

INTEGRA
UNDERGROUND

GLENCORE



Biodiversity Management Plan

Document Number: INTUG-263795162-22

Status: Approved

Version: 3.1

Effective: 8 September 2019

Review: 8 September 2024

Owner: Environment and Community Manager

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1 Introduction

1.1 Background

This Biodiversity Management Plan (BMP) is one of a series of Environmental Management Plans that together form the Environmental Management System for the Glencore Integra Underground Mine, herein referred to as the Integra Underground.

The Integra Underground is approximately 12 km north-west of Singleton, in the Singleton Local Government Area (see **Figure 1**). Underground mining operations are approved at a maximum extraction rate of 4.5 million tonnes per annum (Mtpa) of run-of-mine (ROM) coal until 31 December 2035 under Project Approval PA 08_0101 (as modified). This approval allows longwall mining of the Hebden, Barrett and Middle Liddell seams to produce high quality, semi-hard coking coal for export.

The Integra Underground was formerly a part of the larger Integra Mine Complex. This complex comprised both underground and open cut operations and operated under a single project approval instrument which combined the project approvals for the Integra Underground (PA 08_0101) and Integra Open Cut (PA 08_0102). In late 2015, HV Coking Coal Pty Ltd (HVCC) (a 100% Glencore-owned company) acquired all assets associated with the Integra Underground, which had been placed in care and maintenance in May 2014. Bloomfield Collieries Pty Limited (Bloomfield) purchased the open cut and surface facilities (subsequently re-named the Rix's Creek North Mine).

Following the separate sale of the underground and open cut, the combined project approval was modified to separate the approvals. Following the separation of the approvals Integra Underground operated under PA 08_0101 as modified.

HVCC recommenced underground operations in 2017, with development resuming in February 2017 and longwall extraction resuming in May 2017 in accordance with the Extraction Plan as required under Condition 20 of Schedule 3 of PA 08_0101. An application for a further modification to PA 08_0101 (MOD 7) and accompanying Environmental Assessment (EA) was lodged with the Department of Planning and Environment (DPE) in June 2017. Subsequently, approval was granted by DPE on 15 September 2017. The modification application was made to facilitate the construction of a water pipeline from Integra Underground to the adjacent Mt Owen Complex and the subsequent use of the pipeline to transfer mine water. The modification enables surplus mine water collected at Integra Underground to be managed at the Mt Owen Complex and within Glencore's Greater Ravensworth Area Water Sharing Scheme (GRAWSS).

An application for Modification 8 (MOD 8) to PA 08_0101 and accompanying EA was lodged with the DPE in November 2017. Approval was granted by DPE on 16 April 2018. MOD 8 allows continuation of longwall mining of the Middle Liddell Seam further to the north of the currently approved longwall panels, along with the construction and operation of ancillary surface infrastructure required to support the mining activities.

1.2 Purpose and Objectives

This management plan satisfies Schedule 3, Conditions 20(g) and 32 of PA 08_0101, which require the preparation of a BMP.

The purpose of this BMP is to describe the ecological management strategies, procedures, controls and monitoring programs that are to be implemented for the management of flora and fauna at Integra Underground. The objectives of this management plan are to:

- provide a description of the activities at Integra Underground which have the potential to impact on biodiversity in the project area;
- provide a series of mitigation measures to minimise impact to threatened species, including groundwater dependent ecosystems (GDEs);
- provide mitigation measures to minimise impacts from identified activities to be undertaken at Integra Underground; and

- provide a monitoring program for the assessment of potential impact of underground mining on identified threatened species.

1.3 Requirements of the BMP

1.3.1 Statutory Requirements

PA 08_0101 stipulates requirements related to this BMP. These are summarised in **Table 1–1** below.

Table 1–1 – Relevant Development Consent Conditions

PA 08_0101 Condition	Development Consent Condition Description	Relevant Section of BMP
Schedule 3, Condition 17	The Proponent must ensure that the project does not cause any exceedance of the performance measures in Table 10 <u>Biodiversity</u> Threatened species, populations, habitat or ecological communities: Negligible impact	This plan
Schedule 3, Condition 17A	If the Proponent exceeds the water and biodiversity performance measures in Table 10 and the Secretary determines that: a) It is not reasonable or feasible to remediate the subsidence impact or environmental consequence; or b) Remediation measures implemented by the Proponent have failed to satisfactorily remediate the subsidence impact or environmental consequence, Then the Proponent must provide a suitable offset to compensate for the subsidence impact or environmental consequence, to the satisfaction of the Secretary.	Section 2.8.3
Schedule 3, Condition 17B	The offset must give priority to like-for-like land-based environmental offsets, but may also consider payment into any NSW Offset Fund established by OEH, or funding or implementation of supplementary measures such as: a) actions outlined in threatened species recovery programs; b) actions that contribute to threat abatement programs; c) biodiversity research and survey programs; and/or d) rehabilitating degraded habitat. Note: Any offset required under this condition must be proportionate with the significance of the impact or environmental consequence.	Section 2.8.3
Schedule 3, Condition 20	The Proponent must prepare an Extraction Plan for all second workings on site. This plan must: (g) include a: Biodiversity Management Plan, which has been prepared in consultation with OEH, to manage the potential impacts and consequences of subsidence on biodiversity and which includes measures to manage potential impacts and/or environmental consequences of the proposed second workings on aquatic and terrestrial flora and fauna;	This plan
	(h) include Trigger Action Response Plans, or equivalent, to address potential subsidence impacts and environmental consequences that may result from mining subsidence;	Appendix C

PA 08_0101 Condition	Development Consent Condition Description	Relevant Section of BMP
	(i) include a contingency plan that expressly provides for adaptive management where monitoring indicates that there has been an exceedance of any performance measures in Table 10, or where any such exceedance appears likely; and	Appendix C
	(j) include a program to collect sufficient baseline data for future Extraction Plans	Section 4
Schedule 3, Condition 29	The Proponent must: (a) commission a suitably qualified and independent expert, whose appointment has been approved by the Secretary, to carry out a detailed survey of geotechnical, geomorphic and ecological baseline condition of the Mt Owen Bettys Creek Diversions: • prior to carrying out any second workings under the creek diversions; and • within 6 months of completing the second workings under these creek diversions; and (b) provide a copy of these surveys to the Department within a month of the completion of each survey.	Section 3
Schedule 3, Condition 32	Biodiversity Management Plan The proponent must prepare a Biodiversity Management Plan for the project to the satisfaction of the Secretary. This plan must:	This plan
	(a) be prepared in consultation with OEH and then submitted to the Secretary for approval.	Section 1.4. Appendix A This BMP was approved by the Secretary on 28/09/2017 (refer to Appendix B) Consultation with government agencies completed for MOD 8.
	(b) include:	
	A description of the short, medium, and long term measures that would be implemented to manage the remnant vegetation and habitat on site;	Section 3.1
	A detailed description of the measures and procedures to be implemented for: - protecting vegetation and soil outside the areas that are to be impacted; - rehabilitating creeks and drainage lines on the site (both inside and outside the disturbance areas), to minimise net loss of stream length and aquatic habitat; - managing salinity; - managing impacts on fauna; - landscaping the site and along public roads to minimise visual and lighting impacts; - controlling weeds and feral pests, including terrestrial and aquatic species; - controlling access; and - bushfire management.	Section 3.2

PA 08_0101 Condition	Development Consent Condition Description	Relevant Section of BMP
	A detailed description of the measures and procedures to be implemented to: - minimise, to the greatest extent practicable, the disturbance of threatened species and EECs (including undertaking pre-clearance surveys), and rehabilitate any areas of disturbed land associated with the construction of the water pipeline infrastructure; - provide for the salvage, transplanting and/or propagation of any threatened flora (including, but not limited to, threatened orchid species) found during pre-clearance surveys, in accordance with the Guidelines for the Translocation of Threatened Plants in Australia (Vallee et al., 2004); and - satisfy the requirements of conditions 32A to 32C of Schedule 3;	Section 3.1 Section 3.2 See conditions 32A to 32C below
	A program to monitor the effectiveness of these measures, and progress against the performance and completion criteria; and	Section 5
	Details of who would be responsible for monitoring, reviewing and implementing the plan.	Table 6.1
	The Proponent must implement the approved management plan as approved from time to time by the Secretary.	Noted
Schedule 3, Condition 32A	The Proponent must plant and maintain, until established, 10 like-for-like trees for every established tree removed during construction of the water pipeline infrastructure that is associated with the following flora communities: • Central Hunter Ironbark — Spotted Gum — Grey Box Forest EEC; • Central Hunter Swamp Oak Forest; • Hunter Valley River Oak Forest; and • Central Hunter Bulloak Forest. <i>Note: An established tree is considered to be two metres or greater in height.</i>	Section 3.3 Section 4.3
Schedule 3, Condition 32B	The Proponent must ensure that the rehabilitation of land disturbed during construction of the water pipeline infrastructure focuses on the regeneration, enhancement and/or re-establishment of: (a) significant and/or threatened flora communities, including: • Central Hunter Ironbark — Spotted Gum — Grey Box Forest EEC; • Central Hunter Swamp Oak Forest; • Hunter Valley River Oak Forest; • Central Hunter Bulloak Forest; and (b) habitat and/or foraging resources for other significant and/or threatened flora and fauna species that occur in the vicinity of the disturbance area for the water pipeline infrastructure.	Section 3.1 Section 3.2 Section 3.3
Schedule 3, Condition 32C	The Proponent must implement the mitigation and management measures specified in EA Mod 7 during construction of the water pipeline infrastructure, including avoiding disturbance of stags, hollow bearing trees and the Bettys Creek Habitat Management Area.	Section 3.2
Schedule 3, Condition 38	The Proponent must rehabilitate the site in a manner that is generally consistent with the rehabilitation strategy described in the documents referred to in conditions 2 or 3 of Schedule 2 and the objectives in Table 12. Site (as a whole): Safe, stable and non-polluting	Section 3.1

PA 08_0101 Condition	Development Consent Condition Description	Relevant Section of BMP
	Mt Owens Bettys Creek: Rehabilitate to the same or better geotechnical, geomorphic and ecological condition as prior to mining, unless the owner agrees otherwise	
Schedule 3, Condition 39	The Proponent must carry out rehabilitation of the site progressively, that is, as soon as reasonably practicable following the disturbance	Section 3.1
Schedule 5, Condition 2	The Proponent must ensure that the management plans required under this approval are prepared in accordance with any relevant guidelines, and include:	
	a) detailed baseline data;	Section 2
	b) a description of: - the relevant statutory requirements (including any relevant approval, licence or lease conditions); - any relevant limits or performance measures/criteria; and - the specific performance indicators that are proposed to be used to judge the performance of, or guide the implementation of, the project or any management measures; and	Section 1.3 Section 3.2
	c) a description of the measures that would be implemented to comply with the relevant statutory requirements, limits, or performance measures/criteria	Section 3
	d) a program to monitor and report on the: - impacts and environmental performance of the project; and - effectiveness of any managements measures (see (c) above);	Section 4
	e) a contingency plan to manage any unpredicted impacts and their consequences; and	Section 3.2 and the TARP in Appendix C
	f) a program to investigate and implement ways to improve the environmental performance of the project over time;	Section 5
	g) a program to regularly review management practices to align with contemporary best practice industry standards;	Section 3.5
	h) a protocol for managing and reporting any: - incidents; - complaints; - non-compliances with the conditions of this approval and statutory requirements; and - exceedances of the impact assessment criteria and/or performance criteria; and	Section 4.5 and 6.4 of the Environmental Management Strategy
	i) a protocol for periodic review of the plan.	Section 5

1.3.2 GCAA Requirements

This BMP has been prepared in accordance with Glencore Coal Assets Australia's (CAA) 11.18 *Biodiversity Offset Management Protocol*.

1.3.3 Extraction Plan Guideline Requirements

The DPE and the former NSW Department of Industry – Division of Resources and Energy (now known as the Resources Regulator) prepared guidelines for the preparation of extraction plans required under conditions of development consent, project approval and mining leases for underground coal mining. These guidelines must be applied in the preparation of any Extraction Plan required under conditions of development consent granted under the NSW *Environmental Planning and Assessment Act 1979* (EP&A Act) for underground coal mining in NSW.

The Extraction Plan must include a number of key component plans, including a BMP, which are to follow the structure outlined in **Table 1-2** below. This BMP has also been prepared to meet these requirements, as shown in the table.

Table 1-2 – Extraction Plan Guideline Requirements

Extraction Plan Guideline Requirement	Relevant Section of BMP
Overview of all landscape features, heritage sites, environmental values, built features or other values to be managed under the component plan;	Section 2
Setting out all performance measures included in the development consent relevant to the features or values to be managed under the component plan;	Section 3.2
Setting out clear objectives to ensure the delivery of the performance measures and all other relevant statutory requirements (including relevant safety legislation);	Table 3.1
Proposing performance indicators to establish compliance with these performance measures and statutory requirements;	Table 3.1
Describing the landscape features, heritage sites and environmental values to be managed under the component plan, and their significance. It should be noted that a full description of such features, sites and values would commonly have been provided and considered in a recent environmental impact assessment. Consequently, this section can be relatively brief, and focus on the presentation of appropriate figures and/or graphical plans;	Section 2
Fully describing all currently-predicted subsidence impacts and environmental consequences relevant to the features, sites and values to be managed under the component plan;	Section 2.6
Fully describing all measures planned to remediate these impacts and/or consequences, including any measures proposed to ensure that impacts and/or consequences comply with performance measures and/or the Applicant's commitments;	Table 3.1 Section 4
Describing the existing baseline monitoring network and the current baseline monitoring results, including pre-subsidence photographic surveys of key landscape features and key heritage sites which may be subject to significant subsidence impacts (such as significant watercourses, swamps and Aboriginal heritage sites);	Section 4
Fully describing the proposed monitoring of subsidence impacts and environmental consequences;	Section 4
Describing the proposed monitoring of the success of remediation measures following implementation;	Section 3
Fully describing adaptive management proposed to avoid repetition of unpredicted subsidence impacts and/or environmental consequences;	Section 3
Fully describing contingency plans proposed to prevent, mitigate or remediate subsidence impacts and/or environmental consequences, which substantially exceed predictions or which exceed performance measures;	Section 3, and the TARP in Appendix C
Listing responsibilities for implementation of the plan; and	Section 6

Extraction Plan Guideline Requirement	Relevant Section of BMP
An attached Trigger, Action, Response Plan (effectively a tabular summary of the above).	Appendix C

1.3.4 Statement of Commitments

Table 1–3 includes all obligations that are identified in the Statement of Commitments appended to PA 08_0101.

Table 1–3 – Relevant Statement of Commitments

Desired outcome	Existing or proposed actions	Relevant Section of BMP
Operations are managed such that adverse impacts to native flora and fauna are prevented, minimised and/or offset.	HV Coking Coal will implement the following flora and fauna management procedures:	
	revegetate the planned Bettys Creek diversion channel and adjacent areas;	Completed
	undertake surveys along the creek diversion and revegetated areas to record any significant loss of planted seedlings and monitor the use of revegetated areas by native fauna;	Section 4
	revegetation design, weed management, exclusion of cattle and ongoing monitoring in the area of the Bettys Creek diversion will be coordinated in consultation with Glendell;	Section 3
	the abandoned Bettys Creek channel will be managed (ie weed control and exclusion of cattle) in conjunction with the ongoing management and monitoring of the proposed diversion;	Section 3
	based on the ephemeral nature of the existing channel, consideration will be given to blocking off the abandoned channel at the downstream end to act as a billabong to retain any surface flows;	Blocking the abandoned channel has been considered, and was not found to be feasible or necessary due to the open cut mining activities in the area.
	undertake pre-clearance inspections of borehole sites. Where possible, the inspections will be undertaken during the summer flowering period to optimise detection of <i>Bothriochloa biloba</i> and avoid impacting directly on any individual plants	B. biloba is no longer listed under BC Act or EPBC Act

Table 1–4 includes all obligations that are identified in the Environmental Assessments for MOD 7 and MOD 8 to PA 08_0101.

Table 1-4 – Relevant Statement of Commitments (MOD 7 and MOD 8)

EA Commitment	Timing	Relevant Section of BMP
MOD 7 - Integra to Mount Owen Complex Water Pipeline Modification Environmental Assessment (Hansen Bailey 2017a)		
4. The alignment of the pipeline (and its associated infrastructure) may be modified to minimise impacts to sensitive ecological or archaeological values identified within the Assessment Boundary.	Prior to and during pipeline construction	Section 2.8.2
10. Removal of hollow-bearing trees, proximate stags and larger trees (trunk diameter > 10 cm) will be avoided wherever practicable.	During pipeline construction	Section 3.2
13. In the event that any topsoil is required to be disturbed, it will be reinstated and revegetated as soon as practicable after construction.	After pipeline construction	Section 3.3
MOD 8 – Longwall Extension Modification Environmental Assessment (Hansen Bailey 2017b)		
5. The Biodiversity Management Plan will be updated to include mitigation measures relevant to the Modification. The Biodiversity Management Plan will be updated in consultation with the relevant regulatory authorities.	Following approval of MOD 8	Section 2.8.2 Section 1.4
6. Direct disturbance of threatened ecological communities (EECs and CEECs) will be avoided	Ongoing during construction activities	Section 2.8.2
7. Planting of like-for-like trees will be undertaken to compensate for the removal of established trees due to the Modification alone (i.e. not including areas that are approved to be disturbed by the Mt Owen Complex	As required	Section 3.1
8. Consultation with Forestry Corporation of NSW will continue during the development and finalisation of the mine plan for the Modification, as well as during the operational phase	Ongoing	Section 1.4

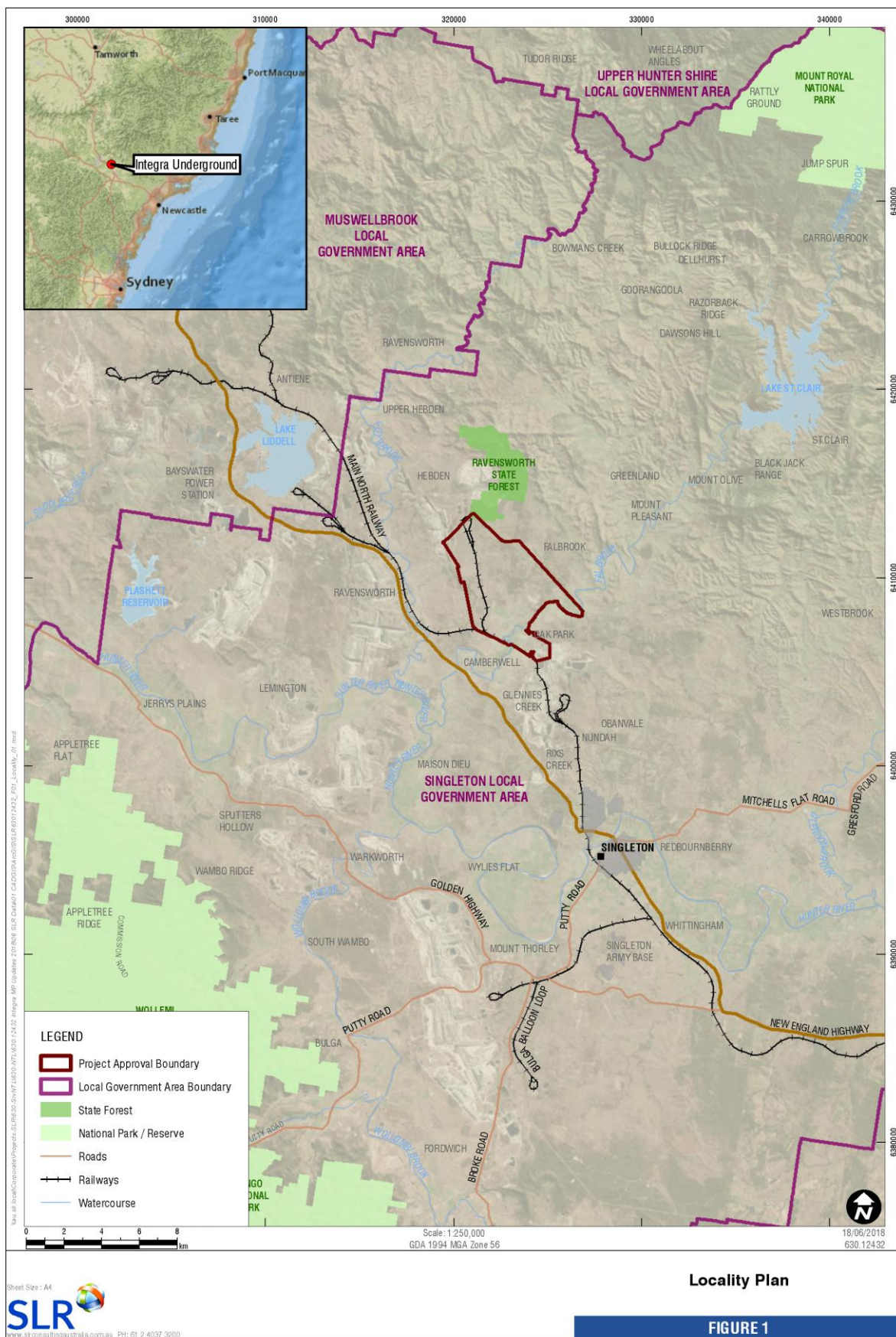
1.4 Consultation

The BMP has been prepared in consultation with the NSW Office of Environment and Heritage (OEH). A copy of the correspondence between Integra Underground and OEH has been provided in **Appendix A**.

A copy of the DPE approval of the BMP is in **Appendix B**.

This BMP has been reviewed and updated following approval of MOD 8 (see **Section 1**). The *Longwall Extension Modification Environmental Assessment* (Hansen Bailey 2017b) contains details of the consultation undertaken in relation to MOD 8.

Consultation with the Forestry Corporation of NSW will continue during the development and finalisation of the mine plan, as well as during the operational phase.



2 Existing Environment

The Integra Underground Coal Project Environmental Assessment (EA) (ERM 2009) contains a detailed description of the existing environment at Integra Underground. This section contains a brief summary of the vegetation communities and threatened species that exist within the underground mining area. **Figure 2** illustrates the location of these vegetation communities, and **Figures 3** illustrates threatened fauna species records.

An ecological impact assessment was completed for the MOD 8 EA (Hansen Bailey 2017b), and additional information from this assessment has been included in these following sections.

2.1 Land ownership and use

The majority of surface disturbances associated with Integra Underground's operations will occur solely on Glencore owned and managed property.

The Mt Owen Complex consists of the Mt Owen, Ravensworth East and Glendell open cut coal mines. All mines are owned and managed by Mt Owen Pty Limited (Mt Owen) on behalf of Glencore Coal Australia Pty Limited (Glencore). Mt Owen is a wholly owned subsidiary of Glencore. The project boundary for the Mt Owen Complex overlaps with the Integra Underground project area.

Mt Owen engage Colinta to manage grazing activity. Grazing activity is conducted in a sustainable manner with cattle rotated between paddocks. Fencing is inspected by Mt Owen personnel on a regular basis and repaired where required.

The Mt Owen Betty's Creek Habitat Management Area is also within the Integra Underground Project Area, as shown on **Figure 3**.

2.2 Vegetation Communities

Vegetation communities recorded within the project area at Integra Underground (ERM 2009 and Hansen Bailey 2017b) include:

- Central Hunter Ironbark - Spotted Gum - Grey Box Forest;
- Central Hunter Bullock Forest;
- Central Hunter Swamp Oak Forest;
- Hunter Valley River Oak Forest;
- Hunter Lowland Red Gum Forest; and
- cleared and revegetated areas.

A brief description of these vegetation communities is provided below.

2.2.1 Central Hunter Ironbark – Spotted Gum – Grey Box Forest

The Central Hunter Ironbark - Spotted Gum - Grey Box Forest corresponds to the "Central Hunter Grey Box - Ironbark Woodland in the NSW North Coast and Sydney Basin Bioregions", which is an Endangered Ecological Community (EEC) under the NSW *Biodiversity Conservation Act 2016* (BC Act). This community is also listed as a Critically Endangered Ecological Community under the federal *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

The community is characterised by a canopy of *Corymbia maculata* (Spotted Gum), *Eucalyptus moluccana* (Grey Box), *Eucalyptus crebra* (Narrow-leaved Ironbark) and *Eucalyptus fibrosa* (Broad-leaved Ironbark). *Eucalyptus tereticornis* (Forest Red Gum) and *Eucalyptus melliodora* (Yellow Box) become co-dominant along the ridges and valleys. The shrub layer includes species such as *Pittosporum angustifolium* (Butterbush), *Daviesia genistifolia* (Broom Bitter-pea), *Pultenaea retusa*, *Cassinia aculeata*, and *Acacia amblygona* (Fan Wattle). The ground cover varies in density across this community and includes *Sporobolus creber* (Slender Rats Tail Grass), *Eragrostis cilianensis*, *Solanum*

cinereum (Narrawa Burr), *Wahlenbergia gracilis* (Native Bluebell), *Lomandra longifolia*, *Cymbopogon refractus* (Barbed Wire Grass), *Stipa* sp., *Cheilanthes sieberi* (Mulga Fern) and *Dichondra repens* (Kidney Weed). This community is recognised as having high regional significance due to extensive historical clearing and poor reservation (Peake 2006).

The main issues facing the woodland community are invasive weeds and lack of connectivity and understory in some locations (ERM 2009). As shown in **Figure 2**, this community is located above LW6 to LW12 within the Integra Underground Project Approval Boundary. Mining of these panels has been completed. There is also Central Hunter Ironbark – Spotted Gum – Grey Box Forest within the eastern area of the Project Approval Boundary where no mining is proposed, and at the northern end of LW 13 to LW 15, as well as LW20.

2.2.2 Central Hunter Bulloak Forest

Within the Project Area the Central Hunter Bulloak community is characterised by dense stands of *Allocasuarina luehmannii* (Bulloak) to a height of 15 m. Scattered throughout are specimens of Narrow-leaved Ironbark, and *Casuarina glauca* (Swamp Oak). The shrub layer is generally absent, with a very sparse ground cover as a result of the dense layers of fallen *Casuarina cladodes*. Cunningham (2011) states that *Daviesia genistifolia* (Broom Bitter-pea) has been observed within this community. The most commonly occurring groundcover species are *Aristida ramosa* (Three-awn Speargrass), *Bothriochloa macra* (Red-leg Grass), *Austrodanthonia bipartita* (Wallaby Grass) and *Dichelachne micrantha* (Shorthair Plumegrass). Also noted within this community was the common weed species, *Opuntia aurantiaca* (Tiger Pear).

This community is not recognised as being of regional significance although it is restricted in its extent (Peake 2006). This community was observed to be generally healthy by ERM (2009) at Integra Underground; however, weed control may be required in isolated areas.

As shown in **Figure 2**, within the Integra Underground Project Approval Boundary this community is located above LW8 to LW12. Mining of these panels has been completed. This community is also above LWs 13 and 14, where mining is yet to be completed.

2.2.3 Central Hunter Swamp Oak Forest

This community was observed to be generally healthy within the Integra Underground Project Approval Boundary, although weeds were present in some areas (ERM 2009).

Swamp Oak Forest is generally restricted to lower-lying locations along drainage lines and creeks. Swamp Oak dominates the canopy, with the occasional *Angophora floribunda* (Rough-barked Apple) and Forest Red Gum trees present.

As shown in **Figure 2**, within the Integra Underground Project Approval Boundary, this community is located along Main Creek; above LW5 and LW6, and north-east of LWs 6, 7 and 8. Mining of these panels has been completed. There is Swamp Oak Forest above LWs 13, 14 and 15.

2.2.4 Hunter Valley River Oak Forest

The Hunter Valley River Oak Forest community is characterised by an open forest structure. Within the region, this community occurs along the Hunter River and its tributaries (ERM 2009). Unlike the Central Hunter Swamp Oak Forest, it occurs closer to high energy banks and is not usually associated with soils of higher than usual salinity levels (ERM 2009).

Casuarina cunninghamiana subsp. *cunninghamiana* (River Oak) and *Schinus ariera* (Pepper Tree) dominate the canopy layer in the community along the margins of Glennies Creek. The shrub layer at this location is relatively sparse and characterised by juvenile specimens of the canopy species (ERM 2009). The ground cover species are similar to those identified within adjacent grassland communities, while along the edges of the creek, moisture loving species dominate (ERM 2009).

Along Bowmans Creek, the community represents a mid-high to tall forest dominated by *Casuarina cunninghamiana* subsp. *cunninghamiana* (River Oak) (Umwelt 2014). The community is heavily disturbed and introduced trees, namely *Salix babylonica* (Weeping Willow) and *Schinus areira* (Pepper Tree), occur as co-dominant species (Umwelt 2014). It is the dominant riparian community along Bowmans Creek and generally occurs as a narrow band of vegetation restricted to the generally steep river bank (Umwelt 2014).

As shown in **Figure 2**, within the Integra Underground Project Approval Boundary this community is generally positioned in two locations, south of the longwall panels along Bowmans Creek and in the south-eastern corner of the Project Approval Boundary along Glennies Creek. There is no Hunter Valley River Oak Forest above, or in the vicinity of, LW 14 to LW 20.

2.2.5 Hunter Lowland Red Gum Forest

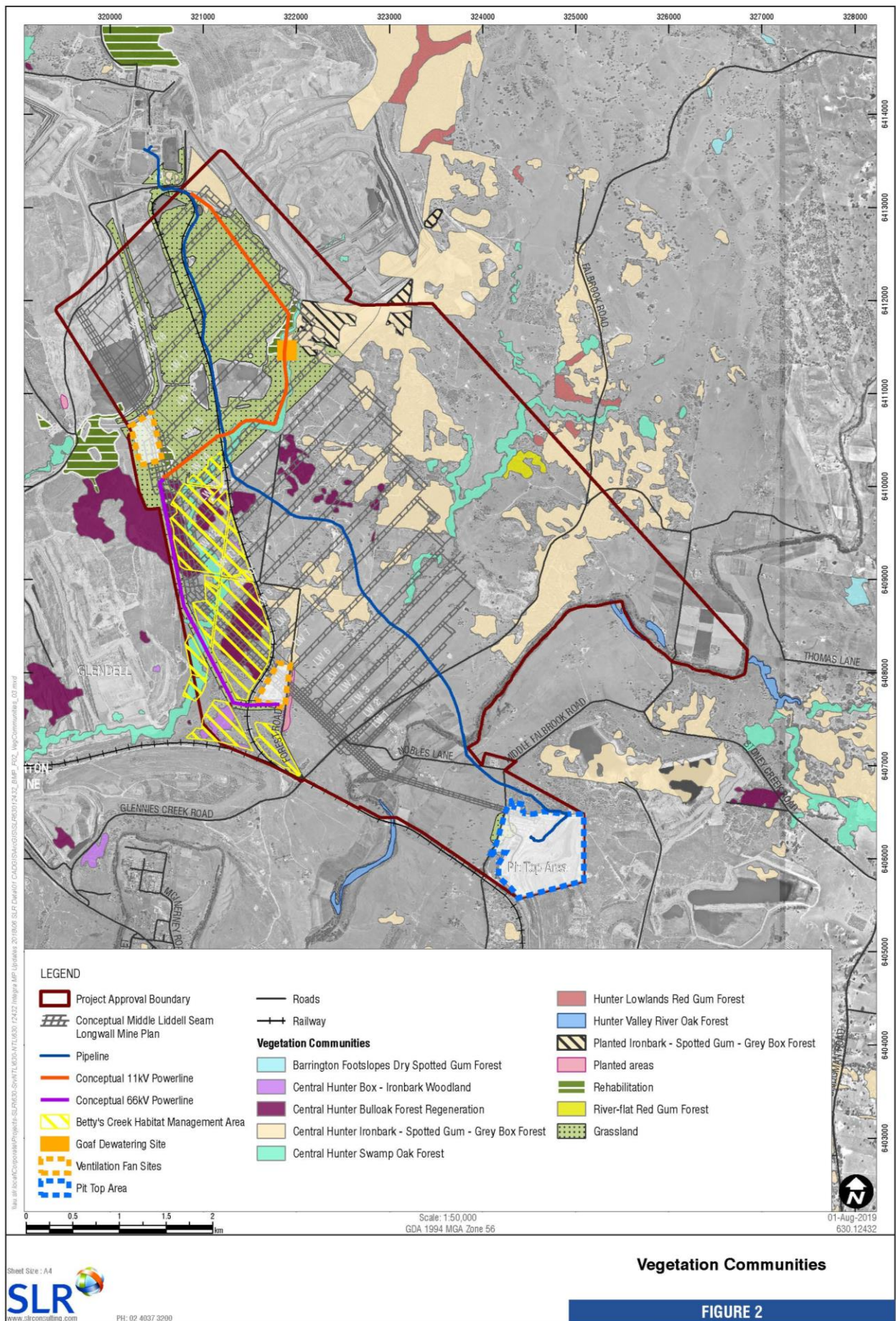
Hunter Lowland Red Gum Forest, corresponds to the “Hunter Lowland Redgum Forest in the Sydney Basin and NSW North Coast Bioregions”, an EEC under the BC Act. The Hunter Lowland Red Gum Forest is a highly variable forest or woodland community that occurs generally between Muswellbrook, Beresfield, Mulbring and Cessnock (Peake 2006).

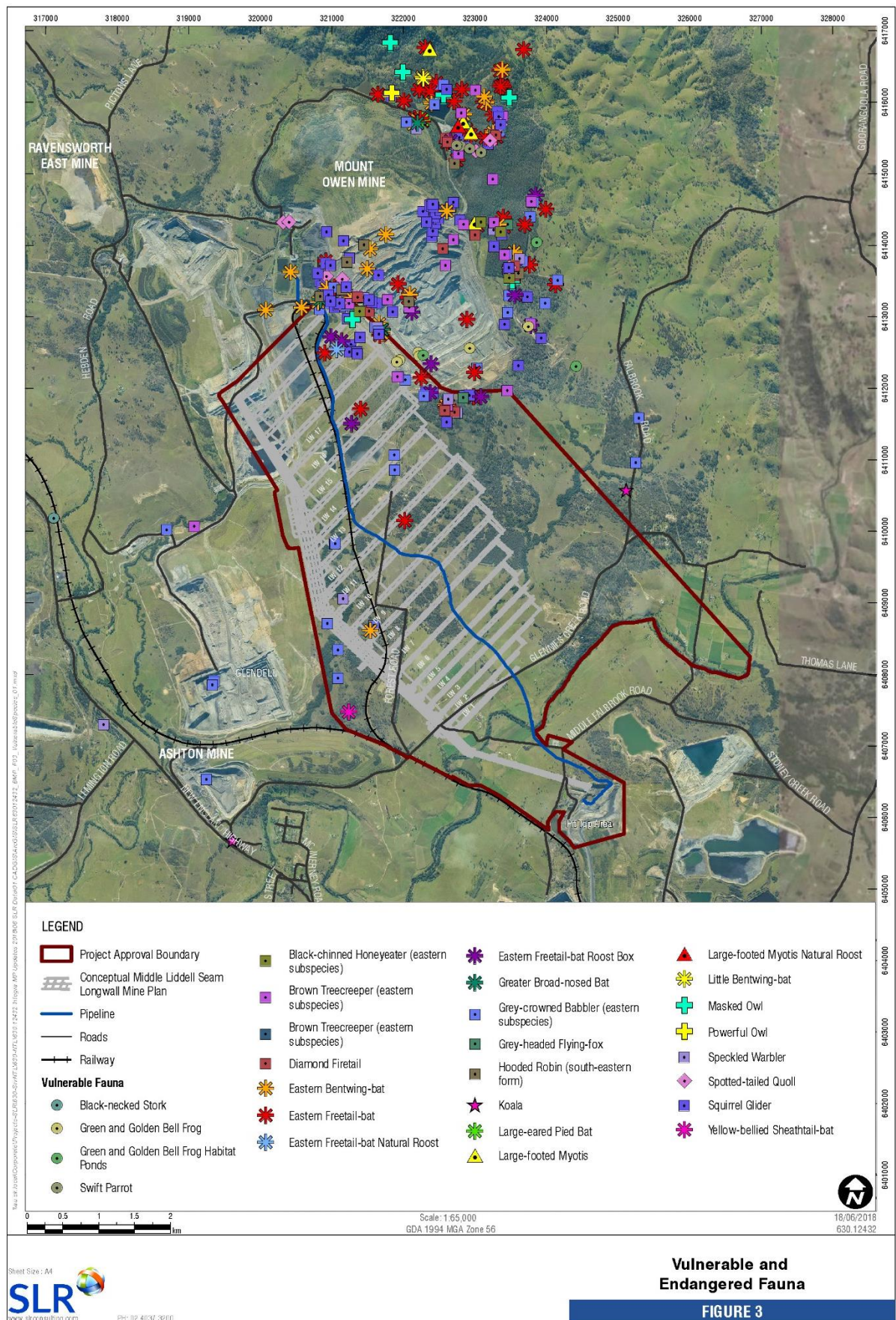
This community is characterised by *Eucalyptus tereticornis* (Forest Red Gum), *Eucalyptus punctata* (Grey Gum), *Eucalyptus crebra* (Narrow-leaved Ironbark) and *Angophora floribunda* (Rough-barked Apple) (Umwelt 2007).

As shown in **Figure 2**, within the Integra Underground Project Approval Boundary, this community is located on a drainage flat associated with Main Creek, in the east of the Project Approval Boundary. There is no Hunter Lowland Red Gum Forest above, or in the vicinity of, LW14 to LW 20.

2.2.6 Cleared and Revegetated Areas

The cleared areas within the Integra Underground project area are a result of previous clearing and grazing by stock (ERM 2009). Natural and assisted regeneration and revegetation is also occurring within the Integra Underground project area, with vegetation management and rehabilitation occurring along the Bettys Creek diversion.





2.3 Threatened Species

A number of threatened fauna species were identified within the vicinity of the mining area (ERM 2009), including the Green and Golden Bell Frog (*Litoria aurea*), Grey-crowned Babbler (*Pomatostomus temporalis*), Speckled Warbler (*Pyrrholaemus sagittatus*), Diamond Firetail (*Stagonopleura guttata*), Black-chinned Honeyeater (*Melithreptus gularis gularis*), Brown Treecreeper (*Climacteris picumnus*), Southern Myotis (*Myotis macropus*) and Brush-tailed Phascogale (*Phascogale tapoatafa*). These species are dependent on woodland/forested habitats.

No threatened fauna species were recorded within the assessment boundary during the MOD 8 ecological assessment (Hansen Bailey 2017b). A number of other threatened species that have been recorded to the north of Integra Underground in the Mt Owen Complex area and Ravensworth State Forest are likely to occur in habitats within the Integra Underground project area.

No threatened flora species were recorded within the Integra Underground project area (Hansen Bailey 2017b).

2.4 Weed and Pest Species

A number of weed species, including four species of noxious weeds, were identified at Integra Underground and in surrounding areas during flora surveys conducted as part of the EA for the Integra Underground (ERM 2009). The four noxious species recorded were: African Boxthorn (*Lycium ferocissimum*), Fireweed (*Senecio madagascariensis*), Tiger Pear (*Opuntia aurantiaca*) and Prickly Pear (*Opuntia stricta*). A number of feral animals have also been identified within the Integra Underground project area that can impact on native fauna and flora, including the Red Fox (*Vulpes vulpes*), Wild Dog/Dingo (*Canis lupus*), European Rabbit (*Oryctolagus cuniculus*), and Feral Cat (*Felis catus*).

2.5 Bettys Creek

Bettys Creek drains in a south-westerly direction over the western portion of the underground mining area into Bowmans Creek, approximately 6 km upstream of the Bowmans Creek confluence with the Hunter River. A 2,500 m diversion of the creek was previously approved and is detailed in ERM (2009). This diversion has subsequently been constructed. The *Bettys Creek Diversion Asset Management Plan* has been prepared to cover the management of this area (Refer to: www.glencore.com.au/IntegraUnderground).

2.6 Groundwater Dependent Ecosystems

ERM (2009) concluded that no groundwater dependent ecosystems (GDEs) were present within the mining area. However, understanding of GDEs has expanded since that time and the following vegetation types and habitats recorded in the Integra Underground project area are considered to be GDEs:

- aquatic habitats and ecosystems of Bettys Creek;
- riparian vegetation including the Central Hunter Swamp Oak Forest that occurs along Bettys Creek; and
- where River Red Gum (*Eucalyptus camaldulensis*) individuals and populations have been used to revegetate the Bettys Creek diversion.

An area of Hunter Valley River Oak Forest also occurs immediately adjacent to the MOD 8 Assessment Boundary (Hansen Bailey 2017b). Both the Central Hunter Swamp Oak Forest and Hunter Valley River Oak Forest are classes as 'Terrestrial Vegetation' GDEs.

2.7 Biodiversity Offset Areas

There are no biodiversity offset areas managed by Integra Underground within the Integra Underground project area.

Biodiversity offset areas have been established to offset the impacts of the Mt Owen Complex. These biodiversity offset areas protect approximately 2,000 ha of land strategically located around the Mt Owen Complex, and in the wider Hunter Region.

The Bettys Creek Habitat Management Area (HMA) occupies an area of approximately 174 ha, the majority of which is within the Integra Underground project area (**Figure 2**).

As part of the Mt Owen Complex BMP, active and passive regeneration activities are detailed as the applicable re-establishment methods within the Bettys Creek HMA. This includes the active regeneration of box-gum forests and riparian forests and the passive regeneration of bullock forests.

The Bettys Creek HMA is subject to seasonal ecological monitoring under the Mt Owen Complex BMP.

2.8 Potential Impacts

2.8.1 Overview

Key operational activities at Integra Underground include:

- longwall development within the Middle Liddell seam using continuous miners;
- longwall mining within the Middle Liddell seam. The approval for MOD 8 allows mining within LW15 to 20;
- extraction of coal to a maximum of 4.5 Mtpa of ROM coal;
- subsidence monitoring and remediation as per the approved Integra Underground Extraction Plan;
- storage of ROM coal at the pit top and haulage of ROM coal to the Rix's Creek North Coal Handling and Preparation Plant (CHPP);
- operation of workshop and administration areas;
- ventilation and gas management; and
- on site water management as per the Integra Underground Water Management Plan (WMP).

The operation of Integra Underground will require minimal surface disturbance from time to time, with disturbance generally limited to six principal sources, including:

- exploration activities;
- gas drainage works;
- ventilation works;
- construction activities;
- minor subsidence remediation works, if required; and
- implementation of erosion and sedimentation controls associated with the above disturbance activities.

With the exception of temporary gas drainage boreholes and some possible exploration, no other direct surface disturbance external to the above areas is proposed at Integra Underground.

Further information on the key surface disturbance activities is provided in the Integra Underground *Exploration Activities and Minor Surface Infrastructure Management Plan*.

2.8.2 Direct Impacts

The installation of the gas drainage boreholes and associated infrastructure will result in the disturbance of vegetation within the Bettys Creek HMA, along with a small area of Central Hunter Swamp Oak associated with the Goaf Dewatering Site (refer to **Section 2.5** and **Figure 2**). All borehole sites will be located within the Project Approval Boundary in either areas of grassland or within the approved disturbance footprint for the Mt Owen Complex.

All surface disturbance activities will be undertaken in accordance with the GCAA *Ground Disturbance Permit Procedure* (CAA HSEC PRO 0002) and the Integra Underground *Exploration Activities and Minor Surface Infrastructure Management Plan*.

The following mitigation measures will be implemented to ensure that direct ecological impacts from surface disturbance are minimised (Hansen Bailey 2017b):

- Vegetation communities identified as CEEC/EEC will be avoided;
- Removal of hollow-bearing trees, proximate stags and larger trees (trunk diameter > 10cm) will be avoided where practicable;
- Clearing of intact woodland and forest patches will be avoided wherever practicable;
- Pre-clearance assessments will be conducted and vegetation removal for the construction of surface infrastructure will be supervised;
- Hydrological function and fauna passage in the creeks and riparian zones will be maintained during construction activities;
- Existing tracks will be utilised and the creation of temporary access tracks (during construction) will be minimised as far as practicable;
- Topsoil will be reinstated to disturbed areas as soon as practicable after construction; and
- All measures will be communicated to all employees and contractors to ensure that the measures are understood and observed.

2.8.3 Indirect Impacts

Integra Underground's operations may indirectly impact the vegetation communities within the Integra Underground project area through subsidence (ERM 2009).

Potential impacts to biodiversity within the Integra Underground project area associated with subsidence include:

- tilting of trees from formation of subsidence troughs and consequent indirect impacts to fauna;
- ponding within areas of vegetation outside of the creek causing adverse impacts to vegetation;
- surface flow alterations within the creek or other drainage lines;
- cracking of hard surfaces (within the creek or outside of it); and
- draining of dams, billabongs or springs.

Subsidence will cause a trough centred above each longwall panel, resulting in the ground surface being subject to certain tilt and strains. The EA prepared for the Integra Underground Mine (ERM 2009) found that tilting due to subsidence will not cause measurable short or long-term damage to any threatened species in the Integra Underground project area.

Subsidence-related ponding and breakout of flow from the creek channel is anticipated along Bettys Creek. Ponding depth on the floodplain may be up to 0.8 m in places. As prolonged ponding may affect vegetation, ponds outside of Bettys Creek will be drained, and the area re-profiled. Assuming this draining occurs soon after ponding, few long term effects are predicted (ERM 2009).

An assessment of the impact of Middle Liddell seam mining on the Mt Owen Middle Bettys Creek Diversion was undertaken by GeoTerra as part of the approved Subsidence Management Plan for Integra Underground. Based on the outcomes of this assessment, longwall mining of the Middle Liddell seam for LW13 and LW14 was expected to have minor adverse impacts.

Impacts to the diversion and tributary drainage lines are expected to be consistent with or less than impacts described above (SCT 2017), which were extracted from the original EA.

As noted above, the forecast subsidence for LW13 and LW14 only is estimated to be approximately 1.9 m and 1.4 m, respectively (SCT 2017). This is not expected to significantly increase ponding potential beyond that which currently exists (SCT, 2017). Mining of LW13 and LW14 is considered likely to contribute to further minor erosion of the existing diversion; however impacts are expected to be manageable and consistent with expectations from the original EA (SCT, 2017). Monitoring indicated that subsidence from LW13 is within these predictions.

The severity of this erosion will ultimately be dependent on observed subsidence. For this reason a Creek Diversion Monitoring Program has been developed as part of the Betty's Creek Diversion Asset Management Plan to monitor for and identify potential impacts to the Mt Owen Middle Bettys Creek Diversion and its stream stability and health (refer to Section 4). A Creek Diversion Management Plan is also provided in the Integra Underground Water Management Plan and in this BMP.

Further, surface cracking is unlikely to be perceptible on agricultural land, but is more likely to be evident on hard surfaces such as roads. Remediation works, where required, are unlikely to result in any significant losses of vegetation.

An area of the Ravensworth State Forest and the Southern Remnant Biodiversity Offset Area are predicted to experience vertical subsidence of up to approximately 0.3m, with low levels of tilt and strain as a result of MOD 8 (Hansen Bailey 2017b). Impacts to native woodland are expected to be negligible and no significant impacts are predicted for the area of derived grassland within and adjacent to the Mt Owen Rail Spur (Hansen Bailey 2017b). Impacts to native vegetation are minor and no greater than the predictions of previous subsidence assessments.

Hansen Bailey (2017b) also concluded that although GDEs have the potential to be affected by subsidence, the mining of LW 15-20 is not predicted to result in any measurable drawdown of alluvial aquifers therefore significant indirect impacts to biodiversity values are not expected.

Should a subsidence impact occur which cannot be remediated to the satisfaction of the DPE, Integra Underground will provide a suitable offset to compensate for a subsidence impact or environmental consequence in accordance with Schedule 3, Condition 17A and 17B of PA 08_0101.

3 Ecological Management Controls

3.1 Short, medium and long term measures

A number of short, medium and long term measures have been identified and will be undertaken to implement the management strategy:

- Short term measures:
 - establish baseline subsidence monitoring plots over longwall panels LW13, LW14, and appropriate reference sites (complete - refer to **Section 4.1**);
 - establish baseline subsidence monitoring plots over longwall panels LW 15 – LW 20;
 - implement weed and pest management controls where required in the project area, as described in **Section 3.2**, such as along the diverted channel of Bettys Creek and adjacent vegetation; and
 - continue to adopt management strategies to ensure cattle and other livestock are excluded from the diverted Bettys Creek riparian zone.
- Medium term measures:
 - continue to undertake ongoing rehabilitation of completed exploration borehole sites and minor surface disturbance, and implement maintenance works as required along the riparian zone of the diverted channel of Bettys Creek;
 - undertake subsidence monitoring as mining progresses (in accordance with the Integra Underground Extraction Plan);
 - implement weed control to manage new weed incursions;
 - undertake annual monitoring of revegetation success;
 - for the Integra Underground to Mt Owen pipeline and MOD 8 construction, plant and maintain, until established, 10 like-for-like trees for every established tree removed during construction of the water pipeline infrastructure that is associated with the following flora communities:
 - Central Hunter Ironbark — Spotted Gum — Grey Box Forest EEC;
 - Central Hunter Swamp Oak Forest;
 - Hunter Valley River Oak Forest;
 - Central Hunter Bulloak Forest. (see **Section 4.3**); and
 - Planting of like-for-like trees will be undertaken to compensate for the removal of established trees due to construction of surface facilities approved by MOD 8 only (i.e. not including areas that are approved to be disturbed by the Mt Owen Complex)
- Long term measures:
 - rehabilitate disturbed exploration, minor surface disturbance areas and the Integra Underground to Mt Owen Complex pipeline areas in accordance with final landform/land use design; and
 - long term ongoing monitoring of revegetated areas along the Bettys Creek diversion to inform revisions to the management plans and any required alterations to management practices.

3.2 Ongoing Management Strategies

Integra Underground will continue to implement a suite of management strategies to mitigate the impacts of its operations on biodiversity. **Table 3-1** below lists the management strategies that will be implemented and the performance criteria that will be used to measure the effectiveness of these strategies.

A Trigger Action Response Plan (TARP) has been developed to identify triggers and responses in the event of unexpected variations to the outcomes of proposed management strategies. The TARP is provided in **Appendix C**.

Table 3-1 – Management Strategies and Performance Criteria

Characteristic	Management Strategies	Performance Measures	Responsible Parties	Timing
Vegetation	Implementation of weed management controls to limit the spread of weeds into remnant vegetation (refer to 'exotic and invasive species' below). The location of required surface infrastructure for underground operations, such as gas drainage infrastructure, will be selected to avoid the clearance of trees, shrubs and stands of native grasses, to the greatest extent practicable. Any threatened flora found during pre-clearance surveys and unable to be avoided will be salvaged, transplanted and/or propagated in accordance with the <i>Guidelines for the Translocation of Threatened Plants in Australia</i> (Vallee <i>et al.</i>, 2004). For the Integra Underground to Mt Owen pipeline, stags, hollow bearing trees and the Bettys Creek Habitat Management Area will be avoided. For the Integra to Mt Owen Pipeline and MOD 8 construction, removal of hollow-bearing trees, proximate stags and larger trees (trunk >10cm) will be avoided wherever practicable. For the Integra Underground to Mt Owen pipeline, 10 like-for-like trees for every established tree removed during construction of the water pipeline infrastructure that is associated with the following flora communities will be planted and maintained until established: • Central Hunter Ironbark — Spotted Gum — Grey Box Forest EEC; • Central Hunter Swamp Oak Forest; • Hunter Valley River Oak Forest; and	1. The Ground Disturbance Permit form GCAA HSEC PER 0004 is correctly completed and authorised in accordance with GCAA HSEC PRO 0002. 2. Pre-clearance surveys are correctly completed as part of the Ground Disturbance Permit procedure for the Integra Underground to Mt Owen pipeline and MOD 8 construction to identify threatened flora species, stags, hollow bearing trees and established trees of the following species: • Central Hunter Ironbark — Spotted Gum — Grey Box Forest EEC; • Central Hunter Swamp Oak Forest; • Hunter Valley River Oak Forest; and • Central Hunter Bulloak Forest. 3. Annual weed monitoring results shows percent coverage of weeds has not increased across the project area. 4. There are no significant weed infestations and weeds do not comprise a significant proportion of the species in any stratum based on visual inspection. 5. No unauthorised disturbance occurs. 6. Establishment of 10 like-for-like trees for every established tree removed during pipeline construction and MOD 8 construction. 7. Annual rehabilitation monitoring illustrates that the plant cover and abundance has been increasing during successive rehabilitation monitoring events.	Environment and Community Manager or delegate	1. Ongoing 2. Ongoing 3. Annually 4. Annually 5. Monthly inspection 6. Annual monitoring

Characteristic	Management Strategies	Performance Measures	Responsible Parties	Timing
	Central Hunter Bulloak Forest. Direct disturbance of threatened ecological communities (EECs and CEECs) will be avoided Planting of like-for-like trees to compensate for the removal of established trees due to the MOD 8 alone (i.e. not including areas that are approved to be disturbed by the Mt Owen Complex			
Fauna habitat	Implementation of weed management controls to limit the spread of weeds into remnant vegetation (refer to 'exotic and invasive species' below). Ensure riparian habitat is fenced appropriately and has restricted access. Promote rehabilitation of riparian corridors. Monitoring of aquatic fauna in rehabilitation areas. Hydrological function and fauna passage in the creeks and riparian zones will be maintained during construction activities	1. Annual weed monitoring results shows percent coverage of weeds has not increased across the project area. 2. There are no significant weed infestations and weeds do not comprise a significant proportion of the species in any stratum. 3. Fences around riparian habitat are adequately maintained based on visual inspection. 4. No significant reduction in habitat suitability for fauna or alteration to the composition or structure of native plant communities occurs due to inappropriate management practices. 5. No significant reduction in aquatic fauna due to inappropriate management practices.	Environment and Community Manager or delegate	1. Annually 2. Annually 3. Monthly 4. Annually 5. Annually

Characteristic	Management Strategies	Performance Measures	Responsible Parties	Timing
Soils and salinity	Erosion and sediment control will be managed within the Integra Underground project area in accordance with the management measures described in the Water Management Plan (WMP) to prevent downstream erosion and sedimentation impacts in vegetated areas. Cattle will be excluded from sensitive areas along the Bettys Creek's diverted riparian corridor to assist erosion control in those areas. Disturbance or exposure of soils in areas identified as having a high salinity risk will be minimised where possible.	1. Erosion and sediment control measures are implemented and maintained as per the Integra Underground WMP. 2. Review of aerial photography/results of visual inspections show that no significant soil disturbance has occurred, for example from cattle grazing activities. 3. Visual inspection verifies there are no gully or tunnel erosion features, or rills >200mm deep. 4. No evidence of cattle egress within the Bettys Creek riparian corridor. 5. Rehabilitation of surface disturbance areas undertaken in accordance with procedures outlined in the MOP.	Environment and Community Manager or delegate	1. During construction of surface infrastructure such as gas well sites and exploration boreholes. 2. Quarterly/Monthly 3. Monthly 4. Monthly (inspections) 5. As surface infrastructure becomes redundant in accordance with the MOP.
Bushfire	Due to the overlap between the operations, some land within the Integra Underground project area is managed by the Mt Owen Complex and the rest by Integra Underground. In the Mt Owen controlled areas, bushfire risk is managed as per the Mt Owen Complex Biodiversity and Offset Management Plan. (Refer to: www.mtowencomplex.com.au) Management strategies in accordance with this plan include: - maintaining a suitably equipped response to any fires on site and assisting the Rural Fire Service and emergency services on site - control burning and/or where permitted, appropriate grazing management regimes to reduce ground fuel loads whilst minimising impacts on biodiversity - maintain strategic fire trails and access roads. Integra Underground will adopt an approach consistent with the Mt Owen Bushfire	No significant reduction in habitat suitability for fauna or alteration to the composition or structure of native plant communities occurs due to inappropriate fire regimes. No accidental fires attributed to operators at Integra Underground occur. All designated access roads and tracks are maintained.	Environment and Community Manager or delegate	Annual review of fuel loads and the need for mechanical fuel reduction.

Characteristic	Management Strategies	Performance Measures	Responsible Parties	Timing
	Management Plan on Integra Underground-owned land. In addition to the above listed management strategies, an appropriate Asset Protection Zone of 20 m will be maintained around the ventilation shaft site and gas drainage wells.			
Landscaping	Landscaping will be undertaken in accordance with the MOP to minimise visual impacts from Integra Underground's operations. Rehabilitation of exploration areas which will seek to be similar to surrounding vegetation in order to replicate the original natural landscape. Landscaping (established vegetation) is in place between the ventilation facility and closest private residence. Disturbance and infrastructure included in PA 08_0101 as modified are consistent with the existing landscape. The final landform design will be maintained, particularly the connectivity of fauna habitats across the site.	1. All rehabilitation within the mining lease is completed in accordance with the closure criteria outlined in the MOP, and compliance of rehabilitation works is reported in the Annual Review. 2. Achievement of a safe, stable and non-polluting landform.	Environment and Community Manager or delegate	Annually in accordance with the MOP
Fauna	Speed limits will be enforced on access roads to reduce the likelihood of fauna injury. Where applicable, wildlife crossing areas will be identified and signs will be erected to alert operators. Lighting will be directed at operating equipment only, in order to reduce light spill and impact on nocturnal fauna. Appropriate weed and pest control measures will be implemented (see below).	1. No loss of fauna from vehicle strike. 2. No increase in weed or pest species is recorded within the Integra Underground project area. As per the Integra Underground MOP, Integra Underground will develop analogue rehabilitation monitoring locations for the Integra Underground project area during the MOP period to compare against current and future rehabilitation associated with the recommencement of operations at Integra Underground. These analogue rehabilitation monitoring locations will also provide suitable baseline to determine whether an increase in pest species is experienced within the Integra Underground project area. 3. If an increase in weed or pest species is encountered, the management strategies will be revised in consultation with a suitably qualified	Environment and Community Manager or delegate	Annually

Characteristic	Management Strategies	Performance Measures	Responsible Parties	Timing
		person and, if necessary, the scope of existing management strategies will be expanded and additional management strategies will be implemented. 4. Information on weed and pest management activities is reported in the Annual Review.		
Exotic and Invasive Species	Implementation of appropriate weed and pest control measures focussing on controlling noxious weeds and feral animals including: - implementation of an annual weed inspection program supporting routine observation of the presence of weeds, and the identification of target species, priority treatment areas, and suitable treatment techniques; - records will be maintained of weed infestations and control programs will be implemented according to best management practice for the weed species concerned. All inspections and control programs will be undertaken by a suitably licensed and experienced weed control contractor; - if topsoil stockpiles are to be in place for the long term, they will be treated by herbicide spraying or scalping of weeds (if required) prior to resspreading topsoil; - a monitoring program will be developed to monitor and control all vertebrate pest species (including wild dog, red fox, pigs, feral cats, rabbit and deer), if reported sightings substantiate the need for such monitoring; and - regular control campaigns to reduce vertebrate pest species (including wild dog, red fox, pigs, feral cats, rabbit and deer) in native vegetation areas, if reported sightings support such a campaign.	1. Records of noxious weed observations, pest observations, treatment, and disposal are kept. 2. Any non-compliance or reports of noxious weeds upon Integra Underground property received from Council are appropriately actioned. 3. No increase in weed or pest species is recorded within the Integra Underground project area. As noted within the approved Integra Underground MOP, Integra Underground will develop analogue rehabilitation monitoring locations for the Integra Underground project area during the MOP period to compare against current and future rehabilitation associated with the recommencement of operations at Integra Underground. These analogue rehabilitation monitoring locations will also provide suitable baseline to determine whether an increase in weed or pest species is experienced within the Integra Underground project area. 4. If an increase in weed or pest species is encountered, the management strategies will be revised in consultation with a suitably qualified ecologist or environmental scientist and, if necessary, the scope of existing management strategies will be expanded and additional management strategies will be implemented. 5. Information on weed and pest management activities is reported in the Annual Review.	Environment and Community Manager or delegate	Annually

Characteristic	Management Strategies	Performance Measures	Responsible Parties	Timing
Agriculture	Domestic stock will be excluded from the Bettys Creek riparian corridor and from any exploration areas (where applicable). All access gates will be locked and access will be suitably controlled. Only essential access roads will be maintained within the riparian corridor or native vegetation communities to allow access for suitable personnel for monitoring, maintenance, fire protection and other legitimate purposes.	1. Livestock are excluded from rehabilitation areas and no evidence of detrimental impacts associated with livestock grazing is identified during area inspections. 2. No evidence of cattle egress within the Bettys Creek riparian corridor and exploration areas 3. All signage is maintained in good, legible condition. 4. All designated access roads and tracks are maintained.	Environment and Community Manager or delegate	Monthly inspections
Bettys Creek	If adverse effects on Bettys Creek due to subsidence are observed, the creek and/or diversion will be rehabilitated to an appropriate standard, as per the MOP. No specific mitigation measures are proposed for either the Bettys Creek main channel or floodplain. However, a monitoring program will be implemented (refer to Section 4) to determine if subsidence impacts result in rapid changes in channel or floodplain form, and remediation measures implemented if required. Upon completion of mining beneath Bettys Creek, Integra Underground will undertake works that are required to return the creek, diversion channel and floodplain to a similar state as existed prior to subsidence. This may include, but is not limited to, draining ponded areas, re-establishing drainage paths or diverting surface water flows from areas of potential ponding.	1. The progress and effects of revegetation and rehabilitation works within creeks and drainage lines are monitored and reported in the Annual Review. 2. The completion criteria outlined in the MOP is achieved.	Environment and Community Manager or delegate	Annually

Characteristic	Management Strategies	Performance Measures	Responsible Parties	Timing
Minor surface disturbance areas	Surface infrastructure such as exploration areas, ventilation systems, gas drainage boreholes and associated infrastructure will be positioned in cleared areas where possible to avoid modification of vegetation, and in particular, avoid clearance of trees, shrubs and where possible stands of native grasses. A registry of exploration boreholes, including rehabilitation status will be maintained. Disturbed exploration areas will be rehabilitated in accordance with the procedures outlined in the MOP.	1. The Ground Disturbance Permit form GCAA HSEC PER 0004 is correctly completed and authorised in accordance with GCAA HSEC PRO 0002. 2. No unauthorised disturbance occurs. 3. Rehabilitation works are completed in accordance with the procedures outlined in the MOP, and compliance of rehabilitation works reported in the Annual Review. 4. Achievement of a safe, stable and non-polluting landform.	Environment and Community Manager or delegate	1. Ongoing 2. Monthly inspections 3. As surface infrastructure becomes redundant, in accordance with the MOP 4. As surface infrastructure becomes redundant, in accordance with the MOP
Subsidence	Any ponds identified outside of Bettys Creek will be drained, and the area re-profiled. Monitoring as per Subsidence Monitoring Programs within Extraction Plans. For LW17-20, refer to Table 5-3 of the Subsidence Monitoring Program.	1. Re-profiling works undertaken in accordance within the landform presented in the MOP. 2. Draining occurs in a timely manner such that vegetation is not impacted by the ponding. 3. No significant erosion is present that constitutes a safety hazard or compromises the capability of the supporting the end land use.	Environment and Community Manager or delegate	Annually

3.3 Revegetation and Regeneration Activities

The predominant final post-mining land use for the Integra Underground project area will include native vegetation established from indigenous local seed stock (where available). Revegetation of the exploration areas and areas adjacent to the diverted Bettys Creeks channel will be undertaken to create a mosaic of habitats that are connected by vegetated corridors to maximise use of the landscape by native fauna.

Reconstructing habitat in areas of native derived grassland can be used to link existing areas of high conservation value. This will result in improved connectivity of remnants and will benefit wildlife populations. Revegetation can also be used to create buffer zones around existing areas of high conservation value that will help minimise or remove edge effects and increase the condition of these areas.

The following list provides some general principles for the revegetation and regeneration works in exploration and minor surface disturbance areas:

- to minimise the lag time on habitat development, the revegetation works will commence as soon as possible;
- to maximise revegetation success, the type of vegetation to be re-instated will match the type of native vegetation nearest to the area to be revegetated or other native vegetation type where natural recruitment will likely be high;
- the vegetation types to be restored will attempt to create natural habitat conditions;
- the revegetation works will rely on natural regeneration from the soil seed bank and active weed control. Stock exclusion will be instated and areas which do not respond to natural regeneration will be supplemented with tubestock plantings and selective direct seeding;
- seed and plants used for the restoration works will be sourced from local provenance stock (where available) to retain the local genetic integrity of the vegetation and maximise vegetation establishment success;
- regular monitoring activities to detect the success/failure of the restoration works will be performed; and
- all areas of restoration will have restricted human access and be protected by exclusion fencing.

The riparian corridor along the diverted portion of Bettys Creek will be maintained over the life of Integra Underground's operations. To improve the biodiversity values of the riparian corridor over time, a standard set of management measures will be undertaken (where relevant and as necessary). These measures will include:

- weed control;
- management of human access;
- control of feral or overabundant native herbivores;
- retention of regrowth;
- replanting or supplementary planting where natural regeneration is insufficient;
- retention of dead timber;
- supplementary habitat creation;
- nutrient control;
- erosion control;
- retention of rocks; and
- dog and/or fox control.

It is proposed that degraded and regenerating lands be returned to a condition resembling their pre-disturbance state. This will be achieved through staged plantings, weed control and management of the Integra Underground project area, including corridor connections and well formulated rehabilitation plans.

Rehabilitation of land disturbed during the construction of the water pipeline from Integra Underground to Mt Owen focused on the regeneration, enhancement and/or re-establishment of significant and/or threatened flora communities. In accordance with Schedule 3 Condition 32A of PA 08_0101, 60 *Casuarina glauca* (Swamp Oak) species trees were planted to directly compensate for the 6 trees disturbed. An additional 40 were planted with the aim of ensuring that a minimum of 60 trees are established.

3.4 Riparian Zone Management

Management of riparian zones, namely the riparian corridor along the diverted portion of Bettys Creek will be maintained over the life of Integra Underground's operations. Management of the riparian corridor will be focused on improving the resilience of existing riparian vegetation.

The details of programs to manage and monitor riparian areas are outlined in the **Table 3-1** above and in the Bettys Creek Diversion Asset Management Plan, which considers the recommendations in the *Guidelines for Controlled Activities on Waterfront Land* (DPI 2012).

3.5 Creek Diversion Management Plan

Approximately 2.4 km of the Mt Owen Middle Bettys Creek Diversion will be undermined by mining of panels LW13 and LW14 as part of the recommencement of operations at Integra Underground.

As noted within **Table 1-1**, a detailed survey of the existing condition of the Mt Owen Middle Bettys Creek Diversion is required. This survey will be undertaken as per the monitoring program for the diversion established in the Integra Underground Water Management Plan. This survey was completed prior to secondary extraction commencing.

As described in the Water Management Plan, the monitoring program will be split into two parts; 'Major' monitoring and 'Minor' monitoring, to ensure major environmental and/or operational issues are identified, monitored and rectified as early possible, and that results are frequently audited as part of the Major Monitoring methodology to ensure accuracy of subjective ratings.

The monitoring program is described in detail in the Integra Underground Water Management Plan. Review of the monitoring program will be undertaken to ensure the ongoing effectiveness of the monitoring strategy.

3.6 Training and Communication

Generic induction training is provided to all employees and contractors through the GCAA *Generic Surface Induction* and the *Site Familiarisation*. This induction training includes a discussion of this BMP and biodiversity at Integra Underground.

From time to time, workforce communication days and toolbox talks allow for discussion of the objectives and requirements of this and any other relevant plans.

3.7 Contemporary Best Practice

Management practices will be reviewed annually as part of the Annual Review so that current practices align with contemporary best practice standards. These actions will be documented and their implementation monitored.

4 Monitoring

The conditions of PA 08_0101 do not require Integra Underground to conduct ecological monitoring. Notwithstanding, to demonstrate commitment to biodiversity management, Integra Underground will implement a program to monitor the potential impacts of subsidence on sensitive ecological features. The monitoring program will be targeted to areas predicted to be affected by subsidence impacts, and is primarily designed to detect changes in vegetation and/or habitat condition.

4.1 Baseline Data Collection

Baseline data collection is necessary to be able to statistically test whether or not an impact has occurred. In addition to the collection of data, photographs of monitoring sites will provide important comparisons of the areas across time.

4.1.1 Terrestrial Vegetation

In 2017, SLR Consulting (SLR) completed the baseline monitoring using plot and transect surveys in the mapped vegetation communities within the predicted zone of subsidence, in accordance with the BioBanking Assessment Methodology (BBAM).

Plots were monitored to establish the baseline vegetation condition in the identified communities as follows:

- Central Hunter Ironbark-Spotted Gum-Grey Forest
 - o 1 quadrat in the patch of this vegetation at the end of LW14
- Central Hunter Bulloak Forest
 - o 1 quadrat in this vegetation community at the start of LW13

In addition, a reference site was monitored in each of these two vegetation communities. These sites were selected by Integra Underground and are located outside of the predicted subsidence zone (including previously mined panels) but within the project area. The data collected from the reference sites has allowed the vegetation in the plots within the subsidence zone to be compared to vegetation monitoring in the plots outside of the impact zone as mining progresses. A third reference site has also been established within cleared grazing land in the project area. The proposed final land use of the minor surface disturbance areas associated with the underground will be grazing, and therefore, establishment of a reference site in pasture will enable the collection of data to which monitoring data obtained from rehabilitated sites can be prepared.

At each monitoring site a photograph was taken and the coordinates of the SE corner of each quadrat recorded with a GPS. This will allow replication across time. Surveys were also undertaken in conjunction with random meander searches, so that any potential ponding/ponding impacts can be identified. Random meanders will also assist in identification of other potential impacts such as surface cracking or tree tilt. If any areas of swamp or billabong are identified within the Integra Underground project area, then these should also be monitored to detect any potential loss of water or change in flora species across time.

4.1.2 Riparian Vegetation and GDEs

The riparian vegetation along Bettys Creek is managed and monitored in accordance with the Integra Underground Bettys Creek Diversion Asset Management Plan.

Monitoring of a number of sites within the Bettys Creek diversion above Longwalls 13 and 14, as well as sites downstream and upstream of these longwall panels prior to the commencement of Longwall 13 was also completed by SLR in May 2017. This included stream level, water quality, CSIRO ephemeral stream assessment, rapid appraisal of riparian condition (RARC), visual inspection and photographic recording, and cross sections at selected monitoring points.

The study indicated that the diversion stability fluctuates over different sections of the creek and the stream health of the diversion is typically very poor. This is predominantly a result of the long history of mining and grazing practices in the area. The health of the rehabilitated riparian areas is expected to improve over time as the canopy cover increases provided that stock access and mining impacts to

these areas are minimised. This monitoring program will be undertaken post mining to identify any subsidence impacts to the Bettys Creek diversion so that they can be managed appropriately.

The riparian vegetation along Main Creek and Glennies Creek will be monitored on an annual basis. A quadrat will be established in each of these two riparian areas to monitor any changes that may occur.

4.1.3 Other Habitats

Other significant fauna habitats that can be affected by subsidence include rocky areas, overhangs or caves, which can collapse or slump. No significant rocky habitats were identified in the original EA (ERM 2009) report; however if these are recorded within the Integra Underground project area then they will be included in any ongoing monitoring. Hollow bearing trees are potential habitat for the squirrel glider which has been recorded adjacent to the Integra Underground project area.

4.2 Ongoing Monitoring

- Monitoring of the above-mentioned sites, including reference sites, will again be undertaken upon completion of mining of each panel LW13 to 20 (preferably with 6-12 weeks)..

Where impacts are detected then targeted and appropriate remediation will be implemented.

In addition, ongoing subsidence monitoring is undertaken in accordance with the approved Extraction Plan. As recommended by Hansen Bailey (2017b), a subsidence monitoring location within the Ravensworth State Forest and Southern Remnant Area will be established to monitor impacts from subsidence.

4.3 Rehabilitation

Regular monitoring of rehabilitation areas will be undertaken during the initial vegetation establishment period and beyond to demonstrate whether the objectives of the rehabilitation strategy are being achieved, and whether a sustainable, stable landform has been provided.

Depending on the outcomes of the monitoring, Integra Underground may undertake some rehabilitation maintenance to repair any areas that have failed. This may include, but not be limited to, the reseedling or fertilising of areas that may have failed to establish.

The monitoring results from rehabilitated areas will be compared to the reference sites established as part of the baseline monitoring program (refer to **Section 4.1**). Reference sites indicate the condition of surrounding undisturbed areas and allow comparisons to be made between the rehabilitated sites and the undisturbed areas.

Rehabilitation of land disturbed during the construction of the water pipeline from Integra Underground to Mt Owen focused on the regeneration, enhancement and/or re-establishment of significant and/or threatened flora communities. In accordance with Schedule 3 Condition 32A of PA 08_0101, 60 *Casuarina glauca* (Swamp Oak) species trees were planted to directly compensate for the 6 trees disturbed. An additional 40 were planted with the aim of ensuring that a minimum of 60 trees are established.

Planting of like-for-like trees will also be undertaken to compensate for the removal of established trees due to the MOD 8 alone (i.e. not including areas that are approved to be disturbed by the Mt Owen Complex.

Table 4–1 summarises the monitoring procedures that will be implemented within the project area as part of Integra Underground’s ongoing commitment to rehabilitation and regeneration.

Table 4–1 Monitoring procedures for rehabilitation areas

Aspect of Rehabilitation	Elements to be Monitored	Monitoring Frequency
Exploration areas	Describe the vegetation in general terms, e.g. mixed woodland with grass understorey and scattered shrubs, dense shrubs etc	Baseline, 12 months after establishment and then every two years (pending a review of the monitoring program after 12 months)
2 m x 2 m Quadrats	Count the number of plants of all species, excluding grass. Measure live vegetation cover for understorey and grasses (separately) using a line intercept method. Record details of ground cover (litter, logs, rocks etc.). General observations of fauna vertebrate species (including species of conservation significance) will also be undertaken.	12 months after establishment and then every two years (pending a review of the monitoring program after 12 months)
Plantings of 10:1 ratio associated with Integra Underground to Mt Owen pipeline	Count the number of plantings Measure height of each planting	12 months after planting and then annually
Weeds and pests	Species identity. Approximate numbers/level of infestation. Observations of impact on rehabilitation (if any).	Quarterly during the first two years, then as part of the annual inspection after that
Aquatic fauna	Species identity. Water quality parameters. Spring and Autumn.	Monitored as per the Bettys Creek Management Plan.

4.4 Risks to Successful Implementation

The two major risks to the success of the BMP are that:

- the management of biodiversity will not be carried out in accordance with this BMP. The Environment and Community Manager is primarily responsible for driving the implementation of this plan; and
- this plan fails to be relevant to the operations within the Integra Underground project area as a result of the revisions to the MOP. To reduce this risk, this plan will be reviewed (and revised if necessary) at periods of no greater than 12 months in accordance with the requirements of Schedule 5 Condition 6 of PA 08_0101..

5 Review and Improvement

5.1 Plan Review

This BMP will be reviewed (and revised if necessary) in accordance with the requirements of Schedule 5 Condition 6 of PA 08_0101.

6 Accountabilities

The general roles and responsibilities of staff at Integra Underground in respect of this BMP are presented in **Table 6–1**.

Table 6-1 – Accountabilities

Role	Accountabilities for this document
Operations Manager	• Provide adequate resources for the implementation of this management plan
Environment and Community Manager or delegate	• Implement this management plan; • Undertake all rehabilitation within the Integra Underground project area in accordance to the MOP; • Maintain communication with regulatory bodies and notify of any incidents or non-compliance issues relating to biodiversity; • Provide advice and facilitate training where required for biodiversity management; • Manage consultants for monitoring and pre-clearance surveys; • Manage contractors for weed and pest control where required; and • Annual review of bushfire fuel loads.
All personnel	• Comply with all requirements of this management plan.

7 Document Information

Relevant legislation, standards and other reference information will be regularly reviewed and monitored for updates and will be included in any future revisions to this BMP. Related documents listed below provide the linkage and source to develop and maintain compliance information relevant to the BMP.

7.1 Related Documents

Related documents, listed in

Table 7-1 below, are documents directly related to or referenced from this document. Internal procedures have not been reviewed or endorsed by DPE and Glencore is responsible for verifying these procedures are in accordance with this management plan and generally in accordance with PA 08_0101

Table 7-1 – Related documents

Number	Title
GCAA	
GCAA-625378177-9978	11.0 Environment
CAA HSEC PRO 0002	Ground Disturbance Permit Procedure
Integra Underground	
INTUG – 793190785-45	Environmental Management Strategy
INTUG-793190785-953	Mining Operations Plan
INTUG-793190785-49	Exploration Activities and Minor Surface Infrastructure Management Plan
INTUG – 793190785-68	Water Management Plan
INTUG-793190785-151	Extraction Plan – Longwalls 13 and 14
INTUG-793190785-2055	Extraction Plan – Longwalls 15 and 16
INTUG-793190785-3013	Extraction Plan – Longwalls 17 to 20

7.2 Reference Information

Reference information, listed in **Table 7-2** below, is information that is directly related to the development of this document or referenced from within this document.

Table 7-2 – Reference information

Reference	Title
ERM 2009	<i>Proposed Integra Underground Coal Project – Environmental Assessment.</i>
DPI 2012	<i>Guidelines for Controlled Activities on Waterfront Land</i>
Hansen Bailey (2017a)	Integra to Mount Owen Complex Water Pipeline Modification EA for Glencore Coal Pty Ltd
Hansen Bailey (2017b)	Integra Underground Mine Longwall Extension Modification Environmental Assessment for HV Coking Coal Pty Ltd
Hansen Bailey (2018)	Integra Underground Mine Longwall Extension Modification Response to Submissions for HV Coking Coal Pty Limited
SCT 2017	<i>Integra Underground Mine: Subsidence Assessment for LW13 and LW14 Extraction Plan</i>

7.3 Change Information

A summary of the document history is provided in **Table 7-3** below.

Table 7-3 – Change information

Version	Date	Review team (consultation)	Change Summary
1.0	February 2017	Chloe Piggford (Integra Underground) Mark Robinson (Integra Underground) Nicole Armit (EMM) David Richards (EMM)	New document for Integra Underground
2.0	September 2017	Chloe Piggford (Integra Underground)	Update to reflect Modification 7 of Project Approval in line with Schedule 5, Condition 6 of PA 08_0101.
3.0	June 2018	Sophie Nicholas and Chris Jones (SLR) Chloe Piggford (Integra Underground)	Update to reflect Modification 8 of PA 08_0101
4.0	August 2019	Megan Crowhurst and Chris Jones (SLR) Keith Simkin (Integra Underground)	Update following regulator comments on LW15-16 Extration Plans

Appendix A – External Consultation Records



Office of
Environment
& Heritage

DOC16/574014-1

Mr Mark Robinson
Integra Underground
Glencore
mark.robinson@glencore.com.au

Dear Mr Robinson

Integra Underground Recommencement - Review of Management Plans

I refer to your email dated 8 November 2016 notifying the Office of Environment and Heritage (OEH) of a change in ownership and proposed recommencement of mining operations at Integra Underground Mine. Your email sought feedback from OEH on the approved management plans for Integra which have been updated in line with the ownership changes and proposed development and extraction of LW13-14 in 2017/18.

As I indicated to you in a follow up email (10 November 2016), the Hunter Central Coast Region Planning Team has a significant workload at present. I had hoped to be able to provide a review of the following plans within the time frames provided: Rehabilitation – Mine Operations Plan, Aboriginal Heritage Management Plan, Biodiversity Management Plan and Water Management Plan. Unfortunately, it has not been possible to review these plans in the short time frame provided.

As I previously advised, the Non Aboriginal Heritage Management Plan was forwarded to OEH Heritage Division for review. I understand Heritage Division will provide advice on behalf of OEH and the Heritage Council of NSW in separate correspondence.

If you require any further information regarding this matter please contact Robert Gibson, Regional Biodiversity Conservation Officer, on 4927 3154.

Yours sincerely



28 NOV 2016

RICHARD BATH
Senior Team Leader Planning, Hunter Central Coast Region
Regional Operations

Locked Bag 1002 Dangar NSW 2309
Level 4/26 Honeysuckle Drive Newcastle NSW 2300
rog.hcc@environment.nsw.gov.au
ABN 30 841 387 271
www.environment.nsw.gov.au

Appendix B – BMP Approval



**Planning &
Environment**

**Planning Services
Resource Assessments**
Contact: Matthew Sprott
Phone: 8217 2054
Email: matthew.sprott@planning.nsw.gov.au

Chloe Piggford
Environment and Community Manager
Integra Underground
PO Box 320
Singleton NSW 2330

Dear Ms Piggford

Integra Underground Mine (PA 08_0101) – Management Plans

I refer to your letter of 8 December 2016 requesting the Secretary's approval of a number of management plans required under the conditions of approval for PA 08_0101, prior to the recommencement of operations at the Integra Underground Mine.

The Department notes that Glencore is seeking to pursue the staged recommencement of operations at the mine, commencing with the development of first workings for Longwalls 13-14 in February 2017 and progressing to longwall extraction in May 2017.

The Department has now completed its assessment of the final draft versions of the following management plans submitted via email on 10 February 2017:

- Air Quality and Greenhouse Gas Management Plan (condition 15, Schedule 3);
- Noise Management Plan (condition 9, Schedule 3);
- Biodiversity Management Plan (condition 32, Schedule 3);
- Heritage Management Plans for Aboriginal and non-Aboriginal heritage (condition 33, Schedule 3); and
- Exploration Activities and Minor Surface Infrastructure Management Plan (condition 41, Schedule 3).

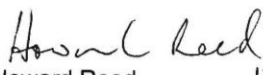
The Department is satisfied that the above plans include appropriate management measures and adequately address the requirements of the project approval, for the purposes of developing first workings for Longwalls 13-14 of the Integra Underground Mine. However, the Department considers that these plans would benefit from further refinement to the description of the approved longwall layout, clarification of the flora and fauna species and vegetation communities overlying the project area and additional specificity around the measures that would be implemented through trigger action response plans to address the likely impacts of the development.

Consequently, I wish to advise that the Secretary conditionally approves the above plans for the purposes of developing the first workings for Longwalls 13-14. Glencore is required to consult further with the Department regarding the refinement and subsequent approval of these plans prior to the commencement of longwall extraction at the site.

Please ensure the effective date on the cover page of the above plans is revised to reflect the date of this letter. Once finalised please place a copy of the approved plans on your website.

If you wish to discuss this matter further, please contact Matthew Sprott at the details listed above.

Yours sincerely


Howard Reed 17.2.17
Director Resource Assessments
as the Secretary's nominee

Department of Planning and Environment
Level 22, 320 Pitt Street Sydney NSW 2000 | GPO Box 39 Sydney NSW 2001 | T 1300 305 695 | www.planning.nsw.gov.au



Planning Services
Resource Assessments
Contact: Robyn Skinner
Phone: 6575 3409
Email: robyn.skinner@planning.nsw.gov.au

Ms Chloe Piggford
Environment & Community Manager
Integra Underground
PO Box 320
Singleton NSW 2330

Dear Ms Piggford,

Integra Underground Mine (PA 08_0101) – Management Plans

This letter refers to the following site-wide management plans for Integra Underground Mine that were submitted to the Department for approval:

- Biodiversity Management Plan, submitted 3 April 2017 (condition 32 of Schedule 3); and
- Heritage Management Plans for Aboriginal and non-Aboriginal heritage, submitted 27 March 2017 (condition 33 of Schedule 3).

The Department notes these revised plans were submitted after the Department issued a conditional approval on 17 February 2017. The Department has since reviewed the revised plans and considers they now adequately address the full requirements of the relevant conditions. Consequently, the Secretary approves the above plans.

Once finalised please place a copy of the approved plans on your website and forward a copy to the Department.

If you wish to discuss this matter, please contact Robyn Skinner on 6575 3409.

Yours sincerely,


Howard Reed 6.4.17
Director Resource Assessments
as nominee of the Secretary

Department of Planning and Environment
320 Pitt Street Sydney NSW 2000 | GPO Box 39 Sydney NSW 2001 | T 1300 305 695 | www.planning.nsw.gov.au



Planning &
Environment

Planning Services
Resource Assessments
Contact: Megan Dawson
Phone: 9274 6391
Email: megan.dawson@planning.nsw.gov.au

Ms Chloe Piggford
Environment & Community Manager
Integra Underground
PO Box 320
Singleton NSW 2330

Dear Ms Piggford,

**Integra Underground Mine (PA 08_0101)
Updated Management Plans following Modification 7**

I refer to your correspondence of 26 September 2017, submitting five updated management plans for Integra Underground Mine to the Department for approval. I understand that these plans have been updated to address the new activities and requirements approved under modification 7 on 18 September 2017.

The Department has reviewed the following plans and is satisfied that they meet the relevant requirements under PA 08_0101:

- Noise Management Plan (condition 9 of Schedule 3);
- Water Management Plan (condition 31 of Schedule 3);
- Biodiversity Management Plan (condition 32 of Schedule 3);
- Aboriginal Heritage Management (condition 33 of Schedule 3); and
- Historic Heritage Management (condition 33 of Schedule 3).

Consequently, I wish to advise that the Secretary approves the above plans. Please provide final (untracked) versions of these plans to the Department at your earliest convenience and place a copy of them on your website.

If you wish to discuss this matter further, please contact Megan Dawson on 9274 6391.

Yours sincerely,

A handwritten signature in black ink, appearing to read 'M. Sprott'.

28/09/17

Matthew Sprott
A/Director Resource Assessments
as nominee of the Secretary

Department of Planning and Environment
320 Pitt Street Sydney NSW 2000 | GPO Box 39 Sydney NSW 2001 | T 1300 305 695 | www.planning.nsw.gov.au



Planning &
Environment

Planning Services
Resource Assessments
Contact: Jack Murphy
Phone: 8217 2016
Email: jack.murphy@planning.nsw.gov.au

Ms Chloe Piggford
Environmental and Community Manager
Integra Underground

Email: chloe.piggford@glencore.com.au

Dear Ms Piggford,

**Integra Underground Project (08_0101)
Environmental Management Plans**

I refer to your email dated 7 September 2018, submitting a revised environmental management strategy and revised environmental management plans for the Integra Underground Project. The Department has reviewed the following documents:

- Heritage Management Plan dated September 2018 (condition 33, Schedule 3);
- Air Quality and Greenhouse Gas Management Plan dated September 2018 (condition 15, Schedule 3);
- Biodiversity Management Plan dated September 2018 (condition 32, Schedule 3);
- Environmental Management Strategy dated September 2018 (condition 1, Schedule 5);
- Water Management Plan dated September 2018 (condition 31, Schedule 3);
- Construction Traffic Management Plan dated September 2018 (condition 42, Schedule 3);
- Noise Management Plan dated September 2018 (condition 9, Schedule 3); and
- Exploration Activities and Minor Surface Infrastructure Management Plan dated September 2018 (condition 41, Schedule 3).

The Secretary has approved the above documents. Please ensure finalised copies of these documents are made available on the company's website.

Should you have any enquiries in relation to this matter, please contact Jack Murphy.

Yours sincerely,

A handwritten signature in blue ink that reads 'Howard Reed'.

Howard Reed 10.9.18
Director
Resource Assessments
as nominee of the Secretary

Appendix C – Trigger Action Response Plan

Table C-1 – Trigger Action Response Plan

Characteristic	Trigger	Action	Response
Vegetation	Damage to fencing allows vehicle and grazing access	Damage to fencing will be inspected by an appropriately qualified person	Stock and vehicles will be excluded and fencing damage repaired
	Large weed infestations are recorded during monitoring	Weed infestations will be inspected by an appropriately qualified person	Weed control will be undertaken in accordance with the MOP.
	Inadvertent clearing occurs for gas drainage infrastructure or other surface activities	Inadvertent clearing will be inspected by an appropriately qualified person	Inadvertently cleared vegetation will be replaced, and the GDP process reviewed to determine if improvements are required that would prevent inadvertent clearing in the future. Rehabilitation of surface disturbance areas undertaken in accordance with procedures outlined in the MOP.
Soils and salinity	Downstream erosion and sedimentation is degrading the condition of retained vegetation	Erosion, sedimentation and vegetation condition are inspected by an appropriately qualified person	Erosion and sediment control measures implemented and maintained as per the IUG WMP.
	Cattle grazing in sensitive areas along Betty's Creek diverted riparian corridor	Vegetation condition will be inspected by an appropriately qualified person	Stock and vehicles will be excluded and fencing damage repaired
	Disturbance or exposure of soils in high salinity risk areas	Soil condition will be inspected by an appropriately qualified person	Supply of information (aerial photography and survey data) to verify that no significant soil disturbance has occurred, for example from cattle grazing activities. Planting salt tolerant species in rehabilitation areas where a high risk of salinity has been identified.

Characteristic	Trigger	Action	Response
Bushfire	Bushfire in the Betty's Creek diverted riparian corridor and/or revegetated exploration areas	Bushfire management procedures will be reviewed in consultation with Mt Owen (given the overlap of the two operations).	Recommendations of the review of bushfire management practices will be implemented where required.
	Grass fire	Fuel loads and areas requiring ploughing/slashing (as appropriate) and/or weed control will be visually inspected by the Environment and Community Manager or delegate.	Firebreaks and grasslands will be kept in a condition to provide adequate setbacks and minimise fuel levels (subject to consistency with biodiversity objectives).
Landscaping	Landscaping is not providing a suitable visual buffer for IUG's operations, resulting in a complaint.	Landscaping requirements of the MOP will be reviewed.	Landscaping will be completed in accordance with the MOP, such that visual impacts are buffered.
	Unsuitable native species are used in rehabilitation.	Landscaping requirements of the MOP will be reviewed.	Rehabilitation will be completed in accordance with the MOP, such that suitable native species are planted.
	Landscaping is not providing vegetation and habitat connectivity.	Connectivity requirements of the MOP will be reviewed.	Rehabilitation will be completed in accordance with the MOP, such that connectivity is provided for native vegetation and wildlife.
Fauna	More than three fatal wildlife injuries observed in a month.	Fatal wildlife injuries recorded and reviewed to determine appropriate measures.	Speed limits will be enforced on access roads to reduce risk of fauna injury. Where applicable, wildlife crossing areas will be identified and signs will be erected to alert operators.
	Wildlife entering surface infrastructure area.	Damage to fencing will be inspected by an appropriately qualified person.	Wildlife will be excluded and fencing damage repaired.
	Lighting directed toward areas of retained native vegetation.	Lighting direction will be inspected by an appropriately qualified person.	Lighting will be directed at operating equipment only, in order to reduce light spill and impact on nocturnal fauna.

Characteristic	Trigger	Action	Response
Exotic and Invasive Species	Large infestations of noxious weeds are recorded during monitoring.	Weed infestations will be inspected by an appropriately qualified person.	Weed control will be undertaken in accordance with the MOP.
	Weed growth is observed on topsoil stockpiles.	Weed infestations will be inspected by an appropriately qualified person.	Weed control will be undertaken in accordance with the MOP.
	Invasive fauna including Feral Dogs and Red Foxes and Rabbits are recorded.	A monitoring program will be developed to monitor invasive species populations.	Invasive species control will be undertaken by an appropriately qualified person.
Agriculture	Cattle grazing in sensitive areas along Betty's Creek diverted riparian corridor.	Vegetation condition will be inspected by an appropriately qualified person.	Stock and vehicles will be excluded and fencing damage repaired All gates and entry points will be locked to prevent stock and vehicle access
Bettys Creek	Adverse subsidence effects observed on Betty's Creek and/or diversion.	Subsidence areas will be inspected by a suitably qualified person to determine the level of remedial works required.	Bettys Creek and/or diversion will be rehabilitated to an appropriate standard, as per the MOP.
Minor surface disturbance areas	Inadvertent clearing occurs for gas drainage infrastructure or other surface activities.	Inadvertent clearing will be inspected by an appropriately qualified person.	Inadvertently cleared vegetation will be replaced, and the GDP process reviewed to determine if improvements are required that would prevent inadvertent clearing in the future. Rehabilitation of surface disturbance areas undertaken in accordance with procedures outlined in the MOP.

Characteristic	Trigger	Action	Response
Subsidence	Ponding occurs outside Betty's Creek.	Ponding is inspected by a suitably qualified person to determine the scope of re-profiling and drainage required.	Any ponds identified outside of Bettys Creek will be drained, and the area re-profiled. Draining occurs in a timely manner such that vegetation is not impacted by the ponding. Re-profiling works undertaken in accordance within the landform presented in the MOP.