

Proposed Insertions: Insert in Section 1.1.12 of PRCP

Appendix 7 includes a copy of the pre-disturbance fauna investigation, the updated conservation status of those species observed and WildNet reports for species, conservation significant and pest species lists for the ML area and buffer.

Proposed Insertions: Reproduction of Table 3.7 of Appendix 7

Species	Common Name	EPBC 1999	QNCR 1994
Reptiles			
<i>Egernia rugosa</i>	Yakka skink	V	V
<i>Lysgisaurus roco</i>	Chillagoe Litter-skink		NT
<i>Lerista ameles</i>	Limbless Fine-lined Slider		V
<i>Lerista cinerea</i>	Vine-thicket Fine-lined Slider		V
<i>Lerista wilkinsi</i>	Two-toed Fine-lined Slider		C
<i>Ctenotus zebrilla</i>	Cape York Fine-snouted Ctenotus		C
<i>Furina barnardi</i>	Yellow-naped snake		C
<i>Ramphotyphlops broomi</i>	Blind snake		
<i>Simoselaps warro</i>	Burrowing Snake		
<i>Acanthophis antarcticus</i>	Common Death Adder		V
Birds			
<i>Lophoictinia isura</i>	Square-tailed kite		C
<i>Haliaeetus leucogaster</i>	White-bellied Sea Eagle	Migratory and Marine Protected Species	C
<i>Accipiter novahollandiae</i>	Grey Goshawk		C
<i>Erythrotriorchloris radiatus</i>	Red Goshawk	V	E
<i>Falco hypoleucos</i>	Grey Falcon	V	V
<i>Ninox rufa</i>	Rufous Owl		NT
<i>Tyto novaehollandiae kimberli</i>	Masked Owl	V	C
<i>Hirundapus caudacutus</i>	White-throated Needletail	V and Migratory and Marine Protected Species	V
<i>Poephila cinta</i>	Black-throated Finch	E	C
<i>Neochmia rufiauda ruficauda</i>	Star Finch	E	C
<i>Neochmia phaeton</i>	Crimson Finch	E	C
<i>Erythrura gouldiae</i>	Gouldian Finch	E	E
<i>Mylagra cyanoleuca</i>	Satin Flycatcher	Migratory and Marine Protected Species	SL
<i>Melthithreptus gularis</i>	Black-chinned Honeyeater		C
Mammals			
<i>Dasyurus hallucatus</i>	Northern Quoll	E	C
<i>Phascogale tapoatafa</i>	Brush-tailed Phascogale	V	C
<i>Pseudocheirus peregrinus*</i>	Common Ringtail Possum		LC
<i>Petrogale mareeba</i>	Mareeba Rock Wallaby		C
<i>Macroderma gigas</i>	Ghost Bat	V	E
<i>Hipposideros diadema</i>	Diadem Horseshoe-Bat	E	NT

Species	Common Name	EPBC 1999	QNCR 1994
Hipposideros semoni	Greater Wart-nosed Horseshoe-bat	V	E
Chalinolobus picatus	Little Pied Bat		C
EPBC STATUS SUMMARY		QNCR STATUS SUMMARY	
E= Endangered = 6 V = Vulnerable = 8 Migratory and marine protected species = 3		E = Endangered = 4 V = Vulnerable = 6 NT = near threatened = 3 C = least concern = 15 SC= Special Least Concern = 1	

* *not Pseudocheirus peregrinus occidentalis*

Source of updated conservation status

[Species Profiles \(SPRAT\) \(environment.gov.au\)](https://environment.gov.au/species/profiles/sprat)

[Species - Conservation status of Queensland wildlife | Open Data Portal | Queensland Government](#)

POINT 3: Further information on PRC Plan Guideline Section 3.6.5

Identification of infrastructure that will be decommissioned

Context of Response

Section 1.3.1.6 describes temporary minor fuel storage and Section 1.4.1.5 describes its removal. The only other infrastructure on site is the perimeter fence discussed below.

Evidence of agreement - Perimeter fencing details

Context of Response

Initial and final fence perimeter listed in spatial information, however the basis of the 4 year retention was not included.

Proposed Insertions: Insert in section 1.3.1.5 of PRCP and RA5 description of Table 7 of PRCP

The compensation agreement with Masterson includes retention of a perimeter fence for a minimum of 4 years. The fence will be removed following 4 year achievement of cover. Posts removed and wire removed at the achievement of stability and revegetation milestones and no additional works required.

POINT 4: Further information on PRC Plan Guideline Section 3.7.1

Rehabilitation trials

Proposed Insertions: Insert in section 6.3.1.2 of PRCP

Trial 1 location selected for the backfilled and reprofiled Pit 1 available in year 2030. The underlying land characteristics will be backfilled pit as per sequence in rehabilitation method with topsoil spread of 15cm and overall slope of 8°. The seed mix will be applied with and without fertiliser as per trial. No previous trials have been carried out on site.

Proposed Insertions: Replace section 6.3.1.1 of PRCP

To determine whether the ratio and combination of seeds for native pasture revegetation can achieve the desired groundcover and diversity on the rehabilitated landform and to determine the success rate of germination for the seed types consistent with the RE 9.3.2 and RE 9.8.1 grasses with and without the use of a low nitrogen fertiliser. Depending on the underlying subsoil sodicity characteristics, ameliorants may also be applied.

Limitations for Trial 1 include the germination conditions at time of assessment of trial plots may not be representative of conditions for main rehabilitation areas and locally sourced seeds may not be available.

POINT 5: Further information on PRC Plan Guideline Section 4.1

Proposed Insertions: Replace words in Table 13 of PRCP and Table 20 of PRCP and PRCP Schedule for Rehabilitation Milestones

Rehabilitation Milestones

RM3

Text altered to remove “surface treatment soil” to state “topsoil”

RM2

Text altered (d) amend “sediment fences” to “sediment controls”

RM4, RM5 AND RM6

Context of Response

No changes to Rehabilitation Milestones RM4 or RM6 proposed, rather further detail of the characteristics of the reference/analogue sites included in the Planning Part has been added.

RM5 has deleted “(d) Evidence of pre-disturbance native fauna recorded in rehabilitation area.” as per **POINT 2 (h)**.

Proposed Insertions: Insert in Section 5.1.8 of RPCP

Reference sites for revegetation assessments

Location of reference sites considered to be representative of the ML disturbance areas but within the ML perimeter are located as follows:

- Site characteristics considered representative of the 133ha ML area based on vegetation cover, slope, soil characteristics. RE is largely uniform across the site and land use outcome is grazing not RE dependent.

Analogue site 1: Soil group B1

Analogue site 2: Soil group D1

Data collected from each analogue site:

Soil:

- Slope;
- topsoil depth;
- subsoil sodicity;
- erosion estimate (rill count and volume estimation).

Vegetation:

- species count;
- cover percentage;
- form distribution (groundcover/mid-storey/canopy);
- weed percentage;
- habitat features.

Vegetation transects

Vegetation transects will consist of a modified BioCondition survey. Fixed 100 m x 50 m vegetation transects will be established and monitored throughout the Project Area with the following information recorded in regards to vegetation structure:

- RE;
- Canopy species and relative abundance;
- Canopy minimum, maximum and average height;
- Crown cover;
- Shrub species and relative abundance;

- Shrub average height;
- Shrub canopy cover;
- Weed cover;
- Ground cover;
- Ground layer species and individual percentage cover;
- Percentage cover of bare ground and organic material.

RM11

Proposed Insertions: Insert alternative text in PRCP Schedule and section 5.3.2.4 of PRCP

- Backfilling of ore/waste/overburden to pit.
- All major earthworks within pit footprint complete.
- Batter slopes meet final design specifications.
- Installation of contour berms on backfilled landform.
- Integration of natural ground level with backfilled pit profile.
- Installation of upslope drainage for pit perimeter areas to provide erosion protection on slopes prior to vegetation cover criteria met.

RM12

Proposed Insertions: Alternative text in PRCP schedule and section 5.3.2.4 of PRCP

- Backfilled pits assessed as geotechnically stable by a suitably qualified geotechnical engineer such that no slumping is observed or expected in placed material.
- Stability assessment includes final slope status and geometry (<10°), condition and engineering characteristics and assessment of failure mechanisms.
- Final landform slope lengths and angles consistent with landform design criteria.

Proposed Insertions: Insert in Section 5.1.5 of PRCP before Figure 16.

Scope and assessment criteria of geotechnical assessment

The scope of assessment for a geotechnical engineer is to prepare a geotechnical assessment of the final slope status, geometry (<10°), condition and engineering characteristics, such as material strength, assessment of failure mechanisms and acceptability of failure based on consequence and probability, factor of safety over the life of slope.