

Appendix F

Agricultural Impact Statement Addendum – Mine Development

McPhillamys Gold Project

Amendment Report - Agricultural impact statement addendum

August 2020



PREPARED FOR LFB RESOURCES NL

McPhillamys Gold Project

Amendment Report - Agricultural impact statement addendum

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Prepared by



David Richards

Senior Environmental Scientist

28 August 2020

Approved by



Nicole Armit

Associate Director

28 August 2020

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Executive Summary

LFB Resources NL is seeking development consent for the construction and operation of the McPhillamys Gold Project (the project), a greenfield open cut gold mine and associated water supply pipeline in the Central West of New South Wales (NSW). The project is comprised of two key components:

- the mine site where the ore will be extracted and processed (ie the mine development); and
- an associated water pipeline which will enable the supply of water from near Lithgow to the mine site (ie the pipeline development).

The proponent, LFB Resources NL, is a 100% owned subsidiary of Regis Resources Limited (herein referred to as Regis).

The project is State significant development (SSD) pursuant to Schedule 1 of State Environmental Planning Policy (State and Regional Development) 2011 (State and Regional Development SEPP). A development application (DA) and an environmental impact statement (EIS) were submitted to the NSW Department of Planning, Industry and Environment (DPIE) in 2019 under Part 4 of the NSW *Environmental Planning and Assessment Act 1979* (EP&A Act). The DA and EIS were subsequently publicly exhibited from 12 September 2019 to 24 October 2019.

Following the public exhibition of the EIS, submissions were received from government agencies, special interest organisations and the general community. In response to issues raised in submissions, as well as a result of further detailed mine planning and design, Regis has made a number of amendments to the project.

This Agricultural Impact Statement (AIS) Addendum has been prepared to outline the changes to the project that have been made since the public exhibition of the EIS particularly relevant to the mine development's potential impacts on agricultural resources, and to address comments raised in submissions received.

While a number of changes have been made to the project, the development for which approval is sought remains largely the same as was presented in the EIS. No amendments have been made to a number of key aspects of the project, including mining and processing methods and the overall project life. As part of the project amendments, some small adjustments have been made to the site layout and disturbance footprint through the process of design optimisation. However, the general layout remains essentially the same to that presented in the EIS such that the key elements of the open cut pit, the TSF and the waste rock emplacement remain in the same location.

The amended mine development is planned to disturb an area of approximately 1,116 hectares (ha), which will temporarily be removed from agricultural use. The amended disturbance area accounts for less than 1% of the 132,592 ha used for agriculture in Blayney local government area (LGA). More than half of the 2,514 ha mine development project area, comprising 1,398 ha, will remain undisturbed by the mine development during operations, with the majority of this land continuing to be used for current agricultural (grazing) purposes. In many cases this land will be leased back to the original owner/leasee and as a result agricultural practices should remain unchanged.

The overarching rehabilitation objective of the project is to restore the land as much as possible to its pre-mining land use at the end of its operational life; that is, primarily an agricultural land use comprising grazing on improved pasture while improving the biodiversity values of the area lost due to past agricultural clearing by re-establishing endemic open-woodland communities on the waste rock emplacement as part of the rehabilitation program.

There is no change to the proposed rehabilitation and closure management measures for the amended project; however, there are minor changes to the areas covered by the post-mining land and soil capability (LSC) classes due to the amended disturbance footprint associated with the mine development. These are shown in Table ES1.

Table ES1 **Change in LSC class areas over the life of the project**

LSC Class	Capability	Pre-mining area (ha)	Post-mining area (ha) – EIS	Change over mine life (ha) – EIS	Post-mining area (ha) – amended project	Change over mine life (ha) – amended project
Land with a wide range of uses (cropping, grazing, horticulture, nature conservation)						
1	Extremely high	0	0	0	0	0
2	Very high	0	0	0	0	0
3	High	0	0	0	0	0
Land with a variety of uses (cropping with restricted cultivation, pasture cropping, grazing, some horticulture, forestry, nature conservation)						
4	Moderate	932	920	-12	929	-3
5	Moderate-low	1,492	1,080	-411	1,081	-411
Land with a limited range of uses (grazing, forestry and nature conservation)						
6	Low	86	422	+336	409	+323
Land generally unable to support agriculture (selective forestry and nature conservation)						
7	Very low	4	21	+17	29	+25
8	Extremely low	0	71	+71	66	+66

As shown in Table ES1, the amended mine development is predicted to result in a nett reduction of 414 ha of soil with LSC classes 4 (3 ha) and 5 (411 ha) and a nett increase of 348 ha of soil with LSC classes 6 (323 ha) and 7 (25 ha). Land where capability is reduced as a result of the project is predominantly in the footprint of the waste rock emplacement and tailings storage facility (TSF). The void from the mine pit (approximately 66 ha) will have no agricultural value (LSC class 8). However, the LSC class across parts of the TSF footprint will be improved from LSC class 5 pre-mining to LSC class 4 post-rehabilitation.

The mine development will result in a reduction in carrying capacity (dry sheep equivalent (dse) per hectare) and the gross value of agricultural production both during construction and operations and post mining. The reductions in carrying capacity and the gross value of agricultural production have been reassessed as a result of the amendments to the mine development (Table ES2).

Table ES2 **Reduction in agricultural production over the life of the project**

Disturbance footprint	Reduction in carrying capacity during life of project (dse/yr)	Reduction in gross value of agricultural production during life of project (\$/yr)	Reduction in carrying capacity post mining (dse/yr)	Reduction in gross value of agricultural production post mining (\$/yr)
EIS	10,064	\$406,193	2,362	\$95,373
Amended project	8,962	\$361,706	2,728	\$110,114

The amended project will contribute to a reduction of less than 0.9% during mining and 0.3% post-closure of the \$42.7 million of gross value of agricultural production in the Blayney LGA in 2015/16.

Table of Contents

Executive Summary	ES.1
1 Introduction	1
1.1 Overview	1
1.2 Project amendment overview	3
1.3 Purpose of this report	5
1.4 Submissions on the EIS	5
2 Agricultural resources and production within amended project area	8
2.1 Biophysical strategic agricultural land	8
2.2 Soil and landscape assessment	8
2.3 History of agricultural enterprises within amended project area	8
2.4 Land to be temporarily removed from agriculture	10
2.5 Land to be returned to agriculture post project	11
2.6 Land that will not be returned to agriculture	12
3 Existing regional agricultural resources	14
4 Agriculture impact assessment	15
4.1 Impacts on agricultural resources or industries	15
4.1.1 Carrying capacity during the life of the project	15
4.1.2 Risk matrix for agricultural impacts	16
4.2 Consequential effects on agricultural productivity	16
4.2.1 Carrying capacity post mining	17
4.3 Uncertainty associated with predicted impacts and mitigation measures	18
4.4 Further risks	18
4.4.1 Biosecurity	18
4.4.2 Pests and weeds	19
4.4.3 Erosion and sedimentation	19
4.4.4 Air quality	20
4.4.5 Noise and vibration	20
4.4.6 Traffic	21
4.4.7 Water resources	21
4.4.8 Socio-economic impacts	25

5	Mitigation measures	30
5.1	Review of project design and alternatives	30
5.2	Monitoring and management	30
5.2.1	Pests and weeds	30
5.2.2	Water resources	30
5.2.3	Air quality	32
5.2.4	Noise	33
5.2.5	Transport	34
5.3	Capacity to rehabilitate disturbed lands	34
5.3.1	Rehabilitation goals and post mining land use	34
5.3.2	Rehabilitation completion criteria	36
5.3.3	Rehabilitation management plan	38
6	Consultation	39
6.1	Overview	39
6.2	Ongoing engagement	39
6.3	Community consultative committee	39
6.4	Near neighbours	40
7	Conclusion	41
	References	42

Tables

Table 1.1	Matters raised in submission from DPI Agriculture relating to the AIS and how they have been addressed	5
Table 2.1	Agricultural use of properties within the amended disturbance footprint	10
Table 2.2	Change in area of each LSC class over the life of the amended project	11
Table 4.1	Estimate of reduction in carrying capacity during the life of the project	16
Table 4.2	Change in area of each LSC class over the life of the amended project	17

Figures

Figure 1.1	Regional setting – project application area – amended project	2
Figure 1.2	Amended mine development layout	4
Figure 2.1	Regis land ownership	9
Figure 2.2	Projected post-mining land and soil capability classes	13

1 Introduction

1.1 Overview

LFB Resources NL is seeking State significant development consent under Part 4 of the NSW *Environmental Planning and Assessment Act 1979* (EP&A Act) to develop and operate a greenfield open cut gold mine, associated mine infrastructure and a water supply pipeline in Central West New South Wales (NSW). The project application area is illustrated at a regional scale in Figure 1.1. LFB Resources NL is a 100% owned subsidiary of Regis Resources Limited (herein referred to as Regis).

As shown in Figure 1.1, the McPhillamys Gold Project comprises two key components:

- the mine site where the ore will be extracted, processed and gold produced for distribution to the market (the mine development); and
- an associated water pipeline which will enable the supply of water from approximately 90 km away near Lithgow the mine site (the pipeline development).

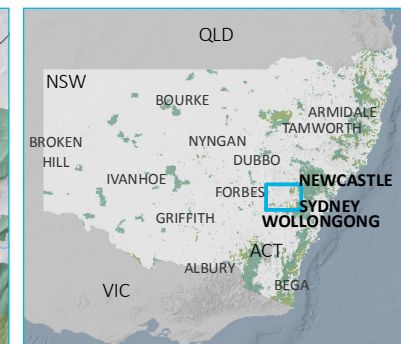
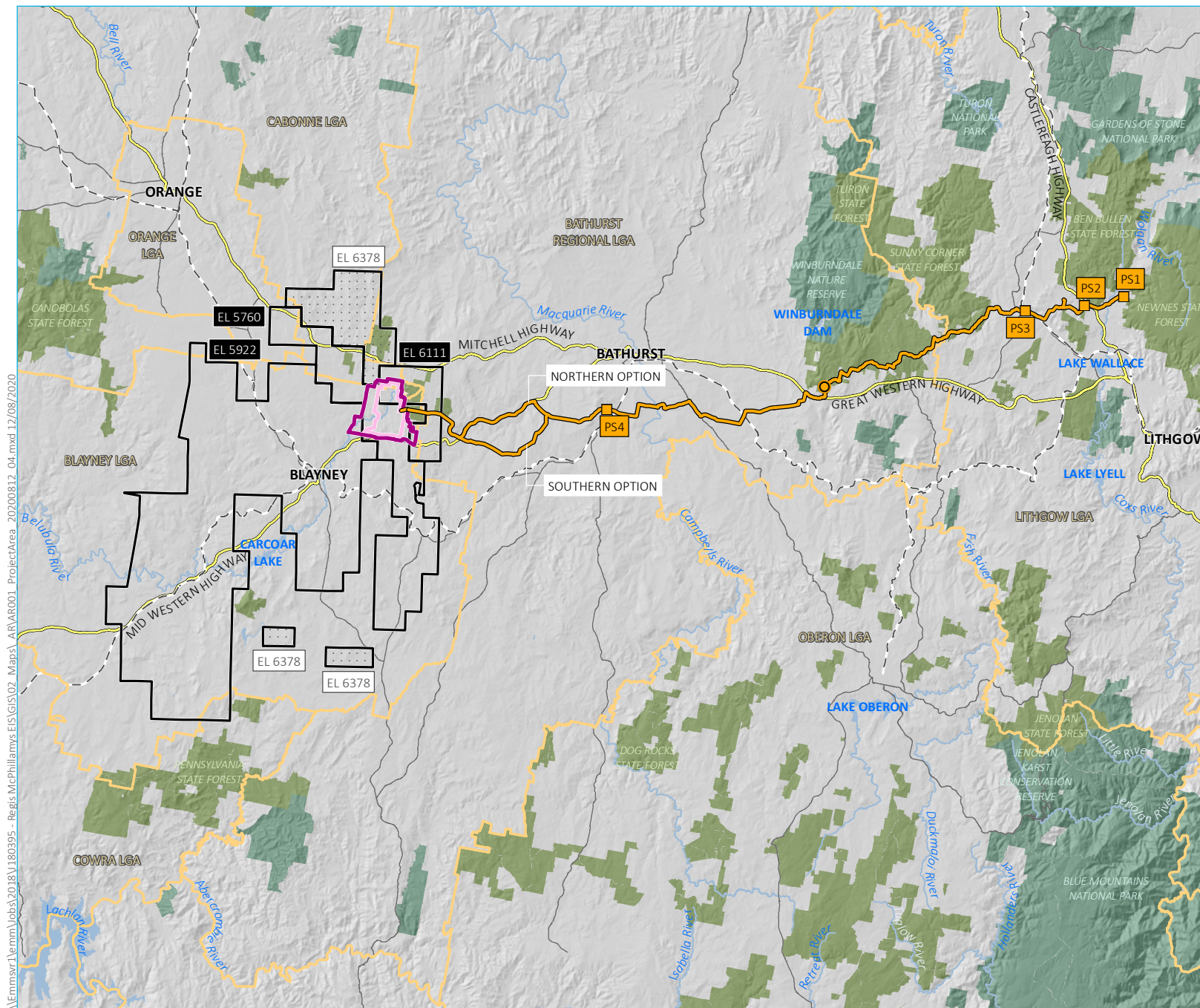
The mine development is approximately 8 km north-east of Blayney within the Blayney and Cabonne local government areas (LGAs). This locality has a long history of alluvial and hard rock mining, with exploration for gold and base metals occurring since the mid to late 19th century. The mine development project boundary (herein referred to as the project area) is illustrated in Figure 1.2 and covers the mining lease (ML) application area for the project as well as the parts of the project that do not require an ML.

An agricultural impact statement (AIS) was prepared by Sustainable Soil Management (SSM) for the mine development component of the project (Appendix I of the environmental impact statement (EIS)). Potential impacts of the pipeline development on land and agricultural resources were addressed in the main report of the EIS.

In accordance with the requirements of the EP&A Act, the NSW *Environmental Planning and Assessment Regulation 2000* (EP&A Regulation) and the Secretary's Environmental Assessment Requirements (SEARs) for the project, an EIS was prepared to assess the potential environmental, economic and social impacts of the project. The development application and accompanying EIS was submitted to the NSW Department of Planning, Industry and Environment (DPIE) and subsequently publicly exhibited for six weeks, from 12 September 2019 to 24 October 2019. During this exhibition period, Regis received submissions from government agencies, the community, businesses and other organisations regarding varying aspects of the project.

In response to issues raised in submissions received, as well as a result of further detailed mine planning and design, Regis has made a number of refinements to the project. Accordingly, an Amendment Report has been prepared by EMM Consulting Pty Ltd (EMM 2020a) to outline the changes to the project that have been made since the public exhibition of the EIS and to assess the potential impacts of the amended project, compared to those that were presented in the EIS. This AIS addendum forms part of the Amendment Report and presents a revised AIS for the amended project.

This AIS addendum provides an assessment of the impacts of the amended mine development on agricultural industries and resources and documents initiatives built into the amended project design to avoid and minimise agricultural impacts. The potential impacts associated with the pipeline development component of the amended project are addressed in the Pipeline Development AIS (EMM 2020b), which is appended to the Amendment Report (EMM 2020a). References to 'the project' in this report are therefore referring to the mine development component only.

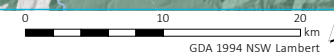


- KEY**
- Project application area
 - Mine development project area (2,514.06 ha)
 - Mining lease application area (1,806.17 ha)
(Note: boundary offset for clarity)
 - Pressure reducing system
 - Pumping station facility
 - Pipeline
 - Existing environment
 - Rail line
 - Primary road
 - Arterial road
 - River
 - Waterbody
 - NPWS reserve
 - State forest
 - Local government area
 - Exploration lease boundaries (of interest)
 - Held by LFB Resources NL (Regis)
 - Held by others

Regional setting –
project application area –
amended project

McPhillamys Gold Project
Agricultural impact statement - addendum
Figure 1.1

Source: EMM (2020); Regis Resources (2020); DPE (2018); DFSI (2017); GA (2011)



1.2 Project amendment overview

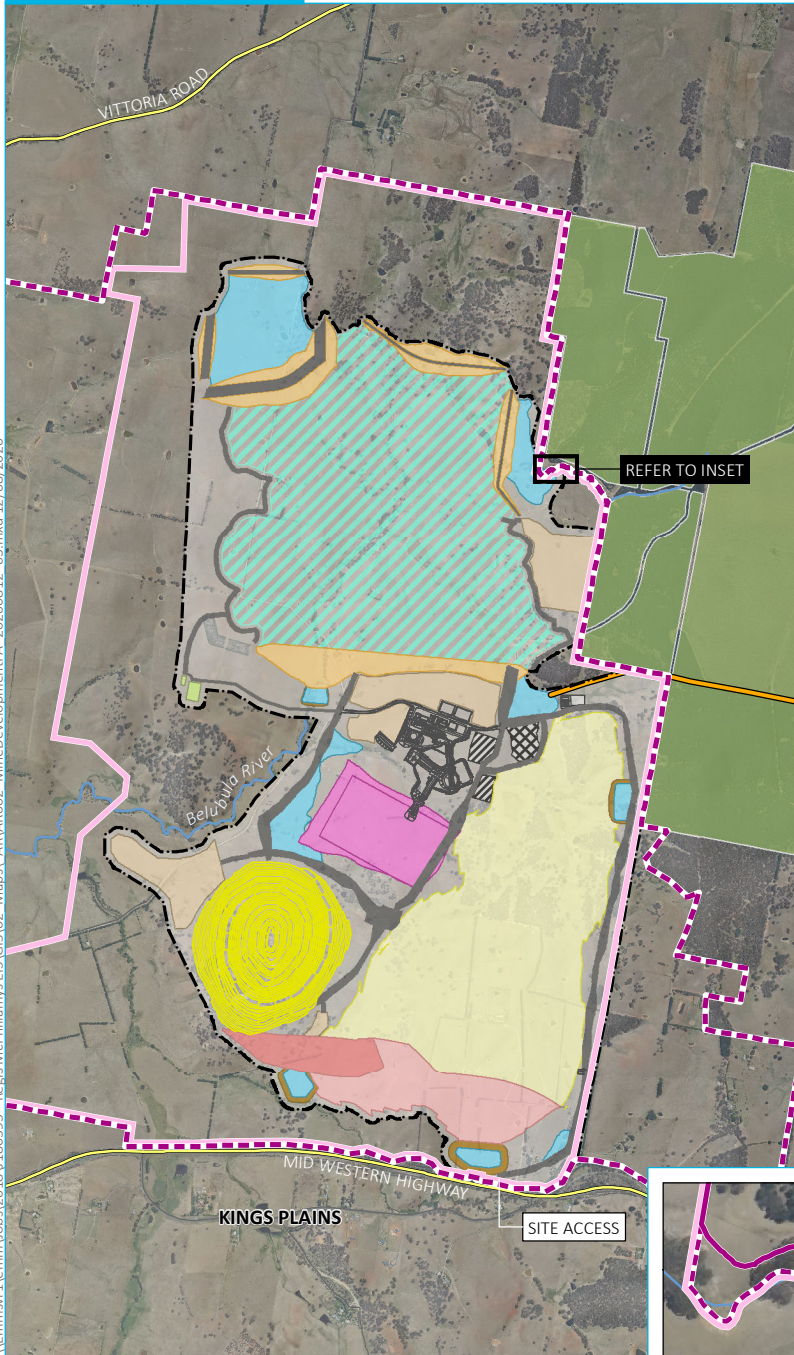
A summary of the key amendments to the project since the exhibition of the EIS are summarised below and described in detail in Chapter 2 of the Amendment Report (EMM 2020a):

- **Site access** – a new location for the site access intersection off the Mid-Western Highway is proposed, approximately 1 km east of the original location assessed in the EIS, in response to feedback from Transport for NSW (TfNSW, former Roads and Maritime Services) and the community. A new alignment is subsequently proposed for the site access road to the mine administration and infrastructure area.
- **Mine and waste rock emplacement schedule** – revision of the mine schedule and the subsequent construction sequence of the waste rock emplacement has been undertaken, in particular consideration of predicted noise levels in Kings Plains. This achieved a reduction in predicted noise levels at nearby residences while extending the construction timeframe for the southern amenity bund.
- **Pit amenity bund** – the size of the pit amenity bund has been reduced as a result of optimisation of the open cut pit design and the improved location of exit ramps for haul trucks.
- **Tailings Storage Facility (TSF)** – amendments to the design include changes to the embankment design and construction timing, the TSF footprint, and the TSF post closure landform.
- **Water management system** – the secondary water management facility (WMF) has been removed from the water management system resulting in an avoidance of impacts to a potential item of historic heritage (MGP 23 - Hallwood Farm Complex (Hallwood)). The size of the WMFs has also been revised to achieve a reduced likelihood of discharge from the storages within the operational water management system as part of a revised nil discharge design.
- **Mine administration and infrastructure area** – the layout of this area has been revised and optimised.
- **Mine development project area** – a very small change has been made to the mine development project area along the eastern boundary (an additional 1 ha, or 0.04% change), to accommodate the required clean water management system. The change takes the project area from 2,513 hectares (ha) to 2,514 ha.

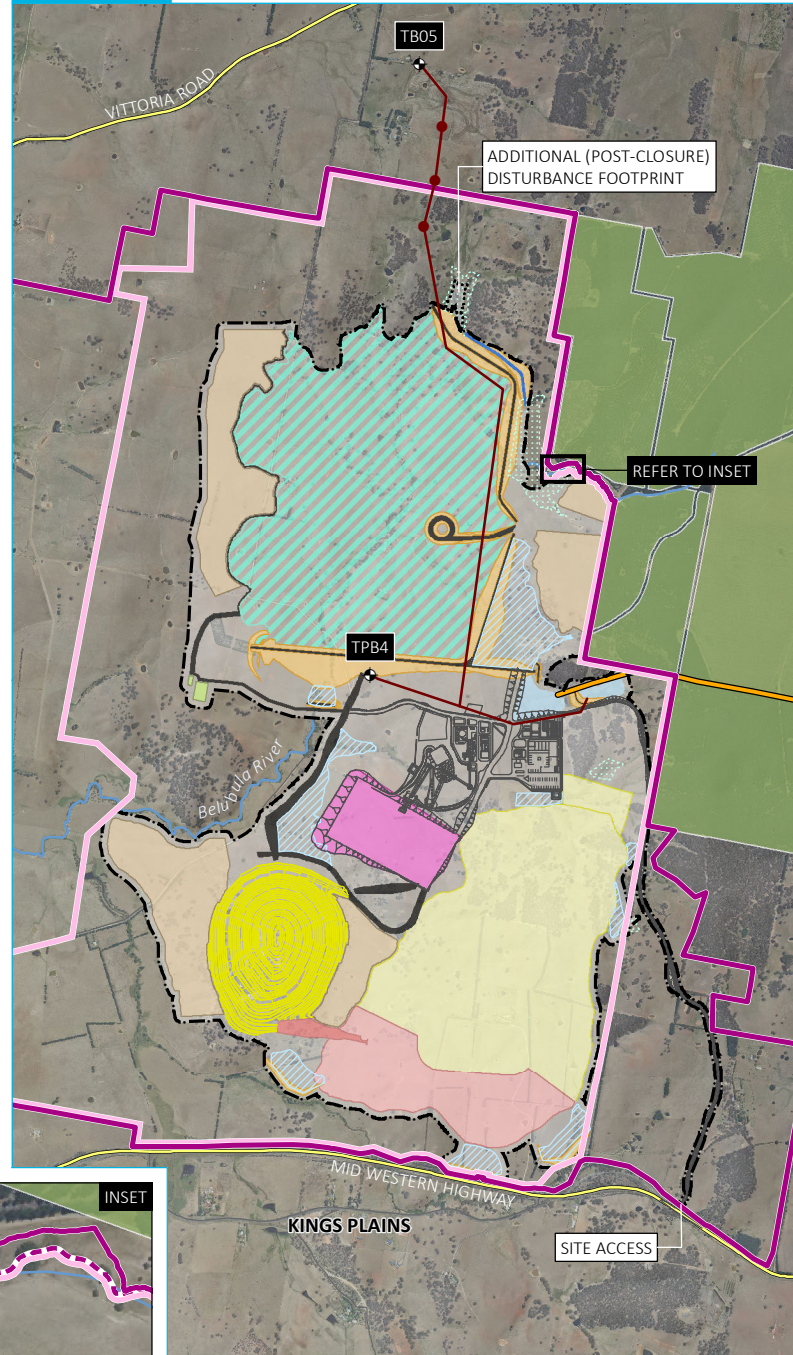
No amendments have been made to other key aspects of the project as presented in the EIS for which approval is sought, such as the proposed mining method, operating hours, annual ore extraction rate of up to 8.5 Mtpa, approximate annual ore processing rate of up to 7 Mtpa, employee numbers, and rehabilitation methods and outcomes.

The amended mine development project layout, compared to that assessed in the EIS, is shown in Figure 1.2.

ENVIRONMENTAL IMPACT STATEMENT



AMENDED PROJECT



- KEY**
- Project application area
 - Mine development project area (EIS)
 - Mine development project area (amended project)
 - Mining lease application area (Note: boundary offset for clarity)
 - Disturbance footprint
 - Pipeline
 - Project general arrangement
 - Construction groundwater bore
 - Indicative construction groundwater bore
 - Indicative construction groundwater pipeline
 - Open cut mine
 - Site infrastructure
 - Belubula River
 - Road
 - Mine administration (EIS)
 - Workshop (EIS)
 - Mining equipment areas (EIS)
 - Magazine and ammonium nitrate emulsion storage
 - Southern amenity bund
 - Pit amenity bund
 - ROM pad
 - Soil zone
 - Embankment
 - Sediment basin structure (EIS)
 - Waste rock emplacement
 - Tailings storage facility (TSF)
 - Water management area (EIS)
 - Clean water diversion (amended project)
 - Water management facility (WMF) - continuous storage (amended project)
 - Water management facility (WMF) - infrequent storage (amended project)
 - Clean water facility (CWF) (amended project)
 - Existing environment
 - Major road
 - Minor road
 - Vittoria State Forest

Amended mine development layout

McPhillamys Gold Project
Agricultural impact statement - addendum
Figure 1.2

1.3 Purpose of this report

This report has been prepared to assess the potential agricultural impacts of the amended project. The assessment considers and outlines the differences in impacts compared to the original project as presented in the EIS. In this way, it serves as an update to the McPhillamys Gold Project Agricultural Impact Statement included as Appendix I of the McPhillamys Gold Project EIS (EMM 2019) (herein referred to as the EIS AIS). It also addresses comments on the AIS raised during the public exhibition period (refer to Section 1.4).

This report is structured as follows:

- Chapter 1 - provides an introduction and overview of the amended project and outlines the scope and structure of this report;
- Chapter 2 - provides a description of production within the amended project area and assesses the impact of the amended project on agricultural land resources;
- Chapter 3 - provides a revised description of agricultural resources within the locality (where required);
- Chapter 4 - identifies and assesses the impacts of the amended project on agricultural resources and industries;
- Chapter 5 - describes the mitigation, management and monitoring measures to be undertaken in relation to project impacts on agricultural resources; and
- Chapter 6 - describes the consultation that has been undertaken since the public exhibition of the EIS (with respect to the project's potential impacts on agricultural resources) and identifies the relevant matters raised in community submissions on the EIS.

1.4 Submissions on the EIS

A number of issues relevant to the project's potential impacts on agricultural resources were raised in submissions received on the EIS from NSW Department of Primary Industries – Agriculture (DPI Agriculture). These issues have also been considered in this AIS Addendum. Detailed responses to all the submissions received are provided in the Submissions Report prepared for the project (EMM 2020c), which has been prepared in conjunction with the Amendment Report (EMM 2020a).

A summary of the key issues relevant to this AIS Addendum are provided in Table 1.1, together with how each matter has been addressed within this report.

Table 1.1 Matters raised in submission from DPI Agriculture relating to the AIS and how they have been addressed

Matters raised	Where addressed
DPI recommends a revised assessment include the following:	-
Describe anticipated rehabilitation process that includes agricultural land restoration, and an indication of its availability for grazing.	Section 5.3, particularly 5.3.1
Risks:	
• Biosecurity risks - Implement a biosecurity risk section as part of the weed, pest and disease management plan.	Section 4.4.1
• Pests and diseases - this be reported on as part of the annual reporting.	Section 4.4.2 and Section 5.2.1

Table 1.1 Matters raised in submission from DPI Agriculture relating to the AIS and how they have been addressed

Matters raised	Where addressed
<ul style="list-style-type: none"> Noise and vibration - Incidents to be recorded. Notifications of surrounding landholdings take place. Incidents that mimic lightning conditions can still create stress to horses/livestock. 	Section 4.4.5 and Section 5.2.4
Consequential productivity effects on agricultural enterprises – address the proposed actions to restore agriculture, including land emplacement, pasture species and anticipated grazing availability (including productivity parameters that include stocking density) when developed.	Section 5.3
Account for any physical movement of water away from agriculture:	-
<ul style="list-style-type: none"> Groundwater - Identify and seek agreement on a monitoring process as part of the water management plan for the mine that considers the impacts on existing local water bores and spring flows and inform community of any changes. What are the remedial actions should impacts be greater than those modelled? 	Section 4.4.7(ii) and Section 5.2.2(ii)
<ul style="list-style-type: none"> Surface water - Monitoring required as part of the mine water management plan. How will this impact on water availability from Carcoar impact on downstream users over each year? How will this inform agricultural water use availability? 	Section 4.4.7(iii) and Section 5.2.2(iii)
Agricultural support services – assess cumulative impacts in the longer term, considering other developments in the region.	Section 4.4.8(i)
Processing and other value adding industries – assess:	-
<ul style="list-style-type: none"> potential impacts on the throughput of the Central Tablelands Livestock Exchange; 	Section 4.4.8(i)
<ul style="list-style-type: none"> potential impacts on other processing and value-adding industries in the region (or provide evidence that there are no such industries); and 	Section 4.4.8(i)
<ul style="list-style-type: none"> cumulative impacts in the longer term, considering other developments in the region. 	Section 4.4.8(i)
Visual amenity – assess potential impacts of night lighting of the project area on The Beekeepers Inn.	Section 4.4.8(iii)
Landscape values – consider whether it would be reasonable to also offer Cottesbrook Honey access to apiary sites on Regis owned land.	Section 4.4.8(iv)
Tourism infrastructure – substantiate why no noise or air quality impacts are anticipated at The Beekeepers Inn.	Section 4.4.8(iv)
Local and regional employment impacts:	-
<ul style="list-style-type: none"> Describe the “local labour recruitment practices and rates” that Regis will implement, including the percentage of recruitment to be drawn from the local agricultural workforce. 	Section 4.4.8(v)
<ul style="list-style-type: none"> Estimate potential impacts on agricultural support services, processing and other value-adding industries, and agricultural tourism enterprises, due to agricultural workers being employed by the project. 	Section 4.4.8(v)
Mitigation measures:	
<ul style="list-style-type: none"> Agricultural lands for the “rehabilitation plan”- describe the proposed pasture species and grazing strategies, and present evidence that they can support sustainable grazing enterprises typical of the region at the proposed stocking rates. 	Section 5.3
<ul style="list-style-type: none"> Agricultural lands for the “water management plans”- describe the intended content with specific reference to agricultural water use, including how management and mitigation measures would be agreed, developed, implemented, monitored and reported, and what mechanisms for dispute resolution with agricultural stakeholders would be put in place, including the role of the Community Consultative Committee in this process. 	Section 5.2.2 and Section 6.3
<ul style="list-style-type: none"> Agricultural enterprises for the “Recruitment strategy” - describe recruitment scenarios, including the percentage of recruitment to be drawn from the local agricultural workforce. 	Section 4.4.8(v)

Table 1.1 Matters raised in submission from DPI Agriculture relating to the AIS and how they have been addressed

Matters raised	Where addressed
Agricultural infrastructure describe the intended content of the “transport management plan” with specific reference to agricultural-related traffic, including how management and mitigation measures would be agreed, developed, implemented, monitored and reported, and what mechanisms for dispute resolution with agricultural stakeholders would be put in place, including the role of the Community Consultative Committee in this process.	Section 5.2.5
Landform establishment and stability (active erosion aspect) - include an aerial assessment in addition to the ground assessment of active erosion.	Section 5.3.2
Performance indicators for the growth medium development - include water holding capacity and bulk density in addition to the chemical testing.	Section 5.3.2
Consultation - Future consultation should continue with landholders in the locality, with specific attention to complaint management and groundwater/surface water changes.	Chapter 6

2 Agricultural resources and production within amended project area

2.1 Biophysical strategic agricultural land

As part of the preparation of the EIS, the footprint of the mine development and the associated area to be the subject of an ML application were refined to avoid impacts on identified biophysical strategic agricultural land (BSAL). Since the submission of the EIS, a minor refinement has been made to the southern boundary of the ML application area, where it has been reduced in two sections to maintain the required distance from neighbouring properties. The revised boundary is shown in Figure 1.2.

There is no BSAL within the ML application area for the amended project.

A site verification certificate (SVC) was applied for and issued by the Secretary of DPIE on 18 June 2019.

2.2 Soil and landscape assessment

A comprehensive soil survey of the project area was undertaken by SSM as part of the preparation of the EIS.

The soil survey assessment results and soil properties described in Section 2.2.1 of the EIS AIS have not changed as a result of the amendments to the project.

As a result of minor amendments to the mine development project area, the LSC assessment has been updated. The LSC Class assessment found that 96% of the amended mine development project area is of moderate (LSC 4 – 932 ha) to moderately-low (LSC 5 – 1,491 ha) capability, which is suitable for grazing or cropping with restricted cultivation.

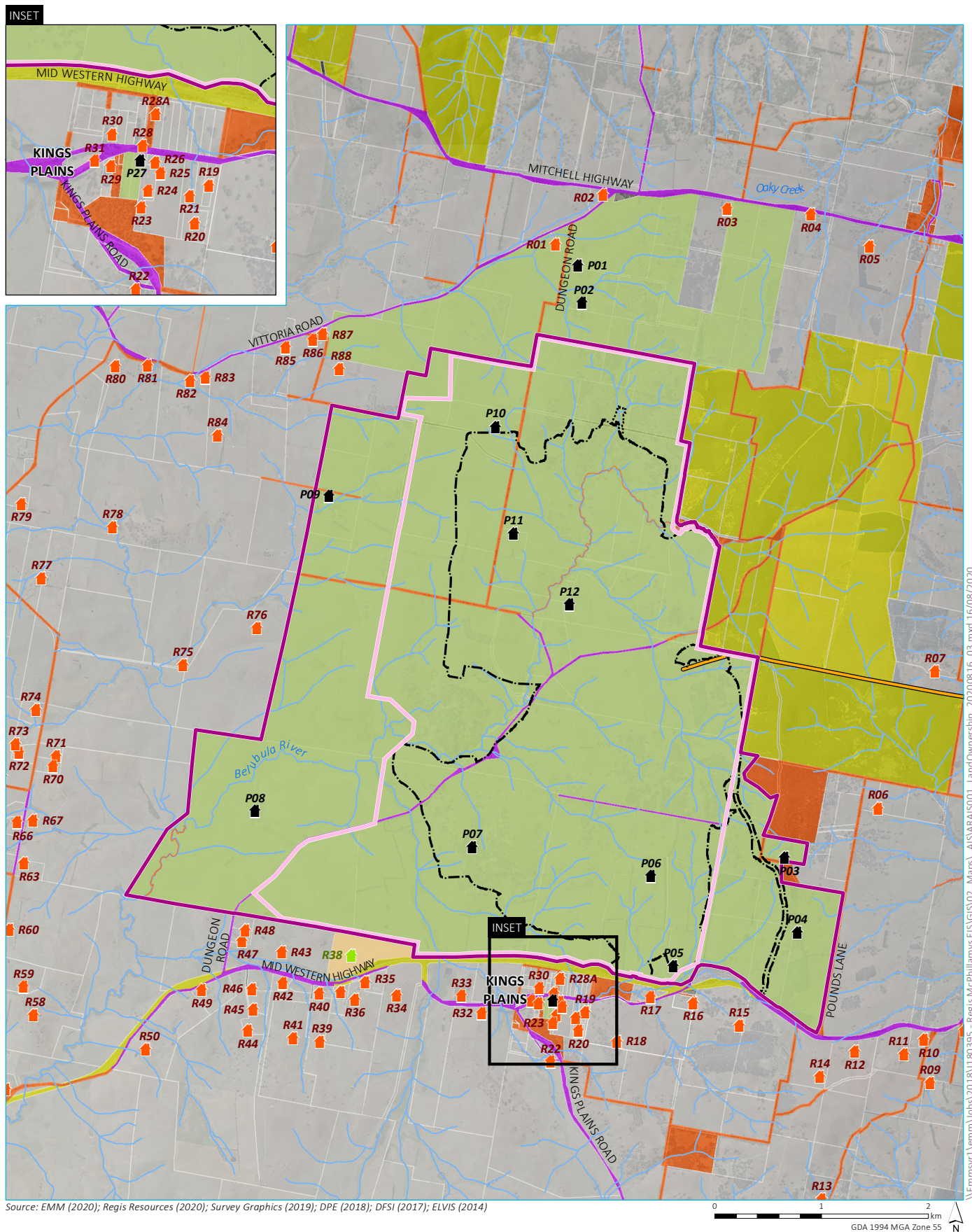
The remaining 4% of the amended mine development project area is mapped as low capability land (LSC 6 – 86 ha) and very low capability (LSC 7 – 4 ha) on the basis that the slope is steeper than 20%.

2.3 History of agricultural enterprises within amended project area

Grazing of livestock has been the main agricultural land use within the locality of the mine since the area was first settled in the 1820s. All of the amended project area (with the exception of one property for which an option to purchase has been agreed to with the current landholder) and some adjoining land, is owned by Regis and is currently used for agriculture (Figure 2.1).

Based on interviews with landholders the main agriculture use of land over the last 10 years has been grazing of beef cattle on unimproved (native) pastures which have had applications of superphosphate and in some cases sub clover. Two of the properties ran sheep in addition to cattle. These two properties had established improved perennial grass/sub clover pastures and regularly grew small areas of oats for fodder. One of the properties that only ran beef cattle had established some improved pastures.

The current carrying capacity for the amended project area was estimated based on information collected during landholder interviews (Table 2.1). The total reported stock numbers were converted to dry sheep equivalents (dse) using conversion factors of 17 dse for cow and calf and 1.7 dse for ewe and lamb (Millear et al. 2005). Based on this information, the 2,909 ha currently owned by Regis or under option to purchase, which covers the amended project area and some adjoining land, is estimated on average to support 25,084 dse at an average carry capacity of 8.6 dse/ha.



KEY

- Sensitive receptors
- Residences under option
- Project-related residences
- Project application area
- Mine development project area
- Disturbance footprint
- Additional (post-closure) disturbance footprint
- Pipeline
- Watercourse/drainage line
- Land ownership status (Regis, 2019)
 - Regis
 - Under option
- Controlling authority
 - Crown
 - Freehold
 - Local government authority
 - NSW government

Regis land ownership

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Agricultural impact statement - addendum
Figure 2.1

Table 2.1 **Agricultural use of properties within the amended disturbance footprint**

Property ID	Total area (ha)	Area within amended disturbance footprint (ha) ¹	Percentage of property within amended disturbance footprint	General nature of agricultural enterprise
Hillside	305	286	94%	Grazing of 80 Hereford cattle and 200 cross bred ewes on improved pasture with regular superphosphate applications. Small area (10 ha) of oats grown for fodder.
Arbour Hills and Undarra	517	396	76%	Forms part of a network of properties in regional NSW. Used to join 600 Angus heifers which are removed prior to calving. Pastures are based on unimproved pastures with topdressing of superphosphate and sub clover.
Koomoorang	468	60	13%	Grazing of 250 Hereford cows and calves on unimproved pastures.
Fleetwood, Cottingly Hill, Alexandria and RTA	292	215	73%	Grazing of 160 Angus cows and calves on unimproved pastures with regular topdressing of superphosphate.
Hopetoun	128	4.5	4%	Grazing of 50 Hereford cows and calves on unimproved pastures, with topdressing of superphosphate.
McPhillamys	257	121	47%	Grazing of 120 Hereford cows and calves, 175 ewes and lambs on unimproved pastures with regular topdressing of superphosphate.
Hallwood	220	0.85	<1%	Grazing of 120-150 Angus cows and calves on improved pastures.
Kings Plains Station	325	12	4%	Grazing of 200 Angus cows and calves as well as 100 goats on unimproved pastures with supplementary feeding.
Dalhunty	21	0	0	Only grazed occasionally to reduce fire risk.
Mungarra	376	2	<1%	Grazing of 1,000 self-replacing merino ewes as well as 50 cows and calves on improved pasture (cocksfoot, rye grass, sub clover mix). Small area (40 ha) of oats grown for fodder.
Total	2,909	1,097	-	-

Note: ¹The total of this column is 1,097 ha. The remaining 19 ha within the disturbance footprint is made up of Crown land (ie road reserves), waterways and land owned by a local government authority. Property names have been used due to changes in ownership and leasing arrangements since the finalisation of the EIS AIS.

The historic carrying capacities used in Table 2.3 of the EIS AIS were utilised in this AIS Addendum.

2.4 Land to be temporarily removed from agriculture

The amended project will disturb an area of approximately 1,116 ha, which will temporarily be removed from agricultural use. The uses to which this land will be put to during mine operation are depicted in Figure 1.2. This is a small reduction in the area proposed to be disturbed in the EIS, which was 1,135 ha.

The disturbance area accounts for less than 1% of the 132,592 ha used for agriculture in Blayney LGA. It is also noted that more than half of the 2,514 ha mine development project area, comprising 1,398 ha, will remain undisturbed by the mine development during operations, with the majority of this land to continue to be used for agricultural (grazing) purposes. In many cases this land will be leased back to the original owner/leasee.

An addendum to the Rehabilitation and Landscape Management Strategy for the mine development has been prepared as part of the Amendment Report (Section 6.17 and Appendix T of the Amendment Report). There is no change to the proposed rehabilitation and closure management measures for the amended project; however, there are minor changes to the areas covered by the post-mining LSC classes due to the project amendments.

Upon completion of mining, all surface infrastructure that is not required to support the post-mining land use will be removed and the area rehabilitated to a condition that is stable and supports the post mining land use, which is typically grazing. As described in the EIS and the Amendment Report, a grazing land use is proposed across most of the rehabilitated mine development project area, with woodland proposed over the waste rock emplacement. All areas where a grazing post mining land use is proposed will be LSC Class 6 or better. Further discussion on the post mining land use is provided in Section 6.17 and Appendix T of the Amendment Report.

Final rehabilitation and project closure requirements will ultimately be developed as part of a detailed closure plan, which will be produced within five years of closure in consideration of input from key government agencies and relevant stakeholders at the time.

2.5 Land to be returned to agriculture post project

As noted above, there is no change to the proposed rehabilitation and closure management measures for the amended project; however, there are minor changes to the areas covered by the post-mining LSC classes due to the project amendments. The projected post-mining LSC classes as a result of the amended project are shown on Figure 2.2.

The amended project is predicted to be associated with a nett reduction of 414 ha of soil with LSC classes 4 (3 ha) and 5 (411 ha) and a nett increase of 348 ha of soil with LSC classes 6 (323 ha) and 7 (25 ha) (Table 2.2). Land where capability is reduced as a result of the project is predominantly in the footprint of the Waste Rock Emplacement and the TSF. The void from the mine pit (66 ha) will have no agricultural value (LSC class 8). However, the LSC class across parts of the TSF footprint will be improved from LSC class 5 pre-mining to LSC class 4 post-rehabilitation. This commitment to rehabilitating the TSF to achieve an LSC class 4 across the final landform to compensate for the loss of some LSC class 4 land in the footprint of the open cut mine, ROM pad, and other infrastructure areas means that there will be only a minimal change (3 ha) in LSC class 4 land across the disturbance area as a result of the project.

Table 2.2 Change in area of each LSC class over the life of the amended project

LSC class	Capability	Pre-mining area (ha)	Post-mining area (ha)	Change (ha)
<i>Land with a wide range of uses (cropping, grazing, horticulture, nature conservation)</i>				
1	Extremely high	0	0	0
2	Very high	0	0	0
3	High	0	0	0
<i>Land with a variety of uses (cropping with restricted cultivation, pasture cropping, grazing, some horticulture, forestry, nature conservation)</i>				
4	Moderate	932	929	-3
5	Moderate-low	1,492	1,081	-411
<i>Land with a limited range of uses (grazing, forestry and nature conservation)</i>				
6	Low	86	409	+323

Table 2.2 **Change in area of each LSC class over the life of the amended project**

LSC class	Capability	Pre-mining area (ha)	Post-mining area (ha)	Change (ha)
<i>Land generally unable to support agriculture (selective forestry and nature conservation)</i>				
7	Very low	4	29	+25
8	Extremely low	0	66	+66

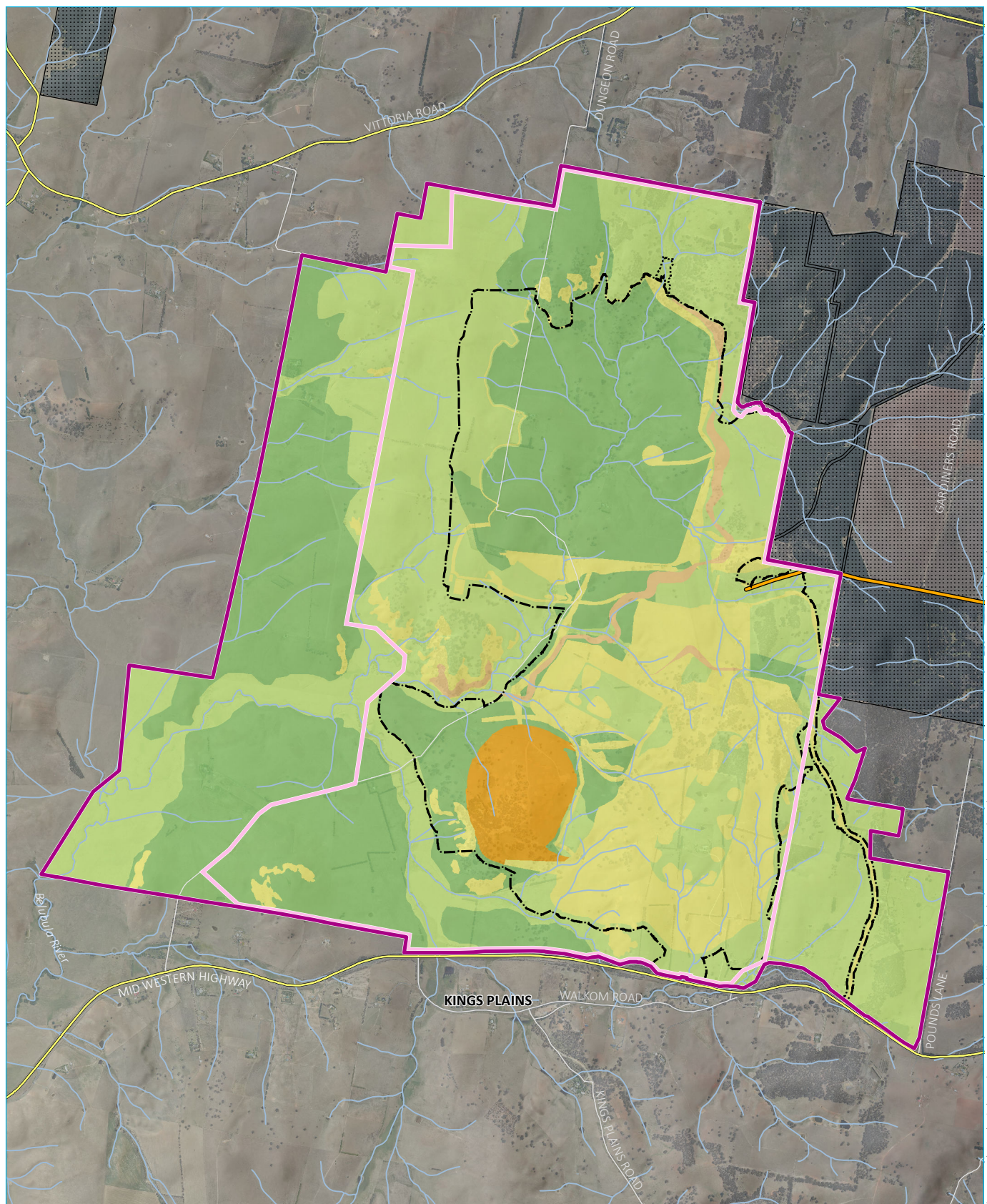
2.6 Land that will not be returned to agriculture

At the end of the mine life the open cut void will remain. Due to the nature of the deposit, this void is unable to be backfilled as mining progresses deeper into the void. The void has been designed with the steepest possible geotechnically stable sides to economically access the ore body and minimise the generation of waste rock. As described in the EIS, there is no opportunity to progressively backfill the void due to the single pit configuration, and any backfilling would prevent access to the ore body at depth. Reclaiming the waste rock to backfill the void after mining has been completed would also both prolong the duration of visual, noise and air quality impacts on sensitive receivers by a number of years and would render the project financially unviable. For these reasons, backfilling of the void is not reasonable or feasible and would exclude the full extent of the resource being mined. The final void will be approximately 450 m deep.

Based on the predicted water table elevations and the work completed by EMM (2020d) and HEC (2020), and consistent with the findings of the EIS, the void is predicted to act as a groundwater sink for around 500 years and may then change to a minor throughflow pit under pseudo steady state conditions. In relation to final void water quality, salinity levels in the void will increase slowly over time as a result of evapo-concentration. As such, there is the potential for water with elevated salts and metals within the pit lake to migrate from the final void in the very long-term (greater than 500 years after mining). However, the rate that the water is predicted to flow from the pit is very low (11 ML/year) (EMM 2020d). HEC estimates that the salinity of the pit lake is predicted to increase due to evapo-concentration, reaching around 1,600 $\mu\text{S}/\text{cm}$ (electrical conductivity) after 1,000 years, which is similar to the current groundwater salinity range.

The amended final void will cover an area of approximately 64 ha, which is a reduction of approximately ha.

Other land where capability is reduced as a result of the amended project is predominately on the batters of the waste rock emplacement and the areas that will be levelled to form foundations for buildings and roads.



Source: EMM (2020); Regis Resources (2020); SoilMan (2020); Survey Graphics (2019); DFSI (2017)

KEY

Project application area

- Mine development project area
- Mining lease application area
(Note: boundary offset for clarity)
- Disturbance footprint
- Additional (post-closure)
disturbance footprint
- Pipeline

Existing environment

- Major road
- Minor road
- Watercourse/drainage line
- Vittoria State Forest

Post mining LSC class

- 4
- 5
- 6
- 7
- 8

Projected post-mining land and soil capability classes

McPhillamys Gold Project
Agricultural impact statement - addendum
Figure 2.2

3 Existing regional agricultural resources

The description of existing regional agricultural resources within the locality (Chapter 3 of the EIS AIS) remains accurate for the amended project, including:

- soil characteristics;
- topography;
- agricultural support infrastructure (including transport routes and general and specialist services);
- water resources and extraction locations (including groundwater and surface water);
- location and type of agricultural activities;
- vegetation;
- climate;
- agricultural enterprises; and
- agricultural employment.

With reference to water resources, as part of the preparation of the Amendment Report, the EIS groundwater and surface water assessments have been updated to reflect the amendments that have been made to the project. The updated assessments are included as Appendix H (groundwater) and Appendix G (surface water) of the Amendment Report (EMM 2020a).

With reference to vegetation, as part of the preparation of the Amendment Report, the EIS biodiversity assessment has also been updated to reflect the amendments that have been made to the project. The updated assessment is included as Appendix M of the Amendment Report (EMM 2020a).

4 Agriculture impact assessment

This section estimates the magnitude of impacts of the project on agricultural resources within the amended project area. The impact assessment takes into account:

- existing land capability and agricultural uses as outlined in Chapter 3 of the EIS AIS;
- the area and length of time that agricultural resources will be impacted by the amended project; and
- the proposed final landform, LSC and land uses (Chapter 2 of this report).

4.1 Impacts on agricultural resources or industries

The key impact of the project on agricultural resources will still be the removal of grazing livestock from disturbed land during the life of the project and the reduced carrying capacity of some land after the disturbed land is rehabilitated. The impact assessment focuses on changes on stock numbers before, during and after the project.

4.1.1 Carrying capacity during the life of the project

Land owned by Regis outside the amended disturbance footprint will continue to generally be used for agriculture during the life of the mine. Much of the land will be leased back to the original owner, so it has been assumed that there will be no change to current management practice on land that will continue to be used for agriculture and therefore no change in carrying capacity.

In contrast, it has been assumed that all land within the amended disturbance footprint will have zero agricultural production during the life of the mine. Although it should be noted that as the development of the waste rock emplacement and TSF will be progressive, some of these areas will be available for grazing during the first few years of the mine operation.

These assumptions have been used to estimate that the carrying capacity on Regis owned land will be reduced by 8,962 dse during the life of the mine (Table 4.1). The reduction in dse during the life of the mine will be 1,102 dse less for the amended project due to the smaller proposed disturbance footprint, when compared with the project design presented in the EIS (ie the EIS AIS estimated a reduction of 10,064 dse).

Table 4.1 Estimate of reduction in carrying capacity during the life of the project

Property ID	Total area (ha)	Before project		Amount of property in disturbance area		Reduction in carrying capacity (dse) ¹
		Total dse	dse/ha	Area (ha)	Proportion (%)	
Hillside	305	1,700	5.6	286	94%	1,602
Arbour Hills and Undarra	517	4,200	8.1	396	76%	3,208
Koomoorang	468	4,250	9.1	60	13%	546
Fleetwood, Cottingly Hill, Alexandria and RTA	292	3,145	10.8	215	73%	2,322
Hopetoun	128	850	6.6	4.5	4%	30
McPhillamys	257	2,338	9.1	121	47%	1,101
Hallwood	220	2,294	10.4	0.85	<1%	9
Kings Plains Station	325	3,570	11	12	4%	132
Dalhunty	21	187	8.9	0	0	0
Mungarra	376	2,550	6.8	2	<1%	14
Total	2,909	25,084	8.6	1,097	-	8,962

Note: ¹ - totals do not add up due to rounding

To estimate the loss in value of agricultural production from this change in carrying capacity, the gross margin for the predominate livestock enterprise (inland store weaners) was taken from the inland store weaner farm budgets compiled by DPI Agriculture (2019). The inland store weaner budgets give a gross value of production of \$40.36/dse and gross margin of \$32.45/dse.

Based on a reduction in carrying capacity of 8,962 dse, the gross value of agricultural production will decline by approximately \$361,706/yr during the life of the mine. This equates to less than 0.9% of the \$42.7M of gross value of agricultural production in Blayney LGA in 2015/16.

4.1.2 Risk matrix for agricultural impacts

No changes to the risk matrix for potential agricultural impacts are required because of the amendments to the project (Table 4.5 of the EIS AIS).

4.2 Consequential effects on agricultural productivity

Although the land will be rehabilitated at the end of the mine life, some areas will have a lower LSC class, hence lower potential carrying capacity after the project is completed. For this reason, there is likely to be a long-term reduction in agricultural productivity resulting from the project.

The proposed rehabilitation methods are described in Section 22.5 and Appendix U of the EIS. These methods remain applicable to the amended project. Rehabilitation monitoring will be carried out throughout the mine life, as will be detailed in the mining operations plan (MOP), to monitor the progress of vegetation establishment over time, and to identify and implement remediation measures as necessary to enhance vegetation establishment.

Preliminary rehabilitation performance indicators and completion criteria for the project are listed in Table 22.4 (grazing and biodiversity) and Table 22.5 (grazing only) of the EIS. Performance indicators for pasture productivity will include carrying capacity (dse/ha). Reporting on rehabilitation activities, monitoring and progress towards achieving agreed rehabilitation criteria will occur in the mine's annual environmental management report (referred to as the Annual Review).

4.2.1 Carrying capacity post mining

Most of the land (96%) within the amended project area has a current LSC class of 4 or 5. These LSC classes are suited to grazing of improved pastures and limited cultivation.

The average carrying capacity of the amended project area prior to the mine development was estimated at 8.6 dse/ha, so it can be assumed that this will be the average carrying capacity of LSC class 4 and 5 land post-mining.

LSC class 6 land is generally only suited to grazing. It is assumed that LSC class 6 will have a carrying capacity of 2.5 dse/ha, which is the average for a good quality native pasture on the southern tablelands (McDonald and Orchard 2015).

LSC class 7 land has very limited agriculture value. It has been estimated it will have a carrying capacity of 1 dse/ha, which is the average for low quality native pastures on the southern tablelands (McDonald and Orchard 2015).

LSC class 8 land has no ability to support agriculture.

Using these assumptions, it is calculated that the carrying capacity of the amended project area will be 2,728.3 dse lower post mining than it was before mining (Table 4.2). This is a reduction of a further 366.3 dse when compared with the EIS AIS.

Based on this change in carrying capacity and the inland store weaner budgets used in Section 4.1.1, the annual gross value of agricultural production from the amended project area will be \$110,114 lower after the project than before. This equates to 0.3% of the \$42.7M gross value of agricultural production in Blayney LGA in 2015/16. This is a further reduction of \$14,741/yr when compared with the EIS AIS. It is also noted that the calculations presented in the EIS AIS assumed a slightly different total area of LSC 5 class land (1,422 ha) and LSC class 6 land (156 ha), when 1,491 ha and 86 ha should have been used, respectively.

Table 4.2 Change in area of each LSC class over the life of the amended project

LSC class	Capability	Before project		After project	
		Area (ha)	Total dse	Area (ha)	Total dse
Land with a wide range of uses (cropping, grazing, horticulture, nature conservation)					
1	Extremely high	0	0	0	0
2	Very high	0	0	0	0
3	High	0	0	0	0
Land with a variety of uses (cropping with restricted cultivation, pasture cropping, grazing, some horticulture, forestry, nature conservation)					
4	Moderate	932	8,015.2	929	7,989
5	Moderate-low	1,492	12,831.2	1,081	9,296.6

Table 4.2 Change in area of each LSC class over the life of the amended project

LSC class	Capability	Before project		After project	
		Area (ha)	Total dse	Area (ha)	Total dse
Land with a limited range of uses (grazing, forestry and nature conservation)					
6	Low	86	215	409	1,022.5
Land generally unable to support agriculture (selective forestry and nature conservation)					
7	Very low	4	4	29	29
8	Extremely low	0	0	66	0
Total		2,514	21,065.4 ¹	2,514	18,337.1
Total reduction in dse post mining					2,728.3

¹Note that this total dse figure is lower than that in Table 4.1, as the figure in this table is just based on the disturbance footprint, whereas the figure in Table 4.1 is based on all the land owned by Regis.

4.3 Uncertainty associated with predicted impacts and mitigation measures

Technical experts in relevant fields have undertaken the impact assessments that form the basis of the EIS and Amendment Report and upon which this report and the EIS AIS are based. Expert reviews of key studies has also been undertaken, including the groundwater assessment and the TSF design.

In addition to the expert review process, specific uncertainty analysis has been conducted on the groundwater model. The surface water model also accounts for variables relating to climate.

Each remedial action, monitoring regime or management action proposed is based on these detailed assessments. The assumptions made and the levels of uncertainty are outlined in each of the technical assessments.

4.4 Further risks

4.4.1 Biosecurity

The movement of machinery onto the project area and increase in vehicle movements present an agricultural biosecurity risk as they could spread animal or plant material or diseases.

This risk will be managed by implementing appropriate machinery and vehicle washdown procedures and restricting unnecessary vehicle movements within the project area. As part of the weed management plan the project area will be regularly monitored for the presence of previously unknown weeds.

A pest and weed management plan will be prepared for the project and will include:

- a weed and pathogen monitoring program to be implemented to minimise impacts to retained vegetation outside the disturbance footprint, but within the project area;
- weed management and pest control programs to be undertaken in consultation with surrounding landholders and based on the results of the weed and pathogen monitoring program; and
- a section that identifies potential biosecurity risks and appropriate management measures.

4.4.2 Pests and weeds

Uncontrolled pests and weeds on the project area have the potential to spread to adjacent agricultural land and impact on its productivity. The presence of pests and weed species have the potential to have a major impact on revegetation outcomes of the post mining land use of agriculture. Additionally, any significant weed species within the surrounding land has the potential to impact on the success of the rehabilitated areas. Weed management will be an important component of rehabilitation activities.

The spread of declared noxious weeds and other invasive weeds that could impact revegetation success and/or plants that are undesirable to grazing stock will be managed across the project area through a series of control measures, including:

- herbicide spraying or scalping weeds;
- post-mining use of rehabilitated areas as a working farm, with associated management practices; and
- rehabilitation inspections to identify potential weed infestations.

Regis monitors properties for the presence of identified problem weeds and pests and implements appropriate control measures. Therefore, it is not anticipated that the project will result in an increased risk of pests or weeds.

Key outcomes of ongoing weed and pest management will be discussed in the project's annual reports (as required), such as the Annual Review.

4.4.3 Erosion and sedimentation

As described in the surface water assessment (Appendix J of the EIS) and updated assessment of the amended project (Appendix G of the Amendment Report), runoff from disturbed areas and establishing rehabilitation will be managed using erosion and sediment control measures designed in accordance with Landcom (2004) and DECC (2008). The following principles, which have been taken from the Landcom (2004) guidelines, underpin the approach to erosion and sediment control for the mine development:

- minimising surface disturbance and restricting access to undisturbed areas;
- progressive rehabilitation/stabilisation of mine infrastructure areas;
- separation of runoff from disturbed and undisturbed areas where practicable;
- construction of surface drains to control and manage surface runoff; and
- construction of sediment dams to contain runoff up to a specified design criterion.

Activities that have the potential to cause or increase erosion, and subsequently increase the generation of sediment, involve exposure of soils during construction of infrastructure (such as during vegetation clearance, soil stripping and earthworks activities) and ongoing mining activities involving clearing and stripping and stockpiling mine materials.

Temporary sediment traps and sediment filters (eg sediment fences) will be installed where necessary downslope of disturbance areas in accordance with Section 6.3.7 of Landcom (2004). These temporary erosion and sediment controls will remain in place until all earthwork activities are completed and the disturbed area is rehabilitated.

An erosion and sediment control plan will be developed to detail the erosion and sediment control measures to be implemented during construction and operation of the project, including the required maintenance and monitoring regime of these controls.

4.4.4 Air quality

The predicted quantity of dust and other emissions from the project was quantified via dispersion modelling, which was undertaken for four stages over the proposed life of the mine in the EIS. An additional stage was modelled as part of the revised assessment prepared for the amended project (ie the Amendment Report (EMM 2020a)).

The results of the modelling show that, for all assessed stages of the amended project, the concentrations and deposition rates for particulate matter (TSP, PM₁₀, PM_{2.5}, dust deposition, metals and metalloids) and gaseous pollutants (NO₂ and HCN) are predicted to be below the applicable impact assessment criteria at nearby residences and therefore represent a negligible risk to agriculture.

4.4.5 Noise and vibration

As part of the Amendment Report, the noise and vibration impact assessment has been updated to reflect the amendments to the project since the public exhibition of the EIS (Appendix J of the Amendment Report). The assessment shows that significant reductions in predicted construction and operational noise levels have been achieved compared to the project design presented in the EIS, from the implementation of the following changes to the construction schedule and project design:

- the relocation of the permanent access road further to the east of the Mid Western Highway;
- use of equipment with a reduced noise output to build WMFs and bunds in the southern area of the waste rock emplacement in proximity to receivers in Kings Plains;
- revision of the waste schedule and development of the waste rock emplacement to optimise topographical shielding and material balance;
- optimisation of mining equipment types, capacity and quantities;
- selection of low noise emitting plant and mobile equipment; and
- optimisation of haul roads and fixed plant areas to exploit topographical shielding.

The results demonstrate that the amended project will have significantly lower noise levels throughout construction and operations when compared with the project presented in the EIS.

In addition to the revised project design, a comprehensive noise monitoring system combined with predictive weather forecasting will allow the project to proactively manage noise emissions via noise management trigger levels, minimising the potential to exceed criteria.

In relation to blasting, and as reported in the EIS AIS, blast effects resulting from the mine development are predicted to be, at worst, for overpressure up to 115 dBZ, and for vibration between 0.1 mm/s and 1.3 mm/s (Appendix L of the EIS). These levels are well below regulatory criteria and considerably lower than other sources of overpressure that horses or livestock are likely to be already subjected to (eg lightning strikes which are typically between 120 dBZ and 130 dBZ).

As noted in Section 10.7.4 (noise) and Section 11.5.3 (air quality) of the EIS, blasting will be conducted in accordance with a blast management plan, which will include blast monitoring at various distances from the blast site and maintenance of a blast monitoring log. The blast management plan will also include:

- a notification procedure to notify nearby landholders prior to blasting events; and

- a complaints handling procedure to ensure queries relating to blasting are recorded and effectively responded to.

4.4.6 Traffic

As reported in the EIS AIS, the traffic and transport assessment report (Appendix Q of the EIS) concluded that the project will not result in any significant impacts on the performance and capacity of the local road networks.

A new location for the site access intersection off the Mid Western Highway compared to that presented in the EIS is proposed, approximately 1 km east of the original location assessed in the EIS, in response to feedback from TfNSW and the community. A new alignment is subsequently proposed for the site access road to the mine administration and infrastructure area.

The majority of the project-related increase in traffic will be associated with staff movements and will be concentrated around shift changes at either end of the day. Therefore, outside of these periods, impacts on agriculture-related uses of the road network during the day will be minor.

A comprehensive transport management plan, including a driver's code of conduct, will be developed to control project-related traffic movements and driver behaviour within the project area and on the surrounding road network. This will include identification of preferred travel routes to and from the project area.

4.4.7 Water resources

i Changes to the water management system

The design of the water management system has been revised resulting in further avoidance of impacts to known items of historic heritage and a reduced likelihood of spill from the storages within the operational water system. The secondary water management facility (WMF) has been removed from the water management system to avoid impacts to MGP-23 (Hallwood Farm Complex). In addition:

- a new Main WMF is proposed in the south-east corner of the TSF;
- the size of the Primary WMF has been reduced and it has been renamed the Site Runoff WMF to better describe its function;
- the capacity of the WMFs collecting runoff from the waste rock emplacement area have increased to ensure these WMFs do not spill; and
- the design of the clean water diversion system has been revised including improvements to the design of the post-closure clean water diversions. This includes the addition of a diversion around the eastern side of the TSF in the final landform design to facilitate the flow of rainfall runoff from the upstream catchment around the TSF downstream.

The description of the surface water management system for the mining development has been updated and is summarised in Chapter 2 of the Amendment Report (EMM 2020a) and described in detail in the revised surface water assessment (Appendix G of the Amendment Report).

The objective of the water management system will still be to control the volume of poor quality water generated by the mine development by maximising its reuse and by limiting and avoiding the contamination of clean water.

The amended layout of the water management system is illustrated in Figure 2.11 of the Amendment Report.

ii Groundwater

A comprehensive groundwater assessment for the project has been undertaken by EMM and is presented in Appendix K of the EIS. An addendum to this assessment has been prepared to account for the amendments to the project since the public exhibition of the EIS (Appendix H of the Amendment Report).

During mine operation, water will be principally sourced externally via a pipeline transferring surplus water from Centennial's Angus Place Colliery and Springvale Coal Services Operations and Energy Australia's Mt Piper Power Station near Lithgow, to the mine development. The supply of water from the above locations will enable a beneficial use of otherwise surplus water from mining in the Sydney Basin and provides a reliable water source for the project.

During construction, water will be predominately used for dust suppression. The pipeline will be operational approximately nine months after commencement of the project, and therefore a water supply will be required for the first nine months of the construction stage prior to the commissioning of the pipeline. The construction water demand is estimated to be 15 to 20 L/sec depending on climatic conditions, with a maximum total of 470 ML for the initial nine months.

Since the submission of the EIS, groundwater investigations have been completed to consider the potential for groundwater to provide the initial project water supply and to assess the potential impacts on groundwater users and the environment. This investigation confirmed that the construction water supply can be primarily sourced from groundwater via production bores within or close to the mine development area. The construction water supply assessment is appended to the groundwater addendum (Appendix H of the Amendment Report). Two test bores, TPB4 and TB05 were installed as part of the groundwater investigation.

Potential impacts from drawdown as a result of sourcing construction water from groundwater bores have been assessed by EMM based on the results of the groundwater investigation and location of sensitive receptors. Results indicate that:

- localised groundwater level drawdown around the production bores extend no more than 500 m;
- there are no third-party bores within the extent of modelled drawdown;
- the predicted extent of drawdown will be significantly less than the predicted drawdown from the open cut pit; and
- a temporary reduction in baseflow contribution of 0.7 ML (2.5 kL/day) to the Belubula River is estimated in the vicinity of TPB4 during the nine month period¹. Users downstream of the mine development who rely on and access water from the Belubula River will not experience a reduced access to water.

During mining, the total annual mine water inflow into the open cut is predicted to peak in year 2 at 580 ML/yr, with a second slightly smaller peak in year 5 at 557 ML/year and declines to 160 ML/year in mining year 11. The predicted peak dewatering for the amended project is lower than the previous simulated mine schedule due to the steadier development profile scheduled over the first years of the amended project.

Once mining concludes, the void will gradually fill with water. The ongoing interception associated with pit inflow and evaporation loss will also require licensing. The volume of pit inflow is predicted to reduce following cessation of mining and after five years will reduce to approximately 200 ML/yr. The volume of water inflowing to the pit void is predicted to remain at approximately 66 ML/yr up to approximately 500 years post-mining.

¹ Based on the existing understanding of the Belubula River (HEC 2020, EMM 2020d), this is a minor change and not expected to be measurable.

Based on the above, the maximum take of groundwater which will need to be accounted for by WALs is 580 ML/yr, which is predicted to occur in mining year 2.

The groundwater inflow is sourced from the Lachlan Fold Belt Murray Darling Basin (MDB) Groundwater Source, with a very minor contribution over time from the overlying water source. Regis has secured groundwater licences, totalling 400 shares (equivalent to 400 shares) in the Lachlan Fold Belt Murray Darling Basin Groundwater Source to licence groundwater abstraction for the project (WAL 41835). Therefore, up to an additional 180 ML will be required in year 2 to meet the peak requirement. There are sufficient licence entitlements available in the Lachlan Fold Belt MDB Groundwater Source for this take, and the take required to meet construction water demand. Regis successfully submitted a registration of interest for 200 unit shares for the most recent controlled allocation order (*Controlled Allocation Order (Various Groundwater Sources) 2020*) on 22 July 2020.

The groundwater model predicts that groundwater levels at existing privately-owned bores in the vicinity of the mine will experience little to no change as a result of the project. All bores will experience a cumulative pressure head decline of less than 2 m, which the NSW *Aquifer Interference Policy* (DPI 2012) defines as ‘minimal impact’.

The project is predicted to have an insignificant impact on changes to spring flows outside the project area. The groundwater model also predicts that with the implementation of the proposed management and mitigation measures the risk of the project impacting on groundwater quality is negligible.

As the project will have a minimal impact on groundwater availability at private bores and an insignificant impact on groundwater quality it will not adversely impact agricultural groundwater use in the vicinity of the project.

The proposed groundwater monitoring approach is discussed in Section 5.2.2 of this report and Appendix H of the Amendment Report. Groundwater monitoring (including levels and quality) has been conducted since May 2014, with more frequent monitoring occurring from December 2016. Groundwater monitoring data will continue to be collected throughout the life of the mine. The monitoring program will provide an early indication of potential impacts to sensitive receptors, including existing groundwater users (as well as groundwater dependent ecosystems and the Belubula River).

A water management plan (WMP) will be prepared for the project, which will document the proposed mitigation and management measures for the approved project and will include the surface and groundwater monitoring program, reporting requirements, spill management and response, water quality and level trigger levels, corrective actions, contingencies, and responsibilities for all management measures.

Two types of triggers will be defined for groundwater quality and quantity, the first will be a performance trigger and the second an early warning trigger (assigned, for example, as 75% of the performance trigger). Response (review, further investigations and evaluation) will be required when the early warning trigger is exceeded and, depending on the results, action may be required to implement mitigation measures to ensure the performance trigger is not exceeded. In terms of groundwater heads, review will also be required if there is divergence observed from model predicted heads. Triggers will also be assigned based on distance from the water affecting activity (ie TSF, open cut, etc) and will be based on a typical Source-Pathway-Receptor assessment approach.

iii Surface water

A comprehensive surface water assessment for the project has been undertaken by HEC and is presented in Appendix J of the EIS. An addendum to this assessment has also been prepared to account for the amendments to the project since the public exhibition of the EIS (Appendix G of the Amendment Report).

A water management system has been developed for the project comprising structures and associated operational procedures to manage:

- clean water (ie runoff from undisturbed or established rehabilitation areas);

- development/construction water (ie runoff from disturbed areas and unestablished rehabilitation which potentially contains elevated levels of sediment); and
- operational water (ie runoff from mining areas such as haul roads, the waste rock emplacement, hardstand areas and the open cut as well as imported pipeline supply water).

During mining, the majority of clean water will be diverted around the mine development via a series of diversion drains, dams, pumps and pipelines. Post mining, all catchment areas (with the exception of the final void) will be either undisturbed or would have been rehabilitated and hence would be part of the clean water system. Permanent clean water diversion channels would be constructed to allow a free-draining landform.

Water management infrastructure has been sized to meet the mine development water demand requirements, with the capacity to store all surplus water generated by the mine development without the need to release operational water to the Belubula River. The overarching objective of the water management system is to control the volume of poor quality water generated by the mine development by maximising its reuse and by limiting and avoiding the contamination of clean water.

The mine development will use excess water from mining and power generation operations in the Lithgow area as its primary raw water supply, enabling a beneficial use of otherwise excess water. This also means that the reliance on other local sources of water, such as bores and other surface water sources is reduced, thereby minimising impacts on other local agricultural water users.

A temporary reduction in the median annual inflow to Carcoar Dam (approximately 4% or 186 ML/year) will occur as a result of construction and operation of the mine. This percentage reduction is consistent with the EIS findings. Permanently, following mine closure and rehabilitation, the reduction in median annual flows will be much smaller (approximately 0.5% or 21 ML/year). These levels of change are expected to be imperceptible in comparison with the natural variability in catchment conditions. The small loss of reporting catchment area to Carcoar Dam is considered to represent a negligible risk to increased storage vulnerability and lower storage reliability as a result of project-related flow reductions entering Carcoar Dam.

Mitigation measures have been proposed to manage potential impacts on surface water quality downstream of the mine during construction and operations. A detailed monitoring program will be developed for the project comprising baseline monitoring, operational monitoring and post closure monitoring. The water quality monitoring program for the project area will be continued through the operational phase with additional streamflow, channel stability, water quality, erosion and sediment control, water inventory and water use, sourcing and pumping monitoring proposed.

The performance of the water management system will be reviewed annually using the monitored data in combination with the site water balance model to identify changes in the system and compare against predictions. In the event of unforeseen impacts or impacts in excess of those predicted, contingency measures have been proposed, including:

- conducting additional monitoring (eg increase in monitoring frequency or additional sampling locations) to inform the proposed contingency measures;
- refinements to the water management system design such as additional sedimentation dams, increases to pumping capacity, installation of new structures as required to address the identified issue;
- the implementation of stream remediation measures and possible additional controls (eg rock armouring) to reduce the extent and effect of erosion; and/or
- the implementation of revegetation measures in conjunction with other stabilisation techniques (as required) to remediate impacts of vegetation loss due to erosion.

4.4.8 Socio-economic impacts

i Agricultural support services and processing and other value-adding industries

The project's potential impacts on the agricultural industry arise from the occupation of agricultural land by a non-agricultural enterprise. This is limited to the land on which project infrastructure will be located, with no anticipated constraints on the current or potential agricultural uses of nearby land.

As reported in the EIS AIS, the Central Tablelands Livestock Exchange is located 10 km south-west of Blayney and is the main livestock selling centre for the central tablelands area of Orange, Blayney, Bathurst, Oberon, Molong, Canowindra and Cowra. In 2018, there were 442,868 sheep and 163,993 cattle sold through the Central Tablelands Livestock Exchange. Due to the large number of animals sold through the livestock exchange annually, the reduction in numbers sold caused by the removal of 1,116 ha from agricultural grazing use would be insignificant.

The project's disturbance area accounts for less than 1% of the land currently used for agriculture in Blayney LGA. Consequently, there will only be a negligible reduction in the demand for agriculture support services available in Blayney which include: machinery sales and service; farm supplies (animal health, seed, fertiliser, chemicals, fencing materials), stock and station agents, veterinary practices, agricultural consultants and professional services (legal and accountancy).

The economic impact assessment (Appendix DD of the EIS) found that the removal of grazing livestock from the disturbance footprint during the life of the project will be inconsequential to the regional economy and agricultural support industries.

As described in Section 37.3 of the EIS, there are a number of other extractive industry/industrial developments that occur in the region around the project area (eg Cadia Valley Operations, Blayney Industrial Estate and various quarrying operations). The potential for cumulative impacts from the project with these developments was considered in Table 37.2 of the EIS.

Based on a reduction in carrying capacity of 8,962 dse, the gross value of agricultural production will decline by approximately \$361,706/yr during the life of the mine. This equates to less than 0.9% of the \$42.7M of gross value of agricultural production in Blayney LGA in 2015/16.

The carrying capacity of the amended project area is anticipated to be 2,728.3 dse lower post mining than it was before mining (Table 4.2). Based on this reduction in carrying capacity, the gross value of agricultural production from the amended project area will be \$110,114/yr lower after the project than before. This equates to 0.3% of the \$42.7M gross value of agricultural production in Blayney LGA in 2015/16.

Based on the total area of land that will be removed from agricultural grazing use as a result of the amended project (both during the life of the project and post-mining) and the limited reduction in the gross value of agricultural production, cumulative impacts on agricultural productivity in the Blayney LGA are expected to be minimal. The amended project will not result in significant cumulative impacts with other known developments on surrounding land uses and sensitive receptors.

ii Visual impact assessment

As described in the EIS AIS, the project design has progressively evolved to reduce its scale and impacts, including visual impacts, particularly through the specific siting of mine infrastructure such that they will be shielded from view by existing topography and vegetation. However, the project will result in some significant changes to the landscape, particularly through the construction of the waste rock emplacement.

A visual impact assessment (VIA) was carried out for the EIS (Appendix S of the EIS) and was updated to reflect the amendments to the project (VIA Addendum – Appendix R of the Amendment Report). The amendments to the project do not change visual impact levels for those with views to the mine development; however, the duration of ‘high’ visual impacts (generally for residences in Kings Plains) has been extended from two to four years (EIS) to up to six years (amended project). After six years, visual effects and impacts will become consistent with the EIS VIA (ie progressively lowering as rehabilitation is implemented and becomes established across the southern face of the amenity bund and pit bund).

As a result of the amendments to the project and the outcomes of the VIA Addendum, Regis will engage with additional residences to the south and south-west of the mine development project area to determine options for residential landscape mitigation treatments to screen or mitigate visual amenity impacts. Negotiated agreements will also be offered to four property owners where off-site landscaping will not reduce impacts.

Following completion of a number of strategic on-site mitigation treatments and rehabilitation establishment, visual effects will be reduced but will remain moderate to high for many components over the life of the mine operations where there are direct views onto operational components. However, this reduction will be significant in the long-term as the new post mining landforms become integrated with the surrounding rural landscape character via the inclusion of micro-topographic design into the waste rock emplacement and careful rehabilitation of tree planting patterns.

iii Lighting

Existing sources of night lighting in the immediate vicinity of the project area are minimal due to its rural setting. The main sources are rural residential properties, farm machinery and vehicles on roads.

As a result of the amendments to the project, previous direct lighting effects from the movement of project-related vehicles operating at night will no longer occur as operations on the southern face and amenity bund will be limited to day time hours only.

There may be some direct lighting above the pit bund up to Year 4. The source of this lighting will be stockpiling activity on the ROM pad (ie within the infrastructure area). After Year 4, the effects will be more attributed to skyglow on the skyline of the pit and amenity bund.

Street lighting at the revised access road intersection with the Mid Western Highway will be visible from nearby residences. Localised vegetation near the intersection may provide some screening of lighting. The revised alignment of the site access road may also create headlight spill from project-related vehicle movements. Headlights will be visible from residences on north-facing hills adjacent to site access road (eg R15).

Australia Standard 4282 (AS4282) Control of Obtrusive Effects of Outdoor Lighting sets out guidelines for the control of the obtrusive effects of outdoor lighting and gives recommended limits for relevant lighting levels to contain these effects within tolerable levels.

Lighting protocols for the project will adopt the following principles:

- operational protocols for setting up of mobile lighting plant will require lighting is directed away from external private receptors;
- lighting sources will be directed below the horizontal to minimise potential light spill;
- light systems will be designed to minimise wastage;
- screening of lighting will occur where possible, for viewers internal and external to the project; and
- lighting of light-coloured surfaces, which have greater reflectivity, will be avoided.

In relation to lighting effects, the proposed suite of mitigation measures will help to reduce direct and indirect lighting impacts from the project (Section 19.9.4 of the EIS, and Section 6.14 of the Amendment Report).

The potential for night-lighting impacts on the BeeKeepers Inn was raised by DPI Agriculture in their submission on the EIS. The BeeKeepers Inn is approximately 3 km from the northern boundary of the project area, and comprises a commercial honey business, café and farm shop.

As can be seen in Figure 5.6 of the EIS, the Vittoria State Forest is in the direct line of sight between the BeeKeepers Inn and the mine infrastructure area of the mine development, providing shielding to the property from where the main source of direct lighting will be.

Further, based on a review of available literature with respect to night lighting and bees, it is noted that:

- forager bees are more likely to be asleep during the night than day (Klein et al 2014) and are therefore less active during this period and less likely to be exposed to lighting from the project; and
- a number of honey bee species have been classified as 'high light active' or diurnal (Gaston et al 2012) and are therefore more active during the day period and less likely to be exposed to lighting from the project.

iv Tourism

While the agricultural landscape provides an attractive backdrop, there are no specific agricultural-related tourist attractions within the immediate vicinity of the project area. The main agricultural-related tourist attractions of the central tablelands are vineyards and orchards which are predominately in the vicinity of Orange.

As noted in the section above, the Beekeepers Inn, a commercial honey factory, café and farm shop, is approximately 3 km north-east of the project area. It is accessed from the Mitchell Highway and is not within line of site of the project area.

Due to the combination of a number of factors including distance, topography and weather conditions, no impacts relating to noise or air quality are anticipated at the BeeKeepers Inn. Predicted noise and dust levels at the property are well below government-set criteria and the property will not have any views of the mine. Therefore, adverse impacts on this business are not anticipated.

Potential impacts to apiarian activities associated with the Beekeepers Inn are associated with a loss of habitat because of project-related vegetation clearance activities.

The Beekeepers Inn periodically place their beehives in the Vittoria State Forest, adjacent to the project area. The project area contains Yellow Box trees (Box Gum Woodland) which provide pollen for the bees; some of which will be cleared for the project. The TSF in the northern part of the project area has been reduced in size to avoid clearing some of the Yellow Box. Importantly, the amended biodiversity assessment (Appendix M of the Amendment Report) states that the project will result in a reduction of just 1.8% in the extent of Box Gum Woodland within a 5 km radius of the project area. In addition, Regis has raised the option of Goldfields Honey and Cottesbrook Honey using alternate Regis-owned land for their beehives, to ensure adequate access to pollen for the bees.

In response to the submissions received relating to bees during the public exhibition of the EIS and ongoing stakeholder engagement, Regis engaged Environmental Risk Sciences Pty Ltd (EnRiskS) to undertake a further review of the project's potential to impact on bees and the local honey industry. The report produced by EnRiskS is attached as Appendix D of the Submissions Report (EMM 2020c) and includes consideration of the potential impacts on bees from dust blown from the project area directly on to plants that bees visit, as well as indirectly when bees drink water that may be impacted by dust from the mine. The report also considered the potential impact of bees being exposed to water within the TSF and other mine-affected water sources.

The assessment concludes that adverse impacts to bees as a result of exposure to metals in dust or via water in the TSF are not anticipated given that:

- concentrations of metals in soils due to the deposition of dust from the project are predicted to be below soil quality guidelines that are protective for soil organisms that live in or on the soil for their entire lifecycles;
- concentrations of metals in water due to deposition of dust from the project are estimated to be below water quality guidelines that are protective for aquatic organisms that live in the affected water for their entire lifecycles;
- concentrations of metals that may mix with nectar or pollen in plants surrounding the mine development area are estimated to be below concentrations that might indicate effects on the survival or health of bees;
- concentrations of metals or cyanide that may be present in water in the TSF are estimated to be below concentrations that might indicate effects on the survival or health of bees; and
- concentrations of metals that could be present in honey are within or below general levels reported for honey worldwide.

v Local and regional employment

As discussed in the EIS AIS, the project is anticipated to have a peak construction workforce of approximately 710 full-time equivalent (FTE) workers. During operations, an average workforce of around 260 FTE employees will be required, peaking at approximately 320 FTEs in around years four and five of the project. This remains the same for the amended project.

The social impact assessment (Appendix T of the EIS) considered the potential impacts of job creation on other sectors. There is a risk that the project could displace other economic sectors, particularly tourism, agriculture and government services, by taking up a sizeable portion of the employed and unemployed labour pool during both construction and operation, and through inflationary impacts on wages, trades and services. This impact is likely to be most significant during the construction phase due to the size of the project workforce. During this phase, the project is likely to draw on the labour pool associated with a range of trades including mechanics, electricians, welders and labourers.

A labour market study carried out by Hansen Bailey (2018) reported on a workforce characteristics study conducted at the nearby Cadia Valley Operations (CVO), which found that the most common occupation prior to joining CVO were trades works (31%), plant or equipment operators (23%) and general labourers (14%). 13% of CVO staff were previously employed in the agriculture, forestry and fishing sector.

People working in agriculture have transferable skills suitable to the mining industry and to the project. There is the potential for the project to attract workers from the agricultural sector, particularly from the younger age brackets (25-45 years).

It is difficult to predict how many people currently working in other industry sectors in the Blayney LGA and broader region will move to new occupations in the mining and resource sector as a result of the project. The impact of the project on local labour supply will be influenced by the potential demand for local hires and the number of flow-on jobs generated in the Blayney LGA by the project.

To ensure that potential adverse impacts on labour supply in the non-mining sector are minimised, Regis will monitor local labour supply and adjust local labour recruitment practices and rates accordingly. Regis will support the local provision of education and training opportunities in the non-mining sector. Additional opportunities in the local area such as partnerships with NSW TAFE will be investigated as project planning progresses.

In addition, Regis will work with other developers (eg Newcrest Mining – as owners of CVO) and relevant stakeholders to coordinate activities and workforce management programs that minimise the cumulative impacts of temporary workforces on the community of Blayney and surrounds.

As discussed in Section 20.6 of the EIS and Section 6.15 of the Amendment Report, a number of social impact management frameworks will be developed for the project, including a workforce accommodation and workforce management framework, which will be developed to mitigate and manage the impact of the project workforce on the Blayney LGA.

5 Mitigation measures

5.1 Review of project design and alternatives

The project design is the result of an iterative process undertaken to achieve a design that represents leading practice in open cut gold mining, providing efficient extraction of the resource, environmental protection and socio-economic benefits.

As noted in Section 1.1, in response to issues raised in submissions received during the public exhibition of the EIS, as well as a result of further detailed mine planning and design, Regis has made a number of further refinements to the project. The amendments that have been made to the project design since the public exhibition of the EIS are discussed in Chapter 2 of the Amendment Report (EMM 2020a).

As noted in Section 2.1, the site layout was amended during the preparation of the EIS to specifically avoid areas of potential BSAL identified in the western portion of the project area. The disturbance footprint avoids BSAL.

5.2 Monitoring and management

5.2.1 Pests and weeds

The spread of declared noxious weeds (and other invasive weeds that could impact revegetation success and/or plants that are undesirable to grazing stock) will be managed across the project area through a series of control measures, including:

- herbicide spraying or scalping weeds;
- rehabilitation inspections to identify potential weed infestations;
- vehicle washdown procedures; and
- post-mining use of rehabilitated areas as a working farm, with associated management practices.

A pest and weed management plan will be prepared for the project and will include:

- a weed and pathogen monitoring program to be implemented to minimise impacts to retained vegetation outside the disturbance footprint, but within the project area; and
- weed management and pest control programs to be undertaken in consultation with surrounding landholders and based on the results of the weed and pathogen monitoring program.

5.2.2 Water resources

i Overview

Two main WMPs will be developed for the project post-approval: one for the construction phase (CWMP) and one for the operational phase (OWMP). The WMPs will document the proposed mitigation and management measures for the approved project and will include the surface and groundwater monitoring program, reporting requirements, spill management and response, water quality trigger levels, corrective actions, contingencies, and responsibilities for all management measures.

The WMPs will be prepared in consultation with DPIE Water, EPA and the Natural Resources Access Regulator (NRAR) and will consider concerns raised during the exhibition and approvals process for the project. The WMPs will include details of:

- the surface water and groundwater monitoring program, including the monitoring network;
- monitoring frequencies;
- water quality constituents;
- physical water take and pumping volumes between water storage structures (including the open cut mine);
- trigger levels for water quality parameters to assist in early identification of water quality trends (including TSF seepage migration);
- a trigger action response plan;
- an erosion and sediment control plan;
- groundwater quality performance and early warning triggers based on statistical analysis of the reported ranges in baseline concentrations of identified analytes of concern (eg pH, salinity concentrations, and concentrations of other analytes);
- groundwater 'quantity' (head) performance will be based on a combination of baseline head data for selected monitoring bores as well as comparison of observed and model predicted heads for different stages of mine development (operational and closure); and
- a program for reviewing and updating the numerical groundwater model as more data and information become available.

ii Groundwater

The groundwater monitoring program will provide an early indication of potential impacts to sensitive receptors, including existing groundwater users (as well as groundwater dependent ecosystems and the Belubula River).

Two types of triggers will be defined for groundwater quality and quantity, the first will be a performance trigger and the second an early warning trigger (assigned, for example, as 75% of the performance trigger).

Response (review, further investigations and evaluation) will be required when the early warning trigger is exceeded and, depending on the results, action may be required to implement mitigation measures to ensure the performance trigger is not exceeded.

In terms of groundwater heads, review will also be required if there is divergence observed from model predicted heads. Triggers will also be assigned based on distance from the water affecting activity (ie TSF, open cut, etc) and will be based on a typical Source-Pathway-Receptor assessment approach.

iii Surface water

The performance of the project's water management system will be reviewed annually using the monitored data in combination with the site water balance model to identify changes in the system and compare against predictions. In the event of unforeseen impacts or impacts in excess of those predicted, contingency measures have been proposed, including:

- conducting additional monitoring (eg increase in monitoring frequency or additional sampling locations) to inform the proposed contingency measures;
- refinements to the water management system design such as additional sedimentation dams, increases to pumping capacity, installation of new structures as required to address the identified issue;
- the implementation of stream remediation measures and possible additional controls (eg rock armouring) to reduce the extent and effect of erosion; and/or
- the implementation of revegetation measures in conjunction with other stabilisation techniques (as required) to remediate impacts of vegetation loss due to erosion.

5.2.3 Air quality

Regis will develop and implement a comprehensive air quality management plan (AQMP), which will be prepared in consultation with the NSW Environment Protection Authority (EPA) and to the satisfaction of DPIE, in accordance with the recommendations of the AQIA prepared for the EIS (Appendix M) and Amendment Report (Appendix L). The AQMP will document management practices and mitigation measures to minimise air emissions from all stages of the project. Regis will continue to undertake a comprehensive air quality monitoring program throughout the life of the project, as per the commitments in the EIS and Amendment Report, including installation of a real time monitoring network during the life of the project. The results of this air quality monitoring program will be reported in the annual environmental management report (referred to as the Annual Review), which will be required as a condition of the development consent. This Annual Review will be submitted to relevant government agencies on an annual basis and will be made publicly available on the Regis website.

In order to control particulate matter emissions from the project, Regis will implement a range of mitigation measures and management practices, including:

- chemical dust suppressants will be applied to high traffic routes exiting the pit to the ROM pad and to the waste rock emplacement and all other unpaved transport routes (eg pit, ramps, topsoil haulage) will be controlled through water suppression;
- a road speed limit of 60 km/hr will be posted to all internal roads; however, it is noted that the average travel speed of material haul trucks is less than 40 km/hr;
- the design of crushers, screens and associated transfer points at the processing circuit will include dust control, dust extraction and / or filter systems;
- all exposed conveyors at the processing circuit will be covered;
- water sprays will be utilised at the ROM pad hopper / primary crusher dump pocket;
- ROM pad operations will be controlled through the use of water carts and / or water sprays;
- the fine ore stockpile will be covered;
- in pit drill rigs will be fitted with dry filter capture devices;
- wet suppression via water carts will be applied to dozer activity areas for waste rock and topsoil operations; and

- topsoil stockpiles, waste rock dumps and TSF walls will be progressively rehabilitated through hydro mulching, hydro seeding, or similar.

The mitigation and management measures committed to are in accordance with accepted industry best practice.

5.2.4 Noise

As described in Section 4.4.5, the noise and vibration impact assessment, which has been updated to reflect the amendments to the project since the public exhibition of the EIS (Appendix J of the Amendment Report) shows that significant reductions in predicted construction and operational noise levels have been achieved, compared to the project design presented in the EIS, from the implementation of a number of key changes to the construction schedule and elements of the project design. These include the use of equipment with reduced noise output to build water management facilities and bunds in the southern area of the waste rock emplacement in proximity to receivers in Kings Plains; development of a waste schedule and construction sequence of the waste rock emplacement to optimise topographical shielding and material balance; and the optimisation of mining equipment types, capacity and quantities.

In addition to the revised project design, a comprehensive noise monitoring system combined with predictive weather forecasting will allow the project to proactively manage noise emissions via noise management trigger levels, minimising the potential to exceed criteria.

A noise management plan (NMP) will be implemented to guide, manage, quantify and control noise emissions from the project. The NMP will detail the noise monitoring program and also a complaints handling procedure to ensure queries relating to noise are recorded and effectively responded to. The key features of the NMP will include:

- Equipment noise levels:
 - selection of equipment to meet the sound power levels specified in the noise and vibration assessment;
 - maintenance of equipment to meet their specified sound power level; and
 - regular testing and measurement of equipment noise levels.
- Development of the pit and waste rock emplacement:
 - construction of the pit amenity bund;
 - haul roads from the pit to ROM and waste rock emplacement to utilise natural topographical shielding and localised noise bunds wherever possible;
 - development of the waste rock emplacement in accordance with the schedule proposed in the Amendment Report;
 - allocation of equipment fleets to undertake bund construction, lifts and rehabilitation works on the southern face of the waste rock emplacement in the daytime only; and
 - sequential construction of WMF4, WMF5 and WMF6 to avoid highly noise intensive activities, as described in the Amendment Report.

- Operations:
 - utilise predictive weather forecasting to identify potential very noise enhancing conditions;
 - implement triggers from noise monitoring terminals when noise levels are approaching the relevant criteria; and
 - evaluate noise levels, weather conditions and current mining activities to proactively reduce equipment numbers or redirect operations to more shielded areas, particularly for haul trucks during the evening and night time periods working on the waste rock emplacement.

5.2.5 Transport

As noted in Section 4.4.6, a comprehensive transport management plan, including a driver's code of conduct, will be developed to control project-related traffic movements and driver behaviour within the project area and on the surrounding road network. This will include identification of preferred travel routes to and from the project area.

The transport management plan will be prepared in consultation with TfNSW and Blayney Council and to the satisfaction of DPIE. This will provide these stakeholders an opportunity to review and provide comment on the proposed mitigation and management measures in greater detail following project approval.

5.3 Capacity to rehabilitate disturbed lands

A comprehensive Rehabilitation and Landscape Management Strategy for the project has been prepared by EMM and is included as Appendix U of the EIS. The strategy has also been updated to reflect the amendments to the project and is included as Appendix T of the Amendment Report. A summary is provided below.

5.3.1 Rehabilitation goals and post mining land use

The proposed post mining land uses for the amended project are the same as those proposed in the EIS Rehabilitation and Landscape Management Strategy. The overarching rehabilitation objective of the project is to restore the land as much as possible to its pre-mining land use at the end of its operational life; that is, primarily an agricultural land use comprising grazing on improved pasture while improving the biodiversity values of the area lost due to past agricultural clearing by re-establishing endemic open-woodland communities on the waste rock emplacement as part of the rehabilitation program. The final void will remain a void.

The anticipated carrying capacity of the project area post mining is discussed in Section 4.2.1.

The rehabilitation objectives are detailed in Table 5.1 of the EIS AIS. The primary changes to the project and how these relate to the proposed post mining land use are as follows:

- Water management areas: The post-closure water management system has been revised as part of the amended project, particularly around the TSF. The number of water management facilities will change but no change in rehabilitation or closure measures.
- Soil stockpiles: The area of soils stockpiles has changed; however, the post-mining land use remains the same for this domain.
- Waste rock emplacement: The construction sequence of the waste rock emplacement has changed; however, the overall shape, size, final landform and final land use has not been changed from what was presented in the EIS.

- Final void: There is a very small change to the shape of the open cut pit as a result of design optimisation (it is 10 m shallower, from 460 m in the EIS to 450 m). However, the final land use has not changed.

The rehabilitation methods (ie soil management, establishment of vegetation, fauna and habitat enhancement measures, erosion and sediment control and post-closure maintenance) have not changed as a result of the amendments to the project and are the same as those proposed in the EIS Rehabilitation and Landscape Management Strategy (Chapter 5 of Appendix U of the EIS).

Rehabilitation works to be undertaken during the closure phase will replace sufficient soil in some areas (eg the TSF) to achieve LSC Class 4, which would be suitable for agricultural land uses including cropping with restricted cultivation, pasture cropping, grazing, some horticulture, forestry and nature conservation (OEH 2012); however, due to a focus on protection of the tailings cover and propensity of project soil for waterlogging, a grazing post mine land use is proposed instead of cropping. Sufficient depth of subsoil and topsoil will be placed on the top sections of the waste rock emplacement that will allow a LSC Class of 5 and LSC Class 6 on slopes (LSC Class 6 is due to slope limitations not soil depth); however, given the focus on protecting the integrity of the waste rock emplacement landform, potentially acid forming (PAF) material cells and capping layers from erosion, grazing will be excluded via fencing and native woodland and forest species established.

Where required to support the proposed post mining land use, some soils will be ameliorated with lime during the stripping phase at rates determined by site specific testing, to address the soil acidity and aluminium toxicity and therefore are likely to produce more productive pastures than currently exists.

To ensure viable pastures for grazing, adequate depths of subsoil and topsoil will be replaced and appropriately ameliorated. The TSF is proposed to be LSC Class 4 which will have a 0.5 m deep trafficking and capillary break layer, approximately 0.6 m of subsoil and 0.1 m of topsoil, whereas to achieve LSC Class 6 0.25 m of subsoil and 0.1 m topsoil would be required (SSM 2020). All areas where a grazing post mining land use is proposed will be LSC Class 6 or better.

As described in the Rehabilitation and Landscape Management Addendum (EMM 2020e), a grazing post mining land-use requires access to adequate stock drinking water facilities. The project will result in the loss of approximately 11 farm dams within the infrastructure and TSF footprint that may have been previously used for stock water supply. However, numerous other farm dams are present, and will remain, around the mine development project area. In grassland pastures adult sheep require between 2 and 6 L of water per day and cattle between 40 and 100 L per day depending on the condition of the pastures and distance from watering points (DPI, 2014).

In pastoral areas, sheep normally graze within a radius of about 2.5 km of a watering point, and cattle within a radius of about 5 km (DPI 2014) depending on if they are lactating and the condition of the pastures. The various farm dams to remain at closure, including in the vicinity of the TSF, will provide the required water supply for these animals under a grazing scenario. It is acknowledged that to maintain the integrity of the TSF final landform, dams for stock will not be established within the TSF footprint; however given the above grazing distances, and that the TSF is approximately 2 km long and 1.5 km wide at its longest and widest point respectively, it is considered that the requirements of a grazing land use, such as access to water around the TSF, will be met.

In addition, the grazing productivity of the TSF and infrastructure areas could be enhanced by future landowners by installing a solar pump and reticulated water supply using a polyethylene pipe and trough network in combination with appropriate management fencing to facilitate rotational grazing.

The clean water diversions that remain post-closure in the project area will be fenced, with appropriate stock crossing points if necessary, to allow the diversion to be planted with riparian species to form a riparian corridor and to protect the diversion from stock damage.

Vegetation species for rehabilitation purposes are anticipated to consist of:

- cover crop species for short-term erosion protection and weed suppression;
- introduced pasture species for stabilisation of the water storage facilities and TSF embankments, long-term soil stockpile protection and rehabilitation for grazing purposes;
- species that comprise the vegetation communities currently present within the project area (Broad-leaved Peppermint-Brittle Gum – Red Stringybark dry open forest, Yellow Box-Blakely's Red Gum grassy woodland and Mountain Gum-Manna Gum open forest species) for the pit amenity bund and waste rock emplacement; and
- riparian species for clean water diversions.

More information about species expected to be used in the rehabilitation of the waste rock emplacement is provided in Section 4.3.6 of the EIS Rehabilitation and Landscape Management Strategy. Indicative riparian species for clean water diversions are also provided in Section 4.3.3 of the Rehabilitation and Landscape Management Strategy Addendum (Appendix T of the Amendment Report).

Seed for cover crop and pasture species will be obtained from commercial suppliers. Collection of native seed has commenced on-site and will continue. Given the limited availability of open woodland on-site for seed collection and the significant reductions in seed viability that can occur when seed is stored, purchase of additional seed from commercial suppliers is anticipated.

Seed will be stored in humidity controlled and vermin free environments to maximise viability.

5.3.2 Rehabilitation completion criteria

Rehabilitation completion criteria will be used as the basis for assessing when rehabilitation of the project is complete. Indicators will be measured against the criteria, and are set for the six phases of rehabilitation (consistent with *ESG3 Mining Operations Plan Guidelines* (DRE 2013), as follows:

- Phase 1 – Decommissioning (ie removal of equipment and infrastructure);
- Phase 2 – Landform Establishment (ie land shaping);
- Phase 3 – Growth Medium Development (ie soil physical and chemical properties);
- Phase 4 – Ecosystem and Land Use Establishment (ie vegetation establishment);
- Phase 5 – Ecosystem and Land Use Sustainability (ie established vegetation is supporting post-mining land use); and
- Phase 6 – Land Relinquishment.

Interim rehabilitation criteria for the project have been developed with the current knowledge of rehabilitation practices and success in similar project environments. These are based largely on experience on mine sites elsewhere in NSW and consist of a set of objectives, rehabilitation criteria and evidence that criteria have been met using Landscape Function Analysis and agricultural productivity measures or the like.

It is anticipated that the project's development consent will require the preparation and approval of a MOP. The MOP will include objectives and criteria for rehabilitation, rehabilitation plans, risks to rehabilitation that need to be addressed, rehabilitation controls and methodologies and monitoring programs. A MOP is not required at this stage of the project as an ML has not been granted; however, the requirements of DRE (2013) have been addressed as part of the preparation of the EIS Rehabilitation and Landscape Management Strategy (Chapter 5 of Appendix U of the EIS). Accordingly, rehabilitation of the project area will be carried out generally in accordance with this strategy.

The rehabilitation criteria presented in Table 5.2 (common rehabilitation performance indicators and completion criteria), Table 5.3 (grazing rehabilitation performance indicators and completion criteria) and Table 5.4 (biodiversity rehabilitation performance indicators and completion criteria) of the EIS AIS have not changed as a result of the amendments to the project. These criteria address the following outcomes:

- restoration of a safe and stable landform that is non-polluting; and
- reinstate soil profiles and function and create landforms that are compatible with surrounding topography; and
- reestablishment of landforms that permit grazing, improved pasture and biodiversity outcomes.

In response to feedback from DPI Agriculture, Regis will consider including further performance indicators for:

- landform establishment and stability – in addition to the ground assessment of active erosion, Regis will consider whether an aerial assessment will be suitable to monitor areas of active erosion; and
- growth medium development - in addition to the previously proposed chemical testing, Regis will consider whether water holding capacity and bulk density should also be assessed to ensure soil properties are suitable for the establishment and maintenance of selected vegetation species.

The interim completion criteria will be updated during the preparation of a detailed rehabilitation plan, in consultation with relevant stakeholders. This will provide stakeholders an opportunity to review the proposed rehabilitation completion criteria and performance indicators in further detail.

Whether rehabilitation criteria have been met depends on the trending of measurements over time compared to pre-mining or reference site conditions. The criteria will be refined and confirmed in the MOP and in the detailed closure plan as the project progresses towards closure.

Grazing productivity parameters (including stock carrying capacity, pasture crude protein levels, digestibility and dry matter content) will be included in the rehabilitation monitoring program and analogue sites will be identified in the MOP.

Reporting on rehabilitation activities, monitoring and progress towards achieving agreed rehabilitation criteria will occur in the annual environmental management report (referred to as the Annual Review).

5.3.3 Rehabilitation management plan

As discussed in Section 5.5.5 of the EIS Rehabilitation and Landscape Management Strategy (Appendix U of the EIS), as part of the MOP, a rehabilitation management plan will be developed to provide a structured and documented process for managing and improving rehabilitation activities at the mine. The plan will serve as a process map for interdepartmental administration of rehabilitation activities within the mine planning and implementation process and will have two focus areas:

- The integration of rehabilitation activities between the various departments within the mine's organisational structure through all stages of the rehabilitation process with an emphasis on joint planning between technical services and environmental departments. To achieve this, the plan will separate the rehabilitation process into difference phases and outline responsibilities at each stage with hold and witness points.
- Establishing effective and robust monitoring methods with clear guidelines on the process to be followed to achieve mine rehabilitation objectives, and a means to record the process followed and results obtained.

6 Consultation

6.1 Overview

The AIS guidelines require information on the stakeholder engagement strategy implemented for the project. An overview is provided in Chapter 6 of the EIS AIS.

As part of the amendments to the project and preparation of the Amendment Report, consultation has been, and will continue to be, undertaken with the local community and neighbouring landholders.

Responses to the community submissions received in relation to the project's impacts on agricultural resources are included in the Submissions Report (EMM 2020c) and include consideration of:

- impacts to agricultural production (off-site) – Section 5.6.1 of the Submission Report;
- impacts to agricultural production (on-site) – Section 5.6.2 of the Submission Report;
- impacts on bees and honey production – Section 5.6.3 of the Submission Report; and
- impacts on horses and livestock – Section 5.6.4 of the Submission Report.

6.2 Ongoing engagement

Regis will continue to maintain open lines of communication with the local community throughout the assessment process, which will continue to include:

- distribution of updates via the project mailing list, project website, Community Consultative Committee (CCC) and local print and electronic media (including the Blayney Chronicle); and
- ongoing one on one meetings with neighbouring landholders.

As discussed in Section 20.6 of the EIS, a stakeholder engagement plan will be developed prior to the commencement of construction to manage potential social impacts and support the realisation of opportunities across the project life.

6.3 Community consultative committee

A CCC was established for the project in late 2018 in accordance with the SEARs and will continue to operate for the life of the project. The key role of the CCC will be to foster dialogue between Regis, the community and key stakeholders regarding the project. The CCC provides community members with a voice and gives Regis a structured process for addressing community interests and concerns.

The CCC includes residents, business people, community groups (including representatives from the Belubula Headwaters Protection Group), Regis and the Councils of Blayney, Bathurst and Cabonne. The Committee has an independent Chairman, David Johnson, appointed by DPIE. The community consultation committee consists of:

- six community members, including Kings Plains residents;
- representative from Belubula Headwaters Protection Group;
- representative from Orange and Regional Water Security Alliance Inc;

- representatives from Bathurst, Blayney and Cabonne Councils; and
- three Regis representatives.

The CCC generally meets every two months and minutes from these meeting are published in the project website.

6.4 Near neighbours

A number of key actions will be undertaken to manage predicted social impacts including:

- ongoing stakeholder engagement – ongoing engagement with the Kings Plains community and residents in relation to the progress of the project, the magnitude and extent of anticipated impacts and proposed management measures;
- property specific management plans – on request from residents, Regis will develop property specific management plans for properties directly impacted by the project. The preparation of these plans has commenced for a number of residences in Kings Plains; and
- maintenance of a community complaints and grievances system, with investigation, response and where required, management actions undertaken for all complaints.

7 Conclusion

This AIS addendum provides an assessment of the impacts of the amended project on agricultural industries and resources and documents initiatives built into the amended project design to avoid and minimise agricultural impacts.

Extensive technical investigations that have taken place over several years, led to a refinement of the project design to minimise the potential impact on agriculture. As discussed, further amendments to the project have been made since the public exhibition of the EIS and the findings of the EIS AIS have been updated (where relevant) to reflect these amendments.

Key findings of this report include:

- The amended project will not impact any potential BSAL.
- There will be a negligible reduction (less than 0.9%) in the gross value of agricultural production in the Blayney LGA during the life of the project and a post mine operation reduction of 0.3%.
- The amended project is predicted to be associated with a net reduction of 414 ha of soil with LSC classes 4 (3 ha) and 5 (411 ha) and a net increase of 348 ha of soil with LSC classes 6 (323 ha) and 7 (25 ha). The project will result in the permanent removal of 66 ha (LSC Class 8) from agriculture (ie final void).
- A minor reduction in the median annual inflow to Carcoar Dam (4%) will occur as a result of construction and operation of the project. Permanently, following mine-closure and rehabilitation, the reduction in flows will be much smaller (0.5%). This level of change is expected to be imperceptible in comparison with the natural variability in catchment conditions. Notably, the project will source the majority of its water from the pipeline development, using surplus water from other mines and the Mount Piper Power Station.
- The groundwater model predicts that privately owned bores within the vicinity of the project area will experience little to no change as a result of the project. No privately owned bores will experience a cumulative pressure head decline of greater than 2 m, which the NSW Aquifer Interference Policy defines as 'minimal impact'.

A comprehensive mitigation program will be implemented to manage potential impacts on agricultural resources. This will include monitoring and, where appropriate, establishment of triggers and appropriate responses. In addition, rehabilitation criteria will be used as the basis for assessing when rehabilitation of the project is complete, and post-mining land uses have been successfully re-established.

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