

ASSESSMENT REPORT

CADIA EAST GOLD/COPPER PROJECT Surface Preconditioning Modification 06_0295 – Mod 4

1 BACKGROUND

Cadia Holdings Pty Ltd (Cadia) owns and operates the Cadia Valley mining complex, located approximately 25 kilometres (km) southwest of Orange, in the Central Tablelands of New South Wales (see Figure 1). The complex is located within the Cabonne and Blayney Local Government Areas (LGAs).

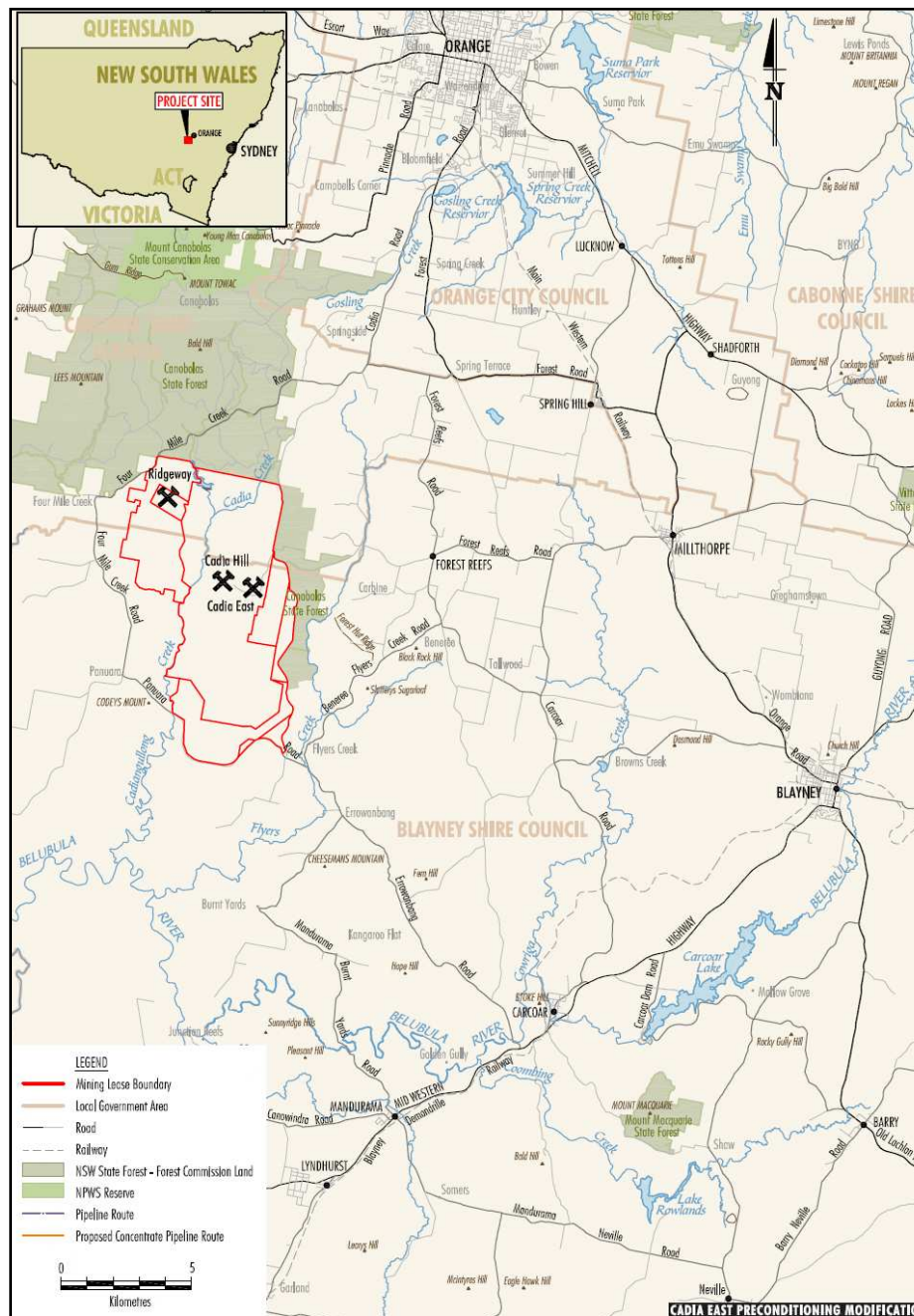


Figure 1: Regional Context

The Cadia Valley mining complex includes the Cadia Hill open cut mine, the Ridgeway underground mine and the Cadia East underground mine, as well as the Blayney Dewatering Facility, which is located approximately 25 km east of the mining complex in the town of Blayney (see Figures 1 and 2).

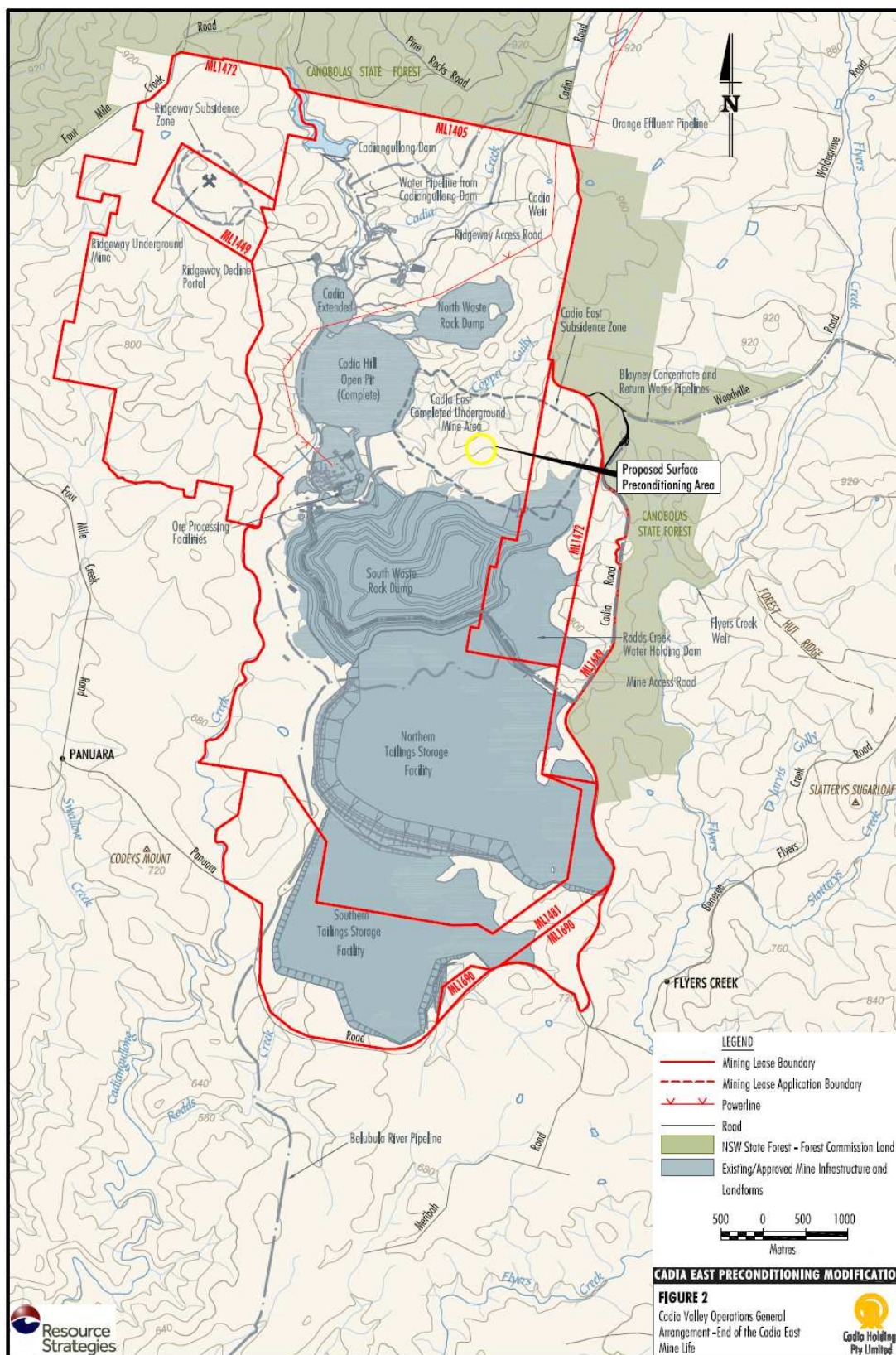


Figure 2: Existing Operations

The mining complex operates under the Cadia East project approval (PA 06_0295), granted by the then Minister for Planning on 6 January 2010. This approval consolidated and replaced 4 previous Ministerial consents regulating open cut and underground operations since 1998.

The Cadia East project approval has been modified 3 times, and allows Cadia to undertake the following activities until 30 June 2031:

- extract ore from the Cadia and Ridgeway mines;
- process up to 27 million tonnes (Mt) of ore a year; and
- transfer processed ore via a pipeline to the Blayney Dewatering Facility, where it is dewatered and transported via rail to Port Kembla for export.

The underground mining method (panel caving) at Cadia East involves controlled caving of the rock mass by undercutting a block of ore. Mining progresses by advancing the undercut level beneath the ore block. As part of this process Cadia must 'precondition' the ore body, which involves drilling into the ore body and using hydraulic fracturing or blasting techniques to create fractures in the rock. Cadia has approval to drill into the ore body from the underground workings.

Since operations at Cadia East commenced (i.e. 2013), it has been identified that some of the host rock above the ore body also requires preconditioning, to better control the caving and subsidence zones at the surface.

2 PROPOSED MODIFICATION

Cadia is seeking to modify its project approval to undertake preconditioning of the host rock from the surface using hydraulic fracturing. The proposed modification involves the use of 10 approved and/or existing diamond drill holes located within the approved Cadia East subsidence zone (see Figures 2, 3 and 4). The drill holes are currently being installed under a separate approval from DRE¹ and extend approximately 350 to 750 metres (m) from the surface to the top of the Cadia East ore body.

As part of this process, water would be pumped from a surface drilling rig into the drill holes to generate fractures that would radiate approximately 50 m from each drill hole. Fractures would be created at vertical intervals of approximately 2 m. The preconditioning works would be undertaken 24 hours a day over a 6 month period.

Water would be sourced from Cadia's approved water supply network, and seepage resulting from the hydraulic fracturing would be captured within the Cadia East underground workings and reused on site. No chemicals would be used in the hydraulic fracturing process, and Cadia has successfully implemented the same methods during the underground preconditioning of the ore body.

The drill holes would be accessed via approved tracks and drill pads. The drill holes, which would be filled with grout to maintain stability, would be drilled out prior to hydraulic fracturing. Waste from this process (i.e. grout fines, water and a biodegradable, organic drilling chemical) would be collected in the drilling sumps and transferred to the existing onsite tailings storage facilities.

Full details of the proposed modification are included in Cadia's Environmental Assessment (EA) (see **Appendix C**).

¹ The drill holes and associated drill pads and tracks were approved by DRE on 6 December 2013 via a Surface Disturbance Notice, issued under Part 5 of the *Environmental Planning and Assessment Act 1979*

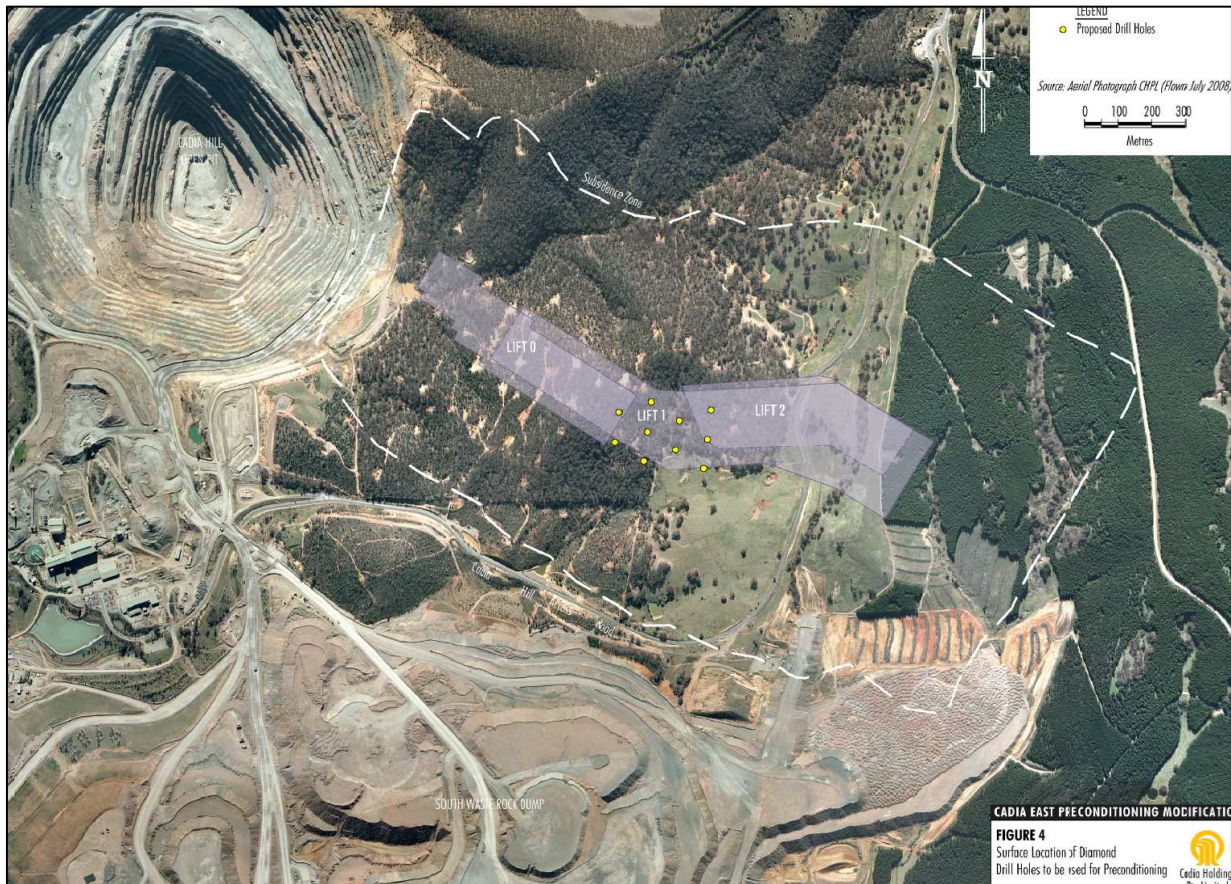


Figure 3: Aerial view of the Proposed Modification

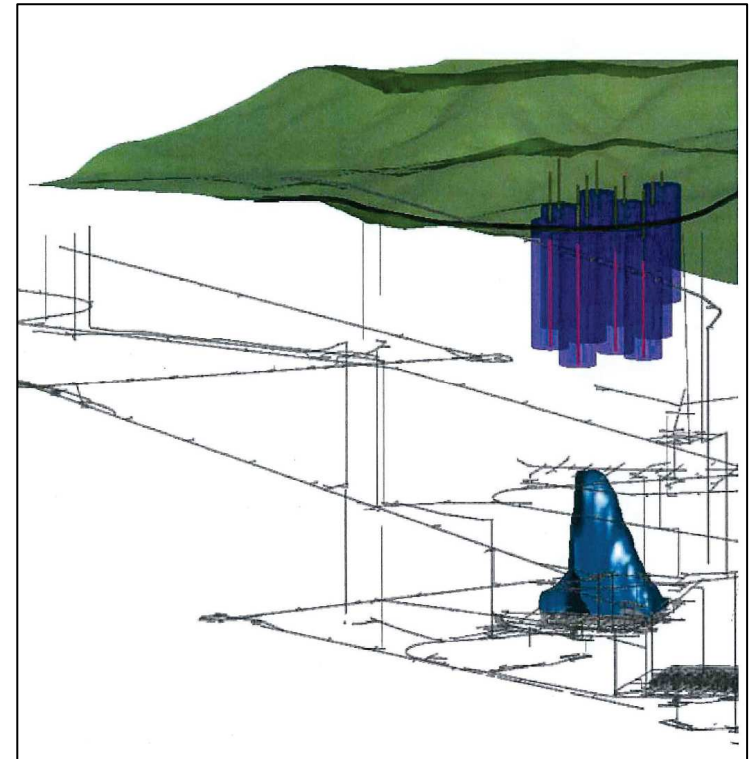


Figure 4: Proposed Drill Holes

3 STATUTORY CONTEXT

3.1 Section 75W

The Cadia East Gold/Copper Project was approved under the former Part 3A of the *Environmental Planning and Assessment Act 1979* (EP&A Act). Although Part 3A was repealed on 11 October 2011, the project remains a “transitional Part 3A project” under Schedule 6A of the EP&A Act. The proposed modification must therefore be considered under Section 75W of the EP&A Act, in accordance with the relevant savings provisions.

3.2 Approval Authority

The Minister for Planning is the approval authority for the modification application. However, under the former Minister’s delegation of 14 September 2011, the Director, Mining Projects may determine the application. This is because no public submissions were received, no objections were received and Cadia did not make any reportable political donations.

3.3 Modification

The Department is satisfied that the proposal can be characterised as a modification to the original approval rather than a new project in its own right. In this respect, the Department notes that the proposed preconditioning works would be consistent with the approved preconditioning works, carried out on the surface within approved disturbance areas rather than underground. Additionally, the proposed modification occurs within the existing subsidence zone and would not change the approved mining, processing and transport methods, extraction rate, operating hours, or the life of the project.

Consequently, the Department is satisfied that that the proposed modification is within the scope of Section 75W of the EP&A Act.

3.4 Environmental Planning Instruments

The Department has considered the relevant environmental planning instruments in its assessment and is satisfied that none of these instruments substantially govern the carrying out of the proposal.

4 CONSULTATION

After accepting the application the Department referred it to key government agencies for comment and made it publicly available on its website from 25 March 2014.

The Department received comments from 3 government agencies, none of which object to the proposal. A summary of the submissions is provided below, and full copies are provided in **Appendix D**. No representations from the general public were received during the course of the assessment process.

The **NSW Office of Water** (NOW) raised no objections to the proposal, but requested that Cadia carry out additional monitoring of nearby bores before and after undertaking the proposed preconditioning works. NOW also requested that Cadia test the quality of water injected into the host rock prior to commencing hydraulic fracturing, to ensure that the beneficial use of the groundwater source is not compromised. Cadia has agreed to these additional monitoring measures.

The **Environment Protection Authority** (EPA) acknowledged that the proposal would not require the use of chemical or other additives in the hydraulic fracturing process, and raised no objections to the proposal.

The **Division of Resources and Energy** (DRE) within the Department of Trade and Investment supported the proposal and made no recommendations.

5 ASSESSMENT

In assessing the merits of the proposal, the Department has considered:

- the EA for the original project;
- the existing conditions of approval;
- the EA for the proposed modification;
- submissions on the application;
- relevant environmental planning instruments, policies and guidelines; and
- the requirements of the EP&A Act.

The key issues for the proposal relate to potential impacts on groundwater due to the pumping of additional water into the host rock, and potential noise emissions from the surface drilling rig. The assessment of these issues is summarised below. Based on its assessment, the Department is satisfied that all potential impacts resulting from the modification would be relatively minor and could be appropriately managed.

5.1 Groundwater

The EA includes a groundwater impact assessment undertaken by Australasian Groundwater and Environmental Consultants Pty Ltd (AGE), including a review of the previous Cadia East groundwater assessment (AGE 2009) in the context of the proposed modification. Additionally, AGE developed an updated groundwater flow model and compared the potential impacts of the proposed modification with the requirements of the Aquifer Interference Policy (AIP).

The preconditioning works would occur within two relatively low yielding hydrostratigraphic units, including the Silurian formation, and the underlying (lower yielding) Ordovician formation. Preconditioning would not occur within the productive Tertiary basalt formation, which is the primary aquifer utilised by surrounding water users.

The groundwater assessment found that the proposed preconditioning would not induce additional fracturing beyond that already assessed and approved under the existing conditions of approval. The proposal would however, result in fracturing at the surface approximately three years earlier than previously modelled for the Cadia East EA. Nonetheless, there would be no net change to the groundwater regime.

The assessment noted that seepage from the Silurian sequence (as a result of the modification) has already been accounted for in the groundwater modelling for the Cadia East EA, and it is only the timing of seepage that would change. Therefore, the proposed preconditioning would not change the amount of water that would drain from the surrounding aquifers into the Cadia East underground workings (i.e. no change to groundwater extraction amounts). As a result, the predicted location and magnitude of the regional groundwater drawdown would be the same as that already assessed and approved.

The assessment also concluded that the whole Cadia East project (including the proposed preconditioning works) would meet the Level 1 minimal impact consideration under the AIP.

Regarding water take, Cadia has approval to extract up to 804 megalitres (ML) a year from the Lachlan Fold Belt MDB Groundwater Source, and up to 50 ML a year from the Orange Basalt Groundwater Source. Cadia proposes to source a maximum 20 ML of water from its approved water supply network (i.e. Rodds Creek Dam or alternative existing water storage) for the proposed preconditioning works. Both the Department and NOW are satisfied that the required amount of water can be sourced from Cadia's existing approved water supply network.

The Department supports NOW's recommendations for additional monitoring, and notes that the existing project approval requires Cadia to review its management and monitoring plans in light of any modification. Therefore these measures would be incorporated in a revised Water Management Plan for the project.

Overall, the Department is satisfied that the proposed modification would have negligible additional impacts on groundwater above and beyond those already approved under the Cadia East Project.

5.2 Noise

The EA includes a noise impact assessment undertaken by Wilkinson Murray, including a review of existing and proposed noise emissions.

The surface drilling rig and pump would be the only additional noise emitting sources associated with the modification (although the drilling rig has been operating under the DRE approval), with pumping proposed to occur 24 hours a day for the duration of the 6 month preconditioning period.

The assessment found that under worst case conditions the proposed modification would increase overall mine noise by a maximum of 1 dBA at the nearest receivers. A 1 dBA exceedance is generally imperceptible, and this increase would not result in exceedances of the night time project specific noise levels (PSNLs) at any receiver (i.e. the period when the most stringent PSNLs apply). Consequently, the Department and the EPA are satisfied that noise emissions from the proposed preconditioning would be negligible.

The Department notes that the existing approval requires Cadia to implement a range of noise mitigating, monitoring and management measures. Cadia is also required to review and revise its existing Noise Management Plan to account for the proposed modification. With these measures in place, the Department is satisfied that the proposed preconditioning would not result in any appreciable noise impacts at sensitive receivers.

6 RECOMMENDED CONDITIONS

The Department has drafted a Notice of Modification (see **Appendix A**) for the proposed modification, as well as a consolidated version of the project approval as modified (see **Appendix B**). Cadia has reviewed and accepted the proposed amended conditions.

7 CONCLUSION

The Department has assessed the merits of the modification in accordance with the relevant requirements of the EP&A Act. Based on this assessment, the Department is satisfied that the modification would not result in any additional environmental impacts. The Department also notes that the proposed preconditioning can be undertaken with negligible additional impacts on groundwater resources and the amenity of surrounding receivers.

Additionally, the Department acknowledges that the proposed preconditioning is necessary to ensure that caving and subsidence advances within the required design and safety parameters.

Overall, the Department is satisfied that the benefits of the modification outweigh any residual costs. Consequently, the Department believes that the modification is in the public interest and should be approved.

8 RECOMMENDATION

It is recommended that the Director, Mining Projects, as delegate of the Minister for Planning:

- **considers** the findings and recommendations of this report;
- **determines** that the modification is within the scope of Section 75W of the EP&A Act;
- **approves** the modification application under Section 75W of the EP&A Act, subject to conditions; and
- **signs** the attached notice of modification (**Appendix A**).



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Team Leader
Mining Projects

2/5/14



5/5/14

David Kitto
Director
Mining Projects

APPENDIX A: NOTICE OF MODIFICATION

APPENDIX B: CONSOLIDATED PROJECT APPROVAL

APPENDIX C: ENVIRONMENTAL ASSESSMENT

APPENDIX D: AGENCY SUBMISSIONS