

15 May 2023

Mining and Petroleum Gateway Panel
C/- Independent Planning Commission
Level 15, 135 King Street
SYDNEY NSW 2000

Dear Panel,

CADIA VALLEY OPERATIONS – GATEWAY APPLICATION TECHNICAL OVERVIEW

Please find enclosed an application for a Gateway Certificate in relation to the Cadia Valley Operations (CVO).

1. INTRODUCTION

Background

The CVO is located approximately 25 kilometres (km) south-west of Orange, in the Central Tablelands of New South Wales (NSW) (Figure 1).

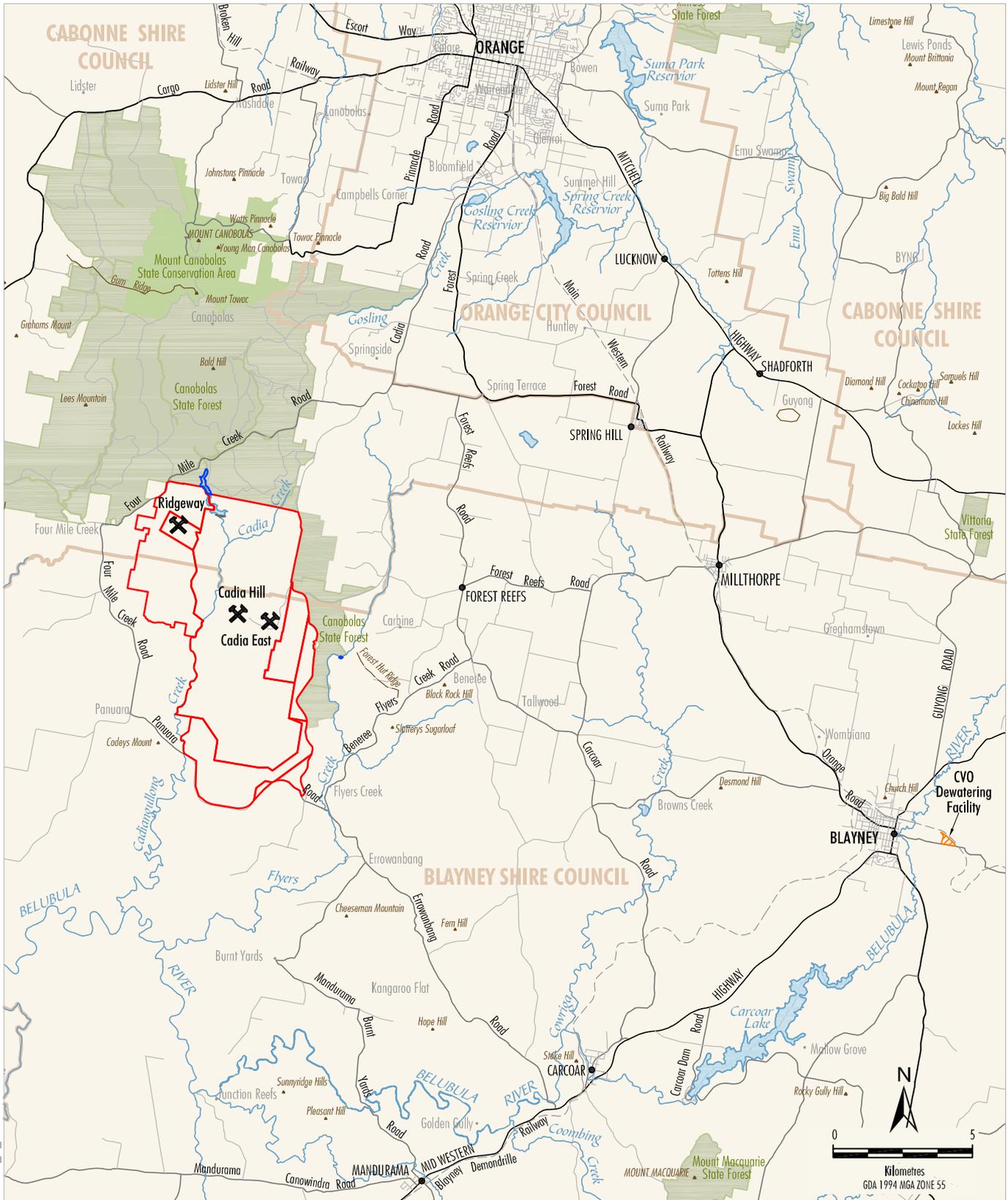
Cadia Holdings Pty Limited (CHPL) is the owner and operator of the CVO, and is a wholly owned subsidiary of Newcrest Mining Limited.

Project Approval (PA 06_0295) for the CVO was granted by the NSW Minister for Planning under Part 3A of the *Environmental Planning and Assessment Act 1979* (EP&A Act) on 6 January 2010.

PA 06_0295 (as modified) includes all of the integrated operations and components of the approved CVO including:

- The Cadia East underground mine.
- The Cadia Hill open pit mine.
- The Ridgeway underground mine.
- Blayney and CVO Dewatering Facilities.
- A range of ancillary and support infrastructure.

CHPL proposes a modification to PA 06_0295, which would be sought under section 4.55(2) of the EP&A Act. Because the modification involves mining-related disturbance outside of existing mining tenements, partly on land identified as Biophysical Strategic Agricultural Land (BSAL), a Gateway Certificate is required.



REC-20-94_GA_101C



- LEGEND**
- Mining Lease Boundary
 - Mining Lease Application
 - Local Government Area
 - Road
 - Railway
 - NSW State Forest
 - NPWS Reserve

Source: Department of Lands NSW (2006);
Department of Industry (2017)



CADIA VALLEY OPERATIONS
Regional Location

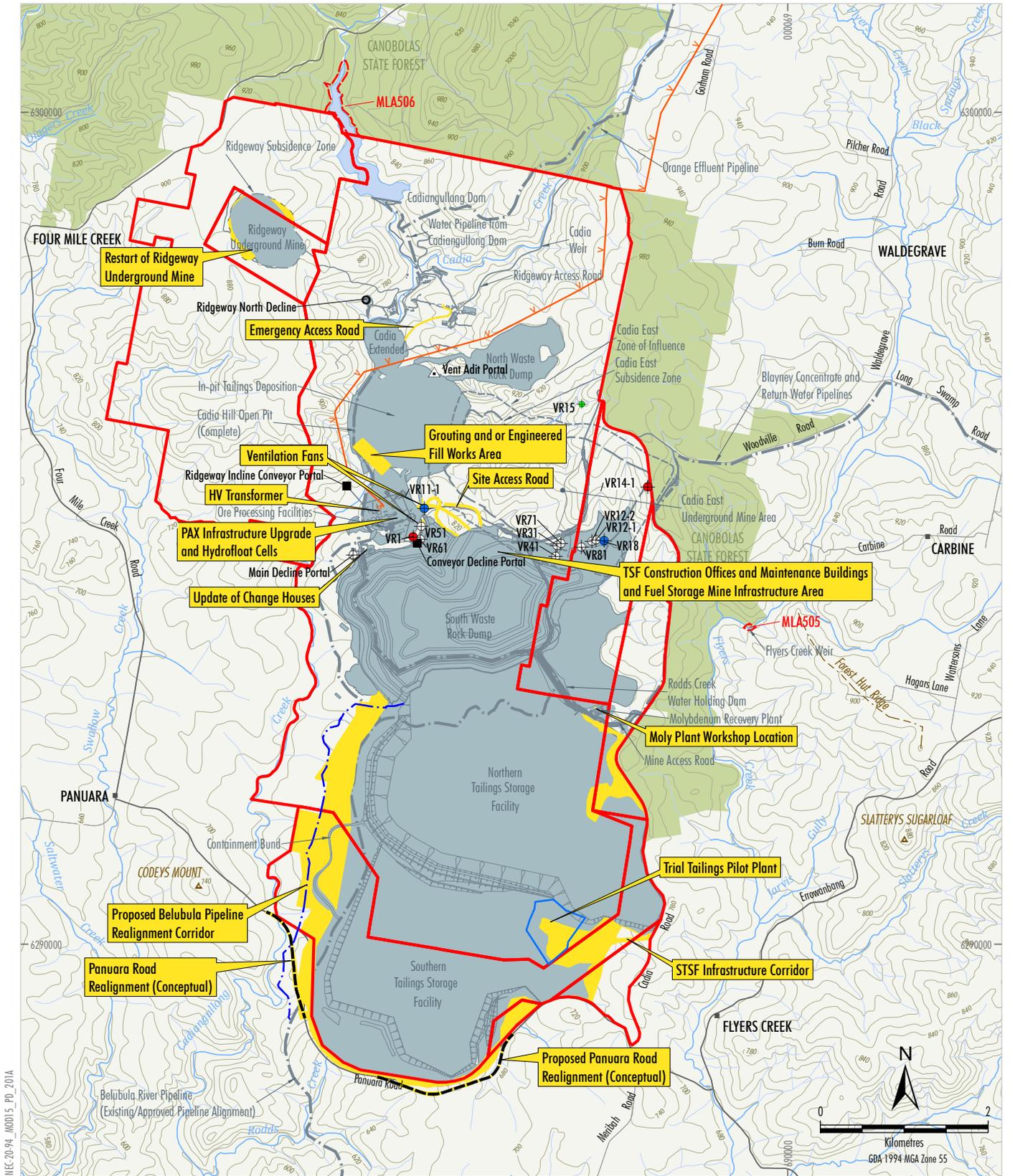
Figure 1

Proposed Modification

Modification 15 (the Modification) proposes changes to the tailings storage facility (TSF) embankment footprints. The footprint change is required following further detailed design to achieve the approved tailings deposition height and the implementation of the centreline or downstream lift construction methodology for increasing the height of the embankments. This iterative detailed design process is consistent with the evolution and optimisation of a concept design through to detailed design (i.e. ongoing feasibility studies and associated design refinement). In addition, a restart of Ridgeway Underground Mine is sought to provide optionality of ore supplies, with relevant environmental studies undertaken to assess any additional impacts associated with the restarting of mining (note that the Ridgeway restart is an option which requires further studies, reviews and assessment).

The main elements proposed for the Modification include the following and are shown on Figure 2:

- Changes to the embankment footprint of the Northern Tailings Storage Facility (NTSF) and Southern Tailings Storage Facility (STSF), such that the embankment and associated disturbance area extents include areas outside of existing Mining Leases (MLs) (No changes to the TSF heights, volume of tailings material stored or stored tailing footprint are proposed. All tailings deposition would remain within the existing MLs).
- A TSF mine infrastructure area, comprises offices, workshops, lubrication and fuel storage associated with the upgrades to the NTSF and STSF embankments.
- A minor realignment of Panuara Road to accommodate the changes to the STSF embankment footprint.
- Restarting the Ridgeway Underground Mine¹ to recover the remaining 15 million tonnes (Mt) of approved resource and a change to the approved subsidence zone footprint.
- Construction of a new site access road and new emergency access road.
- Construction of a larger tailings pilot plant and sand embankment (known as hydrocyclone sands).
- Two additional Cadia East underground mine upcast surface ventilation fans.
- Expansion of the existing 132 kilovolt (kV) electrical substation.
- Changes to the operation of the CVO Dewatering Facility to allow train loading and related operations to occur during evening and night-time hours. This would not result in any change to the annual total number of train movements generated by CVO.
- Approval to conduct construction works for TSF in the evening period (e.g. 6 pm - 10 pm).
- Upgrade of existing infrastructure at the Potassium Amyl Xanthate (PAX) facility.



MEC-20-94_MOD15_PD_201A

- LEGEND**
- Mining Lease Boundary
 - Mining Lease Application Boundary
 - State Forest
 - Powerline
 - Existing/Approved Mine Infrastructure, Disturbance Footprint and Landform
 - Disturbance Footprint for Embankment, Ridgeway Subsidence and Associated Construction and Operational Activities
 - Proposed Panuara Road Realignment (Conceptual)
 - Declines
 - Portals
 - Adits

- Vent Raises**
- + Approved but not Constructed
 - + Active
 - + Proposed for Construction
 - + Decommissioned

Source: Land and Property Information (2017);
NSW Planning & Environment Resource & Energy (2017)
CHPL (2018)



CADIA VALLEY OPERATIONS
Proposed Modification 15
Development Footprint

Figure 2

- Two hydrofloat cells within the existing CVO Ore Processing Facilities' disturbance footprint.
- Realignment of a section of the Belubula River pipeline.
- A minor administrative change to remove the conditions associated with the now decommissioned Blayney Dewatering Facility.
- Removal of the Striped Legless Lizard and the Pink-tailed Legless Lizard species credits from the Project Approval following the completion of additional survey.
- Grouting and / or engineered fill works to mitigate the potential connection between the Pit TSF and Cadiangullong Creek to allow the storage of unconsolidated tailings above 694m AHD.
- Other minor infrastructure additions/changes.

The Modification would not change the following components of the approved CVO:

- Mining method.
- Cadia East and Ridgeway underground mine footprint/dimensions.
- Processing rate.
- Mine life.
- Maximum approved heights of the TSF embankments.
- Waste rock management.

Purpose of this Document

The NTSF and STSF embankments at the CVO are progressively raised to provide additional tailings storage capacity over the life of the mine. As part of the approved Modification 14, CHPL revised the design basis for future TSF embankment raises, replacing the previous upstream lifts construction methodology with centre line and downstream lifts. This transition is in accordance with the findings of the Independent Technical Review Board's investigation into the NTSF (Independent Technical Review Board, 2019).

As part of this Modification, CHPL is proposing changes to the TSF embankment footprints which are required following recent drilling results and a higher engineering significance rating which necessitates larger foundation footprints for the TSFs.

The increased embankment footprint of the STSF (and associated ancillary disturbance) is the reason for this Gateway Application. Given the STSF location is fixed (i.e. it is a large existing tailings dam), there are no practical alternatives to the Modification and the permanent disturbance of 0.8 ha of verified BSAL.

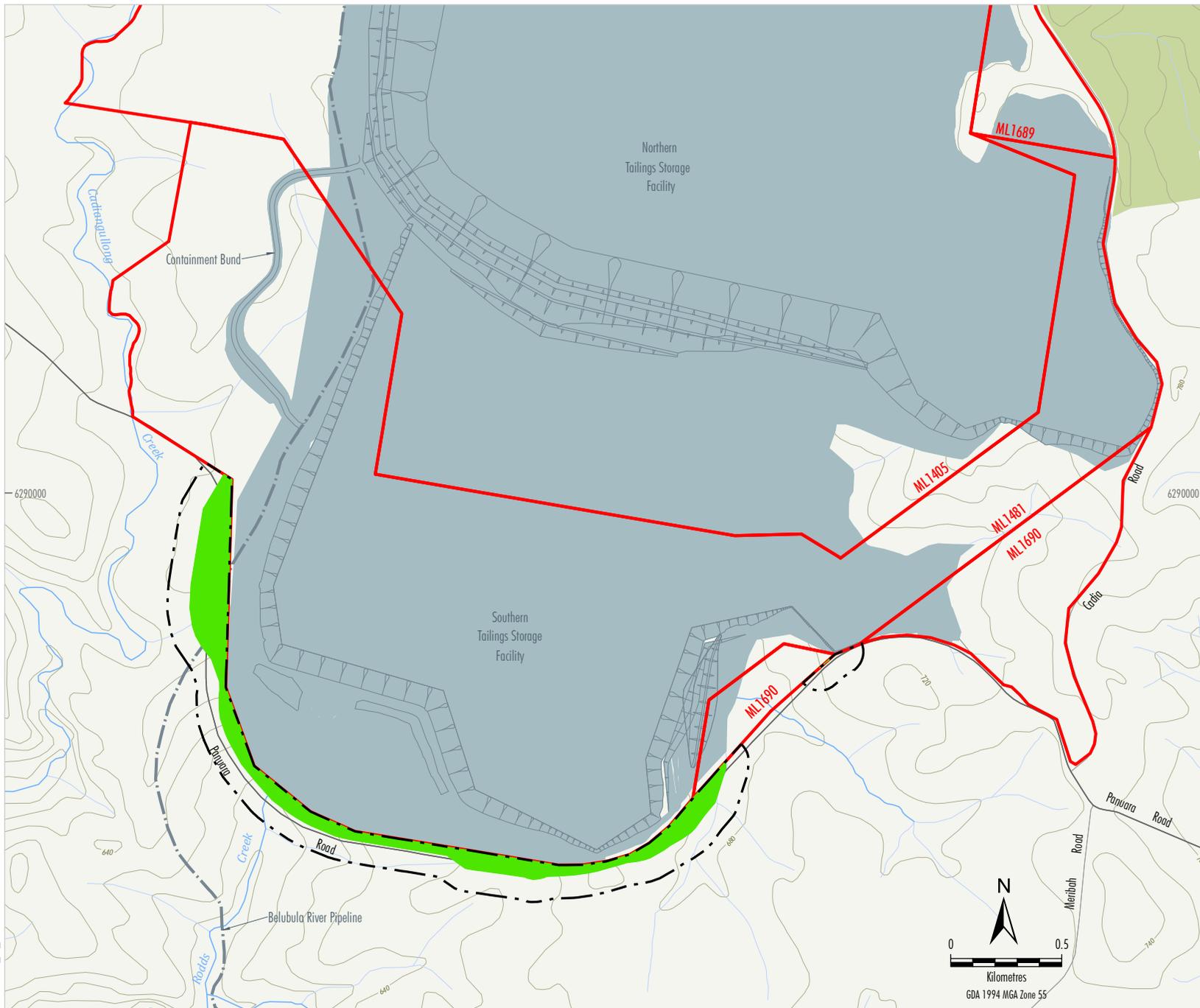
To achieve the approved tailings deposition height of the STSF, the proposed reinforcement of the embankment would result in disturbance outside of the approved mining tenements, partly on land identified as BSAL. Accordingly, CHPL is seeking a Gateway Certificate to extend the STSF to the south of the existing CVO (Figure 3).

The Gateway Certificate Application Area (herein referred to as the Project Application Area [PAA]) includes land verified as BSAL in accordance with the *Strategic Regional Land Use Policy – Interim Protocol for Site Verification and Mapping of Biophysical Strategic Agricultural Land* (Interim Protocol) (Office of Environment and Heritage and the Office of Agricultural Sustainability & Food Security [OEH and OAS&FS], 2013).

No land mapped as equine critical industry cluster or viticulture critical industry cluster in *NSW State Environmental Planning Policy (Resources and Energy) 2021* (Mining SEPP) is located in the PAA. Accordingly, the equine and viticulture industries are not considered further.

This document is a Gateway Certificate Application Technical Overview in support of an application for a Gateway Certificate (Gateway Certificate Application), pursuant to clause 2.29 of the Mining SEPP and in accordance with the *Strategic Regional Land Use Policy Guideline for Gateway Applicants*.

The Gateway Certificate Application will be assessed by the Mining and Petroleum Gateway Panel (the Gateway Panel) for potential impacts of the Modification on strategic agricultural land and its associated water resources.



- LEGEND**
- Mining Lease Boundary
 - State Forest
 - Existing/Approved Mine Infrastructure and Landforms
 - Gateway Certificate Application Area/ Project Application Area
 - BSAL Assessment Area

Source: Land and Property Information (2017);
 NSW Planning & Environment Resource &
 Energy (2017); CHPL (2022)



CADIA VALLEY OPERATIONS
 Gateway Certificate Application Area

MEC-20-94_GA_202A

Figure 3

The Gateway Panel undertakes its assessment in accordance with the relevant criteria outlined in clause 2.31(4) of the Mining SEPP that apply specifically to BSAL.

The Gateway process potentially applies to State Significant mining developments that require a new ML. The PAA, as described in this document, is defined as the extent of surface infrastructure area (i.e. the footprint of the STSF and associated infrastructure) that is located outside of ML 1481 (Figure 3). Components of the Modification that are outside of the PAA (i.e. within existing CVO MLs) are not subject to the Gateway Certificate Application.

Structure of the Gateway Certificate Application.

This Technical Overview is structured as follows:

- Section 1 **Introduction** – provides background to the CVO, an overview of the Modification and the reason for seeking a Gateway Certificate.
 - Section 2 **Agricultural Context** – describes the local and regional agricultural context.
 - Section 3 **Project Description and Modification Rationale** – provides a clear and concise description of the Project, indicates the types of activities that will be undertaken and summarises the Modification rationale.
 - Section 4 **Consideration of Gateway Criteria for BSAL** – provides an assessment of BSAL in the PAA.
 - Section 5 **Strategies to Minimise Potential Impacts on Biophysical Strategic Agricultural Land** – describes strategies that would be implemented to minimise the potential impacts.
 - Section 6 **Conclusion** – provides the key conclusions of the Gateway Certificate Application.
 - Section 7 **References** – provides a list of references cited.
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- Appendix A **Agricultural Resources Assessment** – Minesoils Pty Ltd (2023a)
 - Appendix B **Agricultural Impact Assessment** – Minesoils Pty Ltd (2023b)
 - Appendix C **Groundwater Review** – Australasian Groundwater & Environmental Consultants Pty Ltd (AGE) (2023)

2. AGRICULTURAL CONTEXT

Regional Context

The CVO is located in the Central Tablelands region of NSW which includes the major towns of Bathurst, Blayney, Cowra, Lithgow, Molong, Mudgee, Oberon.

Agriculture in the Central Tablelands is diverse due to the topographical variability of landscapes which supports broadacre cropping and livestock production, alluvial valleys that are suited to vegetables and irrigated hay and high altitudes that provide an ideal climate for horticulture (Department of Primary Industries [DPI], 2020). Agricultural production in the Central Tablelands region generates over \$605 million per annum and is equivalent to approximately 5 per cent (%) of all agricultural product in NSW. The main agricultural activities include beef, sheep and wool, horticulture and cropping (DPI, 2020).

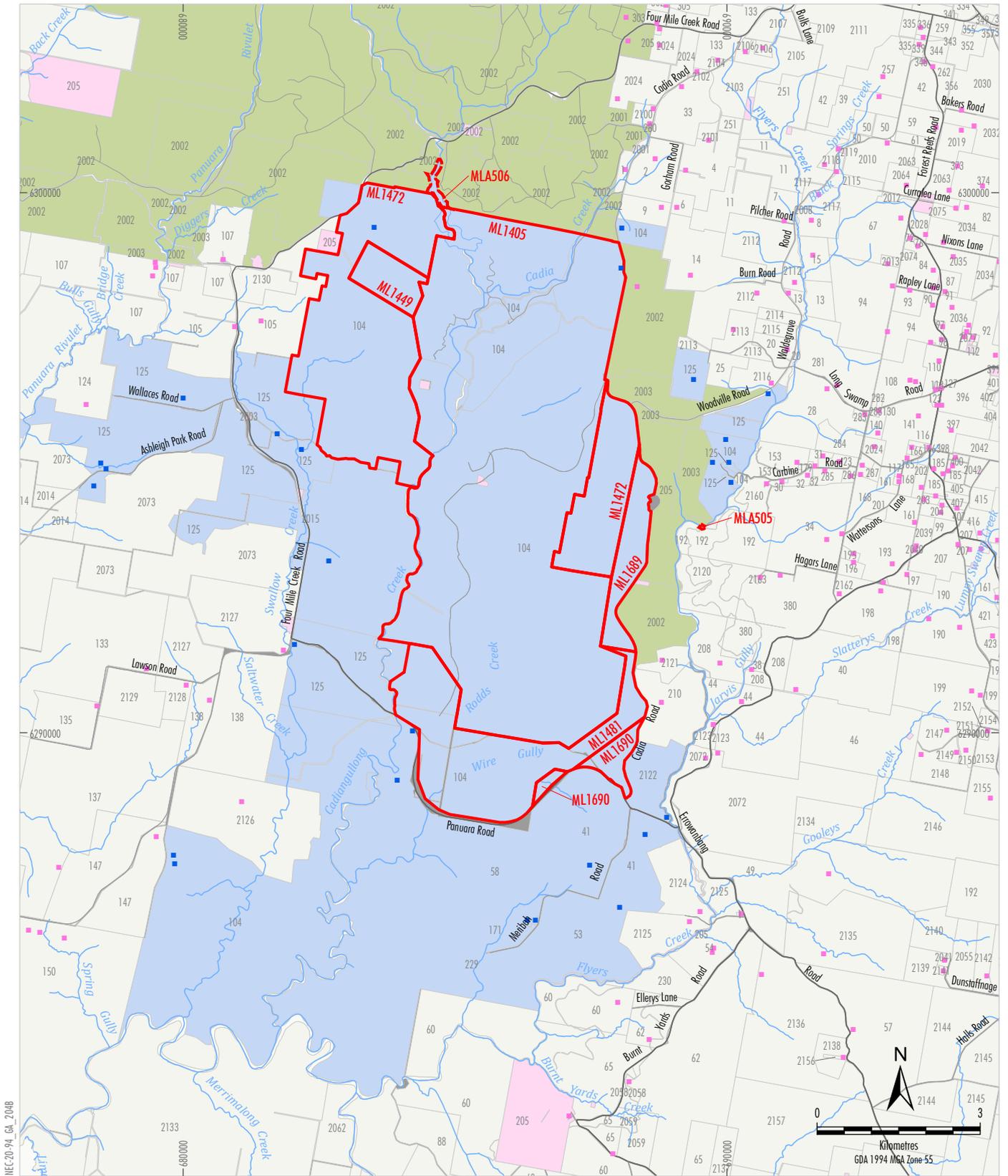
Extractive industries are becoming a more prominent driver of the economy in the Central Tablelands region. The *Central Tablelands Local Strategic Plan 2021-2026* (Central Tablelands Local Land Services, 2021) included mining as a primary industry particularly focused around Orange, where the intended PAA is located.

Local Context

The CVO lies within the Blayney Shire Council and Cabonne Shire Council local government areas. Historically, the local context is characterised by shifting agricultural patterns and rural settlement responding to changes in short to medium term environmental conditions and to changes in economic, social and policy frameworks, often at a scale beyond the CVO locality. The area is traditionally known for quality wool and lambs, with broadacre grain production and cattle grazing more recently becoming dominant commodities (DPI, 2020).

General agricultural improvements are present within or in close proximity to the PAA, including stock fences, shedding, cattle yards, electric fencing and unsealed access tracks. Based on aerial photography, site observation, soil and land capability and consultation with farmers, the farming lots within the PAA are used for breeding and fattening of cattle, on a current estimated stocking capacity of 16 Dry Sheep Equivalent per unit. Cattle are watered through surface dams, and no additional feeding is carried out. Currently, the PAA is not fertilised, and weeds are managed through spot spraying of herbicides. No sensitive agricultural activities such as intensive plant or livestock agriculture are being undertaken within the PAA or its immediate surrounds (Minesoils, 2023b) (Appendix B).

Approved project disturbance areas that have not been disturbed by CVO activities to date (e.g. the Cadia East subsidence zone and associated zone of influence, expanded inundation areas of the NTSF and STSF) are currently used for forestry operations and grazing. Relevant land tenure surrounding the PAA is shown on Figure 4.



MEC-20-94_GA_2048

- LEGEND**
- Mining Lease
 - Mining Lease Application Boundary
 - Mine Owned
 - Privately Owned
 - CHPL Owned
 - Crown Land
 - Local Government
 - Privately Owned
 - State Forest
 - State Government
 - Road Corridor



CADIA VALLEY OPERATIONS
Cadia Valley Operations
Land Tenure and Mining Leases

Source: Land and Property Information (2017);
 NSW Planning & Environment Resource & Energy (2017)

Figure 4

3. PROJECT DESCRIPTION AND RATIONALE

Existing and Approved Cadia Valley Operations

Since its approval in 2010 (PA 06_0295), CVO has been progressively implementing plant upgrades and process efficiency improvements to optimise the ore processing facilities for an ore processing rate of up to 35 million tonnes per annum (Mtpa). The currently approved ore processing rate is 35 Mtpa, however the rate increase from 32 to 35 Mtpa is subject to Condition 6A of Schedule 2¹.

The major components of the Cadia East Project include:

- underground mining of approximately 525 million tonnes (Mt) of ore from the Cadia East deposit using the panel caving mining method and approximately 96 Mt of ore from Ridgeway (inclusive of Ridgeway Deeps);
- development of underground crushing, handling and conveyor systems to transfer ore and waste rock to the surface;
- development of supporting infrastructure for the underground mine including multiple ventilation shafts, and personnel and equipment access systems;
- upgrade of the existing CVO ore processing facilities to accommodate the harder ore from Cadia East and to enable the total CVO ore processing rate to 32 Mtpa. Increasing the on-site ore processing to 35 Mtpa is subject to Condition 6A of Schedule 2;
- construction and operation of a Molybdenum Recovery Plant and trucking of molybdenum products off-site;
- placement of waste rock produced by the Cadia East Project in the existing South Waste Rock Dump;
- raising of the existing NTSF and STSF embankments to accommodate approximately 674 Mt of tailings;
- deposition of tailings within the Cadia Hill Pit TSF (PTSF) up to a level of approximately 713 metres Australian Height Datum (m AHD);
- obtaining additional ML's to facilitate the Cadia East Project extensions of the STSF, NTSF, subsidence zone and Rodds Creek Water Holding Dam;
- CVO water management/supply system including development of additional pipeline/pumping systems and raising of the Rodds Creek Water Holding Dam;
- re-alignment of a 1.1 km section of Cadia Road;
- construction and operation of the CVO Dewatering Facility to the east of Blayney;

¹ The modification approved in December 2021 to increase the permitted processing capacity from 32 Mtpa to 35 Mtpa is subject to conditions including Newcrest commissioning an independent audit report to the satisfaction of the New South Wales Department of Planning and Environment Secretary in relation to Newcrest's approach to managing and minimising the off-site air quality impacts of the Project.

- installation of a new concentrate pipeline and return water pipeline between the CVO and the CVO Dewatering Facility;
- increased rail transportation of dewatered mineral concentrate (i.e. copper and gold concentrate) from Blayney to the eastern seaboard;
- augmentation, relocation and upgrade of supplementary surface facilities including workshops, administration and site access roads;
- pre-conditioning of overburden above the Cadia East deposit; and
- other associated modifications to existing infrastructure (as well as construction of some new infrastructure), plant, equipment and activities to allow mining of the Cadia East deposit and integration with the approved CVO.

Table 1 provides a comparative summary of the currently approved and modified CVO as a result of the Modification. Table 2 summarises the key changes of reference to this Gateway Assessment – Technical Overview and provides a summary justification for these.

Table 1
Comparison of the Approved CVO and the Modification

Project Component	Approved CVO ²	CVO Incorporating the Modification
Mining Methods	Cadia Hill - conventional open pit mining methods (mining now completed). Ridgeway - underground sub-level and block caving with development of associated surface subsidence zone. Cadia East - underground panel caving with development of associated surface subsidence zone.	No change.
Life of Mine Cadia East and Ridgeway Ore Production	Approximately 525 Mt of Cadia East Ore. Approximately 96 Mt of Ridgeway Ore.	No change (potential restart of Ridgeway to facilitate mining of the 15 Mt of approved resource).

2 PA 06_0295 for the Cadia East Project, as modified by section 75W Modifications numbered 1 to 10, section 4.55(1A) Modification numbers 11 to 13 and section 4.55(2) Modification number 14. Consistent with Clause 3BA of Schedule 2 of the *Environmental Planning and Assessment (Savings, Transitional and Other Provisions) Regulation 2017*, the consent authority is required to satisfy itself that any consent as modified would result in the Cadia East Project remaining substantially the same development as was last modified under section 75W (i.e. Modification 10), inclusive of consideration of the changes arising from the previously approved modifications (i.e. Modifications 11 to 14). Information to allow this comparison will be provided in the Modification Report.

Table 1 (Continued)
Comparison of the Approved CVO and the Modification

Project Component	Approved CVO³	CVO Incorporating the Modification
Waste Rock Management	Deposition in the North and South Waste Rock Dumps and mined-out void of the Cadia Extended open pit. Cadia East waste rock to be deposited in the South Waste Rock Dump. Material for the construction of the NTSF encapsulation and STSF embankment construction to be sourced from non-acid forming material from the site waste rock dumps.	No change.
Life of Mine	Mining up until approximately 2031. Project Approval to 2031.	No change.
Tailings Management	Use of the NTSF and STSF and raising of these storages via centreline/downstream embankment lifts. Installation of additional buttressing of the STSF embankment. Deposition of tailings in the Cadia Hill open pit to its full capacity, to a (pre-consolidation) level of approximately 713 m AHD. Cumulative tailings disposal volume of 674 Mt from 2013. NTSF repairs to restore embankment by encapsulation of majority of the slumped section.	Changes to the embankment footprint of the NTSF and STSF, such that the embankment and associated disturbance area extents include areas outside of existing MLs. Construction of a trial tailings embankment from hydrocyclone sands sourced on site. Change to working hours for TSF construction into the evening with compliance with noise criteria of PA 06_0295.
Ventilation Adit	The mining complex includes several ventilation adits/shafts for ventilation of underground mining areas. Decommissioning and closure of existing adit VR101 located within the Cadia Hill open pit. Ventilation shaft within the current approved mine disturbance footprint to replace adit VR101.	Two upcast ventilation fans on the surface to support the Cadia East underground mine (i.e. VR5 and VR11).
Ore Processing	On-site processing of up to 32 Mtpa of gold and copper ore. Increasing the on-site ore processing to 35 Mtpa is subject to Condition 6A of Schedule 2.	Upgrades to the PAX facility. Two hydrofloat cells located within the existing CVO Ore Processing Facilities' disturbance footprint.

³ PA 06_0295 for the Cadia East Project, as modified by section 75W Modifications numbered 1 to 10, section 4.55(1A) Modification numbers 11 to 13 and section 4.55(2) Modification number 14. Consistent with Clause 3BA of Schedule 2 of the *Environmental Planning and Assessment (Savings, Transitional and Other Provisions) Regulation 2017*, the consent authority is required to satisfy itself that any consent as modified would result in the Cadia East Project remaining substantially the same development as was last modified under section 75W (i.e. Modification 10), inclusive of consideration of the changes arising from the previously approved modifications (i.e. Modifications 11 to 14). Information to allow this comparison will be provided in the Modification Report.

Table 1 (Continued)
Comparison of the Approved CVO and the Modification

Project Component	Approved CVO ⁴	CVO Incorporating the Modification
Concentrate Transport and Dewatering	<p>Gold/copper concentrate is transported from the ore processing facilities via a concentrate pipeline to the Blayney Dewatering Facility (now decommissioned and Modification 15 proposes to remove all conditions associated with the decommissioned Blayney Dewatering Facility).</p> <p>The CVO Dewatering Facility to the east of Blayney and the subsequent decommissioning of the existing Blayney Dewatering Facility (now complete).</p> <p>Concentrate pipeline from the CVO to the CVO Dewatering Facility.</p> <p>Transport of dewatered mineral concentrate by rail to the eastern seaboard.</p>	<p>No change.</p> <p>No change.</p> <p>No change.</p> <p>Changes to the operation of the CVO Dewatering Facility to allow train loading and related operations during evening and night time hours. This would not result in any change to the total number of train movements generated by CVO.</p> <p>Minor administrative changes to remove conditions relating to the former Blayney Dewatering Facility from the Project Approval.</p>
Process Consumables	Sodium Hydrosulphide Solutioning Plant (located adjacent to the Molybdenum Recovery Plant) to produce sodium hydrosulphide on-site to meet CVO's operational requirements.	20% increase in PAX consumption
Water Supply and Management	<p>Water supply sourced from the Cadiangullong Dam, Flyers Creek Weir, Cadia Creek Weir, Orange Sewage Treatment Plant treated effluent, Blayney Sewage Treatment Plant treated effluent, on-site groundwater bores, Belubula River, Cadia Extended open pit and site runoff.</p> <p>Additional pipeline/pumping systems and raising of the Rodds Creek Water Holding Dam.</p> <p>Contingent transfer of supernatant tailings water from STSF and NTSF to Cadia Hill open pit for water management.</p> <p>Internal tailings return water pipeline and pumping systems from Cadia Hill open pit.</p>	<p>Further realignment of the Belubula River pipeline.</p> <p>No other changes to the overall water supply and management strategy for CVO.</p>

⁴ PA 06_0295 for the Cadia East Project, as modified by section 75W Modifications numbered 1 to 10, section 4.55(1A) Modification numbers 11 to 13 and section 4.55(2) Modification number 14. Consistent with Clause 3BA of Schedule 2 of the *Environmental Planning and Assessment (Savings, Transitional and Other Provisions) Regulation 2017*, the consent authority is required to satisfy itself that any consent as modified would result in the Cadia East Project remaining substantially the same development as was last modified under section 75W (i.e. Modification 10), inclusive of consideration of the changes arising from the previously approved modifications (i.e. Modifications 11 to 14). Information to allow this comparison will be provided in the Modification Report.

Table 1 (Continued)
Comparison of the Approved CVO and the Modification

Project Component	Approved CVO ⁵	CVO Incorporating the Modification
Power Demand and Supply	Peak demand to 179 megawatts (MW) (using existing power supply infrastructure). 132 kV electrical switch yard.	Expansion of the existing 132 kV electrical substation The peak power demand is estimated to be 194 MW. This increase is due to: <ul style="list-style-type: none"> • Power to supply the two additional upcast ventilation fans described previously. • Commencement of mobile fleet electrification. • Re Installation of the STSF decant pump system. Since approval of Modification 14, CHPL has established a modified Connection Agreement with Essential Energy for the estimated peak power demand. This will support the above as well as increasing production to 35 Mpta as described in PA 06_0295 Schedule 2, Condition 6A.
Employment	An average of approximately 945 employees with an additional construction/development workforce of up to approximately 860 personnel. Intermittent shutdown periods require a nominal workforce of approximately 300 to 700 additional personnel during these periods.	An average of approximately 1090 to 1,140 employees (i.e. an additional 150-200 personnel associated with the recommencement of Ridgeway) with an additional construction/development workforce of up to approximately 970 personnel (i.e. an additional 110 personnel associated with the TSF construction works). No change to the intermittent shutdown workforce personnel.
Final Landforms	Includes South Waste Rock Dump, North Waste Rock Dump, NTSF, STSF, Cadia East Subsidence Zone, Ridgeway Subsidence Zone, Cadia Hill open pit, Cadia Extended open pit, Cadiangullong Dam, Rodds Creek Holding Dam and other water management infrastructure. The final landform of Cadia Hill pit would be a pit lake (i.e. a wet cover). No intersection between the Cadia East underground mine subsidence zone and Cadia Hill open pit in the long term and, therefore, two separate final void waterbodies (smaller in extent compared with the approved subsidence zone) (as described in MOD 13).	Increase in the size of the NTSF and STSF embankment footprints. A change to location of the subsidence impacts from Ridgeway mining. The total area of predicted subsidence impact is smaller than that approved.

⁵ PA 06_0295 for the Cadia East Project, as modified by section 75W Modifications numbered 1 to 10, section 4.55(1A) Modification numbers 11 to 13 and section 4.55(2) Modification number 14. Consistent with Clause 3BA of Schedule 2 of the *Environmental Planning and Assessment (Savings, Transitional and Other Provisions) Regulation 2017*, the consent authority is required to satisfy itself that any consent as modified would result in the Cadia East Project remaining substantially the same development as was last modified under section 75W (i.e. Modification 10), inclusive of consideration of the changes arising from the previously approved modifications (i.e. Modifications 11 to 14). Information to allow this comparison will be provided in the Modification Report.

Table 2
Key Modification Changes and Justification

Key Changes Sought	Justification
<p>Changes to the embankment footprint of the STSF, such that the embankment and associated disturbance area extents include areas outside of existing MLs (however, all tailings deposition remains within existing MLs).</p>	<p>The potential changes to the TSF footprints are driven by new information since the Mod 14 TSF concept designs were formulated:</p> <ul style="list-style-type: none"> • Recent drilling results indicate that the NTSF and STSF requires a larger foundation width. • Higher engineering significance rating would require a larger foundation footprint.
<p>Restart of the Ridgeway Underground Mine (after an initial trial period)¹¹.</p>	<p>Ridgeway Mine has been on care and maintenance since 2017.</p> <p>The remaining approved ore could potentially be mined to supplement Cadia East ore (e.g. during years of Cadia East development works).</p>

Modification Rationale

The extraction of gold by CVO provides benefits at national, state and local level. Benefits from the CVO include direct and indirect employment, apprenticeships and training, the generation of expendable income, export earnings and local, state and commonwealth government revenue. CHPL also provides both direct and indirect business opportunities for its suppliers and service providers with flow-on benefits for the Central Tablelands region.

The Modification seeks to increase the embankment footprint of the STSF outside of the existing tenements, in accordance with the findings of the Independent Technical Review Board's investigation (Independent Technical Review Board, 2019) and is needed to support the ongoing operation of the CVO. Given the STSF location is fixed (i.e. it is a large existing tailings dam on the margin of existing MLs) there are no practical alternatives to the Modification. The proposed changes are driven by new information which has emerged since Modification 14, which includes, recent drilling results and a higher engineering significance rating which necessitates larger foundation footprints for the TSFs.

As disturbance of areas outside of existing tenements (required for the STSF) are within areas identified as BSAL, a Gateway Certificate is required. Although these areas are required for the Modification, they are relatively small compared with the CVO (in the order of 1% of the total CVO disturbance area).

4. CONSIDERATION OF GATEWAY CRITERIA FOR BIOPHYSICAL STRATEGIC AGRICULTURAL LAND

Assessment of Biophysical Strategic Agricultural Land

An assessment of BSAL within the PAA was conducted by Minesoils (2023a) (Appendix A). In accordance with OEH and OAS&FS (2013) a 100 metre (m) buffer was applied around the PAA, (excluding areas within a current ML) both of these areas combined, are referred to as the BSAL Assessment Area, for the purposes of verifying BSAL within or immediately surrounding the PAA (Figure 5) (Minesoils, 2023a).

Verification included excavating 10 soil test pits across the BSAL Assessment Area and surrounds, in accordance with the Interim Protocol. The Interim Protocol outlines 12 steps that must be satisfied to meet BSAL characteristics (Figure 6). BSAL mapping for the Modification is shown on Figure 5. Approximately 24.9 ha hectares (ha) of Interim Protocol verified BSAL has been identified within the BSAL Assessment Area (8.3 ha within the PAA) (Minesoils, 2023a). As noted previously, this is approximately 1% of the total CVO disturbance area. A summary of the Verified BSAL identified within the PAA and the BSAL Assessment Area can be found in Table 3 below.

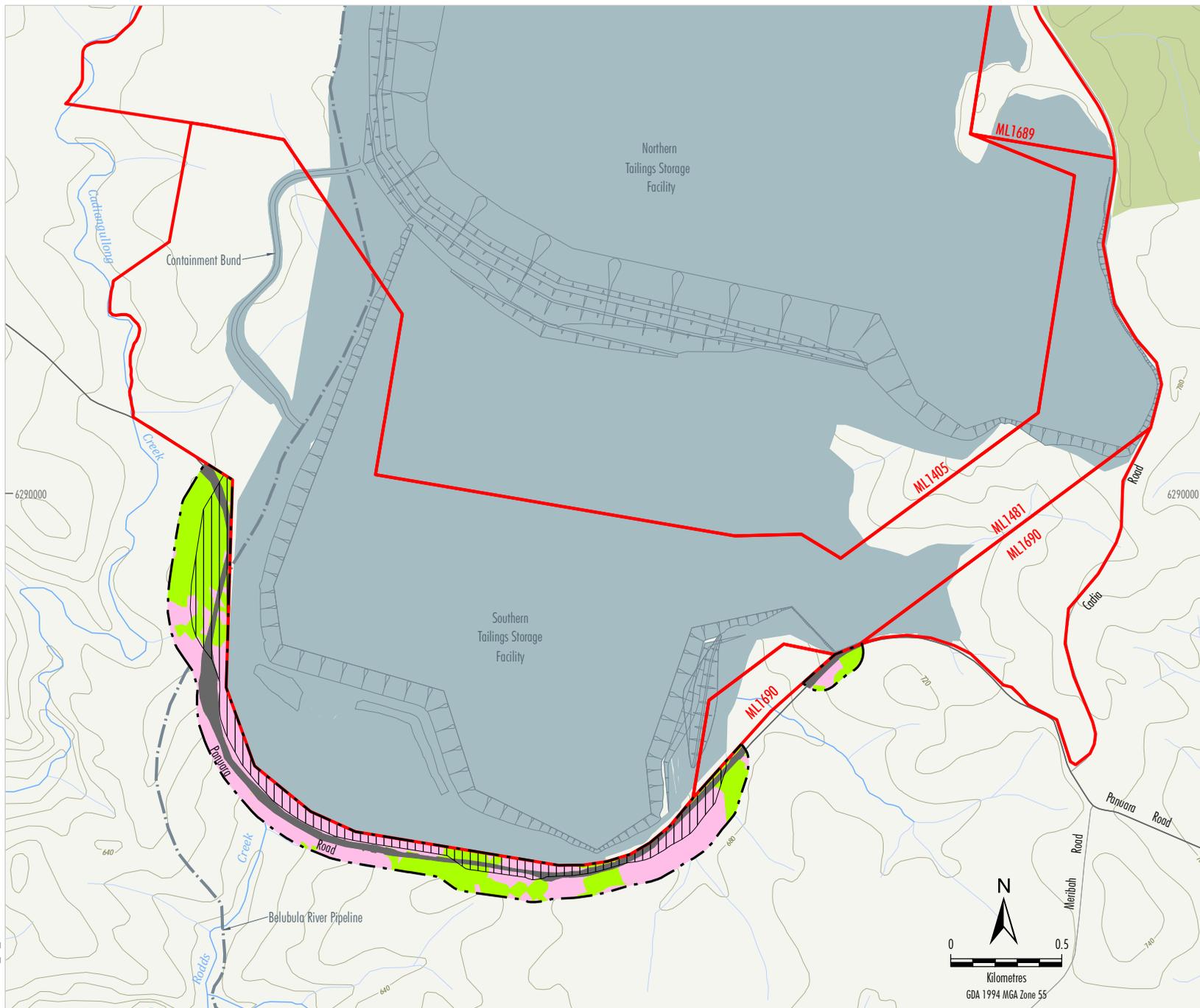
Table 3
Verified BSAL within the PAA and BSAL Assessment Area

Gateway Boundaries	Total Area (ha)	Area of Verified BSAL (ha)	Total % Area of Verified BSAL
PAA	28.2	8.3	29
BSAL Assessment Area	72.9	24.9	34

In addition, site observations, existing regional mapping, and concurrent studies viewed in the context of the findings of this assessment suggest that the verified BSAL likely forms part of a larger contiguous mass (i.e. including land outside of the BSAL Assessment Area). The combined Interim Protocol verified BSAL represents approximately 34 % of the BSAL Assessment Area (29% of the PAA and 0.02% of the Blayney LGA).

Consideration of Gateway Criteria

Table 4 provides an assessment of the Modification against the relevant criteria in the Mining SEPP. Relevant potential impacts on BSAL and highly productive groundwater are discussed below.

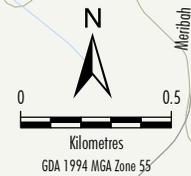


- LEGEND**
- Mining Lease Boundary
 - State Forest
 - Existing/Approved Mine Infrastructure and Landforms
 - Gateway Certificate Application Area/Project Application Area
 - BSAL Assessment Area
 - Verified BSAL
 - Slopes; Verified Non-BSAL
 - Road Disturbance

Source: Land and Property Information (2017);
 NSW Planning & Environment Resource &
 Energy (2017); CHPL (2022)

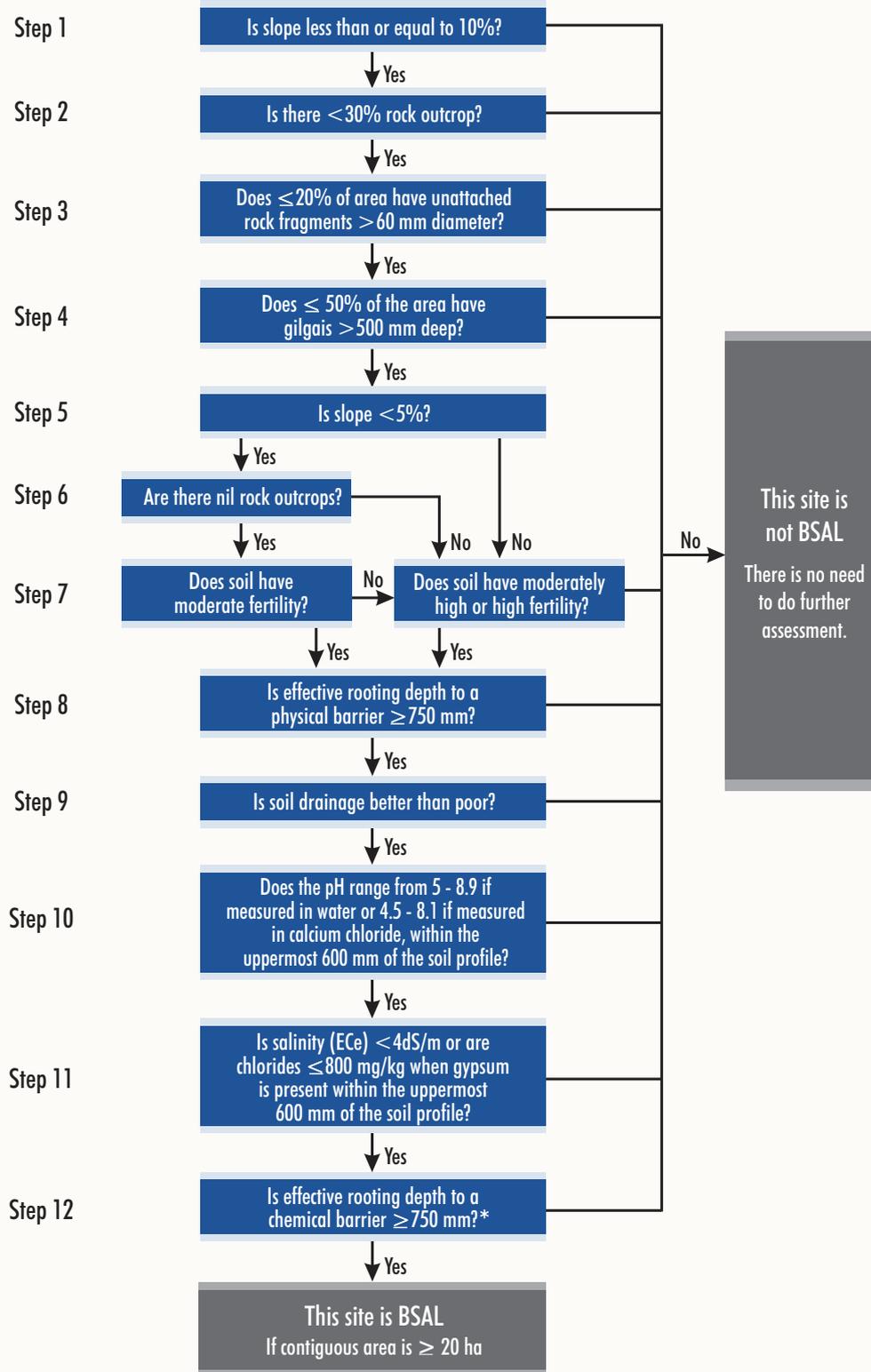


CADIA VALLEY OPERATIONS
BSAL within the BSAL Assessment Area



MEC-20-94_GA_2038

Figure 5



* In accordance with Section 6.10 of the Interim Protocol

REC-20-94_GA_001A

Source: After NSW Government (2013)



CADIA VALLEY OPERATIONS
Flow Chart for Site, Soil and
Landscape Verification Criteria

Figure 6

Table 4
Consideration of Relevant Criteria for Biophysical Strategic Agricultural Land

Criteria	Assessment
Any impacts on the land through surface area disturbance.	The Modification would result in permanent landform changes in the PAA associated with the STSF embankment over an area of 2.0 ha. This embankment would be rehabilitated post-mining and would have a final slope in the order of 1:3 vertical to horizontal. Impacts in all other areas would be minor and temporary.
Any impacts on soil fertility, effective rooting depth or soil drainage	Evidence from the CVO, other sites within Australia and the Agricultural Impact Assessment (Minesoils, 2023b) undertaken for the Modification, indicate that there would be no significant impact to soil fertility or soil rooting depth in the areas of the PAA subject to minor disturbance (Appendix B). The area of 2.0 ha subject to significant landform impact associated with the STSF embankment would likely result in a reduction of effective rooting depth (i.e. although the TSF embankment would be rehabilitated with the application of topsoil, it is expected that rooting depth would be reduced compared with the in situ soils), and changes to drainage due to slope.
Increases in land surface micro-relief, soil salinity, rock outcrop, slope and surface rockiness or significant changes to soil pH	The area of 2.0 ha associated with the STSF embankment would be subject to localised increases in land slope in the order of 1:3 vertical to horizontal, post mining. With appropriate management and rehabilitation, there would be negligible impacts on soil salinity, rock outcrop, surface rockiness and soil pH, both in the STSF embankment area and the remainder of the PAA subject to minor impacts associated with infrastructure.
Any impacts on highly productive groundwater (Aquifer Interference Policy)	The reinforcement of the STSF embankment would not have an influence on groundwater take, and therefore would not affect water access licensing (AGE, 2023). The main concern is potential seepage from the TSF into the underlying bedrock and creeks. The TSF embankment would be designed with a very low permeability core to minimise seepage through the wall (AGE, 2023).
Any fragmentation of agricultural land uses	Throughout the Modification life, the PAA would not be used for agricultural production. Therefore, there would be a minor temporary reduction in the land available for agriculture. The use of the PAA land would not result in the fragmentation or isolation of any existing agricultural land use, as it immediately adjoins the CVO TSF operational area. Following the Modification life, areas subject to minor impacts would be returned to a Land and Soil Capability (LSC) class that facilitates agricultural land use, while areas associated with the STSF embankment (2.0 ha) would not be suitable for agricultural land use. Therefore, there would be a minor to negligible permanent reduction in the land available of agricultural land use. No permanent fragmentation of agricultural use would result from the Modification.
Any reduction in the area of biophysically strategic agricultural land	BSAL (Interim Protocol Verified and Potential BSAL) within the PAA would be subject to minor surface disturbance associated with the development of ancillary surface infrastructure and major landform disturbance associated with the STSF embankment. All areas within the PAA that are anticipated to be disturbed due to the Modification would be subsequently rehabilitated, however, due to the changes in slope – a key factor in BSAL qualification, there would be a minor reduction in BSAL of 0.8 ha.

Source: After Department of Planning and Infrastructure (2013), Minesoils (2023b) and AGE (2023).

Potential Effects on BSAL

Minesoils (2023b) has assessed the potential for impacts on BSAL as a result of the TSF reinforcement (Appendix B). The PAA would be subject to mainly minor and temporary impacts with a 2 ha area of permanent landform change associated with the STSF and would not be subject to direct mining excavation/extraction impacts as part of the Modification. Temporary impacts would consist of ancillary disturbance and infrastructure such as laydown areas, roads, soil stockpiles and water management/seepage dams.

The Modification would result in some minor permanent landform changes over an area of approximately 2 ha, within the PAA, due to the development of the STSF embankment. This embankment would be rehabilitated post-mining and would have a final slope in the order of 1:3 vertical to horizontal. Overall, due to the changes in slope associated with construction of the embankments, (a key factor in BSAL qualification) there would be a minor reduction in BSAL of 0.8 ha within the PAA.

It is anticipated that by adopting the principles of impact avoidance and minimisation during the Modification's construction and operation, and implementing effective decommissioning and rehabilitation at the end of the CVO life, the Modification would have no significant permanent impacts on agricultural resources or enterprises (Minesoils, 2023b).

Potential Impacts on Highly Productive Groundwater

The proposed reinforcement of the STSF embankment would not have an influence on groundwater take, and therefore would not affect water access licensing. AGE (2023) has identified seepage from the TSF into the underlying bedrock and creeks as a potential impact mechanism (Appendix C). Accordingly, the TSF embankment would be designed with a very low permeability core to minimise seepage through the wall. No impacts have been identified on highly productive groundwater in the context of the Aquifer Interference Policy (AGE, 2023) (Appendix C).

5. STRATEGIES TO MINIMISE POTENTIAL IMPACTS ON BIOPHYSICAL STRATEGIC AGRICULTURAL LAND

Mine Planning and Design

The Modification would constitute an extension of the existing CVO's STSF embankment footprint. Features of the CVO that limit its impact on agricultural land include:

- temporary surface infrastructure would be progressively constructed, operated, decommissioned and rehabilitated to support the ongoing operation of the STFS; and
- the scale and nature of the activities in the PAA permanently impacting a limited area of 2.0 ha. The overall impact of the Modification on agriculture and agricultural resources is considered to be minor on a property scale (i.e. the background property is estimated at 1,212 ha) and negligible at the scale of the locality.

In addition, the Modification would use the existing CVO infrastructure, which further serves to limit the disturbance footprint and consequential impacts on agriculture.

Groundwater Management

The Modification would not result in impacts on highly productive groundwater in the context of the Aquifer Interference Policy (AGE, 2023) (Appendix C). Notwithstanding, groundwater level and quality monitoring would be undertaken for the Modification.

The proposed raise of the STSF embankment associated with the Modification would continue to comply with the approved centreline/downstream lift design methodology and is not expected to result in a notable change in seepage water quality. CHPL would continue to implement the approved *CVO Water Management Plan* (Newcrest Mining Limited, 2019) for the Modification.

Rehabilitation

Surface disturbance due to the Modification would be progressively rehabilitated and include those associated with TSF reinforcement activities, surface infrastructure, environmental monitoring and management activities (e.g. soil stockpiling for later rehabilitation and installation of monitoring equipment). These areas would be rehabilitated to their agreed post-mining land use (e.g. agricultural use or native vegetation).

In areas subject to permanent landform changes due to the reinforcement of the STSF embankment, a soil stripping operation would maximise the recovery of soil resources prior to disturbance. This material would be stockpiled and re-spread on the final landform embankment slopes and/or used to bolster rehabilitation efforts elsewhere (Minesoils, 2023a) (Appendix A).

A detailed progress plan would minimise land disturbance in advance of construction and operation activities and include progressive rehabilitation of disturbed areas which are no longer required for construction or operational purposes. This would assist in reducing the net impacts to agricultural lands at any one time, (although this is unlikely to be significant given the scale and nature of impacts on the PAA) (Minesoils, 2023b) (Appendix B).

Soil management practices would involve the stripping and stockpiling of soil resources prior to any mine-related disturbance. The objectives of soil resource management for the Modification would be to:

- identify and quantify potential soil resources for rehabilitation;
- optimise the recovery of useable topsoil and subsoil during stripping operations;
- manage topsoil and subsoil reserves so as not to degrade whilst stockpiled;
- establish effective soil amelioration procedures to maximise the availability of soil for future rehabilitation; and
- take into account the need to provide soil conditions that minimise the risk of soil loss via wind and water erosion during and after rehabilitation.

Minesoils (2023a) has developed soil resource management measures that would be considered in the preparation of the Modification and Rehabilitation Strategy (Appendix A).

6. CONCLUSION

This Gateway Certificate Application has been prepared to certify a proposed increase to the embankment footprint of the STSF (however, with no change to the total stored tailings footprint) which would extend beyond the existing CVO ML and enter land identified as BSAL.

The proposed changes are driven by the emergence of new information, including, recent drilling results and a higher engineering significance rating which necessitates larger foundation footprints for the TSFs. Furthermore, the increased footprint is required to meet the TSF that was approved as part of Modification 14.

Ten soil test pits were excavated to verify BSAL within the PAA. In addition, several consultation meetings were conducted with local stakeholders to further characterise the agricultural enterprises in the area.

Approximately 24.9 ha of Interim Protocol Verified BSAL has been identified within the BSAL Assessment Area by Minesoils (8.3 ha within the PAA) (2023a) (Appendix A). In addition, site observations, existing regional mapping, and concurrent studies viewed in the context of the findings of this assessment suggest that the verified BSAL likely forms part of a larger contiguous mass. The combined Interim Protocol verified BSAL represents approximately 34% of the BSAL Assessment Area (29% of the PAA).

The groundwater review shows that the Modification meets the 'Level 1' minimal impact considerations of the *Aquifer Interference Policy* for key regional 'highly productive' groundwater resources (AGE, 2023) (Appendix C).

Minor surface disturbance to BSAL is predicted as part of the Modification due to ancillary disturbance and infrastructure such as laydown areas, roads, soil stockpiles and water management/seepage dams. Some of these areas would be used for the duration of the Modification, and would be subsequently rehabilitated. Other areas would be progressively rehabilitated as mining progresses. The Modification would result in some minor permanent landform changes in the PAA associated with the STSF embankment. The embankment would be rehabilitated post-mining and would have a final slope in the order of 1:3 vertical to horizontal. Overall, due to the changes in slope, there would be a minor reduction in BSAL of 0.8 ha within the PAA. However, given the scale and nature of impacts, the Modification would have no significant permanent impacts on agricultural resources or enterprises.

It is anticipated that by minimising environmental impacts during the construction and operational phases, coupled with effective decommissioning and rehabilitation procedures during mine closure, the impacts to agricultural land use would be short term with minimal to no impacts on agricultural production in BSAL areas (Minesoils, 2023b).

We would be happy to meet with the Department further in regard to the Gateway Certificate Application.

Should you have any further queries regarding this matter, please do not hesitate to contact Rodney Williams (Manager – Approvals & Permitting).

Yours sincerely,



Geoffrey Newcombe
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7. REFERENCES

- Australasian Groundwater and Environmental Consultants Pty Ltd (2023). *Cadia Valley Operations Gateway Assessment – Groundwater Review*.
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