

*Environment Effects Act 1978*

*Planning and Environment Act 1987*

# **EES Inquiry and Advisory Committee Report**

Stockman Base Metals Project

**2 September 2014**



Stockman Base Metals Project

Inquiry Panel appointed pursuant to Section 9 of the *Environment Effects Act 1978*

Advisory Committee appointed pursuant to Section 151 of the *Planning and Environment Act 1987*



Cathie McRobert, Chair



Rod Gowans, Member



Greg Sharpley, Member

# Contents

	Page
<b>Overall Conclusions and Recommendations .....</b>	<b>8</b>
Overall conclusions .....	8
Consolidated recommendations .....	14
<b>1 Introduction.....</b>	<b>21</b>
1.1 The proposal.....	21
1.2 The site .....	21
1.3 Background to the proposal.....	23
1.4 The EES inquiry .....	24
1.5 The regulatory framework .....	29
<b>2 Policy and Planning Context.....</b>	<b>31</b>
2.1 Planning policy.....	31
2.2 SEPPs .....	32
2.3 ANCOLD guidelines.....	33
2.4 Planning scheme provisions .....	35
2.5 Issues dealt with in this report.....	36
<b>3 Socio-economic Impacts .....</b>	<b>37</b>
3.1 The EES assessment.....	37
3.2 Recommendations .....	43
<b>4 Mine Operations and Processing.....</b>	<b>44</b>
4.1 The issues .....	44
4.2 Previous mining operations legacy issues.....	44
4.3 Mining opening and operations - What is proposed?.....	44
4.4 Mine closure.....	49
4.5 Recommendations .....	50
<b>5 The Tailings Storage Facility .....</b>	<b>52</b>
5.1 The issues .....	52
5.2 What is proposed? .....	52
5.3 Background and existing conditions .....	53
5.4 Submissions .....	54
5.5 Tailings.....	59
5.6 Dam integrity.....	61
5.7 Protecting surface water quality .....	64
5.8 Rates and water quality of seepage from the TSF .....	66
5.9 TSF Impacts on ground water.....	68
5.10 TSF closure.....	69
<b>6 Water Impacts .....</b>	<b>74</b>
6.1 Surface water impacts.....	74
6.2 Groundwater impacts.....	78
6.3 Recommendations .....	82

<b>7</b>	<b>Biodiversity</b> .....	<b>84</b>
7.1	Introduction.....	84
7.2	Aquatic ecology .....	85
7.3	Vegetation and flora – impact on threatened species and communities.....	92
7.4	Terrestrial fauna .....	101
<b>8</b>	<b>Bushfire Risk</b> .....	<b>108</b>
8.1	The issues .....	109
8.2	The EES assessment.....	109
8.3	Submissions .....	111
8.4	Discussion .....	114
<b>9</b>	<b>Transport and Roads</b> .....	<b>117</b>
9.1	The issues .....	117
9.2	What is proposed? .....	117
9.3	Evidence and submissions.....	117
9.4	Discussion .....	120
<b>10</b>	<b>Linear Infrastructure</b> .....	<b>124</b>
10.1	What is proposed? .....	124
10.2	EES assessment.....	125
10.3	Submissions .....	125
10.4	Discussion .....	125
<b>11</b>	<b>Worker Accommodation and the Benambra Car Park</b> .....	<b>127</b>
11.1	Worker accommodation .....	127
11.2	The Benambra car park .....	131
<b>12</b>	<b>Other issues</b> .....	<b>135</b>
12.1	Will cultural heritage values be protected?.....	135
12.2	Energy.....	136
12.3	Waste storage and management.....	137
<b>13</b>	<b>Draft Applications</b> .....	<b>140</b>
13.1	Draft work plan and mine rehabilitation plan.....	140
13.2	Discussion .....	142
13.3	Environmental Review Committee .....	148
13.4	The rehabilitation bond and the proposed post-closure trust fund.....	150
13.5	The draft amendment .....	152
13.6	Other draft applications .....	152

**Appendix A Terms of Reference**

**Appendix B List of submitters**

**Appendix C Hearing document list**

**Appendix D Changes to the Work Plan circulated by the Proponent after the Hearing**

## List of Tables

Table 1	Key approvals applicable to the Project.....	29
Table 2	Vegetation removal.....	96
Table 3	Threatened species assessment.....	102
Table 4	Road maintenance contribution sought by VicRoads.....	119
Table 5	Independent Technical Review Framework.....	146

## List of Figures

Figure 1	Proposed site layout.....	21
Figure 2	Location of the proposed Stockman Project.....	22
Figure 3	Accommodation village site layout .....	128
Figure 4	Indicative car park layout .....	131

## List of Abbreviations

AMD	Acid Mine Drainage
APZ	Asset Protection Zone
BAGs	Biodiversity Assessment Guidelines
BAL	Bushfire Attack Level
BMO	Bushfire Management Overlay
CHMP	Cultural Heritage Management Plan
DBH	Diameter at Breast Height
DEPI	Department of Environment and Primary Industries
DNRE	Department of Natural Resources and Environment
DSDBI	Department of State Development, Business and Innovation
DSE	Department of Sustainability and Environment
DTPLI	Department of Transport, Planning and Local Infrastructure
EA	Ecology Australia
EE Act	<i>Environment Effects Act 1978</i>
EES	Environment Effects Statement
EIA	Economic Impact Assessment
EMP	Environmental Management Plan
EP Act	<i>Environment Protection Act 1970</i>
EPA	Environment Protection Authority
EPBC Act	<i>Environment Protection and Biodiversity Conservation Act 1999</i>
ERC	Environmental Review Committee
ERRB	Earth Resources Regulation Branch
ESO	Environmental Significance Overlay
EVC(s)	Ecological Vegetation Class(es)
FFG Act	<i>Flora and Fauna Guarantee Act 1988</i>
GEG	Gippsland Environment Group
GMZ	General Management Zone
GMW	Goulburn Murray Water
ha	Hectare(s)
Hha	Habitat hectares
ITR	Independent Technical Reviewer
km	kilometre or kilometres
kV	kilovolt
LOT	Large Old Tree
m	metre or metres
NES	National Environmental Significance
PAF	Potential Acid Forming

PCRZ	Public Conservation and Recreation Zone
P&E Act	<i>Planning and Environment Act 1987</i>
SEPP	State Environment Protection Policy
SEPP (AAQ)	State Environment Protection Policy (Ambient Air Quality)
SEPP (AQM)	State Environment Protection Policy (Air Quality Management)
SEPP (GoV)	State Environment Protection Policy (Groundwaters of Victoria)
SEPP (WoV)	State Environment Protection Policy (Waters of Victoria)
SIA	Social Impact Assessment
SMZ	Special Management Zone
SPZ	Special Prohibition Zone
SRW	Southern Rural Water
TDS	Total Dissolved Solids
TMP	Transport Management Plan
TSF	Tailings Storage Facility
the Project	The Stockman Base Metals Project

## EES and draft Amendment summary

<b>The EES</b>	The Stockman Base Metals Project EES
<b>The site</b>	The site is located approximately 19 km south-east of the township of Benambra in East Gippsland.
<b>The Draft Amendment</b>	Draft Amendment to the East Gippsland Planning Scheme for project infrastructure on land outside the Stockman mining lease areas.
<b>The Proponent</b>	Stockman Project Pty Ltd (Stockman), a wholly owned subsidiary of Independence Group NL.
<b>Planning Authority</b>	East Gippsland Shire
<b>Other agencies responsible for approvals</b>	<ul style="list-style-type: none"> <li>• Department of State Development, Business and Innovation</li> <li>• Environment Protection Authority</li> <li>• Department of Environment (Commonwealth)</li> </ul>
<b>Minister's decision on need for EES under the EE Act</b>	16 August 2010
<b>Project declared a controlled action under EPBC Act 1999</b>	29 November 2010
<b>EES accredited under Commonwealth and Victorian government bilateral agreement</b>	10 December 2010
<b>Scoping Directions issued</b>	March 2011
<b>Exhibition</b>	25 March – 8 May 2014
<b>Submissions</b>	36 Submissions, listed in Appendix B.

## Inquiry Process

<b>The Inquiry and Advisory Committee (the Inquiry)</b>	<p>The Minister appointed a combined Inquiry under Section 9 of the Environment Effects Act 1978 (EE Act) and an Advisory Committee under Section 151 of the <i>Planning and Environment Act 1987</i> to report on the Project. The combined entity is referred to as the 'Inquiry' and comprises:</p> <ul style="list-style-type: none"> <li>• Cathie McRobert, Chair</li> <li>• Rod Gowans</li> <li>• Greg Sharpley</li> </ul>
<b>Site Inspection</b>	19 May 2014
<b>Directions Hearing</b>	20 May 2014
<b>Inquiry Hearing</b>	23 - 30 June 2014



## Appearances

- Department of Transport, Planning and Local Infrastructure (DTPLI) represented by Elissa Bell, Environment Assessment Unit
- Stockman represented by Tim Power of Herbert Smith Freehills who called the following expert evidence:
  - Groundwater: Bryan Chadwick of URS
  - Surface Water, Water Quality and Water Balance: David Fuller of Deep River Associates (formerly of URS)
  - Tailings: Stephen Newman of URS
  - Site Hydrogeology: Hugh Middlemis of RPS Aquaterra
  - Geochemistry: Jeff Taylor of Earth Systems Consulting
  - Aquatic Ecology: Simon Harrow of GHD
  - Fauna (terrestrial): Cameron Miller of AECOM
  - Vegetation: Kerry Spencer of Ethos NRM
- DSDBI (Minerals Development Victoria) represented by Anthony Hurst and David Gallus
- DSDBI (Earth Resources Regulation) represented by John Mitas and David Whitehouse
- EPA Victoria represented by German Ferrando-Miguel and Tony Robinson
- Department of Environment and Primary Industries (DEPI) represented by Ryan Incoll
- East Gippsland Shire Council (EGSC) represented by Kate Nelson
- Country Fire Authority (CFA) represented by Adrian Wakenshaw and Gabby McMillan
- Gippsland Environment Group (GEC) represented by Louise Crisp and Ian Magee who called the following expert evidence:
  - Toxic waste and disaster response: Andrew Helps
- Southern Rural Water represented by Chris Hughes
- Goulburn Murray Water represented by Stephen Gemmill
- Beverley Kibble
- John Hermans
- Graham Symons
- Christopher McRae
- Victorian National Parks Association represented by Phillip Ingamells
- VicRoads represented by Mark Bartley of HWL Ebsworth and Chris Padovan of VicRoads (Eastern Region) who called the following evidence:
  - Road pavements: Andrew Papacostas of VicRoads

## Date of this Report

2 September 2014

## Overall Conclusions and Recommendations

The Inquiry considered the EES documentation, expert evidence and all written submissions, including submissions presented to it during the Hearing. In addressing the issues raised in those submissions, the Inquiry has been assisted by the information provided to it as well as its observations from the inspection of the Project site.

### Overall conclusions

#### Environmental risks and impacts

The extensive EES investigations have responded to the issues raised in the scoping phase and advice from the Technical Reference Group (TRG). Like the agencies that presented to the Inquiry, we are satisfied that the analysis undertaken has been robust and has provided an appropriate level of confidence that relevant environmental effects have been evaluated. We consider the work undertaken was 'fit for purpose'. However, submissions and evidence presented to the Inquiry have identified further work will inform the development of more detailed project design, the regulatory framework and the assessment of applications for the various approvals that are required.

The Project has management demands in common with many major developments, which can be addressed through established industry best practice, such as construction management plans, management of hazardous materials and the like. It is the potentially acid forming material generated by the Project, together with the mine's location in remote forests at the headwaters of the Tambo River, that pose specific risks to the environment and have been the focus of our assessment.

The most significant risks to the environment from the Project relate to:

- The discharge of acid mine drainage to the ground and surface water, with associated risks of impacts on biodiversity values, potable water supply from the Tambo River and the health and safety of downstream populations. These risks from stored tailings continue in perpetuity.
- The loss of significant biodiversity values, in particular the loss of Montane Alpine Sphagnum Bogs and Associated Fens and large old hollow bearing trees.
- Fire escaping from the Project site in to a landscape with extreme fire risk and the risk to mine workers and property from bushfires in the locality.
- Social disruption from a large influx of predominantly male workers on small towns, and the capacity of the local housing market and services to meet additional demands generated by the Project.

#### Management of risks associated with potentially acid forming material

Legitimate concerns, evidenced by the previous mine on the site, were raised in relation the discharge of contaminated water to the environment, particularly from the Tailings Storage facility (TSF), the efficacy of measures to effectively manage tailings both during operations and in perpetuity after closure, and the costs of remediation if the proposed measures fail or do not perform as expected.

The Inquiry is satisfied that the risk of contamination of ground and surface water from the mine can be effectively managed through measures identified in the EES and the Inquiry processes.

Key elements of strategies to ensure environmental impacts from PAF material and Acid Mine Drainage do not damage the environment include:

- Undertaking further baseline monitoring to determine appropriate water quality criteria and trigger points, with the key point of compliance being in the Tambo River just downstream of the TSF.
- Ensuring that the TSF dam and processes are designed for long-term endurance. We are satisfied that there will be minimal risk of failure of the TSF dam if it is designed, constructed, operated and maintained in accordance with the relevant ANCOLD standards, as proposed. We note expert evidence that the density of tailing means that they are unlikely to be disturbed by flow passing through the TSF and even in the extremely unlikely event of dam failure, they would not migrate far downstream.
- While evidence indicates groundwater flows will continue to be into the enlarged TSF rather than out, there is potential for outflow in the northern segment in the vicinity of Monkeys Knob. Therefore further monitoring and investigations to inform detailed design and strong engineering controls are proposed in this area.
- Adopting measures to ensure that contaminated water is not discharged (until water quality criteria for discharge are met after mine closure and rehabilitation). In addition to robust design of the enlarged TSF dam, these include:
  - Diverting all storm water around the TSF. When water quality in the TSF meets agreed standards the diversion channels above the TSF would be removed and revegetated.
  - Recycling all water from the TSF during operation.
  - Returning water intercepted from the seep at the toe of the dam to the TSF during operation and maintaining the option of biological treatment downstream of the TSF dam post closure if the quality is below established criteria.
- Avoiding exposure of tailing both during operation and after the mine closes by:
  - Maintaining the stored tailings underwater (in both the TSF and mine voids). Testing and monitoring at an early stage in the mining process should identify the most appropriate paste consistency for both supporting the stope rooves and the long-term maintenance of the alkalinity in the paste.
  - Maximising underground storage of paste thickened tailings, while providing for ease of future access to ore reserves. We accept the evidence that water budget modelling indicates sufficient water will be available for both flooding closed mines with water of appropriate quality and to maintain adequate water cover in the TSF in perpetuity. We note that water balance model assumptions can be verified using observed data as the actual mining operations proceed and prior to design and construction of the various TSF dam lifts. Monitoring regimes would identify and enable early responses to matters such as declining dam integrity or increased seepage from the dam toe.

While the previous mine operation created unwanted challenges, the remediation of the old TSF has tested responses to management options and provides some confidence about their effectiveness.

The development of robust plans for the Project, diligent implementation of those plans and effective monitoring of performance are required and we see Independent Technical Review (ITR) as essential to support the decisions and oversight by Government regulators. We recommend that appointment of EPA Environmental auditors to the role of ITR as the established framework for appointment provides assurances about the credibility of this process. The exception is in relation to the enlargement of the TSF dam, as although the EPA auditors are expected to adopt a multi-disciplinary approach and may supplement their expertise where required, we have accepted submissions that review of this element of the Project requires specialist engineering expertise that is beyond the required skillset of EPA appointed auditors. This process of ITR and monitoring enables early identification of potential risks which may arise and enable prompt responses that avoid or minimise impacts.

The Inquiry emphasises the need for adequate financial security that environmental impacts can be addressed without making demands on the tax payer, as occurred after the previous mine on this site ceased operating. We accept that the establishment of a post-closure trust fund is addressing the particular circumstances of this site, however, submissions at the Hearing did not provide any confidence that the circumstances of this project will be addressed through the use of the generic DSDBI bond calculator.

We acknowledge the considerable effort made by the Proponent and the various government agencies to identify an approach to tailings management which will minimise the environmental risks associated with the Project. In our opinion it has been demonstrated that the design, construction, operation and post closure management of the TSF can be undertaken in a manner that minimises the environmental risks presented by PAF material.

### **Biodiversity Impacts**

The Inquiry considers the assessment of impacts on biodiversity has been rigorous and where uncertainty remains, a precautionary approach is evident in recommendations for further investigation to detect and avoid impacts on flora and fauna species and assessment of trees for hollows at the time of vegetation clearance. We accept that the Project design process and consideration of alternatives has sought to avoid and minimise impacts, as required by policy.

Provided ground and surface water quality and predicted flows are maintained, the EES assessment and expert evidence identified significant biodiversity impacts as being limited to the loss of:

- 0.36 hectares of Montane Alpine Sphagnum Bogs and Associated Fens ecological community (historically referred to as Montane Swamp Complex) as a result of expansion of the existing TSF
- 600 large old trees which may contain hollows that provide valuable habitat for fauna

Offsets for these losses on the mine site and losses of native vegetation associated with the accommodation village and linear infrastructure that satisfy State and Commonwealth Guidelines have been identified and the Proponent is confident that they can be secured.

The Inquiry is satisfied that the Project has responded to policy to protect biodiversity values and does not involve unacceptable impacts.

### **Bushfire Risk**

The Inquiry recognises that the EES adopted an appropriate methodology to identify defensible space and construction requirements under the Bushfire Management Overlay (BMO) and highlighted the enhanced capacity for able bodied, trained mine workers to respond in the event of a fire.

However, the mine and accommodation village are in a landscape with extreme fire risk and we consider further development of an integrated Bushfire Management Plan and Emergency Response Plan to take this into account are needed to protect life. Issues identified for further consideration, in consultation with the CFA and DEPI, include the role of fire refuges, responses to high fire danger conditions, lines of communication, operational and evacuation protocols and responsibilities in the event of fires on the site and in the wider area.

An integrated Fire and Emergency Response Plan for Stockman operations that recognises the remoteness and landscape scale fire hazard of this area should be prepared to the satisfaction of the CFA and DEPI. The Work Plan, the Incorporated Document associated with Clause 52.03 and other approvals should refer to this plan.

### **Socio-economic risks and effects**

The mine will generate significant net economic and employment benefits for the State, regional and local economies. Social impacts have been considered and the pro-active approach adopted through the community engagement strategies and the Memorandum of Understanding (MoU) between the Proponent and the Shire of East Gippsland provides a framework to optimise outcomes for the community, plan for services and minimise social impacts. The Inquiry accepts that the location of the accommodation village outside Benambra addresses occupational health and safety issues and the potential for social disruption from a large influx of predominantly single male workers in the small town in the locality.

This assessment of social and economic effects is on the basis that the Project design, management of operations and rehabilitation proposed in the EES, together with recommendations in expert evidence and this report, are implemented to ensure the significant risks to the environment are effectively addressed.

It was apparent that the Proponent has developed strong relationships and support within the local community but stronger engagement with environmental groups in ongoing consultative processes, such as the Community Reference Group and the Environment Reference Group, would enhance community confidence that undertakings in the EES are implemented.

### **Impacts on matters of national environmental significance**

We consider the EES investigation relating to species of national environmental significance provided an appropriate basis for the conclusions drawn by the relevant experts and the proposed responses to risks.

The EES documentation and the expert evidence presented at the Inquiry hearing relating to species listed under the EPBC Act identified the loss of 0.36 hectares of Alpine Sphagnum Bogs and Associated Fens ecological community as a result of expansion of the existing TSF as the only likely significant impact from the Project on a species listed under the EPBC Act.

A proposal has been developed to offset this loss at a site at Dinner Plains that contains Sub-alpine Wet Heathland EVC. We accept the expert evidence relating to the proposed offset, which indicated:

- While slight variations exist in the floristics at the removal site and the offset site, this EVC is consistent with the Alpine Sphagnum Bogs and Associated Fens ecological community listed under the EPBC Act.
- Preliminary advice from the Commonwealth indicated the acceptability of the Dinner Plain site and the views of DEPI and the peer review report (EA, Terrestrial Vegetation, 2013) support the accuracy of classification.
- The Dinner Plain site provides a suitable offset to meet requirements under both State and Commonwealth legislation, including the suitability criteria under the EPBC Act Environmental Offsets Policy (Section 10.3.6).

We have observed that zoning of the Dinner Plains offset site and the need for buffers to protect its biodiversity values should be addressed in the agreement that secures the offset.

The EES and expert evidence identified the potential for the following species within the Project site:

- Two listed flora species, Purple Eyebright and Kiandra Greenhood, have previously been recorded within the Project site but were not recorded in the EES targeted surveys. While it is highly unlikely that the Project will impact on these species, there is suitable habitat for the Kiandra Greenhood and further field investigation will occur.
- Five EPBC Act listed terrestrial fauna species could occur within the Project site but were not recorded in the field survey work. Three of these EPBC listed species (Smokey Mouse, Spot-tailed Quoll and Spotted Tree Frog), if present, were considered unlikely to be significantly impacted by the Project. As significant impacts could occur to the Giant Burrowing Frog and the Alpine Tree Frog, if present, and a precautionary approach is proposed involving further field investigation.
- The Australian grayling is the only EPBC Act listed aquatic species which has the potential to be impacted by the Project. However, a significant impact is not likely, largely because there have been no records of the species in ten separate years of monitoring and the significant distance downstream (in the Tambo River) of any significant grayling habitat and/or population.

The Inquiry finds that based on the information presented to us, the proposed offset for the loss of 0.36 ha of Alpine Sphagnum Bogs and Associated Fens ecological community satisfies offset criteria, there is a very low risk of impacts from the Project on EPBC Act list terrestrial and aquatic fauna, and a precautionary approach has been adopted to ensure potential impacts are minimised.

### **Will environmental outcomes be acceptable?**

The EES, supported by additional advice in expert reports to the inquiry, present sound responses to key risks arising from the Project. The Inquiry considers it is feasible to achieve acceptable environmental outcomes. Viable measures have been identified to mitigate environmental risks, however, as highlighted above, a conscientious approach is required for all phases of the Project in design, implementation and operation. Recommended requirements for ITR to evaluate proposed measures and verify the effectiveness of implementation are central to our view that outcomes will be acceptable.

Inquiry recommendations to guide further development of the Project are set out in the consolidated recommendations below.

### **The Regulatory Framework**

#### **The Work Approval**

The key consent required for within the Mine licence area is the Works Approval and a range of consents that would otherwise be required are addressed through this mechanism.

Despite the very limited advice from the DSDBI ERB to the Inquiry, a range of modifications to the Draft Works Approval were identified and accepted by the Proponent (see Appendix D).

Presentations to the Inquiry indicated a willingness to draw on the expertise of relevant agencies in the assessment of the works approval, such as DEPI in relation to biodiversity matters, the CFA and DEPI in relation to bushfire risk management, the EPA and water authorities in relation to water quality matters. In particular, as closure and rehabilitation nears, specific endorsement of closure and rehabilitation plans should be provided by DEPI as the manager of the land after it is handed back and the EPA as a regulator of environmental performance.

We endorse the proposed establishment of an Environment Review Committee and a Community Consultation Committee. As already noted, we also see significant benefit in ITR informing the assessment of the Works Approval application.

#### **The draft Amendment to the Planning Scheme**

The Inquiry considers the proposed amendment to allow mine tenement elements of the Project, (including the accommodation village, a car park in Benambra, linear infrastructure, the bore field and the removal of native vegetation) subject to conditions specified in an Incorporated document pursuant to Clause 52.03 of the Planning scheme is appropriate. We have recommended some amplification of matters addressed in the Incorporated Document, such as in relation to bushfire risk, the Transport Management Plan and the management of amenity impacts from the car park in Benambra. Otherwise the Inquiry endorses the use of Clause 52.03 to facilitate elements of the Project and the scope of the associated Incorporated Document as exhibited.

## **Other Approvals**

The EES sets out the range of approvals required for the Project and all of the agencies responsible for these approvals indicated that, while evaluation of detailed proposals will be necessary, they anticipate that future applications should be acceptable.

## **Consolidated recommendations**

For the reasons outlined in this report, the Inquiry recommends that Stockman Base Metals Project proceed subject to the following recommendations:

### **GOVERNANCE AND INDEPENDENT TECHNICAL REVIEW**

- 1. Appoint Independent Technical Reviewer(s), funded by the Proponent, before the issue of a Works Approval, with the role and functions identified in Section 13 of this report.**
- 2. Establish an independent technical peer review and auditing process prior to the commencement of construction to enable in principle demonstration of achievement of outcomes throughout the life of the mine.**
- 3. Draw on the assistance of the Environment Protection Authority to review and approve the role description for the appointment of an Independent Technical Reviewer, who is to be an Environment Protection Authority approved auditor for all aspects except for the design, construction and monitoring of the TSF dam.**
- 4. Before mining construction starts, develop and implement an independent peer reviewed detailed monitoring program to the satisfaction of the Independent Technical Reviewer(s) and Department of State Development, Business and Innovation. The program should be included in the Work Plan. It must identify and specify all relevant existing and proposed quality and quantity parameters for the discharge of water to the environment in the vicinity of the mining operations and the TSF.**
- 5. Prior to the completion of the mining licence appoint an Independent Technical Reviewer(s), funded from the proposed trust fund to be established between the Victorian government and the Proponent with role and functions approved by the Environment Protection Authority and Department of Environment and Primary Industries.**
- 6. Department of State Development, Business and Innovation consult the Environment Protection Authority regarding the contingency plans relating to the quality of discharges to the environment from Project, including accidental discharges, before the Work Plan is approved.**
- 7. Engage regional environmental groups in ongoing consultative processes, including the Community Reference Group.**
- 8. Formulate and implement with the East Gippsland Shire and the Department of State Development, Business and Innovation, a framework for 'scanning' local housing, services and employment conditions and impacts of the Project and report the outcome to the Community Reference Group.**



9. Establish an Environmental Review Committee with relevant parties to oversight the design, construction, operation, closure and post closure of the Stockman Mine. The ERC's role should also include assisting the Independent Technical Reviewer(s) in identifying expertise for various specialist reviews and to receive and disseminate the ITR's reports.

#### **THE REHABILITATION BOND AND POST-CLOSURE TRUST FUND**

10. Ensure the calculation of the rehabilitation bond has particular regard to the environmental risks and costs associated with mining and storing PAF material and the specific form and nature of this project.
11. Establish a Post-closure Trust fund with sufficient funding from the Proponent and the government to ensure adequate monitoring, maintenance and responses to environmental risks posed by the rehabilitated mine, and the TSF in particular.
12. Provide in the Trust fund for:
  - a) The ongoing employment of the Independent Technical Reviewer post closure of the mine
  - b) Rebuilding of the TSF wetlands periodically after closure if recommended by the Independent Technical Reviewer
  - c) Any maintenance requirements in accordance with model predictions for failure of the grout curtain, engineered soils and membrane.
  - d) Maintenance of emergency water supply system or other means to maintain a water cover of the TSF
  - e) Treatment of supernatant water from the TSF long-term
  - f) Monitoring of the surface and ground water flows and quality in the vicinity of the TSF and mine in accordance with the Independent Technical Reviewer recommendations.

#### **THE WORK PLAN**

13. Include the additional matters in the Work Plan or associated Environmental Management Plans that are identified in Appendix D of this report and were agreed by the Proponent.

#### **Tailings and mine back-filling**

14. Adopt best practice to prevent the onset of acid mine drainage in underground voids prior to flooding, including adding neutralizer to paste.
15. Undertake additional testing and design, to the satisfaction of Department of State Development, Business and Innovation on advice from the ITR, to enable the backfilling of all of the Wilga mine stopes with paste thickened tailings for both supporting the roof of the stopes and which minimises the risk of long-term impacts on groundwater quality.
16. Backfill all stope voids and redundant access tunnels in the Wilga mine with paste thickened tailings to minimise the potential environmental impact from this mine and in particular the storage of tailings.

17. **Maximise the volume of paste thickened tailings stored in the stopes and redundant access tunnels of the Currawong mine.**
18. **Implement a long-term monitoring program for the early detection of AMD at onset and early impacts in the mining voids.**
19. **Establish relevant water quality objectives for ground water in the mines, and from the Wilga Spring post mining operations which should be included in the Work Plan.**

#### **Rehabilitation and Post-closure**

20. **The Independent Technical Reviewer to review and approve the Revised Conceptual Closure and Rehabilitation Plan, Detailed Closure and Rehabilitation Plan and any revisions as developed throughout the life of the mine.**
21. **Undertake a feasibility study for the identification of a variety of suitable treatment technologies to treat supernatant water during closure and until such time as a water quality in the TSF and from the seep meets the current discharge standards.**
22. **Establish an appropriate long term water monitoring regime funded from the Trust Fund prior to the end of mining of both the Wilga and Currawong deposits. This monitoring regime should be designed to continue post closure of the mine to verify the impact of groundwater recharge in the vicinity of the mines and on water quality in the Tambo River. As part of this monitoring campaign water quality criteria for the various elements which were noted in the pre-Wilga mining water quality monitoring should be used to identify the appropriate targets to be obtained post closure of the mine.**
23. **Establish trigger levels for water quality at Environment Protection Authority approved monitoring points which initiate immediate remedial actions, both during operation and post closure of the mine.**
24. **Include long-term monitoring and maintenance of water cover of any paste thickened tailings in the Wilga and Currawong mine voids in matters funded by the proposed trust fund.**

#### **Tailing Storage Facility (TSF)**

25. **Further refine the final design of the TSF cover level to confirm the suitability of the design to maintain saturated tailings as the various lifts are developed for the TSF dam.**
26. **Upgrading the TSF embankment to be in accordance with the highest level of risk for ANCOLD guidelines for dams ('High C' Dam Failure Consequence Category in ANCOLD guidelines (2012)).**
27. **Prior to the commencement of construction, develop a detailed monitoring and evaluation program for all surface and ground waters, in the vicinity of the TSF, including the northern saddle dam, which is independently reviewed and reported on an to the relevant government departments and the Environmental Review Committee on an annual basis for the life of the mine.**
28. **Adopt best practice design and construction to prevent lateral seepage of water from the tailings facility.**

29. Undertake a full geotechnical and hydrogeological study to demonstrate that the aging of the original grout curtain, clay liner and membrane will not result in under toe seepage.
30. Include in the Work Plan measures to provide passing flows for the 0.75km section of Straight Creek down stream of the TSF post closure.
31. Develop a monitoring regime for the TSF dam which is applicable to both operational and post closure phases based on the Guidelines on Tailings Dams ANCOLD (May 2012) and Regulation and Practice for the Environmental Management of Dams in Australia ANCOLD (June 2014) and to better support the detailed engineering design of the upgrading of the TSF.
32. Confirm that the seepage volume from the right abutment is no more than the current seepage rate before each staged increase in the height of the TSF.
33. Establish additional groundwater monitoring bores in the vicinity of the proposed northern saddle dam prior to the commencement of operations to obtain appropriate background water flow and quality parameters for future monitoring.
34. Address environmental aspects associated with the TSF in the Work Plan with review by independent experts prior to issuing the Mining Licence and at appropriate stages during the operation of the mine.
35. Include consideration for a range of potential environmental issues, including catastrophic failure of infrastructure based on AS31000:2009 Risk Management – Principles and Guidelines and the ANCOLD Guidelines on Risk Assessment (2003) in the Emergency Preparedness and Response Plan identified in the Draft Work Plan.
36. Establish an independently peer reviewed monitoring program as part of the Work Plan for all surface waters and groundwater in the vicinity of the TSF which:
  - a) Includes monitoring of the upstream water flowing into to the TSF and the water within the TSF.
  - b) Starts before any works on the site and continues throughout the operation of the mine and processing facility.
  - c) Formulates an ongoing post-closure monitoring regime (and management program for the TSF) which would be funded by the proposed trust fund.
  - d) Requires certification by the ITR that the water quality in the TSF is suitable for discharge to Straight Creek before the removal of the diversion channels above the TSF, the biological treatment system and return pump system for all seepage water.
37. Establish a network of monitoring bores at the Benambra bore field together with trigger levels to enable the monitoring and protection of the available drawdown in all aquifers to the satisfaction of GMW.
38. Monitor the network of bores at Benambra throughout the operating period of the mine, with regular hydrogeological review by an independent specialist and reported to GMW and the ERC by the Independent Technical Reviewer.

## **Biodiversity**

### ***Aquatic ecology***

39. Establish a pre-construction and operations biological monitoring program in consultation with the Environment Protection Authority and Department of Environment and Primary Industries that:
  - a) includes both macro-invertebrate and fish monitoring (including crayfish)
  - b) includes the Tambo River and the Straight Creek system
  - c) includes a minimum of three control points in Straight Creek
  - d) incorporates pre-construction surveys for Alpine spiny crayfish and Mountain Galaxias.
40. Develop measures to provide steam flows for the 0.75km of Straight Creek adjacent to the TSF to be by-passed post closure.
41. Incorporate into the work plan the mitigation measures recommended by Mr Harrow on p8-9 of his expert witness statement.

### ***Vegetation and flora***

42. Implement the vegetation offset strategy at the Spotted Bull, One Hut, Pendergast and Dinner Plain properties to offset the vegetation removal arising from the Project, to the satisfaction of Department of Environment and Primary Industries.
43. Ensure adequate long term protection of the Alpine Sphagnum Bogs and Associated Fens community at the Dinner Plains offset site, including consideration of the implications of the planning scheme provisions and the need for buffering of the significant vegetation.
44. Undertake pre-construction surveys for the Kiandra Greenhood orchid and avoid impacts where possible. Where impacts cannot be avoided, determine the significance of the impact under the EPBC Act.
45. In consultation with Department of Environment and Primary Industries, establish a preconstruction and operations wetland and riparian health monitoring program for all Alpine Sphagnum Bogs and Associated Fens sites within the Straight Creek Catchment including at the TSF and immediately downstream along Straight Creek.
46. Mark the limit of works around the TSF on-ground to protect wetland communities from any construction.
47. Incorporate into the work plan the mitigation measures recommended by Ms Spencer on pages 14-16 of her expert witness statement.

### ***Terrestrial Fauna***

48. Implement a preconstruction and operations fauna monitoring program, to be designed in consultation with Department of Environment and Primary Industries, for the range of fauna identified by AECOM (2014), Section 7.2, and include the monitoring of fauna utilisation of the vegetation offset sites.
49. Undertake targeted pre-construction surveys for threatened fauna including along the linear infrastructure easements.

50. **Implement a Feral Animal Management plan.**
51. **Undertake targeted pre-construction surveys for the Giant Burrowing Frog and Alpine Tree Frogs and avoid impacts where possible. Where impacts cannot be avoided, determine the significance of the impact under the EPBC Act.**
52. **Conduct a survey of hollow bearing trees at the time of vegetation clearance and at the offset sites to ensure the retained Large Old Trees provide the appropriate compensatory offset for hollow dependent fauna in terms of the number and size of hollows. Design the survey in consultation with Department of Environment and Primary Industries.**
53. **Incorporate into the work plan the mitigation measures recommended by Mr Miller on pages 18-19 of his expert witness statement.**

#### **BUSHFIRE RISK**

54. **Prepare an integrated Fire and Emergency Response Plan for Stockman operations, to the satisfaction of the Country Fire Authority and Department of Environment and Primary Industries, that recognises the remoteness and landscape scale fire hazard of this area. The Work Plan, the Incorporated document associated with Clause 52.03 (3.1 Residential Village - condition 5) and other approvals should refer to this plan.**
55. **Review the role of fire refuges in the fire response plan and the specifications for proposed mine refuges.**
56. **Identify specific responses and protocols to address times of high fire danger such as Total Fire Ban days and Code Red days.**
57. **Clarify fire response roles at the mine site (between the Proponent, Department of Environment and Primary Industries and the Country Fire Authority).**

#### **TRAFFIC AND ROADS**

58. **The Proponent fund line marking of intersections along the haulage route, where required, and the upgrade of the intersections of the Omeo Highway with Benambra Road and Day Avenue.**
59. **Develop an Integrated Transport Management Plan that:**
  - a) **Addresses all elements of the Project, including road maintenance**
  - b) **Includes a Driver Code of Conduct**
  - c) **Is developed by a working party comprising the Proponent, VicRoads, East Gippsland Shire Council and relevant emergency services.**
  - d) **Is required by the Work Plan and as a condition of the Incorporated document associated with Clause 51.03 of the East Gippsland Planning Scheme.**
60. **The Government determine whether road maintenance works to roads managed by VicRoads that are generated by the Project should be funded by government to support economic development strategies.**
61. **If contributions by the Proponent to the maintenance of roads managed by VicRoads are required:**
  - a) **Use the analysis presented by VicRoads at the Inquiry hearing as the basis for contributions.**

- b) Before the Project starts, execute agreements between VicRoads and Council with the Proponent to maintain and extend the life of roads used by Project trucks.**
- 62. Require the Proponent to provide for the cost of upgrading the unsealed sections of Limestone and McCallum's Roads to a 6m wide 200mm minimum unsealed pavement plus 1.0m full depth shoulders.**
- 63. Add to the proposed Incorporated Document that forms part of the draft Amendment a condition in section 3.2 requiring a car park management plan and Driver Code of Conduct to minimise noise in the car park, before the use starts.**
- 64. The Proponent offer noise attenuation to bedrooms in the two houses opposite the car park that could be affected by early morning noise in the car park/bus set down area.**

# 1 Introduction

## 1.1 The proposal

The Stockman Base Metals Project (the Project) includes recommissioning the existing Wilga underground mine and development of a new underground mine at the adjacent Currawong deposit (see Figure 1) to produce copper-zinc-silver-gold concentrates for export. Over the Projected nine year operating life of the mine, approximately nine million tonnes of ore will be mined to produce about 150,000 tonnes/year of product.

The Project will require a range of on and offsite ancillary infrastructure, including expansion of the existing Lake St Barbara Tailings Storage Facility (TSF), a processing plant, access roads, a bore field, water pipelines, electricity supply infrastructure, upgrades to the proposed transport route (along the Great Alpine Road to Bairnsdale), a worker accommodation village capable of housing around 180 people, and a car park in Benambra (see Figure 1). The precise delineation of some of the out-of-tenement infrastructure, in particular the water supply pipeline from the Benambra bore field, is yet to be determined.



Figure 1 Proposed site layout

## 1.2 The site

The Project, which has an overall footprint of approximately 178 hectares, is located approximately 19km south-east of Benambra, in the steeply sloping eastern highlands of Victoria between 650 and 1200 metres AHD (see Figure 2). The site is at the headwaters of the Tambo River, a Declared Water Supply Catchment, and at the convergence of the East Gippsland Uplands, the Victorian Alps and the Highlands Northern Fall Bioregions.

The Project mining lease is immediately to the west of the Alpine National Park and the proposed mines and processing plant are within State Forest on mining tenement MIN5523.

The TSF is in State Forest but is currently excluded from this mining tenement. Some infrastructure, including the proposed accommodation village and bore field, is on private land.

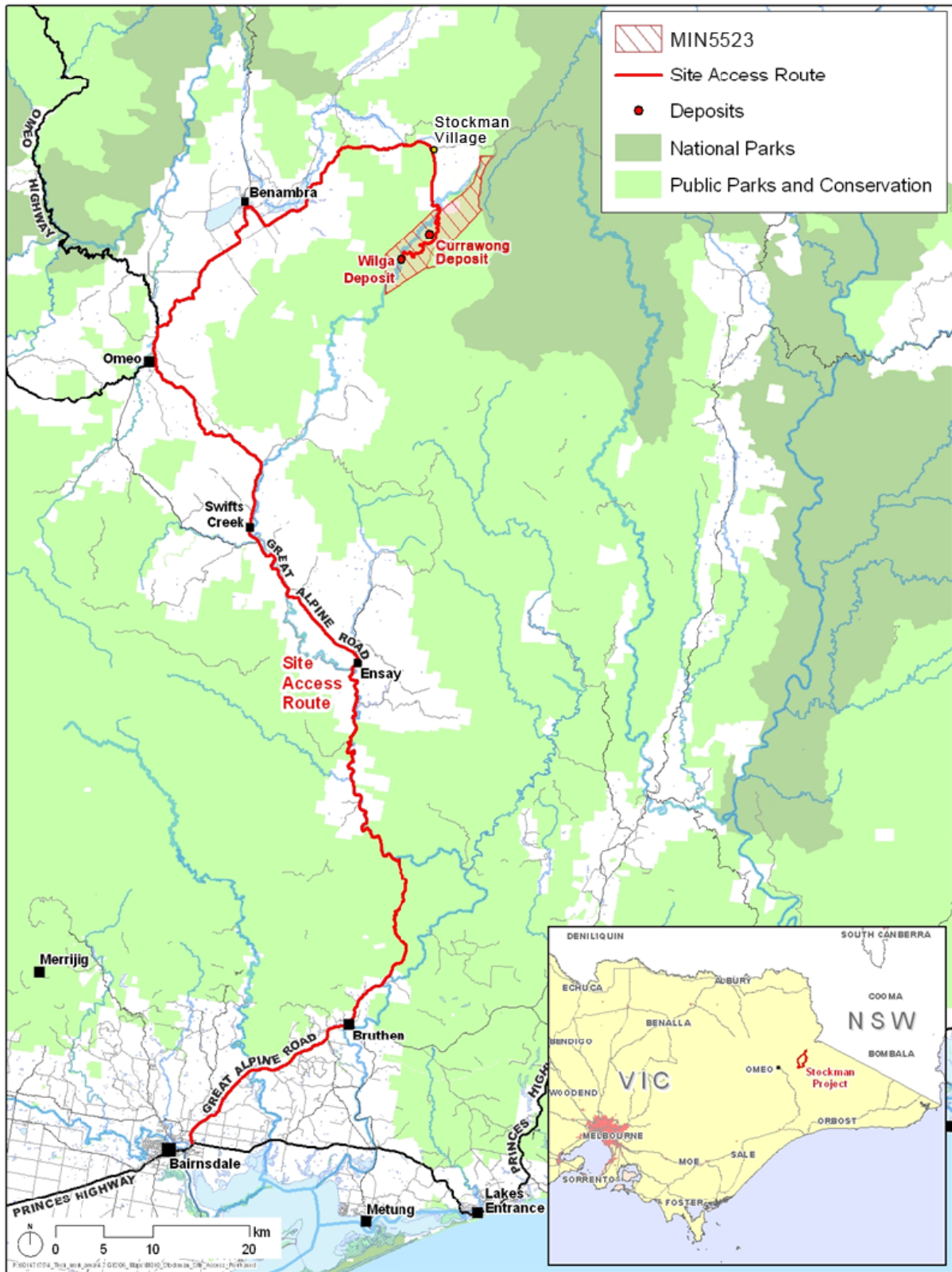


Figure 2 Location of the proposed Stockman Project.



## 1.3 Background to the proposal

### The Previous EES Inquiry

A previous EES Inquiry into the Project<sup>1</sup> in 1988, identified significant issues including the need to provide assistance to the Shire of Omeo to provide infrastructure services and the need for co-ordination of social infrastructure planning. The Inquiry also recommended:

- An economic analysis of costs to Government;
- A review of the design criteria for the tailings dam and process water dam by the Interim Dam Safety Committee;
- Determination of the optimum site for the tailings dam;
- An on-going program of research and reporting on the rehabilitation of the tailings dam;
- A policy for determining realistic bond payments; and
- A specialised agency to assume long term responsibility for monitoring and maintaining abandoned mining operations.

The findings and recommendations of the then Minister for Planning and Environment included:

- The Project should proceed within the designated boundary, except that the Minister for Conservation, Forests and Lands would decide whether or not the TSF site would be used after obtaining further advice.
- If the TSF site was to be used, then further botanical surveys should be conducted to determine its seasonal characteristics and compensation from the mining company for the loss of the State significant Montane swamp site should be negotiated.
- The tailings and process water dams would be 'extremely hazardous'<sup>2</sup> due to the probable loss of life and extensive damage to the property and the environment in the event of dam failure.
- All areas under the TSF site were to be sealed, and the design of the dam wall was to be impervious to leaching, and the TSF was to be subject to the scrutiny of the Dam Safety Committee.
- It was essential that the Dam Safety Committee applied the most conservative design criteria and that there was close scrutiny and regular review of all aspects of the design and construction phases.

### Previous mine operation, closure and rehabilitation

The Wilga deposit was partially mined by Denehurst Limited between October 1992 and July 1996. However, operations ceased abruptly in mid-1996 and the mine was effectively an abandoned site, with Denehurst being put into administration in 1998.

Denehurst operated the Benambra mine extracting zinc and copper ore from the Wilga ore body from 1992 until 1996 when the mining company went bankrupt and operations on the

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<sup>1</sup> *'Inquiry into the Benambra Area Base Metal Mining Project by Macquarie Resources LTD and proposed amendments to the Shire of Omeo Planning Scheme'*. The Inquiry comprised Alan Bunbury (chair), Tim Ealey, and Gail Robinson.

<sup>2</sup> This was based on a classification system that was yet to be more closely defined by the Dam Safety Committee.

site ceased. It comprised an underground mining facility with a processing plant and associated tailings dam in the vicinity of the mine.

In 2005, the government of Victoria carried out site rehabilitation work to minimise the risk of long term environmental liability and the need for active management of the site.

Closure of the mining portals, removal of the processing plant and upgrading and management of the tailings facility was undertaken by the then Department of Sustainability and Environment<sup>3</sup> (DSE), in collaboration with various other State government departments. In association with works to the TSF after failure of the previous mine, a variety of environmental monitoring and management procedures were established, including water quality monitoring within and downstream of the dam, groundwater monitoring and flora and fauna assessments.

The Proponent won a government tender for an exploration licence over the general area in 2007 (which specifically excluded the tailings storage facility known as Lake St Barbara).

## **1.4 The current EES inquiry**

The Minister determined that an EES was required for the Project to be prepared according to the Scoping Directions. The reasons for the decision were as follows:

- *The proposal has the potential for a range of significant environmental effects on key environmental assets, including native vegetation, threatened species and water environments.*
- *The potential extent and magnitude of some effects are unclear, due to the uncertainty associated with both key aspects of the project scope and the limited knowledge of the existing environment in some areas.*
- *Further investigation of a number of project options is needed, including in relation to tailings treatment and storage and water supply, particularly to assess how adverse effects can be avoided or minimised, including through appropriate environmental risk management.*
- *An EES process would enable an integrated assessment of a range of potentially significant and uncertain adverse effects, including consideration of some complex and inter-related terrestrial, aquatic and geotechnical aspects of the proposal.*

A Technical Reference Group (TRG) of relevant agencies<sup>4</sup> was convened to advise DTPLI and the Proponent on the scope of issues to be addressed and the adequacy of the EES documentation. The TRG was an advisory group, not a decision-making body, hence the EES remains the Proponent's document.

### **Discussion**

The Inquiry records that all members of the TRG who made submissions to the EES or presented to the Inquiry, with the exception of VicRoads, indicated that the Proponent had

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<sup>3</sup> DSE had responsibility at that time for the management of public land.

<sup>4</sup> The TRG included representatives of: DPI/DSDBI (Earth Resources & MDV), DSE/DEPI, EPA, Office of Aboriginal Affairs Victoria, North East CMA, East Gippsland CMA, East Gippsland Shire Council, Southern Rural Water, East Gippsland Water, and Heritage Victoria.

responded effectively to feedback from the TRG and this was evident in the confidence expressed by regulating agencies that the Project had or could address potential risks and impacts.

### 1.4.1 Key Issues addressed by the EES

DTPLI advised the Inquiry that:

- At the scoping stage it was identified that EES was to give particular attention to:
  - *Hydrology, including impacts on groundwater (in relation to both mine dewatering and potential off-site extraction for operational purposes) and; surface water (incorporating aspects of water quality and flow), and downstream environments;*
  - *Biodiversity, including impacts on terrestrial ecological values of the Alpine National Park associated with potential water supply infrastructure; aquatic environments potentially affected by hydrological change; and noise and other disturbance associated with proposed mining activities on threatened fauna listed under the Flora and Fauna Guarantee Act 1988 (FFG Act);*
  - *Tailings and other waste storage and management;*
  - *Aboriginal cultural heritage in vicinity of the proposed mine and ancillary infrastructure;*
  - *Indirect effects on amenity and social function of the local community, and community infrastructure capacity.*
- As the nature and extent of potential effects and risks became more apparent as the EES process progressed, the tailings management strategy including the location of the TSF (and its effects on native vegetation) became key issues to be investigated.
- In August 2011, the then Department of Planning and Community Development (DPCD) requested a Senior Officers Group (SOG) be established to resolve or clarify the following items:
  - *The need for surface storage of tailings, taking account of the practicability of maximising the underground storage of tailings in either the existing Wilga mine or the future Wilga or Currawong mines;*
  - *The required post-closure design life for the TSFs, in terms of the duration for which they would be required to maintain both their structural integrity and operational effectiveness to avoid oxidation and mobilisation of pyritic wastes;*
  - *Having regard to the required design life, the financial instrument that would be needed to provide security (potentially in perpetuity) to rehabilitate either the TSFs or associated environmental damage if either the former's integrity or effectiveness was compromised; and*
  - *Establishing parameters for siting of the TSFs, in relation to facility engineering, tailings transport, environmental and cost factors.*

The SOG indicated that the Project proposal should demonstrate that:

*The need for surface storage of tailings has been minimised to the maximum extent possible in particular by describing the application of the principles of wastes hierarchy to the generation and management of tailings.*

*The risks of impacts on the beneficial uses of waterways and groundwater, especially as a result of oxidation and/or mobilisation of wastes from TSFs in waterways (should this be the proposed option), or other facilities having a potential to adversely affect the beneficial uses of waterways or groundwater, will be as low as reasonably practicable in both the short- and long-term by a comprehensive risk assessment.*

*The need for impact on areas of Alpine Sphagnum Bog has been avoided /minimised to the maximum extent possible, in particular by describing the application of the principles of Avoid/ Minimise/ Offset required under the Native Vegetation Management Framework in the proposed siting of TSFs and other facilities.*

The SOG also required it to be demonstrated that *‘an effective combination of engineering and financial security measures, with clear accountabilities, will be applied to mitigate risks and allow for the management of liabilities over the long term.’*

The EES was also required to evaluate alternatives including for:

- Tailings treatment and storage;
- Location(s) for main project elements, including processing facility, tailings storage facility (TSF) and helipad;
- Project water and electricity supply sources and infrastructure locations; and
- Accommodation location and related infrastructure.

## **Discussion**

Our assessment concurs with the identification of key issues as cited above. In particular, the issues that were emphasised and have been a particular focus of the assessment by the Inquiry relate to:

- The criteria for acceptable discharge of water from the mine and the TSF in particular;
- The design of the TSF and mining operations to ensure that ground and surface water is not polluted by discharges from the Project;
- The loss of significant native vegetation, in particular the endangered Montane swamp and hollow bearing large old trees;
- Ensuring the structural integrity of the TSF and the quality of water discharged from it are maintained after closure in perpetuity;
- Securing adequate funding to ensure the tax payer does not need to pay for measures to protect the environment, both during operation and after the rehabilitated mine is handed back to the government.

### **1.4.2 EES project evaluation framework**

The EES process involves the assessment of a project against evaluation objectives, which reflect legislative requirements and government policy, to determine the acceptability of the Project.

The EES draft evaluation objectives include two broader objectives:

- to provide a transparent framework with clear accountabilities for managing environmental effects and hazards associated with the Project in order to achieve acceptable environmental outcomes;

- to enable a mining development that contributes to the economic, social and environmental objectives of the State, consistent with the principles of ecologically sustainable development and environment protection.

The following specific draft evaluation objectives were developed by the State (and the Commonwealth Governments through the EPBC Act) as the basis for assessing if the Stockman Project should proceed:

- *to enable an economically viable mining project that makes the best use of mineral resources;*
- *to avoid, minimise and mitigate effects on flora and fauna species and ecological communities, in particular those listed under the FFG Act and/or the EPBC Act, as well as to comply with the requirements for native vegetation under Victoria's Native Vegetation Management – A Framework for Action;*
- *to protect catchment values, surface water quality, stream flow, aquatic health and groundwater values, as well as avoid impacts on any protected beneficial uses;*
- *to minimise the generation of waste and greenhouse gases to the extent practicable, including the provision of appropriate long-term management and storage of tailings of any potentially harmful mining by-products;*
- *to minimise adverse effects on forestry and other land uses during construction and mining to the extent practicable, including the risks associated with disturbance of potentially contaminated land, and to provide for effective long-term rehabilitation of affected land;*
- *to protect Aboriginal and non-Aboriginal cultural heritage values;*
- *to minimise adverse amenity effects of noise, vibration and emissions to air, and to minimise risks to public health and safety to the extent practicable during mine development and operation;*
- *to minimise potential adverse social and economic effects, and maximise potential socioeconomic benefits in relation to affected townships, residents, community services and infrastructure both during project operations and following closure.*

### **1.4.3 Assessment under the EPBC Act**

As the Australian Government Minister for Sustainability, Environment, Water, Population and Communities determined the Project to be a controlled action under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) (Commonwealth), assessment and approval under that Act is required. The controlling provisions under that Act relate to listed threatened species and communities (sections 18 and 18A).

The EES for the Project is an accredited process under the Commonwealth-Victorian Bilateral Agreement for Environmental Impact Assessment. Consequently, the Minister for Planning's Assessment needs to assess the Project impacts on matters of national environmental significance (NES) in accordance with Schedule 1 Part C of the Agreement, and be provided to the Australian Government Minister.

DTPLI advised that it has consulted the Commonwealth Department of Environment on the scoping requirements for the EES and provided copies of the draft EES and supporting technical reports for their review. A chapter of the EES specifically addresses the matters of NES under the EPBC Act.

#### 1.4.4 Scope of the Inquiry

The Minister appointed a combined Inquiry under Section 9 of the EE Act and an Advisory Committee under Section 151 of the *Planning and Environment Act 1987* to report on the Project. The combined entity is referred to as the 'Inquiry'. The Inquiry is to consider and report on the potential effects of the Project, taking into account the procedures and requirements the Minister specified for the preparation of the EES and the relevant controlling provisions under the EPBC Act.

The Terms of Reference (see Appendix A) require the Inquiry to produce a report to the Minister for Planning to present its:

- *findings on the likelihood and significance of environmental effects, and associated risks, of the project's different components and alternatives documented in the EES, including impacts on matters of NES protected under relevant controlling provisions of the EPBC Act;*
- *conclusions on the feasibility of the project achieving acceptable environmental outcomes in the context of applicable legislation, related policy, relevant best practice, and the principles and objectives of ecologically sustainable development and environment protection;*
- *recommendations on any modifications to the project and/or specific measures that are needed to prevent, minimise or compensate for adverse effects, in order to achieve acceptable environmental outcomes, in the context of relevant standards, objectives and guidelines established under relevant legislation;*
- *recommendations on the framework for environmental management for the project, including in relation to the necessary Environment Management Plans (EMPs) required in association with different approvals;*
- *recommendations on any conditions or matters that should be incorporated in the approval of a work plan or in any other statutory instrument/ approval applying to the works within the Mining Licence area (e.g. mine, ore processing and waste management and storage facilities during the development, operation, closure and post-closure phases);*
- *recommendations on appropriate conditions and requirements to be addressed under the East Gippsland Planning Scheme or in any other statutory instrument/ approval with respect to project components outside of the Mining Licence area (e.g. residential village, car park, bore field, linear infrastructure, localised widening of Limestone and McCallums Roads and associated vegetation removal);*
- *relevant information and analysis in support of the Inquiry's conclusions and recommendations; and*
- *a description of the proceedings conducted by the Inquiry and a list of those consulted and heard by the Inquiry.*

## 1.5 The regulatory framework

In addition to assessment of the Project under the EPBC Act, a range of approvals under Victorian Legislation will be required and will be informed by the Minister's assessment under the EE Act. Table 1 summarises these approvals.

Table 1 Key approvals applicable to the Project  
(Source: EES Chapter 2).

Activities	Approval or permit required	Administered by	Regulatory Instrument
Mining, ore treatment, tailings storage, mine rehabilitation on mining tenements	Mining Lease Work Authority Mining Work Plan, including a rehabilitation plan	DSDBI	<i>Mineral Resources (Sustainable Development) Act 1990</i>
Water abstraction from bores at proposed Benambra bore field, mine dewatering, surface storage of water in dams	Licences to take and use water (including evaporation loss from surface impoundments)	Southern Rural Water	<i>Water Act 1989</i>
Construction, operation, and decommissioning of tailings dam	Dam Licence	Southern Rural Water	<i>Water Act 1989</i>
Construction and operation of diversion drains, and related works	Works on waterways permit of written authorisation	East Gippsland and North East Catchment Management Authorities	<i>Water Act 1989</i>
Vegetation clearing for project activities located within the Project mining tenements	Mining work plan, including a rehabilitation plan. <i>No FFG Act permit relating to Protected Flora is required within a Mining Licence area because an EES has been prepared for the project.<sup>5</sup></i>	DSDBI	<i>Mineral Resources (Sustainable Development) Act 1990</i>
Vegetation clearance for project activities located outside the Project mining tenements	Vegetation offsets and management plans	DEPI	<i>Planning and Environment Act 1987</i>
	Disturbance of protected vegetation; permit to 'take' protected flora	DEPI	<i>Flora and Fauna Guarantee Act 1988</i>
	Authority to take/disturb wildlife	DEPI	<i>Wildlife Act 1975</i>
Mining and associated activities on mining tenements and ground disturbance outside the mining tenements	Approval of a CHMP	Office of Aboriginal Affairs Victoria	<i>Aboriginal Heritage Act 2006</i>
Works and use of facilities outside the mining leases: <ul style="list-style-type: none"> <li>• a residential village.</li> <li>• a car park in Benambra</li> <li>• bore field near Benambra.</li> <li>• water pipeline from the bore field to the mine site.</li> <li>• power line from the mine site to the mine village.</li> <li>• telecommunications tower at the mine village</li> </ul>	Planning Scheme Amendment (see below)	Minister for Planning, East Gippsland Shire Council	<i>Planning and Environment Act 1987</i>

<sup>5</sup> Under the Flora and Fauna Guarantee (Mineral Resources Development) Order 1994.

<ul style="list-style-type: none"> <li>localised widening of McCallums and Limestone Roads.</li> </ul>			
Storage of compressed natural gas (if more than 200 tonnes of CNG stored)	Major hazard facility; dangerous goods licence	WorkSafe Victoria	<i>Occupational Health and safety (Major Hazard Facilities) Regulations 2000</i>
Sewage treatment and disposal; construction and operation of a power station	Works approval and/or licence (scheduled premises)	EPA Victoria	<i>Environment Protection Act 1970 (and relevant SEPPs)</i>
Project affecting Matters of National Significance	Approval to undertake a 'controlled' action	Commonwealth Dept. of Environment	<i>EPBC Act 1999</i>

A draft amendment to the East Gippsland Shire Planning Scheme was exhibited with the EES. It proposes to introduce an Incorporated Document to facilitate the use and development of facilities and infrastructure outside the Mining Licence area associated with the Project. The Incorporated Document would allow a residential village, car park, bore field, linear infrastructure, localised widening of Limestone and McCallums Roads and vegetation removal, subject to meeting a range of conditions. The Proponent intends to request the Minister for Planning to approve the Planning Scheme Amendment in accordance with section 20(4) of the *Planning and Environment Act 1987*, such that no further opportunity for public comment would occur beyond this EES process.



## 2 Policy and Planning Context

The Inquiry has reviewed the policy context of the Amendment and made a brief appraisal of the relevant zone and overlay controls and other relevant planning strategies.

### 2.1 Planning policy

Appendix X of the EES sets out relevant State and local planning policy in some detail. The following discussion of the planning policy context focuses on aspects we consider are most relevant to our assessment.

Overarching planning policy in Victoria is to *‘foster appropriate land use and development outcomes by addressing aspects of economic, environmental and social well-being’* and for planning to *‘integrate the range of relevant policies and balance conflicting objectives in favour of **net community benefit and sustainable development for the benefit of present and future generations***<sup>6</sup> (emphasis added).’ The assessment of the Project requires balancing of policies directed at protecting environmental values and those promoting economic development. Policy emphasises benefits to the community and ensuring development is sustainable over private interests.

It is policy<sup>7</sup> to:

- Protect the health of ecological systems and the biodiversity they support (including ecosystems, habitats, species and genetic diversity) and conserve areas with identified environmental and landscape values. Development that impacts on land that contains high biodiversity values, landscape amenity, water conservation values and extractable minerals is to be avoided. Significant impacts on biodiversity are to be avoided and minimised and there should be no net loss in the contribution made by native vegetation to Victoria’s biodiversity;
- Protect water quality and, where possible, restore catchments, waterways, water bodies, groundwater, and the marine environment;
- Ensure that activities potentially discharging contaminated runoff or wastes to waterways are sited and managed to minimise such discharges and to protect the quality of surface water and groundwater resources, rivers, streams, wetlands, estuaries and marine environments;
- Implement SEPPs.

State policy also promotes economic development that builds on the strengths of an area to achieve its economic potential and encourages *‘exploration and extraction of natural resources in accordance with acceptable environmental standards and to provide a planning approval process that is consistent with the relevant legislation.’*<sup>8</sup> The recently adopted Gippsland Regional Growth Plan and local planning policy also specifically recognise economic development challenges in the region. The *‘exploration for and development of*

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<sup>6</sup> Clause 10.

<sup>7</sup> For example, see Clauses 11.05-4, Clauses 12 and 21.04 (Environmental and Landscape Values), Clause 14.02-1 (Catchment planning and management), Clause 14.02-2 ‘Water quality’.

<sup>8</sup> See for example Clauses 17 ‘Economic Development’ and Clause 14.03 ‘Resource exploration and extraction’.

*mineral resources in appropriate areas'* is encouraged generally and valuable mineral deposits in the Highland sub-region are identified as an opportunity with specific reference to *'the development of the copper and other mineral resources at Benambra through positive planning, including protection of prospective mine areas from inappropriate development.'* Whilst local planning policy acknowledges that the Benambra mine is not operational, it foreshadows re-opening and supports a *'mining industry service role'* for Benambra.<sup>9</sup>

## **2.2 State Environment Protection Policy (SEPP)**

The SEPPs of particular relevance to the assessment of the Project relate to:

- Water quality
- Groundwater management
- Biological and sediment quality
- Air quality

The State Environment Protection Policy – Waters of Victoria (SEPP WoV) sets a statutory framework for the protection of the uses and values of Victoria's fresh and marine water environments. The SEPP (WoV):

- Describes beneficial uses (the uses and values of the water environment that the community and government want to protect). For the Project these include aquatic ecosystems that are largely unmodified; recreation and aesthetic enjoyment; cultural and spiritual values; agriculture and irrigation; and human consumption of water after appropriate treatment;
- Summarises the environmental quality objectives and associated indicator measures required to protect beneficial uses; and
- Provides guidance on the protection and rehabilitation of water environments to achieve environmental objectives and protect beneficial uses.

Specific schedules in the SEPP provide more detailed environmental protection requirements for individual catchments, with Schedule F3 identifying beneficial uses and water quality objectives for the Gippsland Lakes and Catchments. EPA Victoria has previously evaluated the health of the Mitchell, Tambo and Nicholson Rivers under the objectives of the principal SEPP (WoV) policy (EPA, 2003a).

Surface waters in Victoria are categorised in different segments within the SEPP (WoV) policy, the following segments apply to the Tambo River:

- Highlands: mountain river and stream reaches, largely natural, with alpine and sub-alpine environments and generally above 1000m in altitude;
- Forests-B: upland river and stream reaches, with minor disturbance though mostly forested and generally above 400m in altitude.
- Cleared Hills and Coastal Plains: lowland river and stream reaches and their catchments, typified by high levels of disturbance, generally extensively cleared with some isolated remnant native forests and substantial urban centres. Cleared hills are generally above 200m in altitude and coastal plains below this level.

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<sup>9</sup> See Clauses 11.08 (Gippsland regional growth), 21.06-4 (Resource Exploration and Extraction) and 21.12 (Strategies for Sub-Regions, Towns and Localities) and the *Gippsland Regional Growth Plan* Victorian Government 2014.

The Stockman Project site is generally classified within the Highlands segment, although the adjacent reaches of the Tambo River are identified as being located within the Forests-B segment (EPA, 2003a).

The State Environment Protection Policy – Groundwaters of Victoria (Groundwaters Policy) (EPA, 1997) outlines protected beneficial uses and establishes indicators of environmental quality and objectives for ensuring protection of the following beneficial uses:

- maintenance of ecosystems;
- primary contact recreation;
- potable water supply;
- potable mineral water supply;
- stock watering;
- industrial water use;
- agriculture, parks and gardens; and
- buildings and structures.

The policy stipulates that environmental quality objectives for groundwater apply throughout the State, with a small number of exceptions. In locations where the background level of an indicator is higher than the default objective, then the policy says that maintenance of the background level is the environmental objective.

The Groundwaters Policy divides the groundwater environment into five segments on the basis of the groundwater salinity (measured as Total Dissolved Solids (TDS) in mg/L). The policy is based upon a number of key principles, including:

- protection of groundwater and aquifers is fundamental to the protection of surface waters; and
- groundwater and aquifers should be protected to the greatest extent practicable from serious or reversible damage arising from human activity.

The SEPP (Ambient Air Quality) sets air quality objectives and goals for the whole State of Victoria. The SEPP adopts the requirements of the National Environment Protection (Ambient Air Quality) Measure (NEPM). This NEPM sets standards, goals, and monitoring and reporting protocols for six common pollutants<sup>10</sup>.

### 2.3 ANCOLD guidelines

- **ANCOLD Dam Safety Management Guidelines (2003)** is an update of the January 1994 Guidelines on Dam Safety Management. In addition to providing technical procedures required for dam safety programs, it outlines the roles and responsibilities of the key players involved, in particular the importance of a dam owners. Commitment to safety programs, risk management, and the provision of adequate financial and human resources is highlighted. The guidelines propose dam safety programs that are matched to the consequences and risks of a potential dam failure and are intended to apply what might be termed conventional dams (e.g. dams for water supply, irrigation, power and flood mitigation).

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<sup>10</sup> Carbon monoxide (CO), nitrogen dioxide (NO<sub>2</sub>), photochemical oxidants (as ozone), sulphur dioxide (SO<sub>2</sub>), lead and particles (PM<sub>10</sub>). The SEPP also includes a separate objective for visibility-reducing particles, which is not included in the NEPM.

- **ANCOLD Guidelines on Tailings Dams – Planning design, Construction, Operation and Closure (2012)** is an update of the original Guidelines on Tailings Dam Design, Construction and Operation 1999. It provides a single base document with the engineering detail, but can be accepted by all relevant government authorities and national international companies involved in tailings dam development, allowing them to undertake design and construction, consistent with leading industry practice. The Inquiry notes there is considerable information on the design for closure and on the use of risk assessment techniques to assist in design and management.
- **ANCOLD Regulation and Practice for the Environmental Management of Dams in Australia (June 2014)** is a companion volume to the 2001 ANCOLD Guidelines on the Environmental Management of Dams. Since the 2001 guidelines were published much has been learnt about the critical issues that drive environmental concerns arising from the construction of new dams, dam upgrades or altered operational strategies. The objective of this companion volume is to increase environmental awareness by encouraging more sustainable planning, design, construction and operation imports to large dams, in addition to describing the complex Commonwealth and state regulatory environments. It also discusses issues surrounding practices effective stakeholder and community consultation, considers environmental risks associated with the dams and provides a series of technical Practice Notices on a range of environmental issues dam owners and operators need to be aware of in all dam projects. Other key guidance documents.

Relevant guidance documents, other than relevant SEPPs or ANCOLD Guidelines include:

- Victoria's Biodiversity Strategy (1997)
- East Gippsland Native Vegetation Plan - draft (2008)
- National Water Quality Management Strategy
- Gippsland Region sustainable Water Strategy (2010)
- Northern Regional Sustainable Water Strategy (2009)
- East Gippsland Regional Catchment Strategy (2013)
- North East Regional Catchment Strategy (2004)
- Upper North East Water Quality Strategy (2001)
- North East Regional Wetland Management Strategy (2009)
- East Gippsland Regional River Health Strategy (2005- 2010)
- North East Regional River Health Strategy (2006)
- Streamflow Management Plans
- Gippsland Water Quality Action Plan
- DPI Environmental Guidelines - Management of Tailings Storage Facilities
- Leading Practise Sustainable Development Programme for the Mining Industry
- Forest Management Plan for East Gippsland
- Noise from Industry in Regional Victoria Guidelines
- East Gippsland Environmental Sustainability Strategy (2008 - 2013)
- Guidelines for Environmental Management in Exploration and Mining: Mine Rehabilitation (2004)
- Strategic framework for Mine closure (2000)
- Native Vegetation Management - Guide for the Earth Resources industries (2009)

- Mine closure and completion - Leading Practice Sustainable development for the Mining Industry (2006)
- Planning for Integrated Mine closure: Toolkit (2008).

## 2.4 Planning scheme provisions

### Zones and overlays

The mine tenement (and parts of the infrastructure corridors) is zoned Public Conservation and Recreation Zone (PCRZ) and, as noted below, pursuant to Clause 52.08; a planning permit is not required for the elements of the elements of the Project within the mine tenement.

Elements of the Project that are beyond the mine tenement are zoned as follows:

- The Farming Zone (FZ) applies to the accommodation village, the bore field, and sections of the Limestone Road and McCallums Road infrastructure corridors. The accommodation village is prohibited in this zone.
- The Township Zone applies to the proposed car park in Benambra. The car park is a section 2 use that requires a permit for use and development.

The following Environmental Significance Overlays (ESOs) apply to parts of the Project where a permit is required to construct a building or carry out works and to remove vegetation:

- ESO16 Teapot Creek applies to areas where the protection of the Glossy Grass Skink, the Mountain Dragon and Alpine Water Skink is an objective. It encourages management practices to develop an appropriate fire regime.
- ESO17 (Benambra) applies to the bore field and sections of the water pipeline where the protection of the Mountain Galaxias, Glossy Grass Skink, Open Marshwort and Showy Willow-herb is an objective.

### Particular provisions

Clause 52.08 (Earth and Energy Resources Industry) has purposes:

*'To encourage land to be used and developed for exploration and extraction of earth and energy resources in accordance with acceptable environmental standards.*

...

*To ensure that planning controls for the use and development of land for the exploration and extraction of earth and energy resources are consistent with other legislation governing these land uses.*

This Clause exempts all of the mining activities within the mine licence area from planning permit requirements as an Environment Effects Statement is being prepared under the EE Act.

Clause 52.17 (Native Vegetation) requires a permit to remove, destroy or lop native vegetation, including dead native vegetation (unless specific exemptions specified in the table to Clause 52.17-6 apply). Therefore a permit is required for the removal of vegetation on the residential village site, sections of the water pipe and water pump stations and localised widening of the Limestone and McCallums Roads.

Clause 52.19 (Telecommunications Facility) requires a permit for a Telecommunications tower that is proposed at the accommodation village.

Clause 52.47 (Bushfire Protection: Planning Requirements) applies to land subject to the Bushfire Management Overlay and stipulates, amongst other things, objectives and standards for new development, including the requirements for 'defendable space' for different types of developments in different vegetation classes.

## **2.5 Issues dealt with in this report**

This report deals with the issues under the following headings:

- Socio-economic Impacts
- Mine Operations and Processing
- The Tailings Storage Facility
- Water Impacts
- Biodiversity
- Bushfire Risk
- Transport and Roads
- Linear Infrastructure
- Worker Accommodation and the Benambra Car Park
- Other issues
- Draft Applications

## 3 Socio-economic Impacts

The EES includes an evaluation objective:

*To minimise potential adverse social and economic effects and maximise potential socio-economic benefits, including in relation to affected townships, residents, community services and infrastructure.*

### 3.1 The EES assessment

The EES assessment of socio-economic impacts, which is presented in Chapter 19, is based on the Economic Impact Assessment (EIA) by Deloitte (EES Appendix P), the Social Impact Assessment (SIA) by Akin Planning (EES Appendix R) and the whole-of-project-wide risk assessment is presented in Appendix U. In addition, the Draft Works Approval addresses Community Impacts and Engagement in Chapter 10 and the Memorandum of Understanding (MoU) between the Proponent and the East Gippsland Shire (reproduced in EES Appendix S) focuses on optimising socio-economic outcomes.

#### 3.1.1 Community engagement

A Community Engagement Plan (AECOM, 2013a) was endorsed by DTPLI. A Community Reference Group (CRG), established in 2011, acted as a 'sounding board' to gain feedback, a source of local insights and to disseminate information to the local community. It met at about three month intervals and comprised two Stockman representatives, community representatives and independent facilitator. Community workshops on social impacts were held in Omeo (October 2012), one on one meetings were held with stakeholders, and information about the Project was provided through an office established in Omeo, stakeholder briefings and presentations, and the distribution of project newsletters and fact sheets by mail, email, via the Stockman website.

#### 3.1.2 The MoU

The MoU between the Proponent and the East Gippsland Shire was directed at the maintenance and enhancement of physical infrastructure, optimising social and economic outcomes, and building relationships to support the Project. As Council highlighted in its submission to the Inquiry, the MoU was prepared to maximise the short and long term benefits to the community, including:

- *Growing our work force to maximise local employment opportunities while minimising impacts to existing business sectors;*
- *Ensuring the right level of investment in services and infrastructure to match demands resulting from the mine but also leaving a meaningful legacy to the community;*
- *Appropriately integrating the mining operation with the existing community;*
- *Retaining as much investment locally as possible; and*
- *Planning for the longer term sustainable future for the Omeo region once the resource is exhausted.*

The MoU identifies objectives to work cooperatively and in good faith to:

- Advocate for, facilitate and/or deliver infrastructure of a standard for a best practice mine, which also delivers wider benefits to the communities of East Gippsland.
- Facilitate as many positive outcomes from the Stockman Project as possible whilst also working jointly to minimise and mitigate any potential negative social outcomes associated with the Project.
- Facilitate as many positive outcomes from the Stockman Project as possible whilst also working jointly to minimise and mitigate any potential negative economic and employment outcomes for the region associated with the Project.
- Where practical, legislatively possible and in both organisation's best interests, develop an advocacy and relationship management program which will aid both the Project's timely delivery and the delivery of wider community benefits.

The MoU does not address the physical environment as relevant issues were considered to be amply addressed through other legislative processes and other agencies.

### **3.1.3 Economic effects**

A complex computable general equilibrium model<sup>11</sup> considered the direct and flow-on economic effects of the Project to estimate impacts on the state and regional economies.

The EIA concluded that the Project will result in significant economic benefits, with the East Gippsland Statistical Division expected to experience the largest impact. Relative to business as usual, over the life of the Project economic benefits include increased:

- Gross State Product of approximately 3.4 % (\$1,239.1 million), with an average increase on the East Gippsland's Gross Regional product of approximately 233 % (\$890.2 million);
- Investment by \$584.7 million;
- Stimulation to consumption by \$322.0 million;
- Total revenue to Victoria (including royalties) by \$80.1 million;
- Exports by \$1,295.3 million;
- Direct average employment: 70 employees per year over the construction period and 250 employees<sup>12</sup> per year over the operational period of the mine. A large proportion of labour, particularly specialist and skilled workers, are expected to relocate to the East Gippsland region;
- Business in construction services, trade services, business services, road freight transport, other transport and electricity supply Industries. In addition to direct project expenditure, additional spending by the Stockman project workforce and their families will create new opportunities for local businesses;
- Labour force participation, by attracting potential job seekers back to the workforce. The benefit in labour force participation in the region will be dependent on factors such as matching skills, worker accessibility to the mine site, and potential workers' interest in

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<sup>11</sup> The Monash Multi-Regional Forecasting model is a multi-sector, multi-regional model of Australia which distinguishes 54 industries, 58 products, eight States/territories and 56 sub-State regions but does not distinguish base metals mining as a standalone industry.

<sup>12</sup> The majority of employees (75 per cent) will be from East Gippsland comprising a mix of people who currently reside in the region and the relocation of others (but not necessarily to Omeo or Benambra).



seeking employment at the mine. Training (including onsite and at Advance Tafe) will be required to address skill shortages<sup>13</sup>.

Against these benefits, the adverse impacts and risks identified included:

- The potential for skilled labour being drawn to the Project from other industries.
- Some upward pressure on wages is expected and could impact on local businesses competing for workers; there could be a decrease in value for the adversely impacted industries (less than 5 %).
- Increased demand for accommodation may create a supply shortage, however, the sale of houses by Independence after mine closure may supplement the accommodation in the region and could create some oversupply.
- The ability to sustain positive outcomes beyond the mine life

Implications for tourism are uncertain.

### **3.1.4 Social effects**

The Social Impact Assessment (SIA) was informed by the profiling of baseline conditions<sup>14</sup>. The Project is in a remote location with low population and limited services:

- Benambra, which is 19 km from the mine, offers: a hotel, a general store (with post office and café), a motor repair business, a 'neighbourhood house'<sup>15</sup>, a community hall, and a recreation reserve (formerly the home of the Benambra Football team, which is now amalgamated with Omeo). The primary school closed in 2002;
- Omeo, which is approximately 30km from the mine, has a commercial area with shops, trade supplies, eateries, banks, fuel supplies and community services. Town facilities include a primary school and a kindergarten;
- Swifts Creek's commercial centre comprises a number of small businesses, including a hotel, general store, bookshop, cafe, bakery and post office. Swifts Creek accommodates the Tambo Valley's only secondary school, as well as a primary school and kindergarten (Appendix P).

The development of a workers accommodation village at a location that is remote from Benambra was, in part, to manage potential social impacts (see Section 11 of this report).

Community consultation identified a number of issues of concern or interest to the community, including:

- Demographic changes may occur in Omeo as a result of a population increase during the life of the mine (construction, operations and decommissioning);

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<sup>13</sup> For example in Design, Engineering, Science and Transport Professionals, Automotive and Engineering Trades Workers, and Construction Trades Workers.

<sup>14</sup> Profiling of baseline conditions involved demographic analysis, review of applicable social policy and legislation, literature and comparative project review, conceptualising potential social impacts, interviews with service providers and community representatives, three social research focus groups held with local community members, two workshops with local community members to update them on project progress and to obtain feedback on the socio-economic research, review of minutes and other information from community engagement.

<sup>15</sup> The neighbourhood house is the venue for local groups to meet and its staff act as a referral service for financial services, social and community services, the Shire and other services.

- While an increased population in itself was viewed as a positive impact, there may be competition for housing, with some risk of negative impacts on housing availability and affordability;
- With new people coming to Omeo, there are likely to be changes to social and recreational networks and activities.

The whole-of-project-wide risk assessment (Appendix U) indicated that most identified potential social impacts would be negligible after mitigation. The social risks associated with the Project and proposed mitigation relate to:

- Significant change in local population sizes and demography - initial reduction in availability of housing and other accommodation. To address potential adverse impacts associated with housing availability and affordability, Stockman and the East Gippsland Shire will develop a Housing Accord;
- Impact on community services, networks and cohesion due to significant change in local demography. To address potential impacts it is proposed to:
  - Develop a community fund of not less than \$100,000 per annum to be jointly administered by Stockman, the EGSC and the community. The community would determine priorities, within agreed guidelines, with an objective to generate long-term and sustainable community benefits.
  - Develop a Code of Conduct to minimise community disruption in Benambra and Omeo and potential amenity impacts associated with an influx of employees or contractors arrives.
  - Stockman and EGSC will work with service providers (education and children's services, health, and police and emergency services) to help meet changes in demand stimulated by the mine.
- Community impacts (recreation, health and safety and conservation) from Project operations - addressed by design and mitigation measures identified throughout the EES.

Specific socio-economic monitoring or contingency actions are not proposed. However, the MoU promotes contact with the community throughout the Project through:

- establishment of a Community Reference Group
- hosting community information days
- attendance at community forums and meetings
- use of media and communications mechanisms.

### **3.1.5 Submissions**

Various submissions from local businesses, residents and community groups welcomed the stimulation of the local economy from the Project and commended the Proponent's engagement with the community. For example, the Omeo Region Business and Tourism Association Inc. supported the Project, identifying the creation of additional employment opportunities, skills improvement for residents and *'injection of optimism, social capital, expertise and finances, all very important to the small communities that are now struggling to remain viable.'* Similar views were expressed by the Benambra Neighbourhood House group.

However, environmental groups and several residents from the East Gippsland region submitted that the health of the community and the Tambo River should come first, not

financial benefit. These submitters argued that short term economic gains do not justify the risk to the long term risk to biodiversity values, potable water supply and residents' health significant businesses that are dependent on clean water (such as dairying and vegetable/salad growing at Bruthen and fishing and tourism in Lake King).

These submissions focussed on the risk of pollution of the Tambo River from tailings and they argued the necessary assurance that the TSF will be safe in the long term has not been established. A resident of Swifts Creek referred to arsenic, radioactive materials, mercury, sulphur, cyanide, sulphuric acid as common pollutants in mine tailings. She drew a direct link between pollution of the water supply to her home and being crippled by arsenic poisoning.

Unlike residents of Benambra and Omeo, the GEG and submissions from two residents were critical of the engagement with community stakeholders and the consultative process during the preparation and exhibition of the EES. Despite lodging requests to be included on mailing lists, they did not receive information or notice at key points in the EES process. These submissions emphasised the challenge for those in the community to effectively participate in short EES exhibition and Inquiry time frames given the vast amount of technical information and their reliance on volunteer and pro bono assessment. It was submitted that others in the community would share concerns about the issues they raised and there should be a moratorium on project assessment and approvals to allow effective community consultation.

One submission questioned the Shire directing resources to facilitating the Project rather than scrutinising and regulating the proposal to ensure the environment is protected.

DSDBI (Earth Resources Development) highlighted significant positive economic impacts from the Project, particularly for eastern Victoria and in providing a 'strategic platform' to leverage further mineral development in Victoria. It submitted that:

*The Stockman Project presents an important strategic opportunity to demonstrate Victoria's credentials as a destination for investment in earth resources projects, based on its prospectively for base minerals and robust regulatory safeguards, in order to generate business and activity.*

The East Gippsland Shire submission indicated that it has few issues with the Project. The Council acknowledged:

*... the professional approach taken by the Proponents in development of relevant documentation, their interaction with the community and in understanding the role and interest of this Council in the process.*

Council has a high level of confidence that the matters raised from a Local Government perspective can be effectively resolved through the approval process.

However, Council submitted there is a need for robust ongoing monitoring and evaluation of actual social and economic impacts and the effectiveness of identified mitigation measures for the duration of operations. This will allow responses to be modified as and when required and may also assist in determining how to transition the community once the operations ceases.

### 3.1.6 Discussion

The Inquiry agrees with the EES assessment that during the life of the mine there will be significant positive outcomes for the State, regional and local economies and the Project will provide employment in an area with limited job opportunities. There may be increased competition for workers, some upward pressure on wages in sectors with limited excess capacity and some effects on the cost and availability of local housing. However, initiatives have been identified, with the East Gippsland Shire and DSDBI, to optimise Gippsland business and resident employment opportunities, to enhance workforce skills and to provide adequate accommodation for the workers.

Concerns regarding risks to water dependant businesses and the health of residents downstream of the Project are only relevant if water is polluted by the proposed mine. However, the Project should only proceed on the basis that the design and management requirements address this risk, both during mine operation and after closure (see discussion in Chapters 5-7).

The Inquiry finds that the planning for the Project has included appropriate consideration of and responses to potential social impacts associated with an influx of a primarily male workforce in a remote area. It is apparent that the Proponent has worked with Council and other government agencies to anticipate and respond to potential social impacts. This process resulted in the selection of a site for the worker accommodation in a location that is remote from Benambra, which is endorsed by the Inquiry, in order to avoid potentially significant adverse impacts on this small settlement (see discussion in Section 11). We agree with Council that there should be monitoring and evaluation of social impact mitigation measures. This should be designed to address specific issues of concern to avoid monitoring for the sake of monitoring. Reporting of 'scanning' of local housing, services and employment conditions to the Community Reference Group should provide a mechanism that enables responses, often by agencies other than the Proponent. The community reference group should also have a role in providing an avenue for the community to communicate concerns and complaints about social (and environmental) issues.

Submissions from businesses and residents from the local area (Benambra and Omeo) were all supportive of the Project. The Inquiry believes this reflects the commitment made by the Proponent to engage the local community and is indicative of their success in building strong local relationships. As acknowledged in the Draft Works Approval, much of the face-to-face stakeholder consultation concentrated on the Project's near neighbours and local opinion. The Inquiry notes with concern submissions from the GEG and two residents from the wider area that they expressed interest in receiving communications about the Project but were not included on mailing lists. Organisations and individuals have an important role in scrutinising environmental implications of projects such as mines and we recognise the challenges they confront given both the volume and technical nature of the EES and the limited resources available to voluntary organisations. Nevertheless, the formal exhibition process has provided these groups with the opportunity to present their concerns and it is the substance of issues raised, rather than the number of submissions that is important. The community reference group should include representation from the range of stakeholders, including those with a focus on protecting the environment and other agencies.

The Inquiry commends Council for the proactive, constructive approach adopted to the Project through the MoU. Council recognised the functions and expertise of other regulatory agencies and therefore focused on the issues within its direct responsibility and expertise – planning and social impacts. We think it is entirely appropriate for a Council to commit resources to secure the optimum town planning, social and economic outcomes for local residents and businesses. We also note Council’s observation that there may be merit in a MoU with other agencies that are responsible for responding to social and economic impacts or delivering services. This is beyond the scope of this process but is worthy of consideration for future projects. The Community Reference Group should fulfil a function of informing relevant agencies.

### **Conclusions**

- The mine will generate significant net economic and employment benefits for the State, regional and local economies and social impacts have been considered and addressed.
- The Project should only proceed on the basis that the design and management requirements address potential hazard to health and significant environmental risks.
- Strong relationships with the local community are apparent but engagement with environmental groups should occur through ongoing consultative processes such as the Community Reference Group.

### **3.2 Recommendations**

- **Formulate and implement with the East Gippsland Shire and Department of State Development, Business and Innovation, a framework for ‘scanning’ local housing, services and employment conditions and impacts of the Project and report the outcome to the Community Reference Group.**
- **Engage regional environmental groups in ongoing consultative processes, including the Community Reference Group.**

## 4 Mine Operations and Processing

This chapter deals with mine opening, operation and closure, excluding issues associated with the TSF, which are addressed in the following section.

### 4.1 The issues

- Will mine operations and processing have any adverse environmental impacts?
- What is the potential for adverse impacts from the discharge of contaminants to the air, surface water and groundwater.?
- Should the Project conditions in the Draft Work Plan or other statutory implements be modified?
- Will management of PAF material ensure acid formation does not occur?

Issues relating to clearing of approximately 50 Ha for the processing area are addressed in Section 7 and bushfire issues are addressed in Section 8.

### 4.2 Previous mining operations legacy issues

Issues associated with the original mining operation included only partial removal of the Wilga ore body, ongoing management of groundwater, surface pollution in the vicinity of the processing plant from both the operation and removal of the processing plant and rehabilitation and revegetation of the processing plant site.

Potential Acid Forming (PAF) rock from the mine was both left at various places around the workings and dumped into the TSF. The PAF caused a variety of environmental impacts in terms of the production of acidic run-off, which impacted on the environment in the vicinity of the mine. Unfortunately when the site was rehabilitated not all PAF was initially removed and additional works had to be undertaken.

The most serious issues associated with the previous mine related to the TSF, which are discussed in Chapter 5.

In association with works to the TSF after failure of the previous mine, a variety of environmental monitoring and management procedures were established, including water quality monitoring within and downstream of the dam, groundwater monitoring and flora and fauna assessments.

Monitoring of the Wilga mine since closure in 1996 has confirmed the low rate (averaged 0.2 litres per second) of groundwater inflow into the disused mine. This confirms the geotechnical advice that the host rock is virtually impermeable and groundwater flow is only through fine fractures in the host rock. Extensive borehole investigations of the Currawong deposit indicate a similar level of competence of the host rock with similar levels of groundwater flow.

### 4.3 Mining opening and operations - What is proposed?

Chapter 4 of the EES describes the Project, together with the proposed method of mining of both Wilga and Currawong deposits and outlines the processing methodology.

In summary, Stockman proposes to extract ore from two separate ore bodies situated approximately 8 kilometres apart, a centralised processing facility and the transport of semi-

processed ore to the Port of Geelong for further processing elsewhere. Tailings from the processing plant are to be disposed into an upgraded existing TSF which was established for the previous mining operation.

The investigations for the Stockman mine, which commenced with the issue of a mining lease in 2010, included liaison with a variety of government departments to identify the most appropriate site for the new processing plant, disposal of tailings, and other aspects of mine development.

The proposed mine development adopted by the Proponent comprises the following:

- Mining operations commence in the Wilga deposit and then progressively move into the Currawong deposit. It is planned that mining of the Wilga deposit will be completed at the end of year three and mining of the two ore bodies will take a total of approximately 9 years.
- Approximately 1.1 and 7.3 million tonnes of ore will be extracted from the Wilga and Currawong mines respectively. The Wilga resource comprises approximately 3 million tonnes of ore and Currawong 9.5 million tonnes. If the price of the metals increases the Proponent may consider applying to extract additional ore.
- Both Wilga and Currawong utilise shafts and stopes with all ore being transported by truck along the upgraded mine roads to a new processing plant, near the Currawong portal and approximately 8 kilometres from the Wilga portal.
- Approximately 110,000 tonnes of waste rock will be generated from Wilga and 640,000 tonnes from Currawong, the majority of which will be potentially acid forming (PAF). All PAF rock will be returned underground to the worked out stopes. Non-PAF rock will be stockpiled and used in the enlargement of the TSF.
- Approximately 7,000,000 tonnes of tailings will be generated over the nine-year life of the mine, approximately 85% of which will be sourced from Currawong.
- The processing plant and associated facilities will be designed to process approximately 1,000,000 tonnes of ore per year and will comprise:
  - A crushing and grinding circuit to produce material of which 80% is smaller than 0.025 mm in diameter;
  - A differential flotation facility to separate the copper and zinc from the gangue (waste rock) through a series of tanks and cells. The concentrate will be reground finer still and then refloated to maximise recovery;
  - The pH of the concentrate is adjusted using lime to enable the chemical recovery of the zinc and copper. Quicklime will be trucked to the site for this purpose;
  - A concentrate dewatering facility, where thickeners and filters dewater the copper and zinc concentrates to approximately 10% moisture content, ready for transport to port;
  - Storage areas for run of mine material, PAF and non PAF rock, quicklime, dewatered concentrate prior to transport (stored in half height containers prior to transport by road to the Port of Geelong).
- The processing plant requires approximately 2500 ML per year of water. It is proposed to harvest on-site rainwater from the processing plant area, groundwater from the mining operations and recycled TSF water. If the on-site harvesting does not meet the processing requirements, it is proposed to pump groundwater extracted from a bore field near Benambra. Make-up water requirements from the Benambra bore field are estimated to vary from 30 to 230 mega litres per year (see further discussion in Sections

6 of this report and Chapter 4.7 of the EES relating to water issues associated with mining).

- To maximise the amount of ore able to be recovered and to provide adequate strength to support the stope roof, it is proposed to backfill the stopes with paste made from the tailings<sup>16</sup> incorporating cementitious material (currently proposed to be 5 – 7% cement slag). This will also minimise the volume of tailings required to be disposed of the TSF. However, it will not be possible to fill all stopes with paste due to ore processing timing issues. The paste will be:
  - Either trucked from the processing plant or tailings will be trucked back to the Wilga portal and a portable paste facility established at the portal and the thickened paste pumped into the mine.
  - Pumped to the Currawong deposit via pipeline from the central paste thickening plant (Groundwater impacts from the paste thickened tailings are discussed further in Chapter 10 of the EES).
- Approximately 50% of the tailings will not be paste thickened (primarily due to density differences and timing issues associated with mining of the Currawong deposit) and will be pumped into the TSF for long-term storage (further discussion of the TSF is provided in Section 5).
- A variety of chemicals will be used for mineral processing and paste thickening. In addition, a variety of goods will be used for maintenance cleaning and servicing the processing plant and equipment including vehicles. Blasting materials will also be required for mine operation (further details are provided in Section 12.3).
- A gas fired power station near the processing plant to provide the electrical needs (including for the accommodation village and storage facilities for compressed gas to be trucked to the site (Greenhouse gases emitted from the power station are subject to an EPA licence and are discussed further in Section 12.2).

### **4.3.1 Mine opening and operations**

#### **Evidence and submissions**

Submissions relating to the mine operations centred on the loss of flora and fauna habitat which are dealt with in section 7. The other concerns of submitters related to groundwater impacts which are discussed in Section 5.9.

Mr Jacobs, who is the mine development manager and has many years experience operating mines similar to this one, advised that:

- Open cut mining was investigated however the environmental risks associated with the excavation of a large volume of cover material would be unacceptable and it is not necessarily the most appropriate from a mining perspective.
- Underground mining provided the smallest surface footprint and environmental impact.
- Although design of the Wilga portal and adit at a higher elevation would have minimised any potential groundwater impacts, as these features remain from the original Wilga mine, their reuse is proposed.

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<sup>16</sup> Tailings are the fine crushed rock remaining after the ore has been removed.



- The provision of an adequate water supply for use in the crushing and grinding facilities and in the recovery of the ore is a key consideration. Investigations indicated adequate water from rainfall harvesting would not be feasible for both environmental and commercial reasons. As a result, detailed modelling considered a variety of water sources to meet the needs of the site, including:
  - recycling of the TSF water (the largest source) and the reuse of water throughout the mining operations;
  - use of mine drainage water;
  - harvesting rainwater from the processing plant area and near the TSF;
  - use of a 15 mega litres per year extraction licence for the Drillers Dam (situated a short distance downstream of the TSF).

Mr Fuller, who provided evidence relating to water for the Proponent, advised the Inquiry that long-term computer modelling, including the use of data from the millennium drought, indicated there will be adequate water harvested on-site for the majority of the mining operations. However, as an insurance against water shortages the investigation of alternative water sources identified a deep groundwater source at Benambra as an acceptable alternative source (see Section 6).

Dr Taylor, a geochemist called by the Proponent, advised the Inquiry that:

- It is proposed to backfill the worked out stopes with paste thickened tailings to which approximately 4 to 7% of lime slag will be added.
- The addition of the lime slag or another material will give the paste suitable strength to maintain the integrity of the roofs of the stopes and allow the maximum extraction of ore.
- In his opinion the in-place moisture content of the paste would be high, thus making it harder to oxidise in an underground situation.
- More test work needs to be undertaken to verify various aspects of using paste thickened tailings for stope support. While tailings material from their proposed processing methods is not yet available testing will be able to undertaken quickly once production commences.
- While lime is present in the paste he would expect the groundwater to still be saturated with gypsum; if this is an issue the addition of limestone will assist in neutralising the gypsum.

Dr Taylor was questioned about the potential to completely backfill the Wilga deposit, including above the portal level. He advised that the overriding requirement was to maintain the paste underwater and therefore while the engineering of a suitable plug in the portal could be undertaken to avoid the issue of water draining out of the backfilled stopes, he felt that it would be better to only backfill with paste up to portal level. He did acknowledge, however, that it would be possible to provide additional alkalinity to the paste which would assist in minimising the potential for future oxidation. He also acknowledged that the complete filling of all stopes may be feasible as they will be below the long term ground water level and the portal will be required to be sealed to maintain the ground water levels.

Mr Jacobs advised:

- Industry codes require the best use of resources, which in his opinion, means that the declines should be kept open to allow access to ore bodies which are currently not considered economical to mine. He noted that the resource at Wilga is approximately 3 million tonnes with approximately 1 million tonnes proposed to be mined and at Currawong approximately 7 million of 9.5 million tonnes of ore will be mined.
- Based on predicted tailings volumes, filling the declines (in addition to the stopes) in the Wilga deposit with paste thickened tailings would reduce the level of the tailings within the TSF by approximately 0.6 m. (On reflection the Inquiry was unsure if this volume included the back filling of the remaining stopes which are above the portal level of the Wilga mine.)
- The likelihood of requiring stage IV of the TSF due to the issues associated with excess rock, etc is likely to be 50%.

### **4.3.2 Discussion**

Minimal potential environmental issues are expected at the paste thickening plant, apart from the potential for burst pipes or the production of off spec paste.

The Inquiry is satisfied that the proposed approach to mining these ore bodies, including the reopening of the disused Wilga mine, will minimise environmental impacts from the mine operation while allowing the resources to be accessed.

The proposed partial refining of the ore on site for further processing elsewhere has minimised the area to be impacted for processing. We accept that it would not be economically viable to truck the ore to a distant site for full processing and, similarly, the construction of a full refinery on the site would have unacceptable environmental impacts in terms of the area required to be disturbed to construct a full refinery.

Dr Taylor and other experts for the Proponent advised that the long-term storage of tailings underground with a suitable water cover is preferential to long-term storage in the TSF and this is a critical driver in maximising tailings storage in the disused mine stopes. In the interest of achieving this, additional testing and design should be undertaken in an attempt to identify a suitable management regime that enables the complete backfilling of the Wilga mine with paste thickened tailings which minimises the risk of long-term impacts on groundwater quality. We note that the modelled projections presented indicate that all worked out areas of the Wilga mine will be below the long-term groundwater table level.

As it is proposed that all PAF rock will be promptly returned underground, the Inquiry is satisfied that there should be no adverse environmental impacts in the vicinity of the mine or the processing facility. We note that any PAF rock identified at the processing plant is proposed to be stored on a sealed and bunded area prior to transport back to the mine.

We accept that the backfilling of shafts and access tunnels will not have a major impact on the volume of tailings stored underground and could increase in cost should the mine be reopened in the future. However, we believe that in the interests of minimising the potential environmental impact from this mine, and the storage of tailings in particular, that all stope voids and redundant tunnels, etc. within both the Wilga and Currawong deposits should be backfilled with paste thickened tailings. It should be feasible for the mine

operators to identify those tunnels etc which could be used to access adjacent ore bodies and for them to remain unfilled.

Impacts from noise, dust and blasting were not identified in the EES or submissions as issues of concern as all mining, including blasting, is proposed to occur underground and there is limited potential to generate a dust load or noise to the surrounding environment. The Inquiry notes that:

- The only potential issues associated with dust generation related to the construction of facilities, ongoing ore crushing operations and traffic on unsealed roads and areas in the vicinity of the processing plant. The modelled dust discharges from the processing plant comply with the relevant SEPP (Air Quality Management) criteria (dust issues associated with the roads are discussed in Chapter 4.8 of the EES);
- Issues associated with blasting primarily relate to safety issues around handling. These are discussed in Chapter 18 of the EES but are not addressed in the Draft Work Plan. The Inquiry is satisfied that safety issues around blasting will be adequately addressed by current industry practice and legislation.

### **Conclusions**

- The proposed mining method allows access to this valuable resource, while minimising the local environmental impacts.
- The proposed processes to be used both in mining and processing are appropriate and have the least environmental impact near the mines and processing plant.
- The volume of tailings stored underground should be maximised, while providing for ease of future access to ore reserves.

## **4.4 Mine closure**

As noted above, it is proposed to backfill the Wilga mine's stopes to the level of the main portal and to fill the Currawong deposit stopes until processing ceases and no further tailings are produced which can be paste thickened and returned to the Currawong mine.

When mining operations cease at both sites, it is proposed to flood the remainder of the mine with water of a quality suitable to ensure ground water is not contaminated<sup>17</sup>. This will maintain PAF cover and accelerate the return the water table to the conditions which would occur naturally if mining had not been undertaken. In the case of the Wilga deposit plugging of the adit and the main portal will be required as they are below the highest level of workings and the long-term groundwater table. It is proposed that the Post Closure Trust Fund will provide for the ongoing monitoring and top-up of water in mine voids, if required.

### **4.4.1 Evidence and submissions**

Mr Hermans raised concerns in relation to:

- The storing of paste thickened tailings, which are high in pyrites and very fine, underground in both Wilga and Currawong mines.

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<sup>17</sup> At this stage, it is considered likely that the flooding will use bore water from the Benambra bore field. However, the option remains to treat other water sources to comply with requirements of SEPP (Groundwaters of Victoria) and, if necessary the requirements of the EPA.

- Whether the paste thickening technology is suitable in the very long term to prevent any acid reaction occurring.
- The ability for the tailings to remain covered with water after closure and the potential for an extreme dry period to lower the groundwater to a level such that tailings are exposed and dry out.

Mr Newman and Mr Jacobs advised in relation to the sealing of the Wilga site adit and main portal that if that mine were being developed today, the portal would be above the groundwater table and the mining stopes. However, as the Wilga portal exists it will be necessary to design appropriate concrete plugs and treatment in the vicinity of the plug to ensure that groundwater leakage was minimised.

The Inquiry was provided with indicative designs of the portal plug and we were advised that additional design considerations could include the provision of sacrificial concrete to allow for the potential for future acidification of the groundwater. Other options included backfilling a portion of the declines with limestone or other calcareous material. Dr Taylor considered that shotcreting etc, which will probably be required in the vicinity of the portal plug, would also assist in minimising the potential for the production of acidic groundwater.

#### **4.4.2 Discussion**

We note from the evidence of Dr Taylor that the make-up of the paste thickened tailings can be varied to both increase strength and, if necessary, alkalinity prior to flooding the mine stopes to minimise production of sulphates.

The Inquiry accepts the advice of the various experts that the most appropriate method of storing the tailings is underwater and underground. As noted above, we consider:

- Appropriate testing and monitoring at an early stage in the mining process should identify the most appropriate paste constituency for both supporting the stope rooves and the long-term maintenance of the alkalinity in the paste.
- The underground storage of paste thickened tailings should be maximised, although we have recommended that the main decline and other potentially useful tunnels not be filled with paste.

Given the evidence presented to the Inquiry based on early investigatory work, we are satisfied that there is strong potential to identify a paste design, placement and management regime which would allow the complete backfilling of the Wilga mine, excluding the key tunnels etc.

#### **4.5 Recommendations**

- **Undertake more test work when operations commence to identify the most appropriate paste thickened tailings for both supporting the roof of the stopes and the long-term maintenance of their alkalinity.**
- **Undertake additional testing and design, to the satisfaction of DSDBI on advice from the Independent Technical Reviewer(s), to enable the backfilling of all of the Wilga mine stopes with paste thickened tailings which minimises the risk of long-term impacts on groundwater quality.**

- **Backfill all stope voids and redundant access tunnels in the Wilga mine with paste thickened tailings to minimise the potential environmental impact from this mine and in particular the storage of tailings.**
- **Maximize the volume of paste thickened tailings stored in the stopes and redundant access tunnels of the Currawong mine.**
- **Include long-term monitoring and maintenance of water cover of any paste thickened tailings in the Wilga and Currawong mine voids in matters funded by the proposed trust fund.**

## 5 The Tailings Storage Facility

### 5.1 The issues

The containment of tailings and the maintenance of the tailings under water in perpetuity is the key environmental issue associated with this mine. Other issues raised include:

- Groundwater contamination
- Surface water contamination
- Stability of the dam and the potential for a catastrophic dam failure
- Water supply to ensure tailings remain covered
- Seepage from the right abutment
- Flora and fauna impacts downstream of the dam
- Long term management of water
- Monitoring
- Maintenance

### 5.2 What is proposed?

The EES (Chapter 5.5) investigated a number of alternative sites for the establishment of a TSF for the Project and concluded that a major upgrade of the existing is the most appropriate strategy from both an environmental and cost effective point of view. The current TSF (known as Lake Saint Barbara) is the result of a number of years of upgrading, monitoring and management of the old TSF for the previous Benambra mine.

It is proposed to:

- Raise the existing dam wall by up to 25m<sup>18</sup> in a series of stages matched to tailings production.
- Repair the dam wall to:
  - remove some PAF rock, which is understood to have been used in the construction of the original dam wall;
  - extend a plastic liner, which was installed as part of the remedial works to the original dam, up the internal face of the dam;
  - extend the 25 m deep grout curtain at each end of the dam wall and up into the abutments to further minimise the potential of any leakage;
  - expose all surfaces around the edge of the lake to identify areas to be grouted or clay lined, including any potential fractures or leakage zones in the base rock, as identified by the supervising engineer.
- Construct a new discharge weir adjacent to a saddle dam on the northern side of the TSF. This weir is to be designed to have a capacity for a one in 1 million year flood from the catchment above the TSF.
- Ensure the long-term structural stability of the TSF dam after closure of the mine by adding rock material on the downstream face to further strengthen the dam wall and ensure that the TSF is able to withstand a 7.7 rated earthquake (which is the maximum conceivable for Australia).

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<sup>18</sup> From the current height of 1173 metres to 1198 metres

- At the closure of the mine, provide multiple tailings cover layers to ensure that the water in the TSF does not become acidic and has adequate carbon based material to maintain anaerobic conditions at the surface of the tailings in perpetuity.
- Construct a biological treatment system capable of treating water from the seep in the northern embankment to a quality which enables discharge to Straight Creek in accordance with discharge criteria to be confirmed by the Independent Technical Reviewer.
- Construct one in 1 million year capacity diversion channels around the TSF which are to be maintained until the water quality in the TSF after closure is suitable for discharge downstream. The diversion channels are then to be removed and the area rehabilitated.

As noted in Dr Taylor's evidence, 'acid mine drainage represents the biggest environmental challenge facing the Stockman project.'

Potential sources include tailings, rock waste, or stockpiles, concentrate stockpiles and mine voids. Tailings are proposed to be stored both within the mine and the TSF.

In preparing the EES the Proponent has undertaken the necessary preliminary design and investigations to confirm that the storage of a 100% of the tailings is able to be undertaken in the TSF.

Due to the highly sulphidic nature of the tailings it is important that they are isolated from oxygen or they will result in the formation of sulphuric acid when later exposed to water. The extensive experience gained from the operation and rehabilitation of Lake St Barbara has provided a considerable body of data on the treatment and management of tailings from this ore body. This experience and experience elsewhere has identified that provided the tailings are covered by a minimum of 1.5 m of water the potential for acid formation is negligible.

### **5.3 Background and existing conditions**

Lake St Barbara was originally created as the TSF for the Benambra mine which operated from 1992 to 1996. As noted above, the original mining operation was bankrupt and closed rapidly.

The most serious issues associated with the previous mine related to the TSF. When the mine was abruptly closed, in addition to other environmental impacts and poor management procedures, it is understood that 17 tonnes of waste acid was disposed into the TSF. This resulted in ongoing impacts on water quality within the TSF and on discharges downstream of the site, both from groundwater discharge associated with the seep from the right embankment of the dam and from overtopping of the spillway during periods of high flow.

Various government agencies became involved in the rehabilitation, remediation and upgrade of the TSF, which involved:

- Levelling of the tailings as areas were exposed and creating acidic conditions;
- Increasing the height of the dam wall to provide a minimum depth of 1.5 metres of water over the tailings while maintaining adequate freeboard;
- Installing a plastic liner on the upstream face to further minimise seepage through the dam wall;

- Constructing an emergency discharge weir in the southern abutment of the dam;
- Constructing a biological treatment system to improve the water quality from the seep on the northern abutment;
- Placing limestone gravel across the surface of the tailings to assist in raising the pH;
- Providing a carbon source (jute matting, wood chips, etc.) to develop anaerobic conditions on the base of the pond and assist in improving water quality;
- Installing ongoing water quality monitoring equipment for the TSF;
- Ongoing monitoring of water quality in the biological treatment system for the seep; and in straight creek upstream and downstream of the TSF;
- Revegetating the disturbed areas adjacent to the TSF;
- Modifying the diversion channels around the TSF.

In association with these works a variety of environmental monitoring and management procedures were established, including water quality monitoring within and downstream of the dam, groundwater monitoring and flora and fauna assessments.

The current TSF contains approximately 700,000 tonnes of tailings. Monitoring since completion of the remediation works indicates that water quality in the TSF, the biological treatment system and Straight Creek have all improved and are continuing to improve. Water discharges from the TSF are generally in accordance with SEPP (WoV) water quality requirements and are anticipated to further improve with time. Currently, the zinc and conductivity (salinity) exceed ANZECC guideline values and there is variability of various parameters based on flow and seasons, including pH, salinity, sulphates and zinc; all of which, based on the limited monitoring undertaken to date, appear to be improving.

## **5.4 Submissions**

The GEG, Victorian National Parks Association, High Country Branch of the Country Women's Association of Victoria, Ms Crisp, Ms Kibble, Mr Hermans and Mr McRae raised strong concerns about the environmental and health impacts of the TSF. The issues raised in submissions related to:

- The history of the previous TSF and the very high cost of remediation, which the State was forced to meet following the closure of the Benambra Mine. A number of submitters, including the EPA, highlighted the history of water quality issues in the TSF, particularly in relation to the rehabilitation. GEG noted that despite DSDBI, and other government departments spending many millions of dollars, the TSF rehabilitation remains incomplete and still requires additional rehabilitation.
- Carcinogenic impact from contamination of groundwater and the Tambo River.
- The discharge of contaminated water to the environmentally sensitive downstream areas of Straight Creek and thence the Tambo River, both during operation and post closure.
- The raising of the bank another 25 m to store up to 7 million tonnes of tailings would massively increase both the hydraulic pressure on the dam wall and the potential for environmental damage downstream, due to increased leakage discharges to ground water or failure of the dam wall.
- The integrity of the dam, which is constructed as a series of lifts. The stability of the embankment may be compromised by the need to key in successive lifts.



- The potential for contaminated water discharges when the existing tailings dam height is lowered to remove unsatisfactory material which was incorporated in the remediated dam wall.
- The limited efficacy and lifespan (30 years) of the HDPE liner that exists and is proposed to be used on the internal face of the TSF dam and responsibility/funding for future replacements of the liner.
- The potential for acid reaction occurring as the maintenance of a permanent water cover over the tailings in the TSF in perpetuity cannot be guaranteed. The concerns related to the fact that the water cover would be required for the very long term and may be impacted during a drought or by a lack of appropriate maintenance of the TSF. Ms Kibble questioned the Proponent's capabilities to manage a TSF as they have confirmed that they had only operated tailings facilities where the tailings were allowed to dry out.
- The adequacy of the proposed rehabilitation bond, which GEG argued should be at least \$500 million, in light of the extreme risks the Project poses.
- The potential for a catastrophic failure of the dam wall resulting in *'the discharge of millions of tonnes of sulphidic tailings and heavy metals into the Tambo River possibly all the way to Lake King in the Ramsar listed Gippsland Lakes.'* It was submitted that the resulting contamination along the riverside would be catastrophic to farms and farm produce, noting that a number of large vegetable and food suppliers have factories in the area. Fishing and tourism in affected areas through to Lake King would also be affected.

### **EPA Submissions**

The EPA noted that for the duration of the mine DSDBI is responsible for the regulation of any on tenement discharges to ensure compliance with SEPP (WoV) via the Work Plan and Work Authority however discharges beyond the mining tenement would trigger EPA involvement.

Once mining ceases and the DSDBI has formally accepted the rehabilitation of the mine and TSF and the Mining Licence is revoked the ownership of the site would then revert to DEPI. At that point the EPA would then have a role in relation to any water quality issues associated with the TSF.

They advised that the best way to minimise any future risks associated with water quality in the TSF is to ensure that the TSF is designed, constructed and operated to best practice and to have adequate contingency measures in place in to address foreseeable issues. They emphasised that the design is the key for long term environmental security.

The EPA submission identified a number of potential environmental risks associated the TSF:

- Acidic run-off, especially later in the Project and post closure.
- Sediment run-off during construction and then post closure from the spill way of the TSF.
- Salinity impacts from discharges from the TSF.
- Measures to prevent oxidation of the tailings.
- Commitment to avoid overflows from the TSF during operations.

The EPA supported the Project progressing but required the resolution of the following uncertainties prior to approval of the mine work plan to demonstrate achievement of relevant environmental outcomes:

- Preventing untreated supernatant overflow during operations and non-compliant overflows post closure to ensure compliance with SEPP (WoV) objectives.
- Design of the TSF to manage acid loads from unmanaged upstream creeks so that they do not impact on supernatant quality in the long term.
- Methods to derive environmental quality objectives and criteria to determine compliance with SEPP (WoV) for overflow discharges of supernatant water post closure.
- Management and monitoring provisions post closure to enable effective prevention of overflows of non-compliant water in accordance with SEPP (WoV).
- Management of potential sedimentation impacts in the overflow gully north of the TSF to ensure that water quality objectives can be met at the Tambo River.
- Minimise and managing seepage from the TSF throughout the life of the TSF to ensure compliance with water quality objectives at the Tambo River.
- Timing of the flooding and management of the backfilled underground workings to prevent the onset of acid mine drainage.

Dr Ferrando-Miguel submitted that the Proponent needs to confirm that low permeability of the tailings combined with the proposed sealing of the rock faces of the enlarged TSF can be expected to minimise any increases in groundwater flow or leakage from the seep at the TSF dam abutment.

The EPA noted that the existing TSF water quality has taken approximately 8 years to return to acceptable standards. It was therefore recommended that an anaerobic water treatment plant be considered to more quickly treat the water in the TSF at the completion of mining. Dr Taylor, on behalf of the Proponent, advised that the decision as to how to best treat the TSF water should be made towards the end of mining when the properties of the TSF water are better known.

Dr Ferrando-Miguel advised that the goal for water quality would be to return the water quality in the TSF and downstream to the same condition as at present. He advised that a complete set of water quality parameters should be developed and trigger levels established both in the dam and at the confluence of the Straight Creek and Tambo River for requiring changes to practices.

The EPA supported the development of a technical, peer review and auditing process to enable in principle demonstration of achievement of outcomes and to verify that all environmental aspects of the TSF (and mine) are best practice. The EPA advised that they would be pleased to assist in the development of the governance issues associated with the role of the ITR. Dr Ferrando-Miguel concurred with the Proponent that the ITR would be required to have access to a wide range of skills and did not necessarily have to be an EPA approved auditor. However he advised that if the team was lead by an EPA approved auditor, then there would be additional oversight provided by the EPA, under its internal processes. He suggested that the ITR could draw on the expertise of the ERC to identify and assist with access to appropriate specialist expertise as required for the various aspects of the Project.

## **TSF water balance**

The key water balance considerations relate to the operation of the TSF and the requirement to ensure that the tailings are adequately covered with water at all times. In the event that they are allowed to dry out the tailings will become sulphidic and on subsequent rewetting will produce sulphuric acid. These conditions are known to have occurred at the previous TSF and resulted in detrimental environmental impacts downstream of the TSF which took many years and considerable cost and effort to rectify.

The proposal is to ensure that the tailings are fully covered at all times during the operational phase by collecting and recirculating all stormwater, mine water, tailings water etc. through the TSF. At the completion of operations it is proposed to maintain a water cover of at least 2m over the tailings and, after acceptable water quality is achieved, to remove the operational phase diversion drains around the TSF to direct rainfall in the catchment into the TSF.

### **5.4.1 Evidence**

Mr Fuller, for the Proponent, provided details of a range of modelling undertaken for the TSF post closure, including a 100 year historical sequence of rainfall and evaporation. He contended that, even including the millennium drought:

- At all times a minimum of 1.5 m (and that would only be for a short period of time) of water cover would be maintained over the tailings if it is assumed 100% of all tailings are stored in the TSF.
- For the option of 50% of the tailings stored in the tailings dam, at no time would cover on the tailings be less than 1.6 m of water. It was noted that in the 50% of tailings option the dam crest would be lower than the 100% case.

Mr Fuller recommended further refinement of the final tailings cover level as the various lifts were developed for the TSF dam to confirm the suitability of the design to maintain saturated tailings.

Dr Taylor, a geochemist, advised that the density of the tailings in the TSF is higher than would be expected in other tailings facilities due to the density of the host rock. He drew the Inquiry's attention to the rehabilitation of the old TSF where heavy earthmoving equipment was able to safely traffic on top of the tailings during the enlargement of the dam wall. He advised that due to this strength it would be feasible to place 1 to 2 m of coarse rock on top of the finished tailings level which would provide considerable improvement in minimising the evaporation of water. It was his contention that if water availability to keep the TSF covered was problematic, this technical solution would be of great assistance.

Dr Taylor advised that as it is intended to re-establish vegetation in all areas around the TSF that the sediment load on the TSF would be minimal and would have no impact on the tailings. In his opinion, provided the tailings were maintained in the wet condition, there would be no chemical issues associated with degradation of the tailings.

During the rehabilitation of the TSF, the issue of acidic run-off from the catchment was raised by the EPA, and the Inquiry understands that two limestone beds were placed in small streams which entered the TSF in an effort to maintain a suitable pH. Dr Taylor advised that

the run-off volumes which might have a reduced pH would be so small as to have minimal impact on the pH of the TSF water. In his opinion the proposed requirement for an appropriately designed and installed layer of limestone sand and subaqueous layer of organic material will be adequate to maintain water quality in the TSF without the need for additional treatment of water draining into the TSF.

Mr Fuller advised that modelling indicates the 2 m water level cover could be maintained in the long term, up to a seepage rate of approximately 1.5 L/s. He further advised that this could be addressed by raising the crest level to provide greater than 2 m of water cover to avoid issues of drying of the TSF. He also noted Dr Taylor's advice that in an emergency other approaches could be taken to minimising evaporation, including the back filling of the TSF with large diameter rocks to the above water level or the use of appropriate chemicals to minimise evaporation in emergency situations.

Submitters raised concerns in relation to the best method of monitoring water quality within the TSF and water quality of discharges, both from the TSF spillway, the seep and from Straight Creek and the Tambo River. Both Dr Taylor and Mr Fuller confirmed that the approach which would provide the greatest surety would be the development of a detailed, monitoring and evaluation program which was independently reviewed and reported to the relevant government departments, as well as the Environment Review Committee.

The Inquiry questioned Mr Jacobs about the potential benefit of requiring the operator to paste thicken tailings prior to disposal into the TSF. He advised that it would be technically possible but the cost would be in the order of \$85 million and environmentally would achieve little as the paste would still need to be maintained underwater and a larger volume TSF would be required.

#### **5.4.2 Discussion**

The Inquiry notes the opportunities to further validate the TSF water balance model assumptions using observed data as the actual mining operations proceed and prior to design and construction of the various TSF dam lifts.

We also note the variety of options which are available to ensure that the tailings can remain covered with water to ensure the long-term environmental stability of the post closure TSF.

The concerns raised by many of the submitters in relation to the long term ability of the TSF to safely store the large volume of tailings are understandable given the previous history of the operations on this site. Submitters raised a variety of potential scenarios in relation to water volume and water quality discharges from the TSF which were based on issues encountered with the old TSF and the costs associated with the remediation. Submitters' concerns also related to the long-term future when the site is no longer in the public memory and instead is a forgotten lake in the bush.

While we accept that the submitters concerns are real and based on historic fact, we are satisfied that there are a variety of design and management options available, which can be put in place to ensure that the TSF poses minimal risk to the downstream environment long into the future.

In our opinion the key requirements are to ensure that the design of the TSF is such that it is structurally able to endure for the long-term and also to put in place a robust independent

management, monitoring, funding and governance regime to ensure the early identification of any potential risks which may arise into the future and enable prompt responses.

The Inquiry acknowledges the Proponent's agreement to review of all aspects of the TSF (and indeed all environmental issues) throughout the life of the mine by an Independent Technical Reviewer (ITR). In our opinion the establishment of the role of ITR based on an agreed scope of work and reporting, is important to provide the public and government agencies with the reassurance that the best environmental outcomes will be achieved both throughout the life of the mine and post closure.

The Inquiry was advised that it is proposed to develop a trust fund for the post closure regulation and governance of the site. This is discussed further in Section 13 of this report.

### **Conclusions**

- Considerable technical information indicates the remediation of the old TSF has been successful and potential water harvesting and appropriate maintenance of water cover scenarios are available for the proposed enlarged TSF.
- We are satisfied that potential for contaminated water to discharge from the site have been minimised and will continue to be minimised into the future through the combination of:
  - Project design;
  - Independent review of the monitoring and management of the TSF by the ITR prior to, during and post mining; and
  - The establishment of a trust fund for the long-term monitoring and management of the site.

## **5.5 Tailings**

### **5.5.1 Evidence**

Dr Taylor provided the Inquiry with information in relation to geochemistry and the TSF on behalf proponent. He advised that worldwide, 95% of tailings storage facilities are not water covered due to the shortage of water or the requirements for its reuse in the mining operations. In his opinion the maintenance of the TSF constantly underwater provides the highest level of reassurance of the limited risk of water quality issues downstream in the long term. He advised that he had been involved in the rehabilitation of the original TSF and considered that the TSF remedial measures undertaken were leading edge and had been demonstrated to be effective in the intervening period.

He noted that lead and zinc minerals do not oxidise but need acid to dissolve, however copper minerals do dissolve in water. He confirmed that the previous operator had dumped an estimated 17 tonnes of waste acid into the TSF which had a significant impact on increasing the oxidation of iron and various other metals and sulphides in the TSF. In his opinion, the provision of the limestone sand covering the tailings plus jute matting and sawdust had provided a potential for a self-perpetuating method of managing water quality in the TSF. He advised that the limestone sand maintained the water at an appropriate pH and the jute matting provided a carbon source to enable the sulphates to precipitate out as pyrite under anaerobic conditions; also adding alkalinity.

In Dr Taylor's opinion, if the same method of closure is adopted for the enlarged TSF, with the provision of trees close to the edge of the TSF and noting the recent presence of birdlife and algae etc. on the existing TSF, it is unlikely that additional top ups of carbon would be needed to maintain the water quality in perpetuity.

Dr Taylor responded to questions about the proposal to maintain a minimum of 1 m water depth during operational phase and 2m post operation that any oxidation is limited during the operating phase as the water is being recycled with fresh tailings from the processing plant. However, once the processing plant is closed, the additional water depth is necessary in order to minimise oxidation.

### **5.5.2 Discussion**

The Inquiry has noted the concerns of the submitters, which in our opinion have been informed by the experience and rehabilitation requirements of the old Benambra mine TSF. However, we note from both the advice of the EPA, the various technical experts and the considerable body of experience and data associated with the rehabilitation of the existing TSF that it is feasible to store these tailings underwater in perpetuity. We also note that ongoing monitoring will allow early initiation of a variety of additional responses to impending issues and this should ensure that the tailings remain covered with water.

We concur with the advice of the EPA and the technical experts that the key to success is:

- The ongoing review and refinement of the design as the mining operation proceeds;
- Effective post closure management of the TSF; and
- The establishment of the ongoing monitoring and maintenance facilities and funding arrangements.

The Inquiry was not assisted by the very limited advice, technical review of the EES and input at the Hearing from the DSDBI ERB. As the ownership and management of the TSF will become the responsibility of DEPI at the completion of the mine rehabilitation, it is imperative that the Work Plan includes all necessary closure works to enable the handover of a closed TSF which requires minimal maintenance to ensure that the tailings remain in a neutral state forever. This is discussed further in Section 13 where the potential scope of work for the Independent Technical Reviewer is discussed.

As Mr Mitas advised, the ERB will ensure that the outcomes of the Inquiry report will be incorporated in the Work Plan for the mine. We have incorporated a number of recommendations specifically related to ensuring the best environmental outcome for the TSF including recommendations submitted by the EPA.

### **Conclusions**

- The environmentally safe ongoing storage of tailings in the TSF is the key issue in relation to the operation and post closure of the Stockman Mine.
- Environmentally appropriate measures for the management of tailings are proposed.
- The development of a detailed Work Plan which specifically addresses the long term storage of tailings in both the mine and the TSF, the oversight of the Independent Technical Reviewer and the provision of a Trust fund for the long term management and monitoring of the TSF are necessary to safely maintain tailings in perpetuity.

## 5.6 Dam integrity

The TSF dam was constructed in 1992 and augmented during the rehabilitation works in 2006. The Inquiry was advised that the Proponent has drawn on the experience of the engineers involved in the rehabilitation works to identify further remedial actions which should be undertaken prior to the enlargement of the dam wall. This experience indicates that the temporary lowering of the crest level of the dam to enable the removal of potential acid forming rock can be undertaken and a coffer dam can be constructed on the existing tailings with suitable structural integrity to enable the removal of the top levels of the existing TSF dam without impacting on dam safety. Preliminary investigations have identified potential sources of clay within the immediate catchment of the TSF which could be used to raise the TSF dam height.

It is currently proposed to:

- Increase the existing TSF dam crest height (1175.1) in three or four stages to a maximum crest height of 1200, depending on the volume of tailings to be stored in the TSF. Preliminary design and investigation has identified that the most appropriate approach is to move the crest further downstream to enable the continuation of the existing upstream face and slope.
- Extend the existing internal plastic liner up the face and the existing grout curtain under the dam to the full length of the new crest and into the adjacent abutments.
- Expose new dam abutments back to base rock and either grout or clay fill any fissures or permeable areas, depending on the advice of the dam experts at the time.
- Further strengthen the dam wall when mining activities cease and the final crest level of the TSF is established by the provision of appropriately designed rock fill on the downstream face of the dam. The dam wall strengthening would withstand an earthquake of magnitude 7.5 which is considered to be the Maximum Credible Earthquake potentially liable to occur in Australia.
- Install a series of groundwater monitoring bores around the TSF is proposed prior to construction.

### 5.6.1 Evidence

Mr Newman, a dams engineer called by the Proponent, advised that the proposed upgrading of the tailings dam is to be undertaken in accordance with the ANCOLD Guidelines on Tailings Dams (2012) and to be operated in accordance with ANCOLD Dam Safety Management Guidelines (2003). He advised that it is proposed to design the dam, spillway and diversion drains to:

- The highest ANCOLD dam safety risk assessment (Extreme) which would place this dam on an equivalent level to the Dartmouth dam in terms of structural and operational safety.
- Store a one in 100,000 year storm of event and the spillway will be able to pass the Probable Maximum Flood of one in 10 million year event (ANCOLD 'Extreme').
- Pass the one in 100,000 year storm in the diversion drains (which will incorporate appropriate erosion control structures) while the mine is in operation.

The design of the upgraded TSF comprises a clay dam with the non-PAF rock on the outside to provide additional stability. Mr Newman advised that the plastic liner which has been

installed on the inside face of the rehabilitated TSF will be extended up the inside face of the enlarged dam top. He advised from a design point of view, the plastic liner was not required as the dam would be designed purely as a clay filled dam. In his opinion the plastic liner on the inside face would only serve as an additional factor of safety.

Mr Newman noted that existing dam has a grout curtain under the main embankment and it is proposed to extend that grout curtain or full width of the new embankment and also including the abutments and beneath the proposed saddle dam and spill way on the northern side of the TSF. He advised the Inquiry that subsequent to the TSF being filled with tailings the permeability of the tailings would reduce over time as they settled and therefore the requirement for the grout curtain and plastic liner would be reduced as the settled tailings have a permeability similar to the existing bedrock.

The dam is proposed to be designed with a factor of safety of 1.3 during the operational phase and following closure of the mine additional rock material will be placed on the downstream face of the dam to increase the factor of safety to at least 1.5.

Mr Newman advised that critical issue during the enlargement of the TSF will be managing seepage, particularly along the northern edge of the TSF. He advised that as it is proposed to source clay from this area and the northern edge of the TSF will be excavated back to the base rock and any fractures will be grouted or, if necessary, backfilled with compacted clay to minimise seepage. He further recommended the extension of the grout curtain on the existing dam to include the full width of both the extension of the dam on both saddles, underneath the Monkeys Knob area and also the saddle dam and spill way on the northern abutment.

In relation to the failure of the dam, he advised that the key risk is embankment failure but noted that this is most commonly caused by overtopping or a piping failure. However, as the TSF will have a spill way with the capability of passing a one in 1 million year flow overtopping is not considered to be a possibility. In relation to piping failure, he noted that as the TSF will be filled with tailings the opportunity for any piping to develop will be severely restricted. He noted that the tailings will have a permeability of approximately  $1 \times 10^{-7}$  m/s when first placed, which is anticipated to increase to  $1 \times 10^{-8}$  m/s over time. He also advised that prior to a piping failure of the dam visible evidence of potential piping would appear as wet spots on the downstream face or additional flow from the toe of the dam. It was his contention that ongoing monitoring and surveillance regime proposed would enable the early identification and rectification of any potential piping issues.

The second most common method of failure of dams is due to liquefaction of the foundation, which results in failure of the dam wall. Mr Newman advised that the foundations for this dam are base rock and are therefore not subject to liquefaction. Hence this mode of failure is not considered feasible.

Mr Andrew Helps, a disaster expert, appeared on behalf of the GEG. He provided the Inquiry with information in relation to the survival of tailings facilities in Australia, noting that none of the 150 pre-1940s tailings facilities survive. He also noted a number of tailings facilities with environmental issues which have been recently reported in the press. He advised that when a tailings dam fails you get a lot of tailings downstream and reminded the Inquiry that the Gippsland Lakes are downstream of this site and are a Ramsar listed site. He contended



that the best approach to tailings management is complete avoidance and that the operator should be required to undertake the development of the mine processing facilities such that no tailings would be deposited in a storage facility. Mr Helps cited a number of tailings sites in Australia where there had been environmental issues, due to tailings and/or AMD discharge. It was his contention that if the previous much smaller mining operation had been unviable then this proposed development with more extensive capital works may suffer the same fate. In his opinion if the mine operator is unable to cover the cost of treating water and tailings while undertaking the mining operation then it is not a justifiable business case.

Mr Helps under cross-examination discussed the risk assessment undertaken and acknowledged that while it goes some way to addressing potential issues in the future, in his opinion it did not address the issue of catastrophic failure of the dam and the resulting hazards. In his opinion the Proponent needs to address the issue of the consequences of failure of the dam wall as part of the work plan for the mine.

Mr Helps acknowledged the proposed requirement for monitoring regime for both the water within the TSF and for the dam wall in accordance with ANCOLD requirements. However it was his contention that ANCOLD Dam Safety Management Guidelines (2003) requirements for structural stability related to water supply dams and not tailings facilities (The Inquiry noted Mr Help did not address the ANCOLD Guidelines on Tailings Dams). He expressed concern that enlargement of the TSF dam was required to remain stable for ever and he had serious concerns how the Inquiry could ensure that a diligent management regime would be maintained in perpetuity.

### **5.6.2 Discussion**

The Inquiry accepts the advice from the Proponent's expert that the upgrading of the TSF embankment is to be undertaken in accordance with the highest level of risk for ANCOLD guidelines for dams ('High C' Dam Failure Consequence Category in ANCOLD guidelines (2012)). The design and operational approach provides multiple layers of defence and the ability of the monitoring program to identify early any issues which may require remediation to avoid future more problematic issues.

We were advised that the dam will be designed to pass the most extreme flood (1 in 1 million years) as well as survive the Maximum Credible Earthquake. The Proponent's expert engineers accepted and recommended that the design, construction and monitoring of the upgrading of the TSF be undertaken with an independent peer review, in accordance with ANCOLD requirements for the monitoring and surveillance of dams.

There was some discussion as to whether this should be undertaken solely by the Proponent's designers or whether an external person or persons should be required to at least review the work of the designers, constructors and operators.

We note that the ANCOLD Guidelines on Tailings Dams at Section 2.6 identifies '*the need for external third-party review at critical phases of the TSF life cycle*'. It indicates that review should take place during '*concept and feasibility studies, design, construction and closure. Third-party review is also recommended during operations. These reviews are in addition to dam safety reviews referred to in section 8.*' This approach was accepted by the Proponent.

The Inquiry considers that Mr Helps' expertise and experience relates more to emergency response than dam construction. Whilst we accept the evidence of others relating to dam integrity, we agree with him that an Emergency Response Plan to address potential environmental and safety issues, including catastrophic failure of the dam, should be developed and included in the Work Plan.

Whilst we accept the Proponent's advice that in the long term, the tailings will have a low permeability and are therefore less likely to require the additional security of the grout curtain and plastic liner, in the interest of confirming the suitability of such a long term arrangement, we agree with the recommendation to undertake a geotechnical and hydrogeological study to confirm the Proponent's position.

The Inquiry notes the Proponent's proposal in the Draft Work Plan for the following post closure monitoring of the TSF dam:

- Annual inspections and sampling and testing of groundwater and surface water, supervised by the ITR with results reported to the public land manager.
- Comprehensive inspection every five years by a recognised professional in accordance with ANCOLD (2012) guidelines, including a review of the surface and groundwater monitoring programs.
- Safety reviews every 20 years by a specialist firm in accordance with ANCOLD (2012) guidelines. Monitoring of surface water, groundwater and dam embankment performance will be required.

We note that the long-term success of the TSF is dependent on the development of robust long-term monitoring and management regime for the TSF post closure of the mine. It is therefore imperative that the trust fund and its terms of operation are carefully developed and implemented.

### **Conclusions**

- The risk of failure of the TSF dam will be minimised if the dam is designed and operated, as proposed, in accordance with the proposed relevant ANCOLD standards for both water supply dams and tailings dams and is monitored throughout construction and operation by appropriately qualified independent experts.
- An appropriate Independent Technical Reviewer (ITR) is essential to ensure that risks associated with the TSF are minimised.
- The development and diligent implementation of a robust long-term monitoring and management regime for the TSF post closure is critical to ensure the long-term safety of the TSF and environmental standards downstream and is therefore dependent upon the implementation of an appropriate trust fund to meet these costs.

## **5.7 Protecting surface water quality**

Throughout the mining process the TSF will be used as the water supply for the ore processing operations, with all water being returned from the processing area to the TSF for reuse. As a result the water in the TSF will be unsuitable for discharge to the environment. At the completion of the mining operations the water in the TSF will be treated to a standard which allows discharge to the environment. Post closure the diversion channels above the TSF which are proposed to be constructed at the commencement of mining will be removed

to allow the surface runoff to enter the TSF to ensure that the Tailing remain covered with water.

### **5.7.1 Evidence**

The Inquiry heard from Messrs David Fuller, Stephen Newman and Jeff Taylor in relation to the impacts of tailings on water quality, methods of treatment and potential for discharge. In summary their advice that throughout mining operations all storm water would be diverted around the TSF and the water level in the TSF would be controlled to ensure that a minimum of 1.5m of water would cover the tailings and no discharges would occur to the environment. At the completion of mining the minimum water level would be increased to 2 m and the water in the TSF would be treated until it meets adopted criteria. Throughout this period all water intercepted from the seep would be returned to the TSF.

Once the water quality in the seep and the TSF meet agreed standards the diversion channels above the TSF would be removed and revegetated. Then the TSF water level would be maintained by rainfall and the biological treatment system for the seep be allowed to discharge to Straight Creek.

Dr Taylor advised that he had been involved in the rehabilitation of the existing TSF and in his opinion the method of treatment of the TSF AMD had been very successful and provided great confidence that the same water quality objectives could be met for the upgraded TSF. He advised the Inquiry that the illegal dumping of the 17 tonnes of acid into the old TSF had been the key issue in terms of impact on water quality. He advised that a similar approach to the 'capping' of the submerged tailings as previously undertaken had the strong potential to establish a self-supporting system for preventing AMD from the TSF in perpetuity. He also noted that there are a number of established technologies available to further minimise evaporation from the TSF in the event of a water shortage and to provide additional treatment of the water in the TSF.

### **5.7.2 Discussion**

The Inquiry acknowledges that the previous mining operation caused considerable environmental damage and has cost the state several millions of dollars for rehabilitation to its current state. Much of the cost has been associated with the TSF and issues of water containment and quality.

We acknowledge the considerable effort made by the Proponent and the various government agencies to identify an approach to tailings management which will minimise the environmental risks associated with the proposed Stockman mine TSF. In our opinion it has been demonstrated that the design, construction, operation and post closure management of the TSF can be undertaken in a manner which will minimise the environmental risks associated with water containment and quality.

We accept the advice of various experts that the best approach is to undertake a rigorous design process for the TSF and to review that design as the Project progresses. In our opinion the environmental aspects associated with the TSF is the key area which should be carefully addressed in the DSDBI Work Plan and reviewed by independent experts prior to issuing the Mining Licence and at appropriate stages during the operation of the mine.

We further accept that the provision of an ITR to verify compliance and suitability of the design, construction, operation and monitoring provides further assurance that the immediate and long term environmental risks will be minimised. In our opinion the appointment of an EPA Accredited Auditor will provide further assurance of a successful outcome. This aspect is dealt with further in Section 13.

### **Conclusions**

- The potential impacts of AMD discharge from the TSF is one of the key environmental risks associated with the proposed Stockman Mine.
- With careful design, construction, management, monitoring and review the potential environmental impacts can be minimised both during operation and in perpetuity.

## **5.8 Rates and water quality of seepage from the TSF**

When the original TSF was constructed in 1992, a seep of 0.5 L/s was noted from the northern abutment of the dam. Both during the operational of the original mine and the subsequent rehabilitation of the TSF efforts to stem the seep were unsuccessful. However it was noted that despite raising the water level of the TSF, the flow from the seep has remained constant at approximately 0.5 L per second. Monitoring of the water quality from the seep has identified that it is impacted on by the water quality of the tailings water. As part of the rehabilitation of the TSF a biological treatment system was constructed at the toe of the dam to improve the quality of the seepage water prior to discharge to Straight Creek. Treatment comprised the provision of limestone to assist in neutralising the acidic water and organic matter to enable the anaerobic digestion of sulphides of metals contained in the water. Ongoing monitoring has identified an improvement in both water quality within the TSF and from the biological treatment system.

Recycling of process water to the TSF means the water in the TSF will be highly contaminated during the operation of the mine. Due to the potential contamination of the seepage water, it is proposed that all seepage water will be pumped back into the TSF for the duration of mining operations and, if necessary for some time post closure, to minimise the potential for contaminated seepage water being discharged downstream.

### **5.8.1 Evidence**

Experts for the Proponent advised that, subject to appropriate treatment and construction standards, the seepage from the enhanced TSF dam wall is expected to remain in the vicinity of 0.5 L per second. Mr Middlemis advised that, assuming that the TSF is filled to a maximum height from day one and maintained at that level, the modelled groundwater difference between 2013 and 2023 when mining ends would be generally within 0.25 of a metre higher or lower. He contended that seasonal variations in rainfall and groundwater tables would considerably mask this impact.

He advised that as the permeability of the paste thickened tailings was similar to the existing bedrock he was therefore confident that groundwater predictions for the completed mining operations would reflect current conditions.

Mr Middlemis advised that the one area where the groundwater table may be increased in the vicinity of the TSF is along with the northern saddle dam area adjacent to what is known

as Monkeys Knob. He recommended that a detailed monitoring regime be established before the TSF enlargement starts to identify background water levels and quality.

Dr Taylor advised that the density of the tailings from these ore bodies is such that:

- they are unlikely to be disturbed by flow passing through the TSF, particularly as it is proposed to cover the tailings with a layer of limestone sand and organic matter when mining ceases.
- Even in a storm event it would be unlikely for uncovered tailings to be discharged downstream.
- If tailings were discharged, he would not expect them to move far downstream before being settled out.
- Even in the event of a dam break the tailings could be expected to migrate only up to a few kilometres downstream and, it would be extremely unlikely that any would reach agricultural land tens of kilometres downstream.

Mr Chadwick advised that monitoring of groundwater bores near the TSF, together with modelling of the future enlargement of the TSF, indicate that small groundwater flows will continue to be into the TSF rather than out. However he noted there is potential for outflow (in the vicinity of 0.6 L/s) associated with the proposed northern saddle dam and therefore the following strong engineering controls are proposed in this area to minimise discharge to groundwater:

- Expose the base rock along (and in all areas proposed to be inundated due to the raising of the TSF) and for all exposed fractures or high permeability areas identified during excavation to be either grouted or backfilled with clay, depending on the advice of the expert at the time.
- Monitoring bores to establish current groundwater flows (and water quality) and to identify any potential changes following enlargement of the TSF.

The Inquiry was advised that due to the reuse of the quality of water in the TSF will be reduced while the mine operates. Therefore it is proposed that seepage collected from the toe of the dam wall will be returned to the TSF for the duration of the operational period. The geochemist Dr Taylor advised the Inquiry that the issues associated with the old TSF primarily related to the impact of the deposition of 17 t of acid which had been dumped in the TSF when the Wilga mine closed. As the seep on the right abutment indicated the presence of AMD from the TSF, he supported the requirement for all seepage from the TSF to be returned to the TSF for the duration of mining operations and, until monitoring indicates the seepage water quality is suitable for discharge, either to a bioremediation system or directly, to Straight Creek. He further advised that if the seep continues as the dam is raised, the Proponent has identified an area downstream of the dam where a new biological treatment system could be established.

The potential to cover tailings with a low permeability plastic cover was discussed however Mr Jacobs advised that due to the very low permeability of the tailings and the requirement to keep the tailings submerged at all times, construction of a cover would be problematic and poses potential environmental issues.

The Inquiry was advised that the proposed Trust Fund would provide for the ongoing operation and replacement of the biological treatment system.

## 5.8.2 Discussion

The Inquiry notes that seepage from the right abutment of the TSF has been recorded and monitored since construction of the dam in 1992. Various measures have attempted to remedy the seep without success. We also note that the construction of the biological treatment system below the TSF dam has been successful in treating the seepage water to an increasing standard which allows discharge to Straight Creek.

While various submitters raised concerns that the rate of seepage would increase if the TSF dam is raised by up to 25 metres, the Inquiry accepts the various experts' advice that, as the dam will be raised in stages, it will be possible to monitor for any increased seepage and undertake additional remedial measures prior to further increases in dam height. We also note the water balance model has identified that the water cover will not be compromised even if there is a threefold increase in seepage.

While there remains a small potential for the seepage rate to increase and affect the long term water balance, we believe that there needs to be a check in the development of the TSF to ensure that no further increases in the height of the TSF dam are allowed until the seepage rate is contained.

## 5.9 TSF Impacts on ground water

The TSF is on a minor tributary to Straight Creek which eventually discharges into the Tambo River. The catchment area above the TSF comprises approximately 1.27 km<sup>2</sup> with the geology of the catchment similar to that of the mining areas, i.e. potential sulphidic rocks with low permeability and tightly controlled fracturing. Generally the topography above the TSF is considerably higher, with the exception of the northern abutment area. Downstream of the TSF the topography is somewhat flatter primarily due to the presence of Straight Creek.

### 5.9.1 Evidence

Mr Chadwick, a hydrogeologist called by the Proponent, advised that:

- The TSF is in a natural groundwater discharge zone which is exemplified by the numerous springs and soaks which were identified both prior to the construction of the original TSF and noted at various sites around the TSF; even during the site inspection by the Inquiry.
- In his opinion, with the raising of the TSF the steep and positive groundwater head on the TSF will continue to maintain the TSF as a groundwater discharge zone. Preliminary bore work has been identified the host geology as having low permeability with tight fracture control. This is illustrated by the steep groundwater gradients and aquifer testing undertaken on the few existing bores in the area giving a hydraulic conductivity of less than 0.05 m/day.
- Groundwater discharge rates of 0.5 L/s (+/-0.2 L/s) from the seep immediately below the TSF embankment are comparable to pre-TSF construction observations.
- Evidence indicates that seepage out of the TSF is via shallow lateral flow paths rather than vertical.
- As the TSF rises, the increased height will not influence the driving head as the shallow lateral flow path will remain the seepage mechanism and the low permeability of the

tailing, which is marginally less than the host rock, will further restrict any vertical movement.

- The only real opportunity for discharge to the groundwater table will be along the northern abutment and saddle dam.
- Monitoring from the bore (MB-17) adjacent to the TSF and groundwater monitoring, has been undertaken since 1992 and indicates minimal impacts on groundwater quality from the highly contaminated effluent, which was contained in the original TSF.

As noted above, it is proposed to expose the base rock on all areas surrounding TSF which will be inundated in the future by tailings storage. These areas will be inspected for fracturing or high permeability areas and engineering works will be undertaken to minimise the risk of seepage. Mr Chadwick considered this will be particularly important along the northern portion of the perimeter where the proposed increase in the TSF will raise the potential for seepage out of the TSF in this area. He recommended the establishment, prior to the commencement of operations, of:

- additional groundwater monitoring bores in this area to obtain appropriate background water flow and quality parameters for future monitoring.
- a local groundwater model to better support the detailed engineering design of the upgrade of the TSF.

Dr Taylor advised that based on experience to date with the rehabilitation of the existing TSF, following completion of mining and closure of the TSF, the water quality in the TSF would return to a more natural quality which would therefore not impact on the quality of the groundwater in the event that any water was discharged.

### **5.9.2 Discussion**

Based on the expert evidence the Inquiry accepts that there is limited potential for the discharge of water from the TSF to the ground water table. The potential exception is the area in the vicinity of the northern saddle dam, where we are satisfied that appropriate monitoring and engineering design can minimise any impacts.

The Inquiry is further reassured by the experience gained on the existing TSF where, with appropriate treatment, the water in the TSF is able to be maintained to a standard which would have limited impact on the quality of the ground water.

### **Conclusions**

- The discharge of water from the TSF to the groundwater is unlikely and if there was a discharge it is unlikely to have any detrimental impact on the quality of the ground water.

### **5.10 TSF closure**

The tailings in the TSF will be levelled prior to the covering of all tailings with limestone sand and appropriate organic matter to replicate current TSF conditions. The crest level of the TSF spillway will be confirmed to provide a minimum of 2 m cover on the tailings. Following treatment and testing of the tailings water to ensure compliance with requirements of SEPP (WoV) and Australian and New Zealand Guidelines for Fresh and Marine Water Quality (2000) (ANZ the ECC Water Guidelines), the proposed diversion channels around the TSF will be removed to allow the catchment above that TSF to discharge into the TSF and then

discharge either to the new biological treatment system, if necessary, or direct to Straight Creek.

### **5.10.1 Evidence**

A number of submitters including Ms Crisp and Mr Hermans raised concerns in relation to the provision of a fund to be maintained in perpetuity for the ongoing maintenance and control and, if necessary, clean-up of the TSF post closure. Their concerns extended to the potential for a catastrophic failure of the dam with sums of up to several hundred million dollars being proposed as a requirement for a clean-up fund.

Mr Helps submission in relation to catastrophic failure of the dam and the response by the various experts for the Proponent is presented in Section 5.4.1 above.

Mr Gallus on behalf of the DSDBI Earth Resources Regulation Branch confirmed that the Proponent would be required to contribute funds to a proposed Post Closure Trust Fund, which would be administered by the State (discussed further in Section 13). Earth Resources Regulation Victoria has engaged GHD to provide an independent assessment of the monitoring and maintenance requirements for the enlarged TSF and the associated cost estimate (provisional estimate \$5.5 million net present value). He advised that DSDBI and the Proponent are working closely with the intention to develop and implement an agreed funding arrangement, within the context of the respective responsibilities of the state and the Proponent for the existing and proposed enlarged TSF. Mr Gallus advised that Minerals Development Victoria is confident that operating, management and mitigation measures can be rigorously implemented by the regulatory agencies in accordance with the relevant regulatory approvals.

### **5.10.2 Discussion**

As noted by Mr Newman on behalf the Proponent, multiple backups are proposed to ensure that the risk of the TSF impacting on the environment is minimised.

In relation to the TSF dam upgrading, excessive seepage, groundwater discharge, water quality, issues, the Inquiry was advised that it is proposed to have the following mitigations included in the design phase: compliance with ANCOLD guidelines, peer review, multiple design layers of defence (zones, lining, etc), dedicated investigations prior to design and construction. In addition there will be ongoing monitoring and design refinement as the operation proceeds, monitoring and groundwater model refinement and review as further data is collected, passive self-sustaining treatment system is for water within the TSF and the establishment of a trust fund to enable the long-term monitoring and if necessary remedial works to ensure the long-term safety of the TSF and the environment downstream. The Inquiry recommends that all of the above be peer reviewed by an Independent Technical Reviewer to ensure both compliance and the suitability.

A Concept Rehabilitation Plan was included in Appendix B to the Draft Work Plan which is in Appendix W of the EES. The Concept Rehabilitation Plan outlines the key aspects and criteria to be achieved at the completion of the mining phase and prior to hand over to DEPI. The Inquiry noted that the Concept Rehabilitation Plan will be revised at commissioning of the Project and then used as the basis to develop a Detailed Closure and Rehabilitation Plan two years after the Project commissioning. This will then be revised as required throughout



the life of the mine. The Inquiry is satisfied with the level of detail provided in the Concept Rehabilitation Plan and given the proposed timing set out for preparing and updating the rehabilitation plan. We are satisfied that the appropriate level of detail can be included to ensure that when the licence is cancelled that the disused mining area, and associated infrastructure has been appropriately rehabilitated. The Inquiry believes that the ITR will need to be involved in the review at all phases of development of the rehabilitation plan.

It was noted that the environmental draft Environmental Management Strategy included in the Draft Work Plan proposes to implement a Tailings Operating Strategy, Tailings Monitoring Plan, Mine Rehabilitation and Closure Plan, Emergency Preparedness and Response Plan and annual environmental management system review report.

The Inquiry notes the recent release of the ANCOLD publication Regulation and Practice for the Environmental Management of Dams in Australia (June 2014), which includes practice note B19 Advice in relation to the Managing Decommissioning of Tailings Dams. In particular we note that for any new mine proposal a TSF closure plan should be developed as a component part of a wider mine closure plan within the development proposal and Environmental Management Plan and that the management approaches should be in line with recommendations of the ANCOLD Guidelines on Tailings Dams (May, 2012).

Practice note B19 identifies significant implications in relation to potential environmental impacts and liability for owners and the Crown. These implications include:

- *Surface and ground water quality impacts through the release of metals into the receiving environment.*
- *Tailings lost through the operational phase or through sudden failure of the containment structure can smother downstream habitat and be an ongoing source of AMD if the tailings contain sulphides.*
- *Requirements for long-term surveillance and maintenance of the TSF (i.e., tailings dam embankments, spillway)*
- *Requirements for long-term water quality monitoring (surface and groundwater)*
- *The long-term structural integrity of the TSF and liner membranes.*

We also note that the above document requires consideration of both cumulative and consequential impacts and refers to the requirement for a risk assessment in conformity with the principles set out in AS/31000:2009 Risk Management – Principles and Guidelines and the ANCOLD Guidelines on Risk Assessment (2003).

## **Conclusion**

- Subject to the adoption of the recommendations in the EES documents and this report, and compliance with ANCOLD guidelines and relevant Australian standards, the long term risk of impact on the environment from the proposed upgraded TSF can be minimised to an acceptable level.

## Recommendations

- Draw on the assistance of the Environment Protection Authority to review and approve the role description for the appointment of an Independent Technical Reviewer (ITR), who is to be an Environment Protection Authority approved auditor for all aspects except for the design, construction and monitoring of the TSF dam.
- Provide in the trust fund for:
  - a) The ongoing employment of the Independent Technical Reviewer post closure of the mine.
  - b) Rebuilding of the TSF wetlands periodically after closure.
  - c) Any maintenance requirements in accordance with model predictions for failure of the grout curtain, engineered soils and membrane.
  - d) Maintenance of emergency water supply system or other means to maintain a water cover of the TSF.
  - e) Treatment of supernatant water from the TSF long-term.
  - f) Monitoring of the surface and ground water flows and quality in the vicinity of the TSF and mine in accordance with the ITR recommendations.
- Adopt best practice governance for the evaluation and approval of secondary and tertiary documentation relating to construction, management, AMD, back filling and derivation of environmental quality objectives.
- Adopt best practice to prevent the onset of acid mine drainage in underground voids prior to flooding, including adding neutralizer to paste.
- Implement long-term monitoring program for the early detection of at AMD onset and early impacts in the mining voids.
- Further refine the final design of the TSF cover level to confirm the suitability of the design to maintain saturated tailings as the various lifts are developed for the TSF dam.
- Upgrading the TSF embankment in accordance with the highest level of risk for ANCOLD guidelines for dams ('High C' Dam Failure Consequence Category in ANCOLD guidelines (2012)).
- Prior to the commencement of construction, develop a detailed monitoring and evaluation program for all surface and ground waters, in the vicinity of the TSF which is independently reviewed and reported on an annual basis for the life of the mine to the relevant government departments and the Environmental Review Committee.
- Establish an independent technical peer review and auditing process prior to the commencement of construction to enable in principle demonstration of achievement of outcomes throughout the life of the mine.
- Adopt best practice design and construction to prevent lateral seepage of water from the tailings facility.
- Undertake a full geotechnical and hydrogeological study to demonstrate that the aging of the original grout curtain, clay liner and membrane will not result in under toe seepage.

- **Develop a monitoring regime for the TSF dam which is applicable to both operational and post closure phases based on the Guidelines on Tailings Dams ANCOLD (May 2012) and Regulation and Practice for the Environmental Management of Dams in Australia ANCOLD (June 2014),**
- **Undertake a feasibility study for the identification of a variety of suitable treatment technologies to treat supernatant water during closure and until such time as a water quality in the TSF and from the seep meets the current discharge standards.**
- **Confirm that the seepage volume from the right abutment is no more than the current seepage rate before each staged increase in the height of the TSF.**
- **Establish additional groundwater monitoring bores in the vicinity of the proposed northern saddle dam prior to the commencement of operations to obtain appropriate background water flow and quality parameters for future monitoring.**
- **Develop a detailed local groundwater model for the TSF prior to the commencement of operations to better support the detailed engineering design of the upgrade of the TSF.**
- **Carefully address environmental aspects associated with the TSF in the Work Plan with review by independent experts prior to issuing the Mining Licence and at appropriate stages during the operation of the mine.**
- **Include consideration for a range of potential environmental issues, including catastrophic failure of infrastructure based on AS31000:2009 Risk Management – Principles and Guidelines and the ANCOLD Guidelines on Risk Assessment (2003) in the Emergency Preparedness and Response Plan identified in the draft work plan.**
- **Appoint an Independent Technical Reviewer who is an Environment Protection Authority Accredited Auditor able to draw on the ERC to assist in the appointment of relevant specialist technical advice as necessary.**

## 6 Water Impacts

### 6.1 Surface water impacts

Surface water issues are discussed in Chapter 9 of the EES.

#### 6.1.1 The issues

- Impact of stormwater run-off from the processing area
- Water quality impacts from longitudinal infrastructure creek crossings
- Impact on Straight Creek from spillway discharges from TSF
- Water quality impact of surface water flow into TSF
- Post closure impacts on Tambo River water quality

#### 6.1.2 Existing conditions

With the exception of the Wilga mine portal and the TSF the remainder of the mining facilities will be constructed in forest areas which will require clearance and earthworks prior to construction. The surface water in the areas proposed for the processing plant, Wilga and Currawong mines drain via a series of unnamed water ways towards the Tambo River. The terrain is generally relatively steep with limited opportunity for infiltration due to the terrain and the comparatively shallow soil depth over competent rock.

The proposed accommodation village is to be constructed on rolling farm land.

There are partly rehabilitated areas from the previous mine in the general area and further rehabilitation is required to minimise the potential for impacts on surface water. These issues are not addressed further in this report.

#### 6.1.3 What is proposed?

As noted in Section 4 of this report the processing plant requires approximately 2500 ML per year of water. The major source of water will be from the recycling of the water in the tailings dam. Throughout the operation of the mine it is proposed that all water within the TSF will be reused for processing and that there will be no discharges from the TSF spillway. It is also proposed to utilise a current Southern Rural Water (SRW) licence to extract 15 ML of water from the Drillers Dam, collect stormwater from the processing area in a series of cut-off dams and returned it to a main storage dam, harvest on-site rainwater from the processing plant area and use groundwater from the mining operations.

In the event that on-site harvesting facilities are unable to meet processing operation requirements, extensive modelling estimated that 30 to 230 mega litres per year of additional make up water may be required in some years.

The Proponent investigated a number of options to provide additional make-up water which included piping water from Dartmouth Dam, and harvesting water from the tributaries of the Tambo River and storage dams within the forest including a dam on Spotted Bull Creek to the north of the Project area. Based on the rainfall records and the potential environmental and construction impacts of harvesting water from multiple sources in the forest, the adjacent surface water options were eliminated due to environmental concerns and the restricted potential for adequate water yield. The potential for water supply to be

pumped from Dartmouth Dam was also eliminated based both on the cost of construction and the potential environmental impacts of the construction of pipeline through State Forest. As a result the Proponent focused on the provision of additional water based on site collection and a supplementary groundwater options.

It is proposed to pump groundwater extracted under a GMW licence from a bore field near Benambra. This will require the construction of a pipeline from the bore field to the processing plant (see discussion in Section 10).

Throughout the mining operation all surface water will be diverted around the TSF. At the completion of mining no further tailings will be deposited into the TSF and following treatment of the supernatant within the TSF it is proposed to remove the diversion channels around the TSF to allow normal stormwater run-off from the catchment to enter the TSF.

As noted in Section 4 it is proposed to backfill the completed mine's stope voids with paste thickened tailings and then to flood the remainder of the voids with bore water (or water of an appropriate quality) to return the groundwater table to that of pre-commencement of mining. As this is considered highly likely to result in the re-emergence of the Wilga Spring which operated prior to the commencement of the original Wilga mine, there are likely to be ongoing impacts on water quality within the Tambo River (that are not necessarily caused by mining).

#### **6.1.4 Water quality impacts**

##### **Evidence and submissions**

Concerns were raised in relation to the potential for acidic surface water to enter the TSF from the catchment and increase the acid load in the TSF, thus impacting on water quality.

SRW identified its interests in the construction of dams on the site, waterways and licensing of groundwater monitoring bores in the mining area, however the proposed Benambra bore field is controlled by Goulburn Murray Water. SRW advised that as the design, construction, operation monitoring of the various water storages, including that tailings storage associated with the mine, are proposed to meet or exceed ANCOLD guidelines, they are satisfied that the impacts will be minimal on the local surface water system.

East Gippsland Water advised that:

- Its primary interest is to safeguard source water quality to ensure that, after treatment, the urban water supply is compliant with the provisions of the Safe Drinking Water Act 2003.
- As a member of the Technical Reference Group, East Gippsland Water has been consulted throughout the preparation of the EES and had successfully sought the inclusion of a number of provisions.
- The Corporation is satisfied that the EES addressed the risk to water quality from the TSF.

Mr Chadwick and other experts for the Proponent advised that, based on Tambo River water quality monitoring undertaken by Professor Hart in 1993, the Wilga Spring discharged water with highly variable pH and salinity and the spring's contribution to dissolved copper and zinc was approximately 50% of the total load in the river. It was identified that the active region of impact from the Wilga Spring extended to around 1.6 km downstream. Following

dewatering associated with the previous Wilga mine, the spring dried up and has remained that way since. Mr Chadwick advised that groundwater in the area is naturally mineralised and varies depending on rainfall. However, in his opinion once the Wilga mine is backfilled and groundwater levels return to pre-mining levels, the Wilga Spring will again flow with similar characteristics to those which occurred pre-mining. He recommended that a carefully planned, independently peer reviewed (including EPA and DEPI) groundwater and surface water monitoring program be set up to establish background levels for the mine sites and the Tambo River (both adjacent to the Wilga Spring and in the vicinity of the confluence of Straight Creek and Tambo River).

In relation to the TSF, he also recommended the establishment of a peer reviewed groundwater and surface water monitoring program to be commenced prior to commencement of the new mining operation and to be continued in an appropriate format post completion of mining.

Many submitters were concerned about the potential for water discharges from the TSF, either from the seepage or overflows of the TSF, to impact on water quality in Straight Creek and more importantly on the Tambo River, which is used as the prime water supply for the township of Swifts Creek and eventually discharges into the Gippsland Lakes system. Submitters also raised concerns in relation to the potential for a breach of the TSF dam to result in both contaminated water and tailings being discharged via Straight Creek and the Tambo River into the Gippsland Lakes.

Mr Fuller, who was called by the Proponent, advised that:

- The catchment of the TSF (1.27 km<sup>2</sup>) is the equivalent of 0.03% of the total Tambo River catchment.
- In his opinion there would be no impact on the Gippsland Lakes from the Project.
- Based on the modelling of the TSF during mine operation there would be no likelihood of any spills of water from the TSF as there would be sufficient freeboard to hold a 1:10 million year storm flow, plus an additional 0.6 m freeboard.
- During operations all rainwater would be diverted around the TSF via catch drains discharging into Straight Creek, thus continuing the current operation mode.
- Immediately post closure of the TSF will be the critical period of time when discharges would be not acceptable from the TSF as the water quality would still be contaminated and not suitable for discharge to the environment.

## **Discussion**

The Inquiry shares the concerns expressed by submitters and the Proponent's experts, that the long term management of the TSF, and in particular the water management aspects, are the most critical risks and issues to be addressed both during mining operations and for the long-term post closure. We find that the experience gained in the remediation of the old TSF and its ongoing management has provided valuable lessons in what can and cannot be achieved.

The Inquiry noted submitters' concerns in relation to quality of discharges from the TSF and is satisfied that adequate design controls can be put in place during operation to minimise any risk of discharge of contaminated water into Straight Creek. This aspect is discussed further in Section 5.

Based on the experience gained in the rehabilitation of the existing TSF we are also satisfied that, subject to appropriate design review and ongoing monitoring and maintenance, that water discharges from the TSF can be controlled to appropriate water quality levels to enable the long-term discharge over the spillway of the TSF to Straight Creek.

The Inquiry considers it imperative that the ITR review the proposed monitoring program and all water criteria goals for all surface water and groundwater in the vicinity of the TSF. Such a program would include the monitoring of the upstream water flowing into the TSF and the water within the TSF. The monitoring program should be commenced prior to any works commencing on the site and then continued throughout the operation of the mine and processing facility. At the completion of the mining operations the monitoring and management program for the TSF should be specifically reviewed by an independent peer review team and a new, ongoing monitoring regime established which would be funded by the proposed Trust Fund. This is discussed further in Section 13.

We remain concerned in relation to the period between the completion of mining until the quality of water in the TSF is at a suitable quality to enable free discharge during rainfall events. We therefore recommend that a post closure management regime be developed for the TSF which precludes the removal of the diversion channels above the TSF and return pump system for all seepage water until the ITR certifies the water quality in the TSF and the biological treatment system for the seep water is suitable for discharge to Straight Creek.

A review of the Draft Work Plan did not identify any surface or ground water quality standards to be adopted for the mining operations. We also note that criteria to be applied need to take account of background water quality conditions, i.e. with no influence from mining. We have adopted the recommendation provided by the EPA that prior to the commencement of mining construction a detailed monitoring program must be developed and implemented to the satisfaction of the ITR. The monitoring program will inform the subsequent specification of all relevant quality and quantity parameters for the discharge of water to the environment, both in the vicinity of the mining operations and the TSF.

### **Conclusions**

- The long-term management of discharges to the environment from the TSF is the most critical element of this project, both during operation and post closure.
- The Work Plan to be approved by DSDBI must place considerable attention and detail into the safe management of all tailings disposed into the TSF, the management of the TSF during operation and the establishment of the long-term monitoring and maintenance regime for the TSF, downstream waterways and for groundwater.
- The Work Plan must address in detail the requirement for surface and ground water monitoring, including existing and proposed water quality standards to be achieved.

## **6.2 Groundwater impacts**

Groundwater is dealt with in Chapter 10 of the EES. Tailings Dam Ground Water Impacts are discussed in Section 5 of this report.

### **6.2.1 The issues**

- Impact on the ground water table from dewatering of the mines
- Impact on the ground water table post closure of the mines
- Impact of extraction of ground water from the bore field at Benambra
- Ground water discharge from TSF
- Groundwater seep from embankment of TSF

### **6.2.2 What is proposed?**

The Wilga mine has been closed for some years and there has been some rebound in the water level in the worked out areas. However, the water table remains well below the pre-mining water table level. Groundwater is currently 26 to 79 metres below ground level due to the previous mine dewatering. It is proposed to dewater the Wilga deposit at the commencement of mining and for the mine to remain dewatered until the completion of mining and the deposition of paste thickened tailings within the stopes. It is then proposed to artificially recharge the groundwater table within the Wilga mine, following closure and sealing of the portal and adit.

The Currawong deposit will be progressively dewatered as mining proceeds through the ore body, will remain dewatered until the completion of mining, and paste tailings will be placed in the worked out stopes. At the completion of mining it is proposed to artificially recharge the groundwater table within the Currawong mine and to then close the portal. The depth to ground water at the Currawong deposit is between 5 to 19m below ground level.

#### **Off-site extraction impacts**

A new bore field adjacent to the township of Benambra is proposed to provide supplementary water to the mining operations. It is proposed to draw the water from a deep water table which may have connection to a water table above it.

### **6.2.3 The Benambra bore field**

#### **Evidence and submissions**

Mr Sinnott expressed concern that the EES indicated there were no bores accessing the water of a deep bedrock aquifer (approximately 100m below ground level) whereas to his knowledge, there were at least two bores, one of which he owns. He was therefore concerned that his bore may be impacted by extraction for the mine and recommended that more research into the bores and their potential interference with existing bores. Mr Hallam raised similar concerns and advised that he also had a bore with a depth of 114m. In his opinion the proposed bore field should be further from existing bores or an alternative water source identified.

GEG queried whether 230 mega litres of water per year was a sustainable level of extraction.



GMW advised that a groundwater extraction licence will be required for the proposed bore field at Benambra and noted that its review of a hydrogeological report prepared in 2013 addressed the majority of GMW's concerns. They did note that as part of the application for the bore field licence a monitoring program to the satisfaction of GMW will be required. After the Hearing GMW advised the Inquiry that they were satisfied that their powers to undertake annual reviews of the impact of the proposed bores would ensure that other users are not adversely affected and that their records indicate there were no licensed bores at a similar depth to that proposed by the Proponent.

Mr Chadwick's evidence in relation to the provision of off-site supplementary water for the mine processing operations indicated that:

- A number of potential surface water sources had been evaluated including the construction of dams, piping water from the Dartmouth Dam and investigating other groundwater supplies.
- Investigation of the two groundwater sites found the Beloka site has a thinner aquifer of reduced extent and lower yields (20%) than the Benambra bore field.
- Based on a cost analysis and environmental risk assessment of the potential sources, the Proponent has proceeded on the basis of obtaining up to 230 mega litres per year from the deep aquifer near Benambra.
- Extraction of 230 mega litres is the maximum that would be likely in any year; modelling for the mine indicates the full volume is unlikely to be required even at the final years when water availability was modelled to be restricted.
- Available records of existing stock and domestic bores in the vicinity of the proposed bore field indicate access is to water from a shallow aquifer (20 – 60 m) and there are no other users of the deep aquifer at 130+ metres as proposed for this development. It was noted that the deeper aquifer is separated from the upper aquifer by an extensive aquitard with no hydraulic connection between the two aquifers.
- In the event that there are other deep bores, modelling of a continuous extraction rate of 230 ML/year predicted the cone of depression of the bedrock aquifer around the bore field was limited to less than 10m. This is less than 10% at 2 km which is the generally accepted by various water authorities.
- The Benambra bore field is not in a groundwater management area and to his knowledge the only other commercial water use licence from the Benambra sawmill approximately 2.5 km away (he had no knowledge of the licensed extraction volume). He considered it would be appropriate to establish a network of monitoring bores together with trigger levels to protect the available drawdown in all aquifers. In his opinion monitoring of the bores would be required throughout the operating period with regular hydrogeological review by a specialist.

## **Discussion**

The Inquiry acknowledges the extensive investigations undertaken by the Proponent in relation to the groundwater supply for the mine. We note in relation to extraction from the Benambra bore field that:

- Any impacts on adjacent water bores will become readily apparent in the early years of operation and would then be expected to stabilise.

- The Proponent has the ability to both throttle back on water used and if necessary construct additional bores or deeper bores in other areas to further supplement water supply, if considered necessary and required by GMW.
- The model for water extraction rate is based on continuous extraction of 230 mega litres per year, however the water balance modelling envisages only limited need for access to bore water.
- The powers available to GMW are adequate to ensure that other ground water users are not adversely affected.

### **Conclusions**

- Provision of additional make up water from the Benambra bore field can be adequately monitored by GMW to ensure that other users are not unduly influenced.
- The lower need for make-up water in the early years of mining operations will provide adequate time to maximise water reuse on the site, confirm the capabilities of the Benambra bore field and, if necessary, identify alternative sources.

## **6.2.4 Mine dewatering impacts**

### **Evidence and submissions**

Concerns were raised by Mr Hermans and the GEG in relation to potential impacts on flora in the vicinity of the Currawong mine due to a reduction in the water table level.

Concerns were raised by the Proponent's specialists in relation to the return of the water table within the Wilga mine to historic levels. The Inquiry was advised that the original Wilga ore body was discovered due to surface water impacts from a spring which was fed by groundwater from the Wilga deposit. Mr Chadwick, who was called by the Proponent, advised that it is highly likely that with the return of the groundwater table to historic levels, the spring will re-emerge and once again result in adverse water quality impacts on the Tambo River. However, as this was a naturally occurring impact its re-emergence should not be considered as a detrimental impact of the proposed mine.

SRW is responsible for licensing and associated responsibilities under the Water Act 1989, including licensing the groundwater extraction associated with the water in the mines. As expressed in their submission, their interest extends to ensuring that potential impacts from the mining operations on existing water users and the environment are fully considered.

Based on their review of the EES documentation and involvement in the technical reference group, SRW is satisfied that the extraction of groundwater for mine dewatering will have minimal impacts on the local groundwater levels, streams, other groundwater users and groundwater dependent ecosystems. They advised that the Proponent had taken into account feedback provided through the process and noted that the final design reports will need to include detailed design for enlargements of the tailings storage facility as well as a detailed monitoring program and a detailed groundwater monitoring programme associated with the mines.

Mr Middlemis, a hydrogeologist called by the Proponent, advised that long-term experience of inflow rates at the Wilga mine provide a good understanding of groundwater impacts on mining at both Wilga and Currawong deposits. He advised that:

- The long-term monitoring of water rebound in the Wilga mine indicated an inflow rate of 0.2 l/s and a similar rate was expected for the Currawong deposit.
- Based on the monitoring since closure of the Wilga mine, there would be no hydrogeological impacts of long-term drought; the millennium drought had minimal impact on groundwater flows into the Wilga mine.
- Groundwater modelling undertaken for the development of both Wilga and Currawong deposits was well calibrated to the monitoring undertaken for the Wilga mine.
- Modelling indicated that groundwater impact on the low base flow of streams in the vicinity of the mine would be reduced by up to 10% due to the dewatering drawdown effect. However, it is unlikely that this difference would be measurable as the groundwater flow rates are very low and there is very high seasonal variability in stream flow in this area. He noted that there are records of zero flow periods for the Tambo River which also occurred before mining operations.
- The groundwater modelling indicates there were no significant draw down effects along Straight Creek and therefore no impact on the Montane swamps.
- It is highly likely that the Wilga spring on the bank of the Tambo River will reappear with the artificial recharge of the groundwater level at the closure of the Wilga mine. He advised that if the groundwater table was not artificially recharged it could take up to 100 years for the void space within the paste filled Wilga deposit to flood to a level which would result in the re-commencement of the Wilga Spring.

Mr Chadwick recommended a detailed groundwater monitoring bore system around both the Currawong and Wilga deposits, but noted that the Wilga deposit was already reasonably well addressed in terms of monitoring bores. He advised:

- That blasting has limited impact in terms of fractures and is only localised to a few metres. In his opinion, there would be no impact on the permeability of the fractures or increase in the bulk permeability of the host rock.
- As the mines were relatively deep, excavated within strong rock and the stopes are to be backfilled with paste to provide additional support there is a very low likelihood of any subsidence in the vicinity of the two ore bodies.

Dr Ferrando-Miguel on behalf of the EPA advised that it would be important to establish relevant water quality objectives for the ground water in the mines and from the vicinity of Wilga Spring prior to the commencement of mining operations, and this should be based baseline monitoring and included in the Work Plan to be approved by DSDBI.

### **Discussion**

All evidence indicates that that the host rock, which contains the two ore bodies has very tight fracturing and as a result groundwater flows have been and are expected to continue to be very low, with the Currawong deposit having very similar properties to the existing Wilga deposit. As the Proponent intends to backfill voids left in the mine at the completion of mining, either with paste thickened tailings or with clean water, it is anticipated that groundwater levels will be returned to pre-mining conditions within a matter of months after completion of the mines.

The Inquiry notes that this return to pre-mining groundwater levels is highly likely to result in the return of the Wilga Spring with associated water quality impacts on the Tambo River.

For this reason, we agree with submissions and evidence that an appropriate water monitoring regime should be established prior to the commencement of mining of both the Wilga and Currawong deposits and that this monitoring regime should continue on post closure of the mine to verify the impact of groundwater recharge in the vicinity of the mines and on water quality in the Tambo River. Baseline data from this pre-mining monitoring campaign will inform water quality criteria to ensure the pre-Wilga mining water quality targets are achieved after the mine closes.

## **Conclusions**

Based on the water quality monitoring undertaken prior to, during and after the Wilga mining operation, the Inquiry is satisfied that, with appropriate controls of the mining and backfilling processes proposed by the Proponent, the impacts of the mine on groundwater and subsequent impacts on the Tambo River have been adequately identified and quantified and risks associated with groundwater dewatering and refill have been minimised and do not provide any justification for prohibiting the development of this mining operation.

## **6.3 Recommendations**

- **Before mining construction starts, develop and implement an independent peer reviewed detailed monitoring program to the satisfaction of the Independent Technical Reviewer(s) and the Department of State Development, Business and Innovation. The program should be included in the Work Plan. It must identify and specify all relevant existing and proposed quality and quantity parameters for the discharge of water to the environment in the vicinity of the mining operations and the TSF.**
- **Establish an independently peer reviewed monitoring program as part of the Work Plan for all surface waters and groundwater in the vicinity of the TSF which:**
  - a) **Includes monitoring of the upstream water flowing into to the TSF and the water within the TSF.**
  - b) **Starts before any works on the site commence and continues throughout the operation of the mine and processing facility.**
  - c) **Formulates an ongoing post-closure monitoring regime (and management program for the TSF) which would be funded by the proposed trust fund.**
  - d) **Requires certification by the Independent Technical Reviewer(s) that the water quality in the TSF is suitable for discharge to Straight Creek before the removal of the diversion channels above the TSF, the biological treatment system and return pump system for all seepage water.**
- **Establish a network of monitoring bores at the Benambra bore field together with trigger levels to enable the monitoring and protection of the available drawdown in all aquifers to the satisfaction of Goulburn Murray Water.**
- **Monitor the network of bores at Benambra throughout the operating period of the mine, with regular hydrogeological review by an independent specialist and reported to Goulburn Murray Water and the Environment Review Committee by the Independent Technical Reviewer(s).**

- **Establish relevant water quality objectives for ground water in the mines, and from the Wilga Spring post mining operations which should be included in the Work Plan to be approved by the Department of State Development, Business and Innovation.**
- **Establish an appropriate long term water monitoring regime funded from the Trust Fund prior to the end of mining of both the Wilga and Currawong deposits. This monitoring regime should be designed to continue post closure of the mine to verify the impact of groundwater recharge in the vicinity of the mines and on water quality in the Tambo River. As part of this monitoring campaign water quality criteria for the various elements which were noted in the pre-Wilga mining water quality monitoring should be used to identify the appropriate targets to be obtained post closure of the mine.**

## 7 Biodiversity

### 7.1 Introduction

The Stockman Project site is located within the forested foothill slopes of the Great Dividing Range. The Project site is characterised by highly dissected terrain, with steep rocky ridges and spurs that form the headwaters of the Tambo River. Fifteen different Ecological Vegetation Classes (EVCs) exist across three bioregions within the Project site. The Project site is within State Forest and timber has been harvested within and surrounding the site, the most recent being in 2003. The Alpine National Park borders the mine licence area (MIN5523) on the eastern side and is some 25 km from the mine site.

This Inquiry is required to consider and report on the potential effects of the Project during (construction and operation) on terrestrial and aquatic ecosystems, biodiversity, protected species and communities, with particular attention to those matters listed under the FFG Act and the EPBC Act<sup>19</sup>.

The EES identified a number of areas where the Project will impact on biodiversity values, described actions to be taken to avoid and minimise these impacts and where impacts were unavoidable proposed measures to mitigate biodiversity impacts. The Project has the potential to impact on biodiversity through:

- Clearance of native vegetation with associated loss of habitat (70ha approximately) for mine infrastructure, fire safety, and linear infrastructure such as roads, pipelines.
- Potential sedimentation and contamination of streams leading to a decline in water quality (see Section 5) and impacts on aquatic biota.
- Potential altered stream flow impacts from the operation of the TSF.
- Impacts associated with exotic weeds, pest animals, Chytrid fungal disease, disturbance from light, dust and noise.

Submissions to the Inquiry identified concerns about impacts on biodiversity values particularly on EPBC Act and FFG Act listed communities and species and the adequacy of the mitigation measures proposed.

The issues raised about the impacts on aquatic ecology, terrestrial fauna and native vegetation and flora are discussed below. Matters of National Environmental Significance are discussed separately.

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<sup>19</sup> The Project was determined to be a controlled action under the EPBC Act. Consequently the Inquiry needs to assess matters of national environmental significance in accordance with the Commonwealth-Victorian Bilateral Agreement.

## 7.2 Aquatic ecology

### 7.2.1 The EES assessment

The EES Appendix D<sup>20</sup> sets out the approach to aquatic ecology investigations. This involves accessing existing data from government data bases and past monitoring, fish and macro-invertebrate surveys over a number of years and seasons, assessments of riparian habitat and stream substrate conditions and assessment of habitat for threatened species.

Relevant habitat for aquatic fauna comprises the Tambo River and Straight Creek and its feeder streams. Potential impacts on these waterways include:

- During construction: the risk of erosion leading to sedimentation and a reduction in water quality and direct habitat disturbance to stream banks. Except for some road and pipeline works, direct impacts on streamside habitat are unlikely as most of the mining works are more than 100 metres from streams.
- During operations: potential water quality impacts may arise from runoff from mining activity, processing and the TSF and the risk of altered flow regimes downstream in Straight Creek. The impact of the TSF on downstream flows to Straight Creek during operations would be negligible as the majority of the run-off from the catchment would continue to flow down the creek. Post closure the TSF would become a flow through facility and would not impact the hydrology of Straight Creek.

The EES indicates that four species of national or state significance that potentially could be found within the study area:

- **Australian grayling** (vulnerable under the EPBC Act and listed under the FFG Act). A single specimen of Australian grayling was recorded once in 1991 in the Tambo River, approximately 10km downstream from the Wilga mine. Although suitable habitat exists within the reach of the Tambo River within project area, the species was not recorded during aquatic surveys between 2010 and 2011. It was noted that the Wilga Weir may present an impediment to upstream migration, thus limiting the distribution of the species.
- **Macquarie perch** (endangered under the EPBC Act and listed under the FFG Act) have not been recorded in the study area, the species is not found in the Tambo catchment. As minor infrastructure works are proposed in the Mitta Mitta catchment, the risk to the species is low. The aquatic ecology peer review report<sup>21</sup> indicates that some uncertainty exists about the potential presence of Macquarie perch in Morass Creek near the western end of the water pipeline alignment and supports the proposed pre-construction inspections to address this.
- **Murray cod** (vulnerable under the EPBC Act and listed under the FFG Act) are not found in the Tambo catchment and within the Mitta Mitta catchment the status is unknown. Based on habitat preferences it is very unlikely to be found in the vicinity of mine works.
- **Alpine spiny crayfish** (listed under the FFG Act). While the majority of construction works are planned in areas more than 100 metres from waterways, any works on or adjacent to waterways could have the potential to impact crayfish habitat by trampling

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<sup>20</sup> Aquatic Ecology Impact Assessment, GHD, 2013.

<sup>21</sup> Aquatic Ecology Technical Report – Peer Review, Ecology Australia, 2013.

of burrows within stream banks and by increasing sedimentation within the vicinity of works. The expansion of the TSF could impact directly on the species. A number of uncertainties surrounding the existing aquatic ecological conditions in Straight Creek and knowledge gaps about the habitat preferences of the Alpine spiny crayfish were acknowledged.

Of the four species of national or state significance, the EES concluded that only the Alpine spiny crayfish has the potential to be impacted by the Project.

The results of the macro-invertebrate surveys undertaken for the Project did not detect any threatened invertebrate fauna on the Advisory List for Invertebrate Fauna<sup>22</sup>. However the EES acknowledged the potential for threatened invertebrate species that have not previously been recorded to be present. Future macro-invertebrate monitoring will include identification of specimens from families with known threatened species representatives. It was noted that mitigation measures proposed to protect water quality would afford protection to any threatened species present.

The EES proposes a number of mitigation measures which were supported by the peer review report (see the draft work plan in EES Chapter 9), including:

- Preconstruction surveys along Straight Creek and feeder tributaries for Alpine spiny crayfish to better understand the distribution of the species so as to avoid crayfish habitat, management of riparian vegetation, measures for road crossings and the possibly salvage and relocation of crayfish (if found) where impacts cannot be avoided.
- A fish (including crayfish) and macro-invertebrate monitoring program to provide assurance that mining operations do not impact on aquatic biota.
- A range of measures to protect the water quality of local waterways.

GHD (2013) notes that surface water flows may be impacted by mine dewatering in the vicinity of the workings and this may have implications for aquatic biota. It is considered that the impact of groundwater drawdown on the small tributaries flowing into the Tambo River is likely to be limited to minor increased drying periods within small reaches of these tributaries. The peer review report states that it may be reasonable to conclude that the flow reduction impacts to aquatic ecological values may be low, however the ephemeral nature of these streams makes their values more susceptible to flow reductions and marked impacts would be expected if a waterway could no longer retain refuge pools. While GHD 2013, recommended pre-construction inspections of tributaries, it acknowledged that this will remain a residual risk within small lengths of these tributaries.

The EES recommends a biological monitoring program, incorporating both macro-invertebrate monitoring and fish monitoring, to provide assurance that mine construction and operations is not impacting on aquatic ecosystem values. It is proposed that this be designed in consultation with the EPA and DEPI.

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<sup>22</sup> Advisory List of Threatened Invertebrate Fauna, DSE 2009.



## 7.2.2 Aquatic ecology –impact on threatened species

### Evidence and submissions

Ms Buckley submitted that it was not possible to rule out that the Project would have an adverse effect on threatened species. The GEG, Mr Hermans and the Victorian National Parks Association (VNPA), suggested that threatened species, including the Alpine spiny crayfish, would be impacted by roadwork, clearing, pipeline and other construction and that more survey work was required. GEG submitted that the impact of the proposed changed hydrology in Straight Creek on the Alpine spiny crayfish was not known.

DEPI indicated that the downstream risks that might arise from the TSF to the aquatic ecosystem, including impact on the Alpine spiny crayfish, had been adequately addressed by the proposed mitigation measures. These included additional monitoring sites along the Tambo River and Straight Creek, proposed pre-construction surveys and a proposed trapping and relocation program in Straight Creek to begin immediately before expansion of the TSF starts. DEPI advised that they were satisfied that the risks to aquatic eco systems downstream of Straight Creek from accidental or planned discharges from the TSF have been adequately addressed through the proposed monitoring and preconstruction monitoring work undertaken and proposed.

Mr Harrow's presentation to the Inquiry summarised the EES assessment relating to aquatic ecology. It was his view that:

- If Australian grayling are present in the Tambo River near the Project site, they are present in very low numbers. Furthermore, they are not likely to inhabit the smaller tributaries such as Straight Creek and as such the impact on the species is considered to be low. This conclusion is supported by aquatic ecology peer review report<sup>23</sup>. However, Mr Harrow emphasised the importance of the lower reaches of Tambo River for the Australian grayling population in Victoria and he considered it is essential that the Project incorporates mitigation measures to protect the water quality to downstream receiving waters beyond the Project site to avoid risks to this population.
- If Alpine spiny crayfish are present, mitigation measures identified in Chapter 9 of the EES and additional mitigation measures to address erosion and sedimentation from mining activities<sup>24</sup> are proposed to protect aquatic habitat.
- Mountain galaxias were identified in fish surveys and the peer review report<sup>25</sup> identified the potential for a self-sustaining population in Straight Creek. The systematic revision of this species complex has resulted in the description of 15 species, with seven of these listed as threatened under the DSE advisory list<sup>26</sup>. Specimens collected during baseline surveys and historical monitoring have not been identified according to the new classification. Mr Harrow strongly supported the proposal that any additional specimens collected in the preconstruction monitoring program be sent for expert identification.

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<sup>23</sup> EA, Aquatic Ecology, 2013.

<sup>24</sup> Earth Systems and URS, Water Quality baseline and Impact Assessment 2013 and AECOM, Soils and Land Impact Assessment 2013.

<sup>25</sup> EA Aquatic Ecology, 2013.

<sup>26</sup> Advisory List of Threatened Vertebrate Fauna in Victoria, DSE, 2013.

Mr Harrow's expert witness statement reviewed the mitigation and management measures in the draft work plan in relation to aquatic ecology values. Some additional measures are proposed<sup>27</sup> which the Proponent has accepted. These measures included protecting stream bank integrity and streamside vegetation canopy, providing for fish and crayfish passage and salvage procedures. Taken together he concludes that implementation of these actions should minimise the risk to aquatic ecosystem values.

### **7.2.3 Matters of National Environmental Significance**

The Australian grayling was the only EPBC Act listed aquatic species which has the potential to be impacted by the Project. However, GHD (2013) concluded that the Project is not likely to lead to a significant impact largely because no positive records of the species have been identified within the Project site in ten separate years of monitoring and the significant distance downstream (in the Tambo River) of any significant grayling habitat and/or population.

#### **Discussion**

We agree with the advice that there is little likelihood of impacts on Murray cod or Macquarie perch because of their habitat preferences and distribution. We also agree that there is a low likelihood for significant impact on the Australian grayling as it has not been detected within the vicinity of the Project site and is unlikely to inhabit smaller waterways within the Project site. However we recognise the importance of the Tambo River for the Australian grayling population and the potential for the Project to impact on the surface water quality of receiving waters such as Straight Creek and the Tambo River. Measures to maintain appropriate water quality in Straight Creek and the Tambo River will also afford protection to aquatic ecosystems and threatened species.

We note the advice on the Alpine spiny crayfish and that the main threats the Project poses to the species is damage to stream bank integrity and increased sedimentation of waterways. We were also advised that the majority of works on the site will take place more than 100 metres from waterways. The proposed visual inspections and pre-construction surveys across the Project site will provide more information about the distribution of the crayfish and habitat areas to be avoided. Potential impacts on the Alpine spiny crayfish can be minimised by the mitigation measures proposed including pre-construction surveys in the Straight Creek system, avoiding crayfish habitat, providing for crayfish passage at road crossings and potential salvage and translocation.

With respect to mountain galaxias, we support the proposal to seek expert identification of specimens collected in preconstruction surveys and monitoring program as well as the proposal for the macro-invertebrate monitoring and to include detection of threatened species groups.

We agree that the implementation of a biological monitoring program would provide assurance that aquatic ecology values are being maintained.

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<sup>27</sup> Mr Harrow recommended mitigation measures on p8-9 of his expert witness statement that should be incorporated into the work plan.

## Recommendations

- **Establish a pre-construction and operations biological monitoring program in consultation with the Environment Protection Authority and the Department of Environment and Primary Industries that:**
  - a) **includes both macro-invertebrate and fish monitoring( including crayfish).**
  - b) **includes the Tambo River and the Straight Creek system.**
  - c) **includes a minimum of three control points in Straight Creek.**
  - d) **incorporates pre-construction surveys for Alpine spiny crayfish and Mountain Galaxias.**
- **Develop measures to provide steam flows for the 0.75km of Straight Creek adjacent to the TSF to be by-passed post closure.**
- **Incorporate into the work plan the mitigation measures recommended by Mr Harrow on p8-9 of his expert witness statement.**

### 7.2.4 Aquatic ecology- Straight Creek and the potential impact of the TSF

A critical project element requiring performance monitoring throughout the Project's life is the TSF and its potential impact on downstream water quality and flows to Straight Creek and the Tambo River. Should water quality deteriorate and downstream flows to Straight Creek are significantly altered during operations or post closure, the aquatic ecology values in Straight Creek and the Tambo could be impaired.

### 7.2.5 Evidence and submissions

The GEG submitted that there was inadequate baseline data on the aquatic ecology values of Straight Creek. Previous monitoring programs to assess the impact of discharges from the tailings dam were poorly designed such that no conclusions could be reached. The VNPA considered that there had not been adequate survey work undertaken for Straight Creek and that as this waterway would be immediately affected by any seepage or discharge from the TSF, solid baseline data was required.

DSDBI indicated that the performance of the enlarged TSF would be assessed at a monitoring station in the Tambo River downstream of Straight Creek and noted that the natural processes in Straight Creek would provide some final buffering of the water quality before entering the Tambo River.

In his expert witness statement in response to the GEG, Mr Harrow agreed the previous monitoring programs in Straight Creek failed to draw strong conclusions due to a number of confounding factors and any future monitoring program would need to take these matters into account in the design. Notwithstanding this, in terms of macro-invertebrate and fish community composition, the health of the Tambo River and Straight Creek was described as being in good to excellent condition (GHD, 2013).

The peer review report (EA, Aquatic Ecology, 2013) noted the condition of Straight Creek and that the Creek retains value for aquatic fauna. The report proposed that, given the potential for the Project to impact on Straight Creek, a greater focus on determining the values of the waterway and a baseline against which future changes could be detected was warranted. The peer review report suggested that the design of the biological monitoring program, at

least three control sites or three reference sites for Straight Creek be included in the program.

The DSDBI ERB and the EPA observed that the alternate spillway location for the enlarged TSF discharges to a drainage line, to Straight Creek and the potential impact of any release down this waterway to Straight Creek had not been addressed. Mr Harrow acknowledged that an assessment of the potential impacts had not been carried out. He recommended that as part of the proposed pre-construction surveys, the site be visually inspected and if suitable habitat exists, surveys for fish and crayfish be undertaken prior to completion of the final work plan.

The peer review report stated that the impacts of the TSF expansion and the potential changes to the hydrology of Straight Creek had not been addressed in the GHD (2013) report. GHD (2013) acknowledges that during the operation of the mine, diversion drains will divert surface run off around the TSF. The report concludes that the impacts on aquatic ecological values downstream of the TSF are likely to be undetectable. However, post closure surface run off will be directed into the TSF to maintain water levels over the tailings. In responding to the peer review report, GHD (2013) concedes that this potential impact was not considered in the report. It noted that 0.75km of Straight Creek will have flows diverted post closure of the mine. This reach of Straight Creek is likely to contain habitat that will support Alpine spiny crayfish, however, the impact the restriction of flows will have is not known due to a lack of surveys within this reach although a complete restriction of flow is likely to be detrimental to aquatic biota. GHD (2013) recommended pre-construction surveys to provide further information on the aquatic values present in this reach, conceding however that under the current design that this remains a residual impact to aquatic ecology values.

The EA peer review report on terrestrial fauna (EA, Terrestrial Fauna, 2014)<sup>28</sup> outlined that there was some uncertainty regarding potential impacts on fauna habitat and threatened fauna species from the expected changes along the 0.75km of Straight Creek below the dam wall that will have flows diverted post closure. In responding to the peer review report, AECOM (2014)<sup>29</sup>, indicated that with respect to surface flows downstream of the TSF, existing flows can be achieved and that this could involve the installation of bypass channels to allow flows to pass around the TSF to downstream wetlands.

One of the risks to aquatic ecology values identified by GHD (2013), was disturbance to or deterioration of the TSF anaerobic wetland and the potential to impact on Straight Creek should the wetland be removed, its functioning deteriorate or from the potential construction of a new wetland to continue passively treating TSF seepage. The management of the TSF is discussed in Section 5 of this report.

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<sup>28</sup> Terrestrial Fauna Technical Report – Peer Review, Ecology Australia, 2014.

<sup>29</sup> AECOM, Response to Peer Review by Ecology Australia, 2014.

## 7.2.6 Discussion

The Inquiry agrees that there appears to be inadequate understanding of the aquatic ecology values of Straight Creek. Given the potential for the Project to impact on Straight Creek both during operation and post closure an increased understanding of the aquatic values of the Creek against which future changes can be detected is warranted. Knowledge of the values of the waterway and feeder streams would also assist in the consideration and application of mitigation measures. We agree that the values in the 0.75km section of the Creek that may be impacted by altered flows post closure should be established. Furthermore the Inquiry considers that measures to mitigate the impacts of reduced flows to this section of the Creek such as bypass channels be investigated, rather than considering this as a residual impact.

We support the application of pre-construction surveys to the alternative spillway discharge waterway in order to establish baseline values and the need for future mitigation measures.

### Recommendations

- **Implement the vegetation offset strategy at the Spotted Bull, One Hut, Pendergast and Dinner Plain properties to offset the vegetation removal arising from the Project, to the satisfaction of the Department of Environment and Primary Industries.**
- **Ensure adequate long term protection of the Alpine Sphagnum Bogs and Associated Fens community at the Dinner Plains offset site, including consideration of the implications of the planning scheme provisions and the need for buffering of the significant vegetation.**
- **Undertake pre-construction surveys for the Kiandra Greenhood orchid and avoid impacts where possible. Where impacts cannot be avoided, determine the significance of the impact under the EPBC Act.**
- **In consultation with the Department of Environment and Primary Industries, establish a preconstruction and operations wetland and riparian health monitoring program for all Alpine Sphagnum Bogs and Associated Fens sites within the Straight Creek Catchment including at the TSF and immediately downstream along Straight Creek.**
- **Mark the limit of works around the TSF on-ground to protect wetland communities from any construction.**
- **Incorporate into the work plan the mitigation measures recommended by Ms Spencer on pages 14-16 of her expert witness statement.**

## 7.3 Vegetation and flora – impact on threatened species and communities

### 7.3.1 The EES Assessment

EES Appendix D<sup>30</sup> describes the vegetation and flora assessment and methodology.

The methodology involved a desktop investigation of existing data sources as well as very extensive field surveys at over 176 locations between 2007 and 2013. Targeted surveys were undertaken to confirm the presence or absence of rare or threatened species.

The EES indicated that:

- The main impact of the Project is the proposal to clear approximately 70 ha of native vegetation, including the loss of an estimated 600 large old trees.
- Vegetation removal will potentially impact on:
  - Ten rare plant species listed on the Advisory List of Rare or Threatened Plants in Victoria<sup>31</sup>. No impact on the population viability of these species is predicted.
  - Three flora species - Hairy Anchor Plant, Purple Eyebright, Snow Fescue - are listed under the FFG Act and have been recorded on the DEPI database within the Project site but these species have not been recorded within the Project infrastructure footprints. No impact on these species is considered likely.
  - Two EPBC Act listed flora species have been previously recorded in the Project site - Purple Eyebright (endangered) and Kiandra Greenhood (critically endangered) - but targeted surveys have not recorded these species within the Project infrastructure footprints. Further pre-construction field work is proposed.
  - The Alpine Sphagnum Bogs and Associated Fens ecological community (historically referred to as Montane Swamp Complex) is listed as endangered under the EPBC Act and the FFG Act. This community will be directly impacted by the proposed expansion of the TSF with removal of 0.36 hectares.
- Of seven TSF siting options considered, the expansion of Lake St Barbara results in the removal of the third lowest amount of vegetation (measured in hectares) and the design minimised direct impacts to Montane Swamp where practical, including avoidance of a large site<sup>32</sup> at the toe of the dam.
- The impact on the vegetation has been considered in line with the Victorian Native Vegetation Framework<sup>33</sup> (the Framework), which requires that the investigation of options to avoid clearing, evaluate options for the minimisation of clearing where avoidance cannot be achieved and to mitigate any unavoidable clearing through offset measures.
- Options to avoid and minimise vegetation removal were considered in the EES through project re-configuration and redesign. While vegetation losses have been avoided and minimised, total avoidance of vegetation removal for the entire project is not possible given its location within heavily vegetated forest.

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<sup>30</sup> Ethos NRM, Terrestrial Vegetation Assessment, 2013.

<sup>31</sup> Advisory List of Rare or Threatened Plants in Victoria, DSE, 2005.

<sup>32</sup> Site 58, Figure 17

<sup>33</sup> Victorian Native Vegetation Management – a Framework for Action, DNRE, 2002.

- A comprehensive evaluation of the offset proposals for the Project had been undertaken, including the offset for the listed ecological community.
- In addition to minimising loss of native vegetation and the offsets, the EES proposes a range of mitigation measures to further minimise the impacts associated with a number of threatening processes in relation to pests, soil pathogens, dust and hazardous substance spills.

### **7.3.2 Evidence and submissions**

A number of submitters, including the VNPA, Ms Buckley, Mr Hermans, identified the impact on threatened plants and communities as a significant issue, adding to the history of extensive past vegetation removal. The GEG referred to previous reports on the flora values of the area, outlined a number of concerns including the impact on a large number of significant flora species through clearing, particularly Mountain Banksia, destruction of further area of Montane Swamp Complex and the failure to finalise the Action Statement under the FFG Act for this plant community.

DEPI indicated that it is satisfied with the assessment of threatened EVCs and flora species as outlined in the EES.

In her expert witness statement, Ms Spencer indicated that none of the three FFG Act listed flora species had been recorded in within the infrastructure footprints and in her opinion no impacts will occur to these species. The EES assessment of the direct impacts of the removal of specimens of ten rare plant species listed under the advisory list (including Mountain Banksia) concluded that the loss is unlikely to impact of the population viability of any of the species or local populations.

With regard to the two EPBC Act listed species (Purple Eyebright and Kiandra Greenhood) that have previously been recorded in the Project site, Ms Spencer stated that targeted surveys for the Purple Eyebright were undertaken in 2007, 2009, 2010 and 2011 within the infrastructure footprint areas at Wilga and Currawong. As it was not recorded her conclusion is that it is highly unlikely that this species will be impacted by the Project. Kiandra Greenhood was last recorded in 1988 along Straight Creek downstream of the TSF and has not been recorded since as part of the surveys for this Project. Ms Spencer has concluded that given the infrastructure locations, direct impacts on this species are unlikely to occur. However, further targeted surveys for this species in all suitable habitats along Straight Creek are proposed prior to construction and if detected, seek to avoid any impacts by design re-alignment. Where impacts are unavoidable an assessment of the significance of the impact under the EPBC Act would be required and, potentially, an appropriate offset determined. The uncertain status of the Kiandra Greenhood in Straight Creek was identified by the peer review report (EA, Terrestrial Vegetation, 2013) and it is acknowledged that the measures proposed in the EES address this issue.

The proposed expansion of the existing TSF will result in the removal of 0.36 hectares of Alpine Sphagnum Bogs and Associated Fens ecological community which will be required to be offset under both Commonwealth and State legislation. A discussion on vegetation offsets is provided in Section 10.3.6 of this report.

The VNPA, Mr Hermans and GEG submitted that the enlarged TSF dam wall would impact on the Montane Swamp Complex immediately adjacent to the wall. The peer review report

identifies uncertainty relating to the impact of the expanded TSF and the protection/viability of the Alpine Sphagnum Bogs and Associated Fens community at the toe of the existing TSF dam wall. Furthermore the report indicated that the impact of altered stream flows on Straight Creek as a result of the TSF and consequent potential impact on riparian communities that provide habitat for the Kiandra Greenhood were uncertain. The EES<sup>34</sup>, in responding to the peer review report, acknowledged this uncertainty and advised that additional flora survey and on-going monitoring is proposed in order to identify, over time, any decline in vegetation health and the need for mitigation measures. This may require the installation of by-pass channels to ensure adequate passing flows to all sections of Straight Creek. Recommendations are provided by Ethos (2013). In her expert witness statement, Ms Spencer stated that engineering design of the dam wall will avoid direct impact or removal of this montane swamp site as well as a site to the north of the TSF that would have been impacted by stage 4, TSF expansion.

### **7.3.3 Matters of national environmental significance**

Expansion of the existing TSF will result in the removal of 0.36 hectares of Alpine Sphagnum Bogs and Associated Fens ecological community. This is considered a significant impact and an offset proposal has been developed to meet the suitability criteria under the EPBC Act Environmental Offsets Policy (Section 10.3.6). Two listed flora species, Purple Eyebright and Kiandra Greenhood, were identified as previously recorded within the Project site but neither species was recorded in targeted surveys undertaken during the investigation. While it is highly unlikely that the Project will impact on these species, suitable habitat does occur for the Kiandra Greenhood within the Project site and a precautionary approach is proposed involving further field investigation.

### **7.3.4 Discussion**

The Inquiry acknowledges that there has been a substantial body of field work and data collection to underpin the analysis provided by Ethos (2013) and the conclusions reached. On this basis we agree with the assessment that there will be no impacts on the three FFG Act listed species as a result of the Project. We also agree that the removal of small numbers of individuals of rare flora will not impact on the overall viability of these species or local populations.

With respect to EPBC Act listed species, the Inquiry accepts that given the targeted survey effort over four separate years did not record the Purple Eyebright, it is highly unlikely that this species will be impacted by the Project. While the Kiandra Greenhood also was not detected during targeted surveys, its status in the Project area is less certain. Whilst acknowledging that impacts are unlikely, the Inquiry agrees with the recommended approach. This involves further targeted surveys at the TSF and along Straight Creek, prior to construction activities, to locate any populations likely to be impacted. The Inquiry notes that if the Kiandra Greenhood is detected and impact cannot be avoided, the significance of the impact will need to be assessed under the EPBC Act. If significant impact is determined, an appropriate offset would be required under the Commonwealth offsets policy.

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<sup>34</sup> Ethos NRM, Response to Peer Review Report by Ecology Australia, 2013.



The proposed expansion of the existing TSF will directly impact on the EPBC Act listed Alpine Sphagnum Bogs and Associated Fens community and the FFG Listed Montane Swamp Complex. The Inquiry acknowledges that this loss will be required to be offset under both State (Sub-alpine Wet Heathland EVC) and Commonwealth legislation. A discussion on the vegetation offset strategy for this ecological community is provided in Section 10.3.6 of this Report.

Submitters expressed concern about further impacts, beyond the 0.36 hectares, on this ecological community in particular locations adjoining the TSF wall and within Straight Creek. The peer review report (EA, Terrestrial Vegetation, 2013) also raised the uncertainty about potential further impacts on this ecological community. The Inquiry notes the advice that wetland site in the vicinity of the dam wall will be protected from direct impact or removal by construction activities. Less certain is the impact of any long-term hydrological change downstream including the 0.75 km section of Straight Creek that will have flows diverted.

The Inquiry considers that an approach to progressively assess these potential impacts is required as they have implications for both the Montane Swamp Complex community and for riparian vegetation communities (which provide potential habitat for the EPBC Act listed Kiandra Greenhood) downstream of the TSF along Straight Creek. We agree with the measures proposed in the EES to establish a monitoring program of wetland and riparian vegetation quality and health in order to identify any decline and the need for additional mitigation measures, which could include by-pass channels around the TSF.

Mitigation measures recommended by Ms Spencer are set out in pages 14 – 16 of her expert report.

### **Recommendations**

- **Undertake targeted pre-construction surveys to locate any Kiandra Greenhood Orchid and realign or redesign project elements to avoid impact. Where impact cannot be avoided, the significance of the impact will need to be determined under the EPBC Act.**
- **Implement a wetland and riparian health monitoring program at the TSF and immediately downstream along Straight Creek and for all *Alpine Sphagnum Bogs and Associated Fens* sites within the Straight Creek Catchment.**
- **Implement works to maintain a natural water regime to wetland communities and to areas impacted by the construction of the TSF.**
- **Clearly mark the limit of works around the TSF on-ground to ensure adequate protection of wetland communities.**
- **Incorporate into the work plan the mitigation measures recommended by Ms Spencer on pages 14 – 16 of her expert report.**

### 7.3.5 Vegetation and flora – vegetation clearance and provision of offsets

#### Evidence and submissions

A number of submitters expressed concern about the clearance of large area of native vegetation and the impact on biodiversity. The GEG considered that the Project site supported a large number of significant flora species and referred to several reports describing the values in the Project area which would be impacted by the proposal. The GEG, VNPA and Ms Buckley all expressed concerns about further losses to the remaining endangered Montane Swamp Complex community, particularly given the historical losses in this location. They questioned the proposal to offset the loss of this endangered community at Dinner Plain, on a number of grounds:

- As the proposed offset already exists on land owned by the Alpine Shire (and should already be protected given its significance), there is no additional Montane Swamp Complex generated and the outcome is a loss not an offset. This trading loss threatens the overall protection of that community and is a poor outcome for natural heritage.
- The adequacy of the buffer around the Dinner Plain offset site was challenged given the range of activities that could be approved under the current Special Uses Zone applying to the surrounding land.
- The Dinner Plain offset site is not strictly floristically equivalent to the Montane Swamp Complex Community at the TSF that is proposed to be removed.

The VNPA also submitted that the arrangement to protect an existing site in another location to allow removal of an endangered community is bad policy.

#### Assessment of vegetation removal

Ms Spencer in her expert witness statement<sup>35</sup> advised that the assessment of the vegetation impacts for the Project had been undertaken in accordance with the Framework. She noted that changes to the regulations governing native vegetation removal came into effect in December 2013, however, under agreed transitional arrangements the assessment of the vegetation impacts for the Project was finalised under the Framework.

Ms Spencer advised that a total area of 69.8 hectares of vegetation and 600 Large Old Trees will be removed to enable the construction Project infrastructure components as follows:

Table 2 Vegetation removal

Infrastructure site	Area of Removal (hectares)	Large Old Tree Removal
Wilga Mine	1.89	3
Currawong Mine & Ore Processing Site	24.78	292
Tailings Storage Facility	20.08	205
Linear infrastructure	18.29	82
Accommodation Village	0.04	3
Fire Management Areas	4.72	15
<b>Total</b>	<b>69.8</b>	<b>600</b>

<sup>35</sup> Expert Witness Statement, Ms Spencer, 2014.

The majority (83%) of the vegetation removal will occur within EVCs with a Bioregional Conservation Status of Least Concern. However, the majority (89%) of the sites where vegetation removal is proposed comprise high quality vegetation of high and very high conservation significance that are known or potential habitat for rare or threatened flora and fauna.

DEPI is satisfied that the vegetation assessment in the Project documentation adequately described and calculated the native vegetation losses using the Framework and biodiversity implications. The EES indicated that the current project configurations and specific design modifications has reduced the total area of vegetation removal from 134 hectares to 69.8 hectares and reduced the total number of large old trees removed from 983 to 600. DEPI advised that the documentation provided for the Project demonstrated that the Proponent had adopted measures to avoid and minimise the impact on native vegetation, had considered alternative project configurations and had included design modifications.

### **Offset strategy**

As described earlier, the Framework provides for the mitigation of unavoidable clearing through identifying offset measures. The vegetation offset strategy for the Project is described in Ms Spencer's expert witness statement. Assessments were undertaken in accordance with the Framework to meet offset obligations. The calculated offset requirement is 76.35 habitat hectares (hha) of nine different EVC's and a requirement for 3588 Large Old Trees.

Ms Spencer advised that:

- The assessment of three private properties to the north of the mining tenement (known as One Hut, Pendergast and Spotted Bull) confirmed they meet the majority of the offset requirements. Of the total offset requirement 75.73 hha and 3021 Large Old Trees can be met at the One Hut and Pendergast properties<sup>36</sup> and the balance of the Large Old Tree offset requirement (567) can be met at the Spotted Bull property. Offset Management Plans have been prepared for the Pendergast and One Hut properties<sup>37</sup>.
- Assessment<sup>38</sup> has been undertaken for 15 different fauna species and 35 different flora species across 37 different habitat zones within the Project site. In addition the vegetation type, quality and density of large old trees at the offset sites has been assessed using the Framework to meet the 'like for like' habitat requirements (best or remaining 50% of habitat) for rare and/or threatened flora and fauna species.
- Expansion of the existing TSF will result in the removal of 0.36 hectares of the Sub-alpine Wet Heathland (EVC) creek lines in the vicinity of the Lake St Barbara TSF. Additional impact of 0.05 hectares (0.08 hha) on this community in a drainage line could potentially arise with the alternative TSF spill way location. This EVC which has a bioregional conservation status of endangered, and has been assessed as:
  - Being analogous with Montane Swamp Complex, which is listed under the FFG Act.
  - Meeting the EPBC Act criteria of the listed endangered ecological community of Alpine Sphagnum Bogs and Associated Fens.

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<sup>36</sup> One Hut and Pendergast properties (which have available 93.74 hha and 3021 Large Old Trees).

<sup>37</sup> EES Appendix D1, Att 10,11 (Ethos, 2013).

<sup>38</sup> EES Appendix D1, Att 9 (Ethos, 2013).

- An offset for the removal of Sub-alpine Wet Heathland at a Dinner Plains property owned by the Alpine Shire meets both the State and Commonwealth requirements, including the 'like for like' criteria under the Victorian Framework and the EPBC Act Offset Criteria. This offset site was of better quality than the impact site; has higher species diversity, structure and patch size; and is of high importance for the provision of habitat for rare and threatened flora and fauna species.
- The Dinner Plains property of 160 ha contains 2.32 ha (0.74 hha) of the endangered community of which 2.08 ha (0.62 hha) is required for the offset. This site could accommodate offsets for additional impact on this community from an alternative TSF spillway. An Offset Proposal has been prepared for this property.<sup>39</sup>

DEPI indicated that it agreed with the classification of Sub-alpine Wet Heathland in the Project area as equating to the FFG Act listed Montane Swamp Community and the EPBC Act listed Alpine Sphagnum Bogs and Associated Fens community. Preliminary advice from the Commonwealth, which has undertaken an inspection of the site, indicated that the Dinner Plain offset site would meet the suitability criteria under the EPBC Act Offsets Policy.

The Peer Review<sup>40</sup> concluded that the assessment of the direct impacts of vegetation loss had been thoroughly completed. Given the substantial body of field work that had been undertaken, they were confident that the offset sites substantially meet the offset targets and the requirement for Large Old Trees had been accurately inventoried the three Offset Management Plans satisfy the requirements under the Framework and have been well prepared. The peer review indicated their confidence in the correct identification of Sub-alpine Wet Heath as a component of Alpine Sphagnum Bogs and Associated Fens community, and agreed that the Dinner Plain property satisfies the offset target under both State and Commonwealth requirements.

DEPI indicated it is satisfied with the assessment of the offset requirements and the arrangements that are in place to secure the offsets.

### **Forest Management Plan**

The Gippsland Forest Management Plan identifies three Forest Management Zones in the Project area, a General Management Zone (GMZ), a Special Management Zone (SMZ) and Special Protection Zone (SPZ). The Forest Management Plan permits mining, under conditions, and aims to provide for exploration and mining while minimising adverse impacts on State Forest values. State Forest is unrestricted Crown land and the management of the biodiversity values within SMZs and SPZs are required to be considered in accordance with the Framework and the FFG Act.

The GEG stated that a number of flora values in SPZs and the SMZ would be impacted. Ms Spencer in her expert witness statement indicated that the EES had assessed the impact of vegetation clearance on the values identified in three SPZ's and one SMZ that would be impacted and advised that these values can be offset as part of the vegetation offset strategy. Ms Spencer indicated that the impact of this vegetation removal on the National

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<sup>39</sup> EES Appendix D1, Att 12.

<sup>40</sup> EES Appendix D2 Terrestrial Vegetation Assessment – Peer Review, Ecology Australia, 2013.

Forest Reserve System and the reservation targets under the Regional Forest Agreement was not clear.

DEPI responded to questions from the Inquiry on this matter, that this would be a matter for consideration in the review of the Regional Forest Agreement. DEPI is satisfied that the impacts to Forest Management Zones have been adequately addressed.

### **7.3.6 Matters of national environmental significance**

As described previously the loss of 0.36 hectares of the EPBC Act listed Alpine Sphagnum Bogs and Associated Fens ecological community is considered a significant impact and this loss will required to be offset under the Commonwealth Offset Policy. State offsets can contribute to EPBC Act offset requirements and a specific offset proposal has been developed at a property at Dinner Plain to meet both Commonwealth and State offset obligations. Ethos (2013) indicates that the proposed Dinner Plain site will comprise 100% direct offset as it includes an area of 2.08 hectares of Alpine Sphagnum Bogs and Associated Fens community which is more than 5 times the area being removed. Following assessment utilising the EPBC Act offset Gain Calculator, the proposed offset at Dinner Plain will compensate for 117.17% of the loss, meet the minimum 90% direct offset requirement under the Commonwealth guidelines for offsets and requires no other compensatory measures.

### **7.3.7 Discussion**

The Inquiry has previously acknowledged the substantial body of field work and data collection that underpins the terrestrial vegetation and flora assessment. This provides a sound basis for the reporting and confidence in the conclusions reached.

We note that that there is agreement that the assessment of the vegetation impacts arising from the Project are to utilise the Framework. The Framework adopts a three step approach that requires the Proponent to investigate options to avoid clearing, evaluate options for the minimisation of clearing and to mitigate any unavoidable clearing through identifying offsets. The Proponent has demonstrated actions to minimise impacts on the areas of vegetation to be cleared through project configuration and design modifications during the course of the Project. This is acknowledged by DEPI. We are satisfied that the Project has dealt with these matters in accordance with the Framework.

We also recognise that the Forest Management Plan provides for mining activities and that in this forested landscape, if the Project is to proceed, some clearance of vegetation is unavoidable. Under the Framework unavoidable loss of vegetation must be mitigated through offsets. We note the DEPI are satisfied with the loss calculations and the habitat hectare assessments undertaken to provide the basis for the vegetation offsets.

The Proponent has presented a detailed vegetation offset proposal, together with offset management plans, well in advance of the Project implementation. Under the Framework offsets are required to meet 'like for like' criteria which includes, habitat type, landscape role, quality, vicinity to the removal site, timing of the offset and security of the offset. We note that the peer review report, given the extensive field investigations, expressed confidence that the offset sites substantially meet the offset targets, that the requirement

for Large Old Trees had been accurately inventoried and that the offset management Plans satisfy the requirements of the Framework. We agree with this assessment.

A number of submitters expressed concern about the offsetting of vegetation to be lost at one location with the protection of vegetation that already existed at another location as not providing a replacement for the loss. Notwithstanding this view, and as the VNPA acknowledged, the Proponent is obliged to comply with the regulatory framework governing vegetation clearance and the offsetting of loss in the manner proposed accords with the requirements agreed to by DEPI for this project.

Offsets must also address specific habitat requirements to compensate for the loss of any threatened flora and fauna or habitat. We note the advice from Ms Spencer that the Framework methodology has been used to assess the offset sites to meet the 'like for like' habitat requirements (best or remaining) for rare and/or threatened flora and fauna species and that implementing the vegetation offsets will mitigate impacts on these species. We are satisfied that based on the information presented to us, that the offset proposals satisfy the requirements under the Framework for rare and/or threatened fauna including the impact on the forest management zones.

Opinions were expressed by submitters about the inadequacy of the Dinner Plain site in providing an offset for Montane Swamp complex listed under the FFG Act. We were advised that offsets are assessed using the classification of the EVC and the EVC at the TSF site is Sub-alpine Wet Heathland. Furthermore this EVC is consistent with the Alpine Sphagnum Bogs and Associated Fens ecological community listed under the EPBC Act and, while slight variations in the floristics at the removal site and the offset site exist, we accept advice that the offset sites meets legislative requirements under both State and Commonwealth legislation. We note the preliminary advice from the Commonwealth about the acceptability of the Dinner Plain site and the views of DEPI and the peer review report (EA, Terrestrial Vegetation, 2013) regarding the accuracy of classification. We are satisfied that the Dinner Plain site provides a suitable offset under both State and Commonwealth legislation.

We consider the agreements to secure the offset should ensure that the integrity, quality and biodiversity values of the vegetation on the offset set. This should address the need for buffering of the Alpine Sphagnum Bogs and Associated Fens community and the scope of potential uses and development under the Special Use zone that applies to the site.

### **Recommendations**

- **Implement the vegetation offset strategy at the Spotted Bull, One Hut, Pendergast and Dinner Plain properties as described in the EES.**
- **Ensure adequate long term protection of the Alpine Sphagnum Bogs and Associated Fens at the Dinner Plains offset site, including consideration of the implications of planning scheme provisions and the need for buffering of the significant vegetation.**
- **Provide the additional offset requirements for the vegetation clearance identified for the alternative overflow spillway.**
- **Incorporate into the work plan the mitigation measures recommended by Ms Spencer on pages 14 – 16 of her expert report expert witness statement.**

## **7.4 Terrestrial fauna**

### **7.4.1 The EES Assessment**

The Terrestrial Fauna Technical Report<sup>41</sup> is contained in Appendix D of the EES. The assessment of terrestrial fauna and their habitats was based upon review of existing records from data bases, examination of past survey reports from 1986, 1987, 1988 and 2009 and targeted field surveys in 2010 and 2011 for 16 significant species.

The EES indicated that:

- Habitat loss of approximately 70 hectares and 600 large old trees will be the most significant impact on threatened fauna.
- The most significant impact is on hollow-dependent fauna resulting from the removal of large old trees with hollows as these provide roosting and nesting habitat for birds and arboreal mammals.
- Indirect impacts on fauna could arise through habitat disturbance through noise, lighting, vibration, dust and human activity associated with mining operations.
- Particular threatened species for which the Project may pose a risk to local populations comprise 5 EPBC Act listed species and 12 FFG Act listed species which have a moderate or higher likelihood of occurrence or are considered present in the mining tenement.
- Whilst the tenement does not provide unique habitat for any of these species, loss of habitat will impact local populations and there could be potentially significant impacts on the Giant Burrowing Frog and the Alpine Tree Frog which are listed under the EPBC Act and the FFG Act and significant local impacts could also occur to the Alpine Bog Skink and Alpine Water Skink.
- The proposed mitigation measures involve a terrestrial fauna monitoring strategy which will include pre-construction surveys for all disturbed areas, targeted surveys for threatened species and monitoring during operations to assess the effectiveness of fauna mitigation measures. Furthermore habitat offsets are included in the vegetation offset strategy. Mitigation measures are also proposed to manage indirect impacts.

### **7.4.2 Terrestrial fauna – impacts on threatened species**

### **7.4.3 Evidence and submissions**

Mr Miller's expert witness statement summarised the EES (EWS, Miller, 2014)<sup>42</sup> assessment of threatened species that are present or have a moderate or higher likelihood of occurrence in the mining tenement in the following tabular form:

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<sup>41</sup> Terrestrial Fauna Technical Report, AECOM (2014).

<sup>42</sup> Expert Witness Statement, Mr Miller, 2014.

Table 3 Threatened species assessment

Species	Listing	Assessment
Smokey Mouse and Spot-tailed Quoll	EPBC Act (endangered) FFG Act	Not recorded in surveys and no records from the mining tenement. Suitable habitat is present within the Project site and there is a moderate likelihood of occurrence. Based on survey results no significant impact is predicted.
Spotted Tree Frog	EPBC Act (endangered), FFG Act	There are no known records from the mining tenement. There is some potential habitat along the Tambo River and there is a moderate likelihood of occurrence. Project unlikely to cause significant residual impacts provided appropriate hygiene and sediment control measures are implemented
Giant Burrowing Frog	EPBC Act (vulnerable) FFG Act	High likelihood of occurrence within the site. Significant impacts could occur through loss of habitat, altered surface water conditions, reduction in population size and introduction of disease. Mitigation measures include hygiene and sediment control measures, salvage and translocation. Habitat offsets would be required if the species is significantly impacted. Pendergast site may provide a suitable offset.
Alpine Tree Frog	EPBC Act (vulnerable) FFG Act	Alpine Tree Frog. Moderate likelihood of occurrence within the site as there is suitable habitat along watercourses. Significant impacts could occur if present. Mitigation measures include hygiene and sediment control measures. Pendergast and Dinner Plain sites may provide a suitable offset.
Alpine Bog Skink Alpine Water Skink	FFG Act	Not recorded in the Project site. Potential suitable habitat in the Project site. Moderate likelihood that these species could be present in sub- alpine wet heath at the tailings dam site and in locations of proposed easements. Removal of this habitat, if the species are present, would have a significant local impact. Translocation is not considered a viable option. The vegetation offset sites at Dinner Plain and Pendergast may contain suitable habitat offsets for these species.
Diamond Firetail	FFG Act	No records from the Project site but recorded nearby. Occurs over south east mainland Australia. Highly likely to be present. Removal of vegetation likely to have a local impact if present. Offset sites may provide suitable habitat.
Eastern Great Egret	FFG Act	Not recorded in the Project site but records exist nearby. Based on lack of important habitat in the Project site no significant impact predicted
Masked Owl, Powerful Owl, Sooty Owl	FFG Act	Not recorded on the Project site Occur over a range of eucalypt dominated habitats. Would be impacted by clearing of hollow bearing trees. Like for like offset sites providing hollow bearing trees will provide habitat for Owls.
Greater Glider	Victorian advisory list	Present. Occurs in a range of eucalypt dominated habitats in eastern Victoria. Would be impacted on the Project site by clearing of hollow bearing trees. Like for like offset sites providing hollow bearing trees will provide habitat for Greater Glider.
White-throated Needletail	Victorian advisory list	A non breeding migrant and no impacts are expected.
Lace Monitor	Victorian advisory list	Has been recorded from a carcass and predator scats in the Project site. Its core range is eastern Victoria south-eastern NSW and ACT and removal of habitat would have a local impact. The vegetation at the offset sites that is suitable for the species will provide a habitat offset.
Broad-toothed Rat	Victorian advisory list	Has been recorded in the Project site. It occurs over a wide variety of mainly well timbered habitats in eastern Australia. If present, removal of habitat would have a local impact. Native vegetation at the offset sites that is suitable will provide a habitat offset.



GEG, Ms Buckley, and the VNPA noted that the Project would have adverse impacts on threatened fauna as a result of habitat loss.

DEPI indicated that it was satisfied that the Project documentation has adequately identified the impacts on threatened fauna and was satisfied with the proposals to mitigate and offset the impacts. With respect to the Giant Burrowing Frog, DEPI supported the actions to mitigate the risk to this species:

- No ground disturbance within 100m of gully lines and water courses within the Tambo River habitat zone unless authorised by DEPI;
- Targeted searches for the Giant Burrowing Frog prior to construction; and
- Develop procedures for translocation of individuals unexpectedly detected.

### Offsets

In his presentation to the Inquiry Mr Miller advised that under the FFG Act there are no specific offset requirements for listed fauna species. Offsetting for fauna is achieved through vegetation offsets. Mr Miller indicated the value of the vegetation as fauna habitat at the offset sites had been classified in terms of whether the sites provide habitat for threatened FFG Act species potentially impacted by this project and, if so, whether that habitat forms the best 50% of habitat available or the remaining 50% of habitat available. The EES included assessment of the best and remaining 50% of habitat for 15 different fauna species (listed in table 1) across 37 different habitat zones.

Ms Spencer's evidence explained that under the Framework offsets must address specific habitat requirements to compensate for the loss of any threatened fauna (and flora) species. Ms Spencer indicated that the assessment across the entire project site was in accordance with the Framework and involved an Ethos staff member with expertise in fauna to provide input to the fauna habitat potential of the offset areas. Ms Spencer stated that in her opinion, the significant flora and fauna individuals or habitat lost as a result of vegetation removal can be offset in accordance with the Framework by implementing the vegetation offset strategy. Mr Miller noted that while the vegetation offsets will secure good quality habitat for a range of threatened fauna species, the provision of habitat at the offset sites has not been assessed by survey by a fauna ecologist. He also advised that under the EPBC Act offsetting is applied to significant residual impacts. Should this be determined for listed EPBC Act species, offsetting consistent with the EPBC Act offset guidelines will be required.

Mr Miller identified a number of additional measures that would be required to mitigate impacts on threatened species which are detailed in Section 8.3 of AECOM (2014). With respect to the Giant Burrowing Frog, the following measures, *inter alia*, were recommended:

- Targeted searches for the frog prior to construction.
- No ground disturbance within 100 metres of gully lines and water courses unless authorised.
- Development of procedures for salvage and translocation.
- Provision of appropriate habitat offset if a significant impact is assessed as being likely during pre-construction survey.

With respect to the Alpine Tree Frog:

- Targeted searches be conducted for the frog prior to construction.

- Adopt vehicle and soil hygiene controls to prevent the introduction and spread of Chytrid fungus particularly for works and access at and near water courses.
- Monitor frog population for the fungus during operations.

The peer review report (EA, Terrestrial Fauna, 2014)<sup>43</sup> noted that no site assessments had been undertaken within the linear easements and as such uncertainty exists about the faunal values in these areas. Mr Miller confirmed that some locations had not been surveyed, including the accommodation village site and easement infrastructure routes. With respect to the village site, AECOM relied on the vegetation assessment in assessing the faunal values of the property and concluded that because of the modified, fragmented and disturbed condition of the site it is unlikely to support any habitat for threatened species and therefore the impacts are not likely to be significant.

Ms Spencer provided details on the vegetation removal for the water pipeline and road widening, indicating that allowance for this vegetation removal had been made in calculating the vegetation offset requirements and included in the offset strategy.

AECOM (2014) documents the potential indirect impacts on fauna arising from noise, vibration, artificial lighting, human disturbance, sedimentation, weeds, diseases and feral animals as a result of mining activities. In reviewing the draft work plan Mr Miller noted that measures are proposed to address lighting management, dust control, traffic management, weed and soil hygiene protocols and staff training. He proposed additional measures be included in the work plan, including, a specific feral animal management plan, monitoring to include the range of target species identified in AECOM (2014) both within the Project site and at offset sites.

#### **7.4.4 Matters of national environmental significance**

AECOM (2014) identified five EPBC Act listed terrestrial fauna species that could potentially occur within the Project site. None of these species were recorded in the field survey work that formed part of the investigation. Of these five species, three (Smokey Mouse, Spot-tailed Quoll and Spotted Tree Frog), if present, were considered unlikely to be significantly impacted by the Project. Significant impacts could occur to the Giant Burrowing Frog and the Alpine Tree Frog if present within the Project site. A precautionary approach is proposed for the Giant Burrowing Frog and the Alpine Tree Frog involving further field investigation.

#### **7.4.5 Discussion**

For FFG Act listed fauna, we note that DEPI is satisfied with the proposals identified in the report to mitigate and offset impacts including the measures identified in Section 8.3 of AECOM (2014). The Inquiry notes the advice that the clearance of native vegetation within the tenement will directly impact fauna utilising this habitat at a local scale, however, the mining tenement does not represent unique habitat for any significant fauna species. Given the uncertainties for certain species (Giant Burrowing Frog, Alpine Tree Frog, Alpine Bog Skink and Alpine Water Skink) there is potential for impacts to be significant.

The Inquiry supports the implementation of the vegetation offset proposals as outlined in the EES, to assist in mitigating the fauna impacts and notes that for listed FFG Act species

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<sup>43</sup> Terrestrial Fauna Technical Review Report – Peer Review, Ecology Australia, 2014.

this has been assessed in accordance with the Framework. We accept the advice that habitat for the threatened species (including Alpine Bog Skink and Alpine Water Skink) will be offset with the implementation of the proposed vegetation offsets. Notwithstanding that it satisfies the State requirements, we consider it would be appropriate for the fauna monitoring program to include the vegetation offset sites to determine what fauna species are utilising these areas.

The Inquiry considers that there is potential for impacts on the EPBC Act listed Giant Burrowing Frog and Alpine Tree Frog. However, it is not possible to determine in advance if significant impacts are likely to occur as neither species has been detected in recent surveys. Consequently a precautionary approach is required for both species that involves pre-construction surveys in areas of likely impact and where impacts cannot be avoided an assessment of the significance of the impact under the EPBC Act would be required. If significant impact was determined, an offset would be required under the EPBC Act offsets policy.

The Inquiry agrees with the measures outlined in AECOM (2014), Section 8.3, and that their incorporation in to the final work plan will assist mitigation of the fauna impacts. A terrestrial fauna monitoring strategy (AECOM, 2014) is also proposed to be included in the work plan. It is proposed that the strategy be designed in consultation with DEPI and include pre-construction surveys for all disturbed areas with specific targeted searches for threatened species, monitoring during mining operations to evaluate the effectiveness of fauna mitigation measures and monitoring at the offset sites to determine what fauna is utilising these sites. The Inquiry agrees with this approach.

The Inquiry also agrees with the assessment of the accommodation village site based on the condition of the site and there is little likelihood of an impact on fauna as a result of vegetation clearing. Less clear is an understanding of the potential fauna impacts of clearing along the easements for the linear infrastructure. However, the Inquiry understands that an allowance for vegetation loss for linear easement construction has been included in the offset calculations and will be provided for at the offset sites. Furthermore the linear easement will be included in the pre-construction surveys as part of the fauna monitoring strategy with specific targeted searches for threatened species. Based on these measures we consider any unanticipated impacts can be adaptively addressed.

We are satisfied that the measures proposed in the draft work plan for lighting, dust control, and traffic are capable of mitigating the indirect impacts on fauna.

### **Recommendations**

- **Undertake targeted pre-construction surveys including along the infrastructure easements for threatened fauna.**
- **Implement a fauna monitoring program, for the range of fauna identified by AECOM (2014), Section 7.2, designed in consultation with the Department of Environment and Primary Industries, and include the monitoring of fauna utilisation of the vegetation offset sites.**
- **Implement a specific Feral Animal Management plan.**

- **Undertake targeted pre-construction surveys for the Giant Burrowing Frog and Alpine Tree Frogs and re-align or redesign project element to avoid impact where possible. Where impacts cannot be avoided, the significance of the impact under the EPBC Act will need to be determined.**
- **Undertake the additional mitigation measures for the Giant Burrowing Frog, as agreed with the Department of Environment and Primary Industries:**
  - a) **No ground disturbance within 100m of gully lines and water courses unless authorised by DEPI.**
  - b) **Develop procedures for salvage.**
- **Implement mitigation measures as proposed by AECOM (2014), Section 8.3, through the Work Plan.**

#### **7.4.6 Terrestrial fauna – loss of hollow bearing trees**

##### **Evidence and submissions**

VNPA, Mr Hermans and the GEG expressed concern at the removal of hollow bearing trees and the impact on fauna. Submitters indicated that the measure of ‘old trees’ as an offset surrogate for tree hollows was inadequate. The number of hollows, the size and distribution are important in supporting different species’ needs. Submitters noted that ‘*Loss of hollow bearing trees from Victoria’s native forests and woodlands*’ is listed as a Potentially Threatening Process under the FFG Act. The GEG specifically identified the Currawong processing site as containing a significant number of large old trees with hollows and an important site for gliders.

Ethos (2013), in assessing the offset requirements for native vegetation clearance under the Framework, undertook an inventory of Large Old Trees either by direct counting or estimating the number of trees by taking sample counts in a representative area. Hollows have not been counted or surveyed and it has been assumed that Large Old Trees, due to their size, are also hollow bearing. Ethos (2013) have estimated that vegetation removal will lead to an estimated loss of 597 Large Old Trees and this will require 3,588 Large Old Trees to be protected at offset sites.

Mr Miller’s evidence acknowledged the impact of the loss of hollow bearing trees on terrestrial fauna on the Project site. The peer review report indicated that there was substantial uncertainty surrounding the loss of hollow bearing trees and subsequent impact on hollow dependent fauna, as there were no specific metrics around the numbers, size or quality of hollows that are being lost. Furthermore, if the offset sites do not support sufficient appropriately sized hollows relative to those being lost, the compensatory objective of the offset for hollow dependent fauna may not be achieved in the short to medium term, as it takes many years for hollows to develop. The assessment of the like for like habitat offset requirements has been described in the previous Section. AECOM (2014) noted that, as a greater number of large old trees will be offset than will be lost under the like for like arrangements it had been assumed that more hollows would be protected than were being lost, although ultimately this would be a matter for DEPI.

Whilst not commenting on hollows specifically, DEPI has indicated that it is satisfied with the offset arrangements. Notwithstanding, Mr Miller (EWS, Miller, 2014) has recommended

that hollow bearing tree surveys at the source sites and offset sites be undertaken to determine if sufficient hollows will be offset and that if additional hollow bearing trees are required that additional sites be identified for protection. He agreed that the assessment should not only count the abundance of hollows but the density of hollows of different size classifications.

Ethos (2013) has identified properties to secure the protection of 3588 Large Old Trees. They also identify options to reduce the Large Old Trees offset including avoiding the removal of Large Old Trees within Fire Management Asset Protection Zones and along the linear easements. This was supported by Mr Miller in his expert witness statement.

### **Discussion**

The Inquiry recognises the difficulty of recording the number, size and location of hollows that are present in the area to be cleared given the size of the area to be surveyed and limitations imposed by topography. We accept the approach that has been taken. We note that the like for like offsets should support trees of a similar size/age class and as a greater number (six times) will be offset to that being lost, and this potentially may secure protection of more hollows. However there is no empirical evidence on this. We note that while DEPI is satisfied with the offset arrangements, the Proponent has agreed to undertake surveys of hollow bearing trees at the time of clearance and at the offset sites to ensure that appropriate offsets are in place and this will be included in the work plan. The Inquiry supports this and the additional measures proposed to avoid removal of Large Old Trees in the asset protection zones and along linear easements.

### **Recommendation**

- **Implement a preconstruction and operations fauna monitoring program, to be designed in consultation with the Department of Environment and Primary Industries, for the range of fauna identified by AECOM(2014), Section 7.2, and include the monitoring of fauna utilisation of the vegetation offset sites.**
- **Undertake targeted pre-construction surveys for threatened fauna including along the linear infrastructure easements.**
- **Implement a Feral Animal Management plan.**
- **Undertake targeted pre-construction surveys for the Giant Burrowing Frog and Alpine Tree Frogs and avoid impacts where possible. Where impacts cannot be avoided, determine the significance of the impact under the EPBC Act.**
- **Conduct a survey of hollow bearing trees at the time of vegetation clearance and at the offset sites to ensure the retained Large Old Trees provide the appropriate compensatory offset for hollow dependent fauna in terms of the number and size of hollows. Design the survey in consultation with the Department of Environment and Primary Industries.**

## 8 Bushfire Risk

The Project is in an area of extreme risk from bushfire, with the impact of past fires being evident at the mine site. All of the Project elements are in a designated Bushfire Prone Area<sup>44</sup>, the Bushfire Management Overlay (BMO) applies to the mine tenement and, while the village site is not currently mapped within the BMO, it meets the criteria for inclusion in the BMO<sup>45</sup>.

It is State Planning policy<sup>46</sup> to *'Prioritise the protection of human life over other policy considerations in planning and decision-making in areas at risk from bushfire'* and to *'apply the precautionary principle to planning and decision making when assessing the risk to life, property and community infrastructure from bushfire.'* Further, Ministerial Direction 11 requires planning authorities to evaluate how any proposed amendment addresses relevant bushfire risk. The BMO and Clause 52.47 (Bushfire Protection: Planning Requirements) provide guidance for the consideration of applications for planning permits in areas of high bushfire risk which is useful where planning permits are not required, such as for the proposed mine.

Since the Hearing, Amendment VC108 revised the statewide bushfire protection planning scheme provisions. The clear policy priority to protect human life over other policy objectives is maintained but changes respond to concerns about the practical implementation of bushfire protection measures for single dwellings<sup>47</sup>. These changes include, amongst other things:

- Alignment of the BMO provisions with the Australian Standard AS3959 Construction of Buildings in Bushfire prone areas, including the preparation of bushfire hazard site assessments, BAL calculations based on a reduced Fire Danger Index of 100, and provision for flame zone construction standards.
- The need for multiple approvals for vegetation clearance for defensible space is removed as the BMO permit is the only permit process for vegetation removal.
- Where the required defensible space and a private bushfire shelter are provided, a dwelling may be constructed to the next lower corresponding BAL rating.
- Where the option of a private bushfire shelter (a Class 10c building within the meaning of the Building Regulations 2006) is adopted, a mandatory permit<sup>48</sup> condition with a s173 Agreement registered on the title are required.

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<sup>44</sup> Building Amendment (Bushfire Construction) Regulations 2011 (Vic)

<sup>45</sup> Planning Advisory Note 46 Bushfire Management Overlay Mapping Methodology and Criteria

<sup>46</sup> Clause 13.05 Bushfire

<sup>47</sup> See VC108 Explanatory Report

<sup>48</sup> Where the option of a private bushfire shelter is utilised, the Clause 44.-06-3 mandatory condition is: *'The bushfire mitigation measures forming part of this permit or shown on the endorsed plans, including those relating to construction standards, defensible space, water supply and access, must be maintained to the satisfaction of the responsible authority on a continuing basis. This condition continues to have force and effect after the development authorised by this permit has been completed.'*

## 8.1 The issues

- Has the risk from bushfire been effectively assessed?
- Have appropriate risk mitigation measures been identified and incorporated in relevant Project documents?

## 8.2 The EES assessment

The EES included targeted fire hazard investigations to assess:

- The compatibility of the Project with current planning policies and legislation.
- The potential for proposed activities to compromise public safety or environmental conditions by increasing the risk of fire or explosions which could result in fire.

A two 'pronged' approach was adopted to the management of fire events: managing the cause and severity of fire; and limiting the effect fire has on personnel, property and environmental assets.

Separate bushfire planning studies were undertaken for the proposed accommodation village (Appendix O1), the Currawong processing and administration facility (Appendix O2), and the Wilga portal (Appendix O3). The EES concluded:

- **The proposed village** will comply with all of the key bushfire planning requirements and planning policies. This includes BMO defensible space and other protection requirements. Detailed design may also specify a 10ML raw water staging dam at the village site which could also augment fire fighting reserve capacity.
- **Currawong** - as far as reasonably practicable, both engineering and operational controls will reduce the risk to a level that is low. Habitable structures are proposed to be of a BAL- 40 construction rating<sup>49</sup>, mainly due to limitations on available defensible space at the northern extent of the site and the risk of ember attack.
- As the **Wilga Mine Portal** is effectively a laydown area with no habitable buildings, defensible space is not proposed for this element. As occurs in most hard rock mines in Australia, an internal Mine Safety Refuge will be provided down the mine shaft away from any potential bushfire threat. Bushfire shelters are not appropriate for underground use, however radiant heat from bushfires will not be relevant due to the underground location that mine refuges and the refuges appear to be suitable for smoke management from either an above ground or underground fire.

The assessments emphasised that the robust, vigilant approach to operational health and safety risk management by mining operators enhances response capability and distinguishes the Project from many other uses addressed in bushfire legislation. It is normal procedure to train underground staff to a high level of competency in emergency situations, including in the use of contained air breathing apparatus. The controlled workplace (including the village) and ongoing worker training and practice in bushfire and emergency procedures will be implemented as part of the Project risk management strategy.

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<sup>49</sup> Although defensible space on the east, west and south sides of the site would enable a BAL – 29 construction, BAL – 40 construction rating is proposed.

The Environmental Management Strategy: Fire Protection<sup>50</sup> identifies management actions and performance criteria to address fire hazard. In addition to generic measures relating to fire fighting equipment and infrastructure, maintenance of an adequate water supply and access, hazardous substances measures and staff training, it is proposed to:

- Establish Asset Protection Zones (APZ) (buffers of managed vegetation to mitigate the risk below a 12.5 Bushfire Attack Level<sup>51</sup> (BAL) rating) and bushfire protection zones for each project area after completion of bushfire management plans;
- Subscribe to CFA declarations of 'Fire Danger Period' and 'Total Fire Ban', acknowledge declarations at daily planning meetings, and restrict or cancel activities as required by the CFA;
- Develop an emergency response plan that addresses fire response, evacuation, transport management and back up plans (including the use of bushfire shelters).

The Draft Work Plan<sup>52</sup> proposes to address bushfire risk through a combination of APZs, underground bushfire refuges-of-last-resort and emergency procedures. It indicates:

*The implementation of the recommended APZs is expected to afford an acceptable level of protection to people and buildings, although it will not prevent ember attack.*

*The concept of utilising the Currawong underground workings (or Wilga pre-Currawong development) as a bushfire refuge-of-last-resort for the entire site workforce (surface, underground and off-shift in village) will be further developed<sup>53</sup>. Very few case studies exist, but initial calculations of the various design factors such as oxygen depletion, heat generation and CO<sub>2</sub> poisoning seem to point to this as a plausible, albeit last resort option.*

*To provide refuge for 300 people for one hour, calculations show that an excavation of 5 m x 5 m x 50 m would be required, along with a battery powered air conditioner, lighting and an airtight door. It is clear that the underground workings of both mines have vastly greater volumes available.*

The EES and Draft Work Plan acknowledged the need to develop, in consultation with the CFA and DEPI, a clear implementation plan and a comprehensive Fire and Emergency Response Plan, detailing matters such as specific triggers for closure of facilities.

The Incorporated document associated with the Clause 52.03 exemption from planning scheme requirements outside the mine site addresses bushfire as follows:

- Plans are to show Bushfire defendable spaces zones

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<sup>50</sup> EES Table 20-13 Environmental management strategy: fire protection.

<sup>51</sup> BAL ratings are defined in AS 3959–2009 Construction of buildings in bushfire-prone areas and modified under Victorian legislation.

<sup>52</sup> See Section 7.9 Bushfire Mitigation.

<sup>53</sup> The Work Plan proposes one x 20 man refuge chamber and three x 4 man refuge chambers at Currawong and one x 12 man, one x 4 man refuge chambers at Wilga.



- The following condition applies:
  5. *Prior to the commencement of development at the village site a report outlining the Bushfire Protection Measures and a Fire and Emergency Response Plan must be prepared and approved by the CFA and the Responsible Authority. The bushfire mitigation measures as identified in the report, including those relating to construction standards, defendable space, water supply and access, must be implemented and maintained to the satisfaction of the Responsible Authority and the relevant fire authority on a continuing basis. This condition continues to have force and effect after the development authorised by this Incorporated Document has been completed and ceases when the mine closes and the buildings have been removed from the Residential Village Site.*

### 8.3 Submissions

DEPI is the land manager and the control agency responsible for responding to fire at the mine site. Although DEPI's submission to the EES did not address bushfire risk, at the Hearing the Inquiry sought the Department's views regarding fire management issues at the mine site. The response provided after the Hearing identified the *Forests Act 1958*, *Forest (Fire Protection) Regulations 2014* and the *Code of Practice for Bushfire Management on Public Land* (DSE 2012)<sup>54</sup> as sources that set out DEPI's fire management responsibilities, expectations and requirements for the mine site but did not provide any comment. DEPI supported fire management arrangements being formalised in a document sitting under the Work Plan, noting that DSDBI will ultimately need to be satisfied with such a plan.

The CFA is responsible for planning considerations and fire responses at the accommodation village and noted that the CFA would be consulted by the Victorian WorkCover Authority as part of the approval as a major hazard facility or Dangerous Goods storage and handling site. Although the CFA did not make a written submission to the EES, the Inquiry invited the CFA to provide advice at the Hearing, particularly regarding landscape scale fire risks.

The CFA confirmed that at a landscape scale, vegetation, weather and topography pose a real and significant threat of high intensity bushfires reaching the Project accommodation village and mine sites. Likely forms of bushfire attack would include fire front impact where activity is close to natural bush, spotting ahead of the main fire front and ember attack. North to north-westerly influenced weather patterns are associated with most adverse conditions in East Gippsland, along with significant weather pattern changes ahead of frontal weather changes when these events occur close to and southwest of uses in the life of a fire event. It was also noted that in a more extreme fire event, there is a potential for a convective driven fire to move east or southeast from the Tambo river valley in a manner unaffected by local conditions (including weather and topography). When fires of this nature reach areas of lower fuel, the convection column generally 'collapses', showering embers across the landscape and generating higher speed low level winds.

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<sup>54</sup> The Inquiry notes that the focus of this Code is not primarily directed at managing private uses. However, it does refer to Asset Protection Zone (one of four Fire Management Zones for fuel reduction burns) where the most intensive fuel treatment aims to provide the highest level of localised protection to human life and property and key community assets.

The CFA highlighted in relation to the mine operations that the site is remote and at an extreme risk of bushfire; however the use, the nature of occupants, central management and that absence of residential accommodation provide the opportunity for acceptable emergency response procedures. The CFA submitted in relation to the mine site:

26. *A comprehensive fire emergency response could form part of the already proposed Emergency Preparedness Response Plan. As an example the plan could set out the triggers for closure of the facilities on days of high bushfire risk such as Total Fire Ban Days and Code Red Days. In addition defensible space needs to be provided around the mine infrastructure/buildings to prevent escape of fire events from the mine and impacts on the wider landscape. The defensible space would also reduce the risk on mine infrastructure from a fire in the landscape. The extent of defensible space will need to accommodate an area of refuge for workers (and should be determined concurrently with the preparations of the emergency response plan).*

The CFA noted that the proposed workers village is at a relatively remote location with an extreme risk of bushfire and new accommodation of this scale (e.g. private dwellings) would usually not be supported. However, as only mine workers will be accommodated and emergency management responses can be implemented, the risk can be reduced to an acceptable level. The CFA only supports the accommodation on the basis that it is only used in association with the mine and then decommissioned. Bushfire mitigation measures that should be adopted at the accommodation village to reduce the risk from bushfire to an acceptable level include:

- Minimum construction standard BAL-12.5 for all buildings – in combination with provision of defensible space<sup>55</sup> to reduce the impacts of radiant heat and provide protection from ember attack.
- A minimum static water supply of 45,000 litres for the site for fire fighting purposes for both structural and landscape fire threats.
- Access to meet minimum CFA standards that ensure fire trucks can access the site.
- Emergency management plans, including trained and equipped personnel and an emergency response procedure - to ensure that triggers for evacuation of the village can be practically managed in an extreme emergency. This could form part of the already proposed Emergency Preparedness Response Plan.

The CFA sought modification/clarification of the following matters in the document to be incorporated in the planning scheme and the Draft Work Plan, as appropriate:

- Include a sunset/expiry clause specifying that the village and administrative activities are only permitted:
  - In association with the mine; and
  - On the basis that bushfire mitigation measure are implemented.

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<sup>55</sup> Defensible space provided in accordance with the plan 'Stockman Village – Site 02 – Option 02, drawing no 4345SP – 400SV – 03SV2 dated August 2013' and to the standard at Practice Note 656.

- Separate the bushfire mitigation measures that relate to:
  - The layout and form of the development (e.g. construction, water supply, access, defensible space). These measures need to be consistent with the landscape plan, native vegetation offsets, and the road design requirements.
  - Emergency response (e.g. a Fire and Emergency Response Plan).
- Incorporate in the Emergency Preparedness and Response Plan bushfire risk considerations such as:
  - The extent of required defensible space around mine infrastructure and at the accommodation village (shown on plans) and specify vegetation management.
  - Monitoring of the implementation of bushfire mitigation measures.
  - Responses on Total Fire Ban and Code Red days.
  - Training and equipping personnel to respond to bushfire/structure fires.
  - The relationship between the management of the village and the mine site.
- 'Turned on' an exemption from BMO permit requirements (in the Incorporated Document or in a schedule to the BMO) if agreed mitigation measures are implemented.

A response from the Proponent to bushfire (and other matters) raised during the Hearing was circulated to parties. It advised:

- The Work Plan will commit to the preparation of detailed sub-plans, such as the Bushfire Response Plan.
- The Work Plan proposal to use the workings as a refuge of last resort for the entire site workforce requires clarification as these refuge chambers were specifically intended to address underground fires.
- Detailed bushfire management measures within the Bushfire Response Plan will be developed in consultation with the CFA and DEPI before construction starts. Independent Technical Review of bushfire management is not envisaged.
- Whereas the CFA recommended that defensible space and vegetation management around mine infrastructure be incorporated into Work Plan, the Proponent will confirm the areas to be cleared for bushfire protection but considers it is more appropriate to include this detail in the Bushfire Response Plan.
- Clarification is required to both the Work Plan and Incorporated Document that a single Bushfire Management Plan will be developed for the Stockman operations. This Plan will also satisfy the requirement for a 'fire response and readiness plan' in clause 6.3 of the MIN5523 mining licence.

After the Hearing the CFA responded that it supports the deletion of the specific references to refuge chambers and agrees that the design of any 'shelter in place' options needs to be resolved as part of an integrated emergency response plan that considers movements between the sites and areas of defensible space.

## 8.4 Discussion

The Inquiry found the CFA submission particularly helpful, including the presentation of modelling of one scenario<sup>56</sup> of a fire's progress initiated to the west of the Project which illustrated the rate at which fire moves and the limited timeframe for key decisions, even in conditions that are much less dangerous than occurred during the 2009 fires.

The EES assessment of risks from bushfire applied the relevant methodology for determining construction and defensible space associated with the mine infrastructure and, although the BMO does not apply to the accommodation village, the defensible space and construction standards were applied as if the overlay applied. Nevertheless, the Inquiry considers the assessment did not fully recognise the extreme fire risk of this landscape. If not for the expectation that workers will be fit and management will ensure appropriate training and fire response protocols are in place, there would be a predisposition against placing large numbers of people in this environment, as illustrated by the CFA condition that the accommodation village must be associated with the mine and be decommissioned when the mine closes.

Further development of measures to address the extreme fire hazard in the area is needed to ensure the safety of mine workers. In particular, we agree with submissions from the CFA, which were acknowledged by the Proponent, that an integrated plan is required for the whole of the Stockman operation, there should be further consideration of the role of fire refuges and specific triggers for altered work practices and evacuation of the mine and the accommodation village should be established.

The EES response to fire risk places significant reliance on APZ and fire refuges to ensure the safety of personnel. It anticipates that refuges at the mine will serve the accommodation village. For example, Appendix X comments under bushfire:

*.... the village will accommodate an able-bodied workforce that could defend the village or be easily transported to the mine site.*

The Inquiry notes that the Fire Danger Index adopted under the BMO is now lower than when the EES assessment was undertaken and, for single houses, private bushfire shelters are explicitly identified as a measure to address fire risk. However, as the Proponent acknowledged, mine safety refuges are designed for the purposes of refuge in underground fire or gas outburst scenarios rather than a bushfire refuge standard and their function in fire response planning is an issue to be reviewed with CFA and DTPLI. We note that the CFA identified a range of issues to be addressed with regard to refuges, such as challenges in reaching the portal during a fire, potential loss of power, assurances that ventilation is maintained. The Inquiry expects that refuges at the mine site will only have a role in accommodation village fire responses where other options, such as early evacuation, are not viable. This may be, for example, when access to other safer places is more dangerous due to the particular circumstances of a fire event.

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<sup>56</sup> The behaviour of a starting fire 10km north-west of the Project on a day with a 100 Fire Danger Index indicated it would be 3 hours before access for evacuation was compromised.

The Inquiry notes that the EES, the Draft Work Plan and the relevant Environmental Management Plan and the Incorporated Document do not identify specific responses at times of high fire risk, such as Total Fire Ban and Code Red days. These protocols, which may impose significant constraints on operations, should be developed in consultation with the CFA and DEPI.

As recognised in the EES and highlighted by the CFA, the nature of the landscape scale fire risk in this case, together with the nature of the mine and accommodation uses, warrant a project specific Fire and Emergency Response Plan. We agree with submissions that this Plan should:

- Assume a high level of self-reliance in emergency response planning as the remoteness of the site means that it should be assumed that fire and emergency services are unlikely to attend.
- Mitigate the risks associated with fires to project personnel and infrastructure and the wider area that:
  - Emanate from the Project site.
  - Emerge from the wider area, taking account of the fire intensity relevant to the vegetation (fuel load) on the site and the approach to it.
- Establish robust communications with fire and emergency service providers and surrounding land owners/mangers to ensure:
  - Early advice of fire conditions and incidents.
  - Co-ordinated responses.
- Address responses to specific levels of fire danger, including precautions and changes in work practices in fire danger periods, fire fighting responses, and evacuation triggers and protocols.
- Review the design of refuges and their utility as a last resort.

Close liaison with the CFA, DEPI, DSDBI and Council regarding bushfire measures and plans is required in both the:

- Detailed design for the village and the mine; and
- Preparation and implementation of a single integrated Fire and Emergency Plan for the mine site and the accommodation village. The Work Plan, the planning scheme Incorporated Document and any other relevant approvals should then refer to the same plan.

It was apparent at the Hearing that Stockman and inter-agency operational responsibilities also need to be determined to ensure effective responses in the event of a fire.

### **Conclusions**

- The EES adopted an appropriate methodology to identify defensible space and construction standards.
- Further consideration of a number of matters is needed, including the role of fire refuges, responses to high fire danger conditions, operational and evacuation protocols and responsibilities in the event of fires on the site and in the wider area.
- An integrated Fire and Emergency Response Plan for Stockman operations that recognises the remoteness and landscape scale fire hazard of this area should be

prepared to the satisfaction of the CFA and DEPI. The Work Plan, the Incorporated Document associated with Clause 52.03 and other approvals should refer to this plan.

### **Recommendations**

- **Prepare an integrated Fire and Emergency Response Plan for Stockman operations, to the satisfaction of the Country Fire Authority and the Department of Environment and Primary Industries, that recognises the remoteness and landscape scale fire hazard of this area. The Work Plan, the Incorporated document associated with Clause 52.03 (3.1 Residential Village - condition 5) and other approvals should refer to this plan.**
- **Review the role of fire refuges in the fire response plan and the specifications for proposed mine refuges.**
- **Identify specific responses and protocols to address times of high fire danger such as Total Fire Ban days and Code Red days.**
- **Clarify fire response roles at the mine site (between the Proponent, the Department of Environment and Primary Industries and the Country Fire Authority).**

## 9 Transport and Roads

### 9.1 The issues

- The Impact of increased heavy vehicles on:
  - Tourist traffic using the road from Bairnsdale to Omeo.
  - Road safety on the roads from Bairnsdale to the site.
  - Road maintenance requirements from Bairnsdale to the site and responsibility for additional costs generated by the Project.

### 9.2 What is proposed?

Road transport is proposed to be used for all materials in and out of the mining operation and is addressed in Chapter 4.8 and Appendix L of the EES.

Road transport will include the transfer of the processed ore in covered half containers by B double trucks to the Port of Geelong. The provision of quicklime for the processing facility is also likely to use B double trucks. The transport of gas for the on-site power plant will be by semitrailer as will the transport of a wide variety of other construction and operational materials and chemicals required for the mining operation. It has been estimated that the mine will generate an additional average of 40 heavy vehicles per day during construction and 68 heavy vehicles per day during the operational phase; with peaks of 62 and 90 respectively.

In addition to line marking of all intersections, VicRoads original submissions to the EES and the AECOM EES assessment (Appendix L) identified the need to upgrade the intersections of the Omeo Highway with Benambra Road and Day Avenue. The Proponent has indicated its agreement to fund these works. As these works were not contentious, they are not discussed further in this report.

The Omeo Benambra Road will be used by staff travelling to the proposed staff car park at Benambra.

### 9.3 Evidence and submissions

The High Country Branch of the Country Women's Association of Victoria Inc. expressed concern that the increased traffic of 10 B-double trucks per day, along with the considerable other truck traffic using the Great Alpine Road, would have a detrimental effect on the road's condition and also on tourists and businesses. The same concerns were raised by Ms Kibble and Ms Crisp. However, others, such as the Omeo Region Business and Tourism Association Inc., supported the Project, identifying the creation of additional employment opportunities, improvement of skills and expertise and increased optimism as benefits.

Mr O'Connell supported the Project in terms of economic development for the region but noted a concern in relation to the Great Alpine Road. In his opinion the road already carries a lot of B-doubles related to the timber industry and is not up to the standard that it is called for. He submitted that there needs to be widening, sight benches constructed and provision for overtaking both ways. In his opinion the mine and *'existing timber and agriculture, industries deserve a decent and safe road to move their produce out of the region.'*

Mr Sinnott raised concerns in relation to dust from traffic along Limestone Road, which is unsealed. He contended that during holiday periods there is considerable increase in daily traffic, which was not recorded by the Proponent's traffic counts which were undertaken during the winter months. He therefore anticipated that dust from increase in daily traffic due to the mine operation plus the higher numbers of holiday period traffic may impact on the eye health of his cattle. Despite the EES stating that '*Stockman will implement a series of dust control measure*', he believed that more rigorous monitoring and identifiable long-term remedial measures are called for.

Mr Hallam raised concerns in relation to the existing very poor condition of the Bruthen to Benambra Road and submitted the quality of the road needs to be improved and maintained to a higher standard than at present to ensure the safety of all road users.

East Gippsland Shire raised concerns in relation to parts of the route being on School bus route between Omeo and Benambra and sought restrictions on truck travel during school bus times. Their submission also advised of a requirement for the widening of McCallum's Road to provide a minimum 200mm depth with a width of pavement of 6m plus 0.5m shoulders rather than passing bays as proposed by the Proponent.

Chapter 19.5.1 of the EES advises that, as the ore transport trucks would be operating continuously between the site and the Port of Geelong, it would not be possible to sequence them to avoid the Benambra to Omeo Road during school bus times. At the Hearing we were advised that the drivers would be regularly undertaking the trip and their training and code of practice would assist in ensuring that safety was a key concern, particularly in relation to School bus times.

VicRoads noted that, despite the EES scoping requirements specifically highlighting infrastructure damage as an issue that needed to be addressed, the EES does not specifically address this issue in any detail as far VicRoads' road networks are concerned.

Its submission focused on two aspects:

- The requirement for the upgrading of two intersections; being the Omeo Highway and Benambra Road intersection and the Omeo Highway and Day Avenue intersection, which was agreed to by the Proponent at the Hearing.
- The contributions from the Proponent to mitigate impacts on to the roads from heavy mine vehicles as a result of:
  - Increased pavement distress;
  - Increased likelihood of flushing of existing sprayed seal surfacing necessitating treatments to address skid resistance deficiencies; and
  - Impacts on the type of future sprayed seal treatment required.

The evidence from Mr Andrew Papacostas, a VicRoads pavement specialist, addressed pavement design and wear issues. He identified that the proposed large increase in heavy vehicles servicing the Project will increase pavement distress and maintenance requirements and impact the future type of surfacing required on the VicRoads roads. He advised that the Benambra Road and Omeo Highway ('C' class roads) and the Great Alpine Road (a 'B' class road) were not designed to carry the very heavy trucks associated with the mine. In his analysis the loads to be experienced on VicRoads roads will increase from 40% to 750%.



Mr Padovan of VicRoads Eastern Region addressed the Inquiry on the predicted increase in cost of the maintenance of the roads. VicRoads estimated maintenance costs based on a detailed analysis of actual maintenance costs over the past 5 years for the sections of road to be used by the mine trucks. Table 4 (from VicRoads' submission to the Inquiry) summarises the contributions sought by VicRoads.

Table 4 Road maintenance contribution sought by VicRoads

Road Name	Additional Maintenance Cost (\$)
<i>Routine Maintenance</i> - Increase in Pavement Distress Costs.	\$150,000 per year over the course of the mining operation.
<i>Periodic Maintenance</i> - Increase in Likelihood of Flushing to Existing Sprayed Seal Surfaces and Associated Costs.	\$600,000 Total - over the course of the mining operation. Note: It is proposed that this cost could be arranged under a 'deed' agreement and drawn upon as required during the course of the Project.
Periodic Maintenance Modification to Future Programmed Sprayed Seal Treatments and Associated Costs	No costs proposed. VicRoads to manage modifications and associated costs during the course of the mining operation.
Pavement Rehabilitation	No costs proposed.

Mr Padovan advised that the budget available for road maintenance in the region is fixed and that any increased spending on the roads due to the mine would have to be taken from other maintenance projects, unless additional funds are provided by the Proponent. He advised that road maintenance deeds had been put in place for other projects<sup>57</sup>.

VicRoads highlighted that the Draft Work Plan identifies a management action to establish and maintain an agreement with the East Gippsland Shire to assist in the maintenance of public roads used for the Project and argued similar arrangements should apply to roads that are the responsibility of VicRoads.

In their written submissions, VicRoads requested the following conditions:

*'Prior to commencement of the development, intersection and road safety improvement works on the arterial roads identified in the traffic impact assessment. The design and constructed to the satisfaction and at no cost to VicRoads.*

*Prior to commencing work, a pavement condition survey of the travel routes is conducted to establish existing road conditions. The survey must be completed prior to any heavy vehicle operation to the mine. The survey must be in the form of a video of the route and a written report agreed to by both parties.*

*Prior to the works commencing a maintenance contribution agreement between VicRoads and Independence group is signed by both parties and executed.*

*Ensure that a code of conduct is initiated for the heavy vehicle drivers for the Stockman project.'*

VicRoads advised that a Transport Management Plan (TMP) should be included in the Work Plan to enable VicRoads and the East Gippsland Shire to ensure that transport issues are

<sup>57</sup> For example, the *Road Maintenance Deed. Bald hills Wind Farm Pty Ltd /Roads Corporation 23 May 2013.*

appropriately addressed. The TMP should be developed by a working group comprising the Proponent, VicRoads, East Gippsland Shire and relevant emergency services.

In relation to contributions sought by VicRoads for the road maintenance, Mr Power, acknowledged that the Proponent has the resources to address local issues but challenged the justification for 'another tax'. He referred to modelling by Deloitte regarding mining as a source of government revenue, and highlighted the significant funds the government would receive from royalties from the Project, although he acknowledged that in Victoria these funds are not directed to specific areas or purposes associated with the mining activity.

Mr Power questioned whether there is a specific head of power for levies for road maintenance. He noted that some examples cited by VicRoads were contributions for road maintenance generated by non-mining proposals regulated by planning permits or project specific planning scheme provisions (such as wind farms). While he acknowledged that some EES Inquiries have recommended off-site road works (such as for minerals sands projects in north-western Victoria), he had '*significant reservations*' about whether the *Mineral Resources (Sustainable Development) Act* (section 40) and schedule 15 to the associated regulations enable the imposition of obligations for matters outside the mining tenement.

## 9.4 Discussion

The Inquiry agrees with the AECOM assessment for the EES (Appendix L) that:

*The main issue in regards to transportation is not the number of vehicles (as the road network has sufficient capacity to cater for the increased traffic) but the safety of the community and Stockman Project vehicle occupants. The route proposed is the safest existing route (from the identified options). Risk is further reduced through the provision of the car park in Benambra for the workers (instead of driving to/from the workers accommodation).*

The resident submitters' concerns in relation to the impact on tourist traffic were to some extent countered by the local tourist authority's support of the Project. We are unable to identify if the increased truck traffic will restrict tourist visits but accept that there may be increased traffic delays, especially due heavy vehicles on steep, winding sections of the roads. In our opinion the potential increased traffic delays is an issue to be resolved by VicRoads when traffic volumes and delays experienced make it appropriate to do so. We accept that the roads have adequate capacity for the current traffic volumes and additional traffic generated by the mine.

We accept the Council's position to require the widening of McCallums and Limestone Roads rather than providing passing bays as, unlike mine vehicles, the other users of the road would not have the ability to communicate with the trucks, the roads are subject to adverse weather conditions and the roads are both winding and unsealed. We note that Chapter 6.2 of Appendix L to the EES recommends a minimum pavement width of 6m for the main carriageway with 1 metre of unsealed shoulder. As the heavy trucks would be expected to regularly use the shoulders when passing we recommend that the shoulders be provided to the same standard as the main pavement area.

With regard to the impact of dust from trucks on Limestone Road, we note that this is a public road and dust management is proposed. The landowner could implement measures such as planting to intercept dust if it proves to cause problems for stock.

The Inquiry endorses the position by VicRoads that the approved Work Plan must include a TMP developed by a working party comprising the Proponent, VicRoads, East Gippsland Shire and relevant emergency services. The TMP should address, amongst other things, safety measures required at intersections and along the routes, preferred transport routes, driver training, a code of practice for drivers, work site speed limits, management of road closures and maintenance, clearance of native vegetation along routes, site and off-site road maintenance requirements, contractor registration, etc.

We also believe that all drivers using the Benambra car park should be required to adhere to a driver Code of Conduct which must also be included in the TMP.

With regard to contributions towards the maintenance of VicRoads managed roads, the questions are will the Project generate additional costs; if so, how much should the Proponent contribute to those costs; and is there a head of power to require contribution or payment of a levy, which would determine the mechanism to establish the obligation for payments.

The Inquiry is satisfied that there is a nexus between the Project and additional road maintenance works. We consider expert evidence and submissions from VicRoads presented a sound analysis of additional road maintenance requirements generated by mine trucks<sup>58</sup>.

We note that the Project will generate significant revenue to the State government, there is an argument that the provision and maintenance of the State's higher order roads is an element of economic development strategies, and the substantially higher registration fees for heavy vehicles, at least in part, recognises the additional demands they create for road maintenance. At the Hearing the Inquiry queried the extent to which registration fees are intended to address maintenance demands of different vehicle types and whether arrangements for contributions to road maintenance for trucks serving timber industry may provide a model for road maintenance contributions associated with this Project. Parties were not in a position to respond.

Thus we consider there is a policy issue for the Government to determine, rather than the Inquiry, regarding whether additional maintenance costs (that are not recovered by truck registration fees) should be absorbed by government on the basis that the development and maintenance of the road network is an integral part of economic development strategies. If this position is adopted, additional funding to VicRoads to maintain the roads affected by the Project should be provided to maintain safe conditions.

If this policy position is not adopted, in our opinion, it is reasonable for the Project to meet the costs of mitigating impacts from the Project on road infrastructure. We note that the Draft Work Plan includes an arrangement between the Proponent and the East Gippsland

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<sup>58</sup> We note that the annual registration of a B-double prime mover is currently in the order of \$10-11,000 (depending on the number of axles) compared to \$270 for private vehicles.

Shire for the maintenance of local roads, but does not extend to VicRoads, and the Proponent agrees to meet the cost to upgrade two intersections.

The quantum of contribution for road maintenance was not agreed, however, both VicRoads and the Proponent accepted that a contribution from the Proponent is reasonable. We consider the analysis presented to the Inquiry establishes a sound basis for contributions to the maintenance of roads used by mine trucks. The contribution to be required could be refined to address matters such as:

- Audits of existing road conditions and road conditions during the life of the mine and when the mining operations cease.
- Verification that road works to mitigate impacts from mine trucks are actually delivered.
- If requirements for road works that can be attributed to mine trucks prove to be less than expected, provisions could be included for an adjustment to the contribution.

As the Inquiry does not include a legal member, we do not make a finding on the legal power to require a contribution for works outside the mining tenement to mitigate impacts from the operation of the mine. Our recommendations are on the basis such a power exists. A range of mechanisms to secure contributions could be considered<sup>59</sup>.

### Conclusions

- While the traffic volume increase due to the proposed mine is well within the capacity of the existing roads, the Inquiry accepts that the structural capability may be compromised and maintenance requirements are likely to increase due to use by the mine related heavy vehicles.
- If the Government does not determine that maintenance of the road network should be funded as part of its economic development strategies:
  - The analysis of presented by VicRoads at the Hearing should form the basis for Proponent contributions to the maintenance of roads managed by VicRoads.
  - The Work Plan and an agreement with both VicRoads and East Gippsland Shire Council should require the Proponent to contribute to the increased up keep of the roads recommendations.

### Recommendations

- **The Proponent fund line marking of intersections along the haulage route, where required, and the upgrade of the intersections of the Omeo Highway with Benambra Road and Day Avenue.**
- **Develop an Integrated Transport Management Plan, that:**
  - a) Addresses all elements of the Project, including road maintenance.**
  - b) Includes a Driver Code of Conduct.**

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<sup>59</sup> For example, the Draft Works Plan provides for road works beyond the tenement, or Mr Bartley for VicRoads referred to legislation relating specifically to road infrastructure. A Development Contributions Plan (DCP) under the Planning and Environment Act may also be an option, although we note the DTPLI Development Contributions Guidelines (as amended March 2007) indicate the scope of DCPs includes capital costs to extend the life of an asset but they are not intended to provide for recurrent funding of maintenance.

- c) Is developed by a working party comprising the Proponent, VicRoads, East Gippsland Shire Council and relevant emergency services.**
- d) Is required by the Work Plan and as a condition of the Incorporated Document associated with Clause 51.03 of the East Gippsland Planning Scheme.**
- **The Government determine whether road maintenance works to roads managed by VicRoads that are generated by the Project should be funded by Government to support economic development strategies.**
- **If contributions by the Proponent to the maintenance of roads managed by VicRoads are required:**
  - a) Use the analysis presented by VicRoads at the Inquiry hearing as the basis for contributions.**
  - b) Before the Project starts, execute agreements between VicRoads and Council with the Proponent to maintain and extend the life of roads used by Project trucks.**
- **Require the Proponent to provide for the cost of the upgrading the unsealed sections of Limestone and McCallum's Roads to a 6m wide 200mm minimum unsealed pavement plus 1m full depth shoulders.**

## 10 Linear Infrastructure

### 10.1 What is proposed?

Outside the mining licence area it is proposed to construct the following linear infrastructure:

- Groundwater will be pumped from the Benambra bore field to the mine site through a pipeline running above ground along the northern side of Limestone Creek Road and McCallums Road, generally within the existing road reserve. The pipeline of 150mm diameter will generally be above ground except where it is necessary to bury it to cross the road, to avoid interfering with access, to protect the pipeline, or to avoid private property.
- A pump station will be required at Benambra and at four other locations along the water pipeline route. Each pump station will include a water storage tank (22 kilolitres), pump and fuel tank.
- An underground powerline in the middle of McCallums Road from the mine site to the accommodation village.
- Localised widening of McCallums and Limestone Roads.

A number of Planning Scheme zones and overlays apply to the linear infrastructure corridors:

- Sections of McCallums Road and Limestone Road are in the Farming Zone and Public Conservation and Resource Zone (PCRZ).
- Sections of the water pipeline are also in the PCRZ.
- Part of McCallums road is affected by Environmental Significance Overlay – Schedule 16 (ESO16) and sections of the water pipeline are affected by ESO17.

It is proposed to widen several short sections of the carriageway of Limestone and McCallums Roads to provide a 6m wide carriageway with a 1m wide shoulder.

Native vegetation removal will be required to facilitate localised widening along Limestone and McCallums Road and for the construction of the water pipeline and pump stations. A cleared corridor of up to 8m width is proposed for the pipeline. However it is anticipated that the final alignment of the pipeline will limit the amount of vegetation required to be removed to be less than an 8m wide corridor for the entire length.

Construction of the water pipeline will require several creek crossings. Approval from the relevant Catchment Management Authority is required for works in or adjacent to a waterway. Draft applications for works approval are provided in the EES at Appendix Z. The draft applications indicate that a Construction Management Plan will be prepared in conjunction with detailed design to ensure all necessary measures are put in place to protect creek/river and banks.

It is proposed to introduce an Incorporated Document via an amendment to Clause 52.03 to the East Gippsland Planning Scheme to provide planning approval for the linear infrastructure components. A draft Planning Scheme Amendment is provided in the EES at Appendix X. The Amendment provides for the use and development of land for the purposes of a water pipeline and pumping stations and an underground power line. It also

provides for road widening of Limestone and McCallums Roads and for the lopping, removal or destruction of vegetation for the linear infrastructure corridors. These developments are subject to conditions specified in Section 3.4 of the draft Incorporated Document. In summary these conditions require:

- Before commencement submission of location and site plans for approval.
- Submission of a Construction Management Plan for approval that addresses, amongst other things, measures to protect watercourses, vegetation, fauna, archaeological sites, weed management and vehicle management.

## **10.2 EES Assessment**

The key potential environmental impacts associated with the linear infrastructure have been considered in the specialist technical reports supporting the EES and are summarised in the Appendix X as:

- Loss of native vegetation as a result of clearing for the pipeline and road widening.
- Potential impacts on the Environmental Significance identified in ESO16 and ESO17.
- Potential cultural heritage impacts associated with road widening.

The EES indicated road widening and construction of the water pipeline and pump stations will result in the removal of 9.86 hectares of native vegetation and 15 Large Old Trees<sup>60</sup>. This estimate is likely to reduce when detailed design is finalised. Clause 52.17 of the Planning Scheme requires this removal to be offset (see discussion in Section 7).

EES Appendix X provides an assessment of the native vegetation impacts within ESO16 and ESO17 based on a review by Ethos NRM of the linear infrastructure routes in relation to the threatened species identified in the ESO's. It concluded that the native vegetation removal proposed is not likely to pose a threat to the ecological sustainability of the threatened species identified in the ESO's.

Sections of Limestone and McCallums Roads are in area of Aboriginal Cultural Heritage Sensitivity. The EES<sup>61</sup> found 11 Aboriginal cultural heritage places (artefact scatters) along McCallums Road. The draft Planning Scheme Amendment proposes that mitigation measures will be addressed in a Cultural Heritage Management Plan. Protection of cultural heritage values is discussed in Section 12 of this report.

## **10.3 Submissions**

In its written submission to the Inquiry, DEPI indicated that it is satisfied with the details of the draft Amendment, the assessment of the offset requirements and the arrangements that are in place to secure the offsets.

## **10.4 Discussion**

The Inquiry has reviewed the assessment provided on the impact of native vegetation removal on ESO16 and ESO17 and accepts the advice that there is not likely to pose a threat to the ecological sustainability of threatened species identified. However as there was no direct fauna assessment of the linear easements<sup>62</sup>, a precautionary approach of visual

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<sup>60</sup> Expert Witness Statement, Vegetation and flora, Ms Spencer, 2014.

<sup>61</sup> Australian Cultural Heritage Management, 2013.

<sup>62</sup> Terrestrial Fauna Expert Witness Statement, Mr Miller, 2014.

inspections and, if necessary, pre-construction surveys as part the fauna monitoring strategy should be included in the Construction Management Plan.

We note that detailed a vegetation offset proposal have been presented by the Proponent and we are satisfied that this addresses the offset requirements arising from the proposed removal of vegetation for the linear infrastructure. The draft Incorporated document addresses this issue by requiring:

- A written explanation of the steps that have been taken to avoid, minimise and offset vegetation removal
- Approval and initiation of an offset plan, to the satisfaction of DEPI, before any native vegetation is removed

The draft Incorporated Document requires the preparation of a Construction Management Plan. The Inquiry considers that matters relating to minimising vegetation removal, protecting waterways during road works and crossings, protecting cultural heritage are capable of being managed through this process. With the addition of a requirement to implement a vegetation offset and undertake pre-construction fauna monitoring based on inspection of the route, we believe the conditions specified in the Incorporated Document are appropriate.

We note that a number of issues relating to title and road reserve boundaries and their alignment with the actual location of roads will require resolution.

The Inquiry is satisfied that the proposed planning framework for linear Infrastructure is appropriate.



# 11 Worker Accommodation and the Benambra Car Park

## 11.1 Worker accommodation

### 11.1.1 The issues

- Would a Benambra location for the accommodation village be more appropriate than the proposed site which is closer to the mine?
- Is it appropriate to amend the planning scheme to allow the accommodation village?

### 11.1.2 What is proposed?

Housing for up to 17 senior management and technical personnel will be provided in Omeo. Approximately 75% of the Project workforce who live outside a designated local area<sup>63</sup> will be required by Stockman to reside at the accommodation village when rostered on. Most workers will use the shuttle bus transport between the mine, the village and Benambra (see Section 11.2). A small number of senior personnel, contractor and service vehicles will have access to the accommodation village.

A purpose-built worker accommodation village is proposed on the corner of Limestone and McCallums Roads, approximately 10 kilometres north of the Currawong plant and about 22 kilometres (by road) north-east of the Benambra. It comprises:

- Up to 180 motel-style rooms
- Clustered support and recreational buildings that include a commercial kitchen, dry and wet mess, outdoor barbeque areas, a gymnasium, a multi-purpose sports court, a recreation/internet/reading room
- Car parking and bus pick up areas
- Plant to treat wastewater from the accommodation village and the mine site. Treated water will be stored in an 18ml a dam about 150m to the east of the village for irrigation of an area to the south of the village during the summer (see Section 12.3 of this report).
- Potable water supplied from the Benambra bore field and supplemented by rain water harvesting from roofs. Potable water will be treated by reverse osmosis or similar methods if required. Detailed design may also specify a 10ML raw water staging dam on the site which could augment fire fighting capacity.

Construction to snow region Category A standard and measures to address bushfire risk (see Section 8) are proposed.

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<sup>63</sup> Nominally, those not residing within a 30 minute drive of Benambra township.

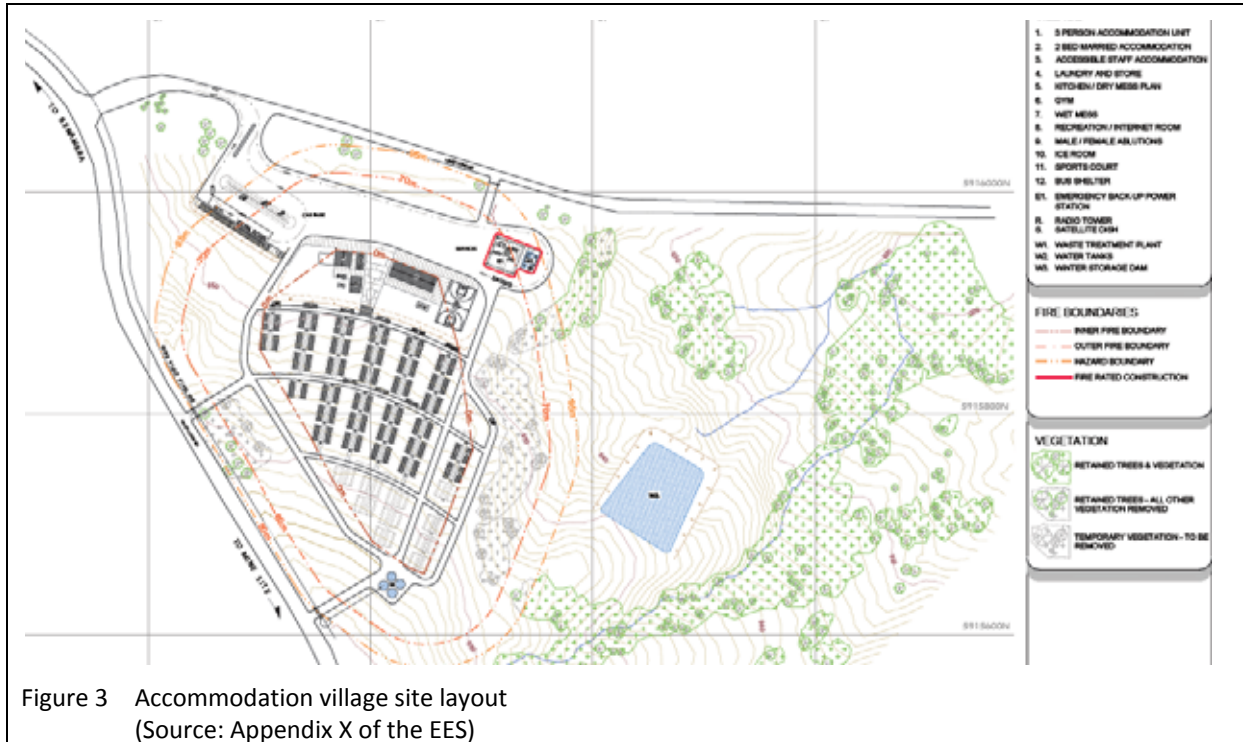


Figure 3 Accommodation village site layout  
(Source: Appendix X of the EES)

The proposed village would probably be characterised under the planning scheme as a ‘residential village’, which is prohibited, or Group accommodation, which requires a permit, in the Farming Zone and a planning permit would be required to remove native (Clause 52.17). The proposed Amendment to Clause 52.03 ‘Specific Sites and Exclusions’ and the associated Incorporated Document allow the use and development of the accommodation village and removal of native vegetation in accordance with conditions specified in Part 3.1 of the Incorporated Document. These conditions require, in summary:

- Plans for approval by the Council comprising:
  - The site layout<sup>64</sup>, generally in accordance with the Stockman Residential Village Concept Plan that forms part of the Incorporated Document, (Figure 3 above),
  - a schedule of external materials and colours,
  - a waste management plan,
  - detailed engineering plans showing the internal road layout, driveway crossovers, drainage and stormwater management
  - a Construction Management Plan
- A Bushfire Protection Measures and a Fire and Emergency Response Plan approved by the CFA and the Council. The bushfire mitigation measures, including construction standards, defendable space, water supply and access, must be implemented and maintained to the satisfaction of the Council and the relevant fire authority.
- Landscaping to be maintained to the satisfaction of the Council.
- Light spill on the surrounding area to be limited.

<sup>64</sup> The plans must show: Site dimensions, setbacks from Limestone and McCallums Roads; location and siting of buildings; indicative elevations; waste storage locations; road and pathway widths; car and bus parking spaces dimensions; the location of sewage treatment plant and winter wastewater storage dam; bushfire defendable spaces zones; native vegetation to be removed; and landscaping.

- After closure and rehabilitation of the mine site:
  - buildings, services and plant must be removed, subject to future discussions about ongoing agricultural use of infrastructure.
  - water storage or effluent disposal areas should be decommissioned, checked for residual contamination and backfilled.
  - disturbed areas must be restored in accordance with a rehabilitation plan to be prepared and approved before the rehabilitation works start.

### **11.1.3 The EES assessment**

The EES addresses worker accommodation in Chapters 4.13, 5.10 and Appendices K and X. An indicative village design, landscape plan, and visual impact assessment were included at Appendix J2 of the EES. The Social Impact Assessment in Appendix R (discussed in Section 3 of this report) is also relevant.

From an initial list of six potential accommodation village sites, two were scrutinised in greater detail – Sloane Street, Benambra and the Commins site about 22km from Benambra. The EES assessment of the two main alternative locations concluded:

- A location near Benambra would be generally more consistent with planning policy, have better potential to generate spin-off benefits for local business than a more remote village location and would be less constrained by impacts on native vegetation or Aboriginal cultural heritage materials (if present).
- A site as close as practicable to the mine operations area was preferred as it provided significant operational and safety benefits associated with:
  - shorter commuting times (village to mine site) after 10 – 12 hour shifts; and
  - lower risk of social disruption arising from introducing a large non-resident into a small town and potential for impacts from anti-social behaviour.

### **11.1.4 Submissions**

Council identified the location of the workers village as one of the more complex and contentious matters for resolution between Council and the Proponent. Council initially preferred the Benambra location to secure the greatest benefits for the community. However, it ultimately supported the remote site based on the EES analysis undertaken. This support for the proposed Commins site:

- Recognised the mine OH&S, management and operational imperatives, (given the distance of the mine operations from Benambra and Omeo);
- Balanced opportunities for existing communities to benefit from additional people and activity while ensuring that negative impacts are minimised;
- Acknowledged the limited services at Benambra and the potential for a major influx of a predominantly male population (more than the existing population of the town) to seriously impact on the functioning of the Benambra community;
- Reflected greater confidence that the site can be designed to appropriately manage the impact of potential wildfire events and accommodate onsite services;
- Was based on the conclusion, acknowledged by the Proponent, that the company operating policies and procedures for managing and encouraging appropriate community interactions would determine successful outcomes for both the mine and the community.

### 11.1.5 Discussion

While conventional wisdom would support town based accommodation, the Inquiry recognises that the EES has carefully considered the relative merits of alternative accommodation village locations and we accept the conclusions reached.

These conclusions recognise that Benambra is a small town with limited facilities to service the workforce or that could benefit from the additional workforce population. The services and facilities available comprise: a hotel, a general store (with post office and café), a motor repair business, a 'neighbourhood house'<sup>65</sup>, a community hall, and a recreation reserve (formerly the home of the Benambra Football team, which is now amalgamated with Omeo). The primary school closed in 2002 and students now travel to Omeo for primary school and Swifts Creek for secondary school.

Given the limited services and non-mine employment opportunities, families are unlikely to relocate to Benambra and the workforce is likely to be predominantly male. Integrating the influx of workers, which would more than double Benambra's population<sup>66</sup>, would pose significant challenges.

Importantly, the proposed workers village site would enhance safety by minimising independent travel on alpine roads, often in the dark, particularly after long mine shifts and in winter when roads are icy.

The EES indicates that a number of factors combine to result in the accommodation village having minimal environmental, visual, or amenity impacts, during operation. Limited impacts on native vegetation will be offset, there are no sensitive receptors (residences) in the area. Further, Appendix J2 illustrates that the proposed site has a limited viewshed due to topography and existing/proposed landscaping (to be managed for bushfire risk), viewer numbers are low and the installation of baffled and motion sensor lighting is proposed. The proposed requirement to decommission the village and restore farming use after closure means that this limited impact will be temporary.

The Inquiry is satisfied that:

- The proposed planning scheme amendment is appropriate to facilitate the Project.
- Conditions specified in the Incorporated Document, including secondary approvals relating to bushfire risk mitigation and sewerage treatment (see discussion elsewhere in this report), provide an appropriate framework to address relevant planning issues.

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<sup>65</sup> The neighbourhood house is the venue for local groups to meet and its staff act as a referral service for financial services, social and community services, the Shire and other services.

<sup>66</sup> The 2011 Census indicated the 'Benambra locality' had a population of 249, which included those in the surrounding area. As noted in EES Appendix R (Akin Planning) the 2006 census indicated that Benambra had a township population of 114.

## 11.2 The Benambra car park

### 11.2.1 The issues

- Is the proposed exemption for the Benambra car park from requirements from a planning permit appropriate?
- Will the amenity of sensitive uses be protected?

### 11.2.2 What is proposed?

To maximise safety and minimise traffic on roads, it is proposed to operate a ‘park and ride’ shuttle bus service from a proposed car park at Foster Street, Benambra (the car park) to the accommodation village and the mine. The use of private vehicles between Benambra and the village/mine will only be permitted for some management staff and contractors. The proposed car park of approximately 200 car spaces is accessed from Sloan Street and bus parking spaces are accessed via a one way crossover from Sloan Street and exit to Foster Street. Perimeter pedestrian paths link the car park to the existing facilities and waiting area shelter is proposed adjacent to the bus parking area (see Figure 4).



Figure 4 Indicative car park layout  
(Source: Appendix X of the EES)

The car park site is part of the primary school which has been decommissioned<sup>67</sup> for many years and is not expected to reopen within the mine life. The site is managed by the Department of Education and Early Childhood Development and access to the site are still to be finalised.

The site is a vacant paddock with cypress trees along the northern and eastern boundaries. It is at the southern approach to Benambra, close to existing community and commercial premises. There are two houses nearby (opposite the site on Sloan Street (a gravel road) and Foster Street). Other uses in the immediate area include former motor repair premises on the opposite side of Foster Street, the disused school building, the Uniting Church, a CFA shed and the Community Hall.

The proposed amendment to Clause 52.03 'Specific Sites and Exclusions' of the planning scheme and the associated Incorporated Document allow the use and development of the Benambra car park in accordance with conditions in Part 3.2 of the Incorporated Document. These conditions require, in summary:

- Submission of site layout plans<sup>68</sup>, which are generally in accordance with the Car Park Concept Plan, (Figure 4 above), detailed engineering plans and a Construction Management Plan for approval by the Council.
- Sealed bus parking area and car park entrances and surface treatment of the car parking area that is easily maintained, able to be line marked and would not unreasonably impact on the amenity of the area.
- Lighting so that no nuisance or loss of amenity is caused to the surrounding area.
- After closure and rehabilitation of the mine, the car park site must either be returned to pre-project condition (except for landscaping) or converted to another use, which would be subject to a future planning permit application.

### **11.2.3 The EES assessment**

The EES addresses the Benambra car park primarily in Appendix X.

The peak traffic movements associated with the car park are expected to be a peak of 132 car trips per day (once a month when shift swing align), with 80 car trips per day being the average over the month<sup>69</sup>. Shift handovers will result in two periods when activity would occur at the car park. These are around:

- 5am when day shift workers arrive to get the bus and 7am when night shift workers return to their cars.
- 5pm when night shift workers arrive to get the bus and 7pm when day shift workers return to their cars<sup>70</sup>.

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<sup>67</sup> Council understood that while the school has not been formally closed it is considered to be unmanned and sufficient future demand to warrant re-opening the school is not anticipated.

<sup>68</sup> The plans must show: site, car space and accessway dimensions; surface treatment; type of security fencing; lighting; indicative elevations of shelters and other buildings; and landscaping.

<sup>69</sup> The estimates take account of workers' residence in the local area/accommodation village, mine shifts and some car sharing.

<sup>70</sup> Transport to the accommodation village (at the start and end of a swing) and the mine (every day for local workers) is expected to be 12 bus trips for the peak time (at swing changeover) or 6 bus trips for the average (approximately 3 bus trips in the morning and 3 bus trips in the evening).

The car park site was selected, in consultation with East Gippsland Shire Council, as it:

- Is in the Township Zone where the proposed car park use is permissible and would make appropriate use of an existing developed site.
- Does not impact on cultural heritage values, native vegetation, housing land supply or agricultural land.
- Is screened by topography and existing trees along street frontages.
- Provides opportunities for interaction with businesses which are within easy working distance (the Hotel and General Store) and there would be opportunities for the other businesses to serve the workforce eg the garage opposite the site could reopen for fuel supplies and repairs.
- Will cause minimal disruptions of traffic movements through the town.
- Only two houses are close to the site and they are set in gardens with established vegetation that screen/filter views to the site. The nearest house is set back approximately 40 metres from the car park and is well screened by dense vegetation.
- Although the car park is expected to be reinstated to resemble the pre-project condition, there is the potential for legacies such as the upgrade of the Community Hall toilets and a range of post-closure uses, Recreational Vehicle or Caravan park style facility or as a staging area during fire events.
- Can incorporate landscaping which will contribute to the character of the neighbourhood and filter views to the car park.

It was noted that the park and ride system involves buses passing houses but there would be a significant reduction in the number of employee vehicles using the road.

The assessment concluded traffic and visual impacts would be minimal. While some increase in noise levels from the car park was acknowledged, noise impacts on the nearest residents were not considered unreasonable due to impact being limited to two periods in the day, the access not being positioned opposite the dwelling and the distance involved.

#### **11.2.4 Submissions**

Council was involved in the car park site selection process and the formulation of requirements in the proposed Amendment. It supported the proposal for reasons similar to those identified in the EES. Other submissions did not address the car park.

#### **11.2.5 Discussion**

The Inquiry site visit confirmed the findings in the EES that the proposed car park is suitable for that use. We are satisfied that the proposed Amendment addresses the key matters. However, whilst workers in the car park are unlikely to generate noise at levels associated with leisure/entertainment related uses, we consider a requirement for a car park management plan to minimise noise in the car park, particularly early in the morning, should be added to protect the amenity of nearby houses. This plan should include the option of offering the owners of the two houses opposite the car park the option of noise attenuation to bedrooms that are exposed to car park noise.

### **11.2.6 Recommendations**

- **Add to the proposed Incorporated Document that forms part of the draft Amendment a condition in Section 3.2 requiring, before the use starts, a car park management plan and Driver Code of Conduct to minimise noise in the car park.**
- **The Proponent offer noise attenuation to bedrooms in the two houses opposite the car park that could be affected by early morning noise in the car park/bus set down area.**



## 12 Other issues

### 12.1 Will cultural heritage values be protected?

#### 12.1.1 The issues

The objectives for evaluation of the Stockman Project include to protect Aboriginal and non-Aboriginal cultural heritage values.

Impacts on cultural heritage values were not identified as an issue of concern in either the EES assessment or submissions to the Inquiry.

#### 12.1.2 What is proposed?

The Project involves ground disturbance with the potential to disturb sites of importance to Aboriginal cultural heritage.

The Project will not impact on any place subject to a Heritage Overlay or listed under the Heritage Register or Inventory.

The EES Chapter 17 Cultural Heritage sets out the investigations undertaken to date and the assessment of potential impacts on cultural heritage values. The assessment by Australian Cultural Heritage Management informed the draft CHMP (Cultural Heritage Management Plan) in Appendix Q. It involved review of Victorian Aboriginal Heritage Register records of existing Aboriginal sites within five kilometre of the activity area, archaeological survey of the proposed areas for mining and infrastructure development, with the participation of traditional owner groups with a local interest, as prescribed under the Aboriginal Heritage Act and the associated regulations.

The EES indicated:

- The Project will not disturb any of the 36 sites on the Victorian Aboriginal Heritage Register.
- No culturally significant sites have been identified within the proposed mining operations area. However, it was noted that the Currawong processing plant has low to moderate archaeological potential and the existence of material could be masked by vegetation.
- Some Aboriginal archaeological material has been recorded in areas proposed for the development or upgrade of linear infrastructure. A surface artefact scatter, five isolated surface artefacts, a subsurface artefact deposit and four subsurface isolated artefacts were identified in the vicinity of Limestone-McCallums Road.
- Further fieldwork will be undertaken before the Project starts. This work will inform the CHMP which must be prepared under the *Aboriginal Heritage Act 2006* (Vic).

#### 12.1.3 Discussion

The Inquiry's review of the assessment of potential impacts on cultural heritage values in EES Chapter 17 Cultural Heritage and the draft CHMP did not identify issues that are not capable of management through the required CHMP. The draft CHMP in EES Appendix Q proposes a structure for the plan but, as the Proponent acknowledged, development of the content is required. This will include further field work, detailed recommendations for the

management of the Aboriginal cultural heritage remains in the area and contingencies if unexpected Aboriginal cultural heritage material is discovered.

## **12.2 Energy**

### **12.2.1 The issues**

- Increasing greenhouse gas emission from the use of gas for the generation of electricity.

### **12.2.2 What is proposed?**

The mine is situated many kilometres away from the existing electricity grid and gas network so a variety of alternative power sources were investigated. Based on the analysis it is proposed to establish a gas fired power station at the processing site. Gas will be delivered to the site by tankers and stored on site for use as required by the 10 Mw power station.

Chapter 5 of the EES discusses the potential power sources for the site and the alternatives investigated. Options included:

- Grid power
- Natural gas pipeline
- Local diesel generation
- Liquefied and compressed gas fired power station
- Biomass power station

Grid connection and a gas pipeline were eliminated due to cost and the assets would become effectively redundant at the end of mining. Diesel was eliminated on a cost basis and also due to environmental considerations. However an emergency diesel generator is proposed as a backup.

A biomass power station was eliminated due to concerns in relation to the technology, the availability of a ready fuel source within 100 km of the site and environmental concerns in relation to emissions.

The EES identified that the most cost effective and environmentally suitable approach is for the construction of a gas fired power station at the site. The decision between liquefied natural gas and compressed natural gas is yet to be made and is partly dependent on a government decision in relation to the provision of gas facilities to other users in the region.

The power generation infrastructure at the Currawong plant site is required to be implemented under an EPA works approval due to the waste gas emissions from the power plant. The EPA has indicated that a preliminary analysis of the documentation exhibited in the EES has not identified any major issues that would prevent the timely acceptance of the works approval application for assessment.

### **12.2.3 Evidence and submissions**

BOC Ltd advise the Inquiry via submission that in their opinion the use of liquefied natural gas (LNG) as the energy source for the power station had environmental benefits over the use of the over compressed natural gas (CNG) due to efficiencies in transportation, which in their estimate would be approximately 50%.

Mr Smith identified that he is proposing to build a dwelling in the vicinity of an existing gas compression station on the corner of Calvert's Road and the Bairnsdale – Dargo Road and is concerned that a major upgrading of the existing gas facility, to service the mine, could impact on their amenity. He sought to raise the issue to the Inquiry to confirm that if such an enlargement was proposed that he would be able to elaborate on his concerns at some future point in time. The issue of a potential future house adjacent to an existing facility owned and operated by others is not an issue that the Inquiry is able to address.

Mr Ferrando-Miguel on behalf of the EPA advised that the use of a gas fired power station is considered to be practical, with minimal environmental impact and could be adequately addressed by the works approval application process to ensure that best practice design and operation is implemented.

The Inquiry was advised that power supply for the workers village is proposed via a buried transmission line from the mine based power plant.

#### **12.2.4 Conclusion**

Having reviewed the EES and the submission from the EPA, the Inquiry is satisfied that appropriate controls are in place to minimise any potential risks from the establishment and operation of the on-site power station. We also accept that a gas fired power station at the mine site is an acceptable environmental solution given the scale of power required.

In relation to the choice of gas supply we accept that it will be a commercial decision which should be left to the Proponent, in consultation with the relevant government agencies.

### **12.3 Waste storage and management**

#### **12.3.1 The issues**

- Potential discharge of hazardous and nonhazardous wastes to the environment, particularly in relation to the mine site and the accommodation village.

#### **12.3.2 What is proposed?**

The EES discusses the various waste streams in Chapter 15, including the issue of waste rock and tailings, as these are considered a waste stream. Issues associated with the TSF are addressed in Section 5. This chapter deals with potentially hazardous materials and non-process wastes.

The hazardous goods that will be used on the site include diesel, grease, gearbox oil, compressed natural gas, process reagents, explosives, cement associated with a temporary concrete batching plant, gases in cylinders (e.g. oxygen, acetylene, petroleum gas), and metal concentrates<sup>71</sup>. Other wastes include domestic waste (food waste, paper, etc.) and septic waste from the operations area and accommodation village.

It is proposed that domestic waste will be temporarily stored in appropriate containers for regular transfer to the transfer station at Omeo or by direct transfer to an appropriate

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<sup>71</sup> The copper concentrate is not classified as hazardous but the Zinc concentrate is a Class 9. Chronic category II.

landfill. Cartage and disposal will always be managed by a licensed waste contractor engaged by Stockman.

The septic waste from the mine will be carted to the accommodation village for treatment to Class C standards. After considering a number of wastewater treatment options URS recommended a sequential batch reactor, under an EPA licence, on the basis that the technology is typical for wastewater treatment of the type and scale required and can satisfy the setback requirements in the Code of Practice. Treated water will be stored in an 18ML, lined winter storage dam about 150m to the east of the village, and can be irrigated during the months of December-February. The irrigation locations are yet to be determined, but up to 24ha to the south of the village is available.

### **12.3.3 Submissions**

Mr Help raised concerns about the potential for chemicals used in the processing of the ore impacting on the environment if there is a tailings spill from the TSF. The CFA noted that it will be consulted by the Victorian WorkCover Authority as part of the approval as a major hazard facility or dangerous goods storage and handling site.

### **12.3.4 Discussion**

As noted in the EES Chapter 15.5.6, *'With the exception of copper and zinc concentrates, the hazardous materials to be used that the Stockman project are routinely used in industrial, mining and manufacturing application's. Therefore, there is an existing strong framework of legal requirements, Australian standards and practical experience for the management of hazardous goods and waste.'* We are therefore satisfied that hazardous wastes and materials associated with the site will be appropriately controlled and monitored as part of the Work Plan which will ensure that risks associated with their transport, storage and use will be minimised.

Chapter 15 of the EES identifies that, in addition to the work plan, some aspects of the *Environment Protection (Industrial Waste Resource) Regulations* may be relevant to the management of waste rock. The SEPP (Prevention and Management of Contamination of Land) is also generally relevant to the management of mine wastes in that it provides a framework for preventing, identifying, and managing contamination.

In relation zinc concentrate, as it is to be placed in a sealed container for transport to the Port of Geelong, the overall risk of loss of zinc concentrate to the environment during normal operations is very low. In the unlikely event of an accident resulting in spillage from a ruptured container, the proposed method of cleanup involves wheel loader machinery, shovels and brooms. It may require temporary bunding to prevent run-off. As zinc concentrate has low water solubility and is not acutely toxic to fauna, it poses minimal risk of injury fauna from short-term exposure to spillage.

The Inquiry is satisfied that the proposed methods of storage, handling and disposal of domestic waste can be safely addressed to minimise environmental risk. In relation to septic waste, the proposed methodology is considered appropriate. The Inquiry is satisfied that the requirement for an EPA works approval and licence for the construction and operation of the treatment plant proposed at the accommodation village will address the risk to the environment. We note that the monitoring of the wastewater treatment plant will be

reviewed by the EPA throughout the life of the mine and that at the completion of the mining operations the accommodation village and associated services will all be removed and the land rehabilitated to farming land, once approved by the EPA.

### **Conclusions**

Based on the information provided in the EES and presentations at the Hearing the Inquiry is satisfied that the risks associated with both hazardous wastes and other wastes from the mining operation and associated works can be minimised and are appropriately covered by relevant legislation.

## 13 Draft Applications

### 13.1 Draft work plan and mine rehabilitation plan

The ERRB of DSDBI regulates the aspects of mining under a number of acts and regulations, the two key ones that relate to this site are the *Mineral Resources (Sustainable Development) Act 1990 (Vic)* (Minerals Act) which primarily relates to the mining operations and the *Pipelines Act 2005* (Pipelines Act).

The operation of the mine will be regulated under the Minerals Act by virtue of a Mining Licence which is obtained for the area to be developed and then subsequently a Work Authority for constructing and operating the mine is issued. The Mining Licence does not allow mining to commence, but is a pre-requisite for seeking approvals and consents under the act.

An approved Work Plan and the issue of the Work Authority are required before construction and operation of the mine start. Before granting the Work Authority, DSDBI must be satisfied that the licensee has:

- An approved Work Plan;
- Lodged an appropriate Rehabilitation Bond;
- Obtained all necessary consents are put and approvals under the MR (SD) act, and other acts;
- Addressed any environmental offset requirements;
- Obtained public liability insurance; and
- Obtained written consent or compensation agreements from the owners or occupiers of the effect of land.

The rehabilitation bond is a financial security intended to ensure that rehabilitation can be undertaken by DSDBI should the operator default. The amount of the bond is calculated to address in full the actual and foreseeability liability based on work specified in the approved Work Plan. DSDBI periodically reviews rehabilitation bonds to ensure that they remain at appropriate levels during the life of the operation.

Other government agencies are empowered to enforce controls on mine infrastructure with impacts that fall outside the mining licence. These include the EPA, which is responsible for ensuring compliance with State environment protection policies. For this project the EPA's areas of control relates to the gas fired power station and the effluent treatment system associated with the proposed workers accommodation.

#### Evidence and submissions

As noted earlier, many of the objecting submitters expressed concern in relation to the environmental impact of the TSF during mine operations, effective rehabilitation and whether adequate funds were secured to ensure full rehabilitation and maintenance in perpetuity. These concerns were reinforced by the experience with the previous Denehurst mine at the site and the resultant cost to the Victorian government for the rehabilitation of the site following the default of the operator.

Mr Mitas, General Manager of Operations and Chief Inspector of the ERRB, advised that the DSDBI is yet to review the EES, submissions, or evidence produced for the Hearing in detail as it was still early in the process. It was his view that, as the Proponent is in the preparation phase of the Work Plan, it is too early to comment on the suitability of the Draft Work Plan. When the licence is applied for, DSDBI will identify what additional information is required after reviewing the available information, including the Draft Work Plan and the recommendations of this Inquiry (after review by the Minister for Planning). DSDBI then works with the Proponent to prepare the Work Plan, in consultation with other government departments. He advised the Inquiry that the mine can be effectively regulated and that the DSDBI will ensure that the outcomes of the EES process will be incorporated in the final Work Plan.

In relation to the operation of the mine, Mr Mitas advised that it will be subject to broad ranging review, monitoring and enforcement processes that commence before any mining occurs and continued through the life of the Project until the ERRB is satisfied that closure and rehabilitation is complete. This occurs through a variety of activities including audit, inspection, monitoring and response to complaints, which are undertaken by regionally based staff with the assistance of in-house technical experts when required. He noted that an Environment Review Committees (ERC) is proposed and these have been established at other mines to overview the operation and rehabilitation post closure of the mines. As discussed in Section 5, the Inquiry and the various submitters, including the EPA have serious concerns in relation to the risks associated with the long-term storage of tailings in the TSF. As noted by the EPA, and agreed by the various experts for the Proponent, the most effective way of mitigating the long term risk is to ensure that the design, operation and closure of the TSF is undertaken in accordance with best practice, and in particular to ensure the long-term environmental stability of the closed TSF.

#### **Additional Matter for inclusion in the Work Plan**

After the Hearing the Proponent forwarded 'Additional Matters to Be Included within the Work Plan' which were identified based on submissions, evidence and discussions at the Hearing. It also drew on discussions after the Hearing between the Proponent DSDBI and the EPA. This document was circulated to other parties and is reproduced in Appendix D, with the addition of brief Inquiry comments on each item.

The Inquiry has summarised the concerns raised by the GEG in response to this document as follows:

- It is essential to determine Environmental Quality Objectives (EQO) for groundwater and surface associated with the TSF based on a detailed monitoring program and include them in as part of the work plan application as they are essential to understand the impact of the mine expansion and to hold Stockman to account for any environmental damage caused.
- A detailed, enforceable surface and groundwater monitoring plan, in addition to the surface water and groundwater EQOs, is required.
- Issues relating to the ITR (which are identified below).
- As the EQOs will not be determined until after the Work Plan is finalised, this could allow the discharge of water that does not meet appropriate criteria before or during the construction of the Stage 1 lift or under a section 30A emergency approval.

- Reference is made to treatment of the supernatant water prior to discharge but this is not possible as the Work Plan does not include any plan to install a water treatment plant.
- The Work Plan must not allow discharge at any time if it does not meet the EQOs and should require Stockman to construct a water treatment plant before the Stage 1 lift (rather than requiring a feasibility study for a water treatment system as recommended by the EPA).

During the Hearing there was some discussion on the merits of a formalised requirement for Independent Technical Review (ITR) of project design, implementation and monitoring. Dr Ferrando Miguel and Mr Robinson of the EPA advised that an ITR role had been established for other major projects, including the Victorian Desalination Plant, and that the EPA would be pleased to liaise with DSDBI in establishing a detailed scope for the role of the ITR. It was noted that the ITR need not have expertise in all aspects required to be reviewed; rather, it should have the ability to draw on that expertise as and when required and the ITR could draw on the expertise of the ERC to identify appropriate experts for the various aspects.

After the Hearing (on 18 July 2014) Mr Power forwarded on behalf of the Proponent a potential outline of the Independent Technical Review (ITR) framework which was prepared as a result of post-hearing consultation between the Proponent, DSDBI and the EPA and was circulated to other parties for comment. Table 6 presents that ITR Framework.

Mr Power considered that in relation to TSF matters, the ITR should have engineering, in particular dam design expertise and experience. An EPA accredited environmental auditor would not be appropriate for this function. He acknowledged that the ITR in relation to water quality may be an EPA appointed auditor but considered this is not mandatory.

The GEG expressed the view that the ITR framework is not sufficiently independent, transparent or accountable for aspects of the Project with significant implications for the environmental impacts. Their concerns regarding the proposed use of ITRs included:

- It is important that the work of the ITR be subject to scrutiny and expert review.
- The public and the Inquiry Panel will not have the opportunity to review and comment on important aspects of the Project, contrary to the EES Guidelines.
- The ITR reviewing both the design and construction of the TSF and undertaking the 'third party reviews for the ANCOLD purposes' is questionable.
- Whether the ITR would operate for the entire life of the mine, as the ANCOLD guidelines require periodic and comprehensive assessments of the TSF at intervals of 2, 5 and 20 years.
- Who will appoint the ITR members and who will undertake the monitoring if the current Proponent moves on?

## **13.2 Discussion**

The Inquiry appreciated the EPA raising a number of environmental related issues which they anticipate would be addressed as part of the DSDBI's review of the Draft Work Plan and in testing the evidence presented at the Hearing.

However, we were disappointed that DSDBI (ERRB), the agency primarily responsible for regulating the mine, did not appear to be prepared to advise the Inquiry on the basis of a detailed review of the EES documents, submissions and the evidence presented at the



Hearing. Whilst Mr Mitas assured the Inquiry that its recommendations would be addressed, it is most unfortunate that advice from this key regulating agency to inform our recommendations was limited to only the broadest of generic responses.

Nevertheless, we do note from the DSDBI submission that, like other agencies, the process leading to the EES, including their participation in the Technical Reference Group and proponent responses to issues raised, provided a level of confidence that key issues have and will be addressed in the Work Plan to ensure an acceptable outcome. A number of comments from Mr Whitehouse during the course of the Hearing indicated an understanding of the EES and identified some relevant areas where DSDBI would expect to see further details within the Draft Work Plan.

The Draft Work Plan is an extensive 220 page document and includes a Draft Rehabilitation Plan as an Appendix. This draft document has been useful in informing the assessment, however, a range of gaps, matters requiring amplification based on further work have been identified. We do not propose to restate the discussion and recommendations of preceding sections of this report which includes a range of recommendations, many of which endorse recommendations from the experts who appeared at the Hearing or confirm the content in EES technical appendices.

We highlight in relation to the changes to the Draft Work Plan that were circulated after the Hearing (reproduced in Appendix D of this report), that the Proponent agreed to:

- Issue 3 and 21: To undertake a study to identify alternative emergency treatment methodologies for the supernatant, both for operations and post closure, to ensure compliance with discharge criteria.
- Issue 4: That the discharge of supernatant from the TSF is required to meet the discharge criteria and be approved for discharge by the ITR prior to discharge.
- Issue 5: The flooded paste level is to be monitored and maintained post closure using the Trust Fund.
- Issue 10: The backfilling of stopes and disused tunnels etc. is to be maximized in both mines.
- Issue 12: Each rise of the TSF dam is to be approved by the ITR and only if the quantity of water from the seep remains at the current flow rate.
- Issues 15 and 20: The Work Plan must include a requirement to develop the post closure monitoring and maintenance requirements prior to completion of mining.
- Issue 18: Mitigation works are required to maintain the seepage rate at the same level as at present.
- Issue 19: The ITR for all aspects associated with the TSF dam shall be an independent specialist dams engineer appointed by the proponent, with the approval of the ERC.
- Issue 24: Clarification is required relating to the role of mine refuge chambers and will be addressed in the Bushfire Response Plan to be further developed in consultation with the CFA and DEPI.
- Issue 25: The Work Plan will confirm the areas to be cleared for bushfire protection (via the Bushfire Response Plan).

- Issue 26: Clarification is required to the Work Plan and Incorporated Document that a single Bushfire Management Plan will be developed for the Stockman operations<sup>72</sup>.
- Issues 27 and 28: to amend Figure 9-8 and the EMP (Aquatic Ecology Management Plan) to address Mr Harrows recommendations relating to road crossings for fish and crayfish passage and mitigation measures on pages 8-9 of his report.
- Issue 29: That a feral animal Management Plan will be prepared.
- Issues 30 and 33: Surveys of hollow bearing trees will be undertaken at clearing and offset sites and Figure 9-8 of the Environmental Strategy will require, where feasible, the retention of hollow bearing trees within fire protection zones, and along linear infrastructure.
- Issue 31: Additional fauna monitoring will occur, including reptiles in potentially affected bogs and streams, for the Giant Burrowing Frog and Alpine Tree Frog, at the Dinner Plains site and as part of the assessment of hollow bearing trees.
- Issue 32: Monitoring will specifically include areas of Montane swamp in Straights Creek
- Issues 34 and 35: ITR for all activities other than the TSF dam to be an EPA approved auditor.

We adopt the recommendation of DSDBI that an Environmental Review Committee (ERC) be established from representatives of the Proponent and relevant government agencies (including the EPA, DTPLI, DEPI, SRW, GMW, East Gippsland Water (EGW), East Gippsland Shire) and the community. The terms of reference should be developed jointly by the parties involved and then incorporated into the Work Plan.

The Inquiry also considers the Work Plan (or Environmental Management Plans within it) should include a complaint management procedure, for example in accordance with the principles of AS10002:2006. It should provide for:

- High accessibility to information on the process, flexibility in methods of making complaints and for complaints without cost to the complainant;
- Immediate acknowledgement and on-going feedback to complainants, including on measures taken to address issues;
- If possible, resolution by complainant acceptance of the actions taken or, if necessary, advice on alternative forms of recourse available;
- Clear responsibility and accountability for responses and progress reporting;
- Detailed recording and tracking of complaints; and
- Regular auditing of the complaints handling process.

### **The Rehabilitation Plan**

A Concept Rehabilitation Plan was included in appendix B to the Draft Work Plan which is in Appendix W of the EES. The Concept Rehabilitation Plan outlines the key aspects and criteria to be achieved at the completion of the mining phase and prior to hand over to DEPI. The Inquiry noted that the Concept Rehabilitation Plan will be revised at commissioning of the Project and then used as the basis to develop a Detailed Closure and Rehabilitation Plan

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<sup>72</sup> It was noted this Plan will also satisfy the requirement for a 'fire response and readiness plan' in clause 6.3 of the MIN5523 mining licence.

two years after the Project commissioning. This will then be revised as required throughout the life of the mine.

The Inquiry is satisfied with the level of detail provided in the Concept Rehabilitation Plan and given the proposed timing set out for preparing and updating the rehabilitation plan. We are satisfied that the appropriate level of detail can be developed to ensure that when the licence is cancelled that the disused mining area, and associated infrastructure has been appropriately rehabilitated.

The Inquiry notes that revegetation as part of the works undertaken by the government after closure of the former mine, have failed in some areas. These are not the responsibility of the Proponent. The experience highlights the need for conscientious implementation of rehabilitation (and other requirements) to realise the intended outcomes.

The Inquiry believes that the ITR, discussed below, will need to be involved in the review at all phases of development of the rehabilitation plan. Consultation with DEPI, as the public land manager, regarding the Rehabilitation Plan is foreshadowed in the concept plan. We consider the EPA should also be consulted as it will be a significant regulator of environmental conditions when the rehabilitated mine is handed back.

### **Independent Technical Review**

The Inquiry acknowledges that the DSDBI have capabilities and powers to enable the review of all aspects of the mine operation, however we remain concerned that they may not have the necessary resources or specific expertise in some areas for close oversight of plans, operations and closure to ensure the long-term environmental risk of the mining operations and in particular the TSF, are resolved. We also note interests of other agencies, including DEPI as the land manager and the EPA as a regulator, takeover the management and regulation of the mine site after closure and rehabilitation.

The Inquiry accepts the desirability of appointing an ITR to inform the preparation of the application for a Work Plan. We do not agree with the GEG that the ITR framework would undermine the scrutiny, accountability or transparency of the regulatory framework. On the contrary, the responsibilities of relevant agencies to regulate the Project would be unchanged but would be informed by review by an independent expert. Further, ITR reports would be provided to the ERC which could then take action if required. ANCOLD recognises the value of independent review and we do not see any conflict in that requirement being satisfied by the same person.

The following table summarises the ITR Framework circulated after the Hearing and includes Inquiry comments.

Table 5 Independent Technical Review Framework

	Circulated Framework	Inquiry Comment
ITR Role	<p>(1) review the design and construction of the TSF;</p> <p>(2) review surface and groundwater monitoring and quality.</p> <p>Stockman and DSDBI and adopt the ITR findings. EPA provides advice to DSDBI upon request.</p> <p>Quarterly report presented to Environment Review Committee</p>	Agree
Appointment and Funding	Appointed by Stockman with their qualifications and expertise to be endorsed by DSDBI.	Agree with review by the ERC and endorsement by DSDBI.
Expertise	<p>Different ITR expertise will be required as the Project moves through different phases. Multiple ITRs will be appointed to accommodate/respond to these different technical requirements.</p> <p>ITR for the TSF should have engineering qualifications and previous dam design experience, EPA environmental auditor not appropriate as their expertise is typically found in contaminated land, industrial facilities or natural resources.</p> <p>The primary criteria for the water quality ITR should be in surface and groundwater quality with prior experience in/knowledge of the Tambo catchment; a pre-existing EPA appointed auditor may be appropriate but should not be mandatory.</p>	<p>Agree</p> <p>See discussion below regarding EPA Environmental Auditors.</p>
ITR Review Functions	<p>The proposed location of groundwater monitoring bores to ensure the bores are suitable to understand the hydrogeological baseline conditions in vicinity of TSF.</p> <p>Proponent's detailed TSF design prior to work plan lodgement.</p> <p>After each stage of TSF construction to ensure construction has is in accordance with the detailed design.</p> <p>(The ITR's review of the TSF design and construction will also be used to satisfy the requirement in section 2.6 of the ANCOLD Guidelines for external third party strategic reviews at critical phases of the TSF lifecycle.)</p> <p>The final detailed design for the Wilga plugs.</p> <p>Surface and groundwater monitoring program proposed by Stockman to determine whether the program is sufficient to derive EQOs.</p> <p>Trigger Action Response Plans for surface and groundwater.</p> <p>Derived EQOs for surface and groundwater.</p> <p>Annual and other monitoring reports.</p> <p>Predicted quality of supernatant discharge from TSF during tailings lifts (if proposed) and post closure.</p>	<p>Agree that the matters identified are appropriate.</p> <p>The Inquiry identifies additional matters for ITR below.</p>

The Inquiry sees merit in utilising an EPA accredited Environmental Auditor. Clear guidelines<sup>73</sup> are in place that establish, amongst other things, high standards of expertise for appointment, there is an expectation that a multi-disciplinary approach will be adopted and

<sup>73</sup> Environmental Auditor Guidelines For Appointment An D Conduct Publication number 865.10 July 2014.

that *'In exercising their functions and duties pursuant to the Act or other acts, environmental auditors owe a primary duty of care to the environment and to the people of Victoria above all others (including their clients).'*' The expertise of EPA Category B (Industrial Facilities) and Category C (Natural Resources) auditors is directly relevant to the functions relating to surface and ground water. Where there would be benefit from accessing specific knowledge or expertise regarding the Tambo catchment (there appeared to be consensus at the Hearing that Dr Hart would be such person), the ITR could be expected to draw on that resource. While an EPA appointed auditor could also draw on dam engineering expertise, the Inquiry accepts the submission that this is a critical element requiring independent review and the appointment of an ITR for the TSF construction may be a person with this expertise, rather than an EPA environmental auditor.

The role of the ITR would be to review all issues which may impact on the long-term storage of tailings or impact on the environment, including both surface water and groundwater issues. In addition to the functions identified above, we consider the following additional matters should be subject to ITR<sup>74</sup>:

- Review the evaluation of the suitability of the paste backfill characteristics for the long term containment underground and impacts on ground water quality
- Annual environmental reporting
- Compliance with the Environmental Management Plan
- Draft Rehabilitation plan for the mine, including all iterations and amendments
- Emergency response plan
- Modelling of the hydrogeology of the TSF for the various stages to minimise groundwater impacts
- Design and construction methods for the sealing of the exposed rock faces of the TSF during raising
- Design and construction of the dam raising of the TSF
- Review of the potential life and impacts modelling of failure of the grout curtain, clay liner and membrane liner of the TSF dam
- Design of the TSF spillway and TSF diversion channels to provide 1:1 million year capacity
- Design, construction and operation of the Biological treatment system for the seep
- Construction monitoring of the TSF, mine and processing plant in relation to environmental aspects
- Pre and Post closure surface water flow and quality monitoring for Drillers dam,
- TSF AMD treatment systems options study
- Closure Plans for:
  - TSF
  - Mine
  - Processing plant
  - Accommodation village
  - Benambra bore field
- Linear infrastructure between the mine and the accommodation village

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<sup>74</sup> We note that agree that the role of the ITR does not need to include the following items: bushfire, aquatic ecology, terrestrial fauna, or native vegetation.

- Compliance reports for the rehabilitation of all mining facilities at the completion of mining and prior to release of the rehabilitation bond by DSDBI

An ITR framework should also apply after the mine is closed and handed back to the public land manager. This process will inform the monitoring and maintenance of safe conditions in perpetuity and should be funded by the proposed Trust Fund. Prior to the closure of the mine, a revised detailed scope of works for the ITR should be prepared, with the role and scope of works to be approved by the ERC, DEPI (as the future owner) and the EPA (as a key regulator).

### **Recommendations**

- **Include the additional matters in the Work Plan or associated Environmental Management Plans that are identified in Appendix D of this report and were agreed by the Proponent.**
- **Appoint Independent Technical Reviewer(s) funded by the Proponent, before the issue of a Works Approval, with the role and functions identified in Section 13.2 of this report.**
- **Prior to the completion of the mining licence appoint an Independent Technical Reviewer(S), funded from the proposed trust fund to be established between the Victorian government and the Proponent, with role and functions approved by the EPA and DEPI.**
- **Establish an Environmental Review Committee to oversight the design, construction, operation, closure and post closure of the Stockman Mine. The ERC's role should also include assisting the Independent Technical Reviewer(s) in identifying expertise for various specialist reviews and to receive and disseminate the Independent Technical Reviewer(s)'s reports.**

### **13.3 Environmental Review Committee**

We adopt the recommendation of DSDBI that an Environmental Review Committee (ERC) be established from representatives of the Proponent and relevant government agencies, including the EPA, DTPLI, SRW, GMW, EGW, EGSC and community representation. The terms of reference should be developed jointly by the parties involved and then incorporated into the Work Plan.

The Inquiry acknowledges that similar arrangements have been put in place for the Victorian desalination plant project, channel deepening project and are proposed for the East-West Link project and the offer by the EPA to assist with a relevant governance process for the ITR.

### **Recommendations**

- **The Department of State Development, Business and Innovation consult the EPA before the Work Plan is approved regarding the Work Plan containing contingency plans relating to potential accidental discharges to the environment from Project.**
- **Establish an Environmental Review Committee with relevant parties to oversight the design, construction, operation, closure and post closure of the Stockman Mine. The**

**ERC's role should also include assisting the ITR in identifying expertise for various specialist reviews and to receive and disseminate the ITR's reports.**

### **13.3.1 Environmental management plans**

Environmental issues relating to the mining operation, are included in Chapter 9 Draft Work Plan and Mine Rehabilitation Plan, which is included in Volume VI, Appendix W of the EES.

An overview of the proposed environmental management strategy is included as a series of tables (figure 9) in the Draft Work Plan which list management objectives, management actions, timing and performance and compliance indicators and provisional criteria; for the various key elements of the Project.

#### **Evidence and submissions**

There were no submissions presented to the Inquiry in relation to the environmental management 'plan' (EMP ) in the Draft Work Plan.

#### **Discussion**

Having reviewed the EMP the Inquiry is satisfied that an appropriate basis exists to build on to establish an EMP which addresses all relevant environmental aspects. The draft EMP requires modification to address the aspects raised within the Inquiries report. We note that it includes a requirement for the establishment of an ERC and provides some outline of its structure and role.

In particular, the EMP should be subject to review by the ITR and should require the establishment of detailed post closure monitoring and maintenance program prior to the completion of mining are required.

Table 10.2 outlines issues raised by stakeholders up to August 2013, together with a response from the Proponent.

#### **Recommendations**

- **Further develop the EMP in the Draft Work Plan to address the issues raised by this report, by submitters to the Inquiry and by the various sections of the EES.**
- **Require the EMP to be reviewed by the Independent Technical Reviewer(s) prior to the issue of a Mining Licence.**
- **Identify in the Environmental Management Plan(s) a requirement for the establishment of a detailed post closure monitoring and maintenance program, funded by the post closure trust fund, and reviewed by the Independent Technical Reviewer(s) and the ERC prior to the completion of mining.**

## **13.4 The rehabilitation bond and the proposed post-closure trust fund**

### **13.4.1 Evidence and submissions**

Mr Mitas advised in relation to the rehabilitation bond that:

- The amount of the bond is calculated using an online calculator and can be varied at the Proponents request over the life of the mining operation. The current calculator is different to method used to determine the rehabilitation bond for the previous Denehurst operation. He acknowledged that the \$150,000 bond required then was inadequate to enable the rehabilitation of the site.
- The Rehabilitation Bond which will be put in place would not cover the clean-up of any existing issues that are a legacy from previous operations, such as in relation to the TSF and the incomplete rehabilitation of the former processing area.

Mr Hurst of the Minerals Development Division of the DSDBI advised the Inquiry that the government is in negotiation with the Proponent to establish a post closure trust fund, to be administered by the State that recognises respective responsibilities for the existing and the proposed enlarged TSF. GHD was engaged to provide an independent assessment of the monitoring and maintenance requirements for the enlarged TSF (provisional estimate \$5.05 million). He advised that the legally binding agreement between the State and the Proponent will apportion costs between the state and the Proponent. The intent is for the interest accrued by the trust fund will be adequate to meet the monitoring, maintenance and management of the TSF in perpetuity. In view of the standard of construction of the TSF to international best practice and the verification of conditions before hand over is accepted, it is not proposed that the fund provide for catastrophic TSF failure.

The GEG and others emphasised the importance of the trust fund having a capacity to ensure the maintenance of safe environmental condition in perpetuity and to deal with the impact of a catastrophic failure of the TSF wall. They argued the fund should be in the order of hundreds of millions of dollars.

### **13.4.2 Discussion**

The Inquiry was advised that the rehabilitation bond for the Denehurst mine was \$150,000, however, the rehabilitation to date has cost in excess of \$5 million.

We were not provided with an estimate of the potential rehabilitation bond for the Stockman mine. Mr Mitas responded to questions on this issue at the Hearing by referring the Inquiry to the bond calculator on the DSDBI website. He highlighted the transparency provided by the calculator regarding the methodology to be used to determine the bond. He added that the bond should not be of concern to the Inquiry as the government would, if necessary, meet any costs to resolve environmental issues that are not covered by the bond. His response was most unhelpful, and surprising given the experience on this site of the rehabilitation bond being grossly inadequate to address the environmental impacts caused by the previous mine.

We note from visiting the DSDBI website that:

- The amount of the bond can be varied over the life of the mining operation depending on the potential liability. This could be expected to account for the increased



rehabilitation required as the extent of works increases and progressive rehabilitation during the life of the mine which would reduce some costs.

- The rehabilitation bond calculator provides for post closure environmental monitoring, project management, surveying (including any documentation and engineering and design changes that may be needed during closure) and contingency funds.
- The calculator does not appear to specifically address rehabilitation of a TSF dealing with PAF material.

It is beyond the Inquiry's role to attempt to calculate the rehabilitation bond and we are certainly not in a position to do so. However, experience on this site has demonstrated a clear need for calculation of the rehabilitation bond to have particular regard to the environmental risks associated with dealing with the PAF material at this site. Careful analysis is required to ensure the purpose of the size of the bond is sufficient to fulfil its purpose, namely to secure an assurance that the miner has financial responsibility for rehabilitation and the tax payer is protected from meeting what could be a substantial cost.

The Committee considers the establishment of an adequate post-closure Trust fund is critical to ensure environmental damage from TSF does not occur and to avoid the, unfortunately, common history of failed TSFs with associated demands placed on taxpayers to rectify impacts. We acknowledge that a systematic approach is being adopted to determine contributions by the Proponent to the Post closure Trust Fund. We are satisfied that, assuming the hand back of the rehabilitated mine and TSF only occurs after verification of effective rehabilitation, the scope of matters identified at the Hearing for funding by Trust Fund is reasonable. As discussed in Section 5, we consider the construction standard and monitoring of maintenance mean that the risk of catastrophic failure of the TSF is minimal and accept that the trust fund does not need to account for that possibility.

### **Conclusions**

- The information provided to the Inquiry did not provide an assurance that the calculation of the rehabilitation bond will ensure that the government (ie the taxpayer) will be fully protected from needing to meet substantial potential rehabilitation costs.
- The proposed post-closure trust fund is a critical part of planning for the Project and submissions from DSDBI Minerals Development Division suggest that the scope and approach to the fund is reasonable.

### **Recommendations**

- **Ensure the calculation of the rehabilitation bond has particular regard to the environmental risks and costs associated with mining and storing PAF material and the specific form and nature of this project.**
- **Establish a Post-closure Trust fund with sufficient funding from the Proponent and the government to ensure adequate monitoring, maintenance and responses to environmental and health risks posed by the rehabilitated mine, and the Independent Technical Reviewer(s) in particular.**

## **13.5 The draft amendment**

### **13.5.1 What is proposed?**

A draft Amendment to the East Gippsland Planning Scheme to regulate the development and use of land for out-of-tenement project elements of the Project. The draft Amendment applies Clause 52.03 and an associated Incorporated Document relating to the accommodation village, car park, water pipeline, power transmission and transport infrastructure, and associated vegetation removal. The draft planning scheme amendment was exhibited as part of the EES (included as Appendix X the EES), therefore Stockman intends to request the Minister to exempt the Amendment from further public exhibition under section 19 of the *Planning and Environment Act 1987* (Vic) and approve it under Section 20(4) of that Act.

### **13.5.2 Discussion**

In preceding sections of this report the consideration of issues has resulted in recommendations relating to matters such as bushfire risk, the Transport Management Plan and the management of amenity impacts from the car park in Benambra. Otherwise the Inquiry endorses the use of Clause 52.03 to facilitate elements of the Project and the scope of the associated Incorporated Document as exhibited.

## **13.6 Other draft applications**

### **13.6.1 Draft EPA works approval**

As the works undertaken in association with mining licence are covered by the Work Plan issued by DSDBI, the only two matters that EPA works approval are the effluent treatment plant at the accommodation village and for the exhaust emissions from the gas fired power station at the processing plant for the mine. The EPA would undertake the primary role of compliance and enforcement of both the power station and the wastewater treatment plant throughout the life of the Project.

The draft EPA works approval applications provide background and basic information in relation to the proposed facility but considerably more detail will be necessary to enable approval by the EPA.

### **Submissions**

The EPA submitted that preliminary analysis of the exhibited documentation has not identified any major issues relating to the power generation infrastructure proposed at the Currawong plant site and the wastewater treatment plant at the accommodation village. Mr German Ferrando-Miguel of the EPA advised the proposed power station and wastewater treatment plants both use robust technology that is well understood and able to meet compliance requirements for an EPA Works Approval and licence.

### **Discussion**

The Inquiry notes that post closure of the mine the ownership of the mine site and TSF will revert to DEPI and the workers village will be demolished and the private lease cancelled.

The Inquiry is satisfied that appropriate technical and regulatory controls are in place to minimise risks associated with the construction, operation and closure of both the power station at the processing site and the wastewater treatment plant at the workers village.

### **13.6.2 Draft application to construct TSF embankment upgrade**

#### **Evidence and submissions**

The draft application for the upgrading of the TSF embankment is included in the EES Appendices at volume VI section Z 14.

The draft application provides basic background information for the various stages but as advised by various experts for the Proponent it is a concept design and will require detailed review and possible modification following further geotechnical investigation and design refinement.

#### **Discussion**

The panel agrees with the various experts in relation to the dam design for the TSF that all design work should be independently reviewed and the construction aspects should be closely monitored.

As noted in Section 5, it is recommended that all aspects of the TSF embankment design and construction be independently peer reviewed as each stage of the embankment raising is investigated and modified.

#### **Conclusions**

The panel is satisfied that with capability of the dam experts for the Proponent and the appointment of the ITR to undertake independent peer review of all aspects of the TSF enlargement that the staged raising of the TSF embankment can be undertaken to ensure that future environmental risks are minimised.

### **13.6.3 Draft application to take and use surface and ground water**

#### **Evidence and submissions**

A series of draft applications related to both the modification and use of mine monitoring bores and the proposed water supply bores at Benambra have been included in the EES Appendices at volume VI.

Both SRW and GMW advised that based on the work undertaken by the Proponent to date, the additional investigations undertaken in relation to preliminary comments from the two water authorities that they are satisfied that the draft applications, together with other information which will be sought by the water authorities will be adequate to enable the works to proceed.

Both water authorities, advised that they have adequate powers under relevant legislation and internal expertise to ensure the suitability of the works and their compliance with relevant legislation.

## Discussion

We note that neither of the water authorities expressed any concerns in relation to the use of groundwater or surface water for the mine. SRW, which is responsible for licensing, groundwater from the mines, groundwater monitoring bores, enlargement and operation of the TSF and construction of any other dams at the mine site advised in its submission:

*“Overall, Independence Group has taken into account feedback provided by SRW throughout the process and incorporated the relevant aspects into the EES and supporting reports.”*

The Inquiry is satisfied that the relevant water authorities have adequate powers and capabilities to address any outstanding issues associated with the draft applications to take and use groundwater and water surface water. The Inquiry was reassured by the advice from the water authorities that the Proponent has undertaken all additional investigations etc requested by them during the development of the EES.

## Conclusions

The use of ground and surface water is appropriately controlled by the relevant water authorities under their existing powers.

### 13.6.4 Draft applications for works – pipeline crossings

The backup water supply for the mine is proposed to be pumped from a bore field at Benambra to the mine site along Limestone and McCallum’s roads. The Benambra bore field is also proposed to be used as the water supply for the accommodation village (see Section 6.2 for further detail).

As the pipeline will be required to cross a number of minor waterways and the Tambo River the Proponent will be required to lodge an application for Works on Waterways Licence, under 67 of the Water Act 1989 for each of the crossings with the North-East CMA and East Gippsland CMA.

Draft applications for the various crossings were included in the EES Appendices volume VI section Z.

## Evidence and Submissions

The submissions by the CMA’s noted their general satisfaction with the level of information provided in the EES and noted that they have licensing powers which gives them powers to require additional information necessary to enable a detailed evaluation of the design of the proposed works.

## Discussion

The Inquiry notes that the Proponent will be required to provide detailed design for the crossings which will be subject to the approval of the CMAs.

Given the ongoing close relationship between the Proponent and the relevant CMAs and the legislative requirements currently in place to ensure compliance with the CMAs requirements the Inquiry is satisfied that the draft applications provide an adequate basis for

the Proponent to work in consultation with the relevant CMAs to enable the works to proceed at the various waterway crossings in a manner that minimises any environmental issues associated with construction and operation of the water supply pipeline.

## **Appendix A Terms of Reference**



## TERMS OF REFERENCE

### Inquiry appointed under Section 9 of the *Environment Effects Act 1978* and Advisory Committee appointed under Section 151 of the *Planning and Environment Act 1987* to report on the Stockman Base Metals Project

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#### **Name**

1. The combined Inquiry and Advisory Committee is to be known as the 'Stockman Base Metals Project Inquiry and Advisory Committee' (the Inquiry).

#### **Purpose**

2. The purpose of the Inquiry is to inquire into the potential effects of the proposed Stockman Base Metals Project (the Project). The report of the Inquiry will inform the Minister for Planning's Assessment of the Project under the *Environment Effects Act 1978* (the EE Act) and will also assist the Minister to make decisions about the proposed amendment to the East Gippsland Shire Planning Scheme to facilitate the project.
3. In overview, the Inquiry is to:
  - i Consider and report on the potential effects of the project, taking into account the procedures and requirements the Minister specified for the preparation of the Environment Effects Statement (EES) under section 8B(5) of the EE Act (see Attachment 1) and the relevant controlling provisions under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) (Commonwealth) as outlined in paragraph 9 below; and
  - ii Address matters relevant to the design and implementation of the project and the draft planning scheme amendment prepared by the Proponent.

#### **Background**

##### Project

4. The Project includes recommissioning an existing underground mine and developing a new underground mine, approximately 19 km south-east of Benambra in East Gippsland. Approximately nine million tonnes of ore are proposed to be mined from underground to produce about 150,000 tonnes per year of copper-zinc-silver-gold concentrates for export over a projected nine year operating life. Tailings from ore processing would either be returned underground as backfill and/or stored above ground in a dedicated tailings storage facility (TSF) with a permanent water cover. The preferred location for the TSF is the site previously used by Denehurst Ltd when it operated the Benambra Project, now known as Lake St Barbara.
5. The Project would require a range of on- and off-site ancillary infrastructure to support the mine operation, including a processing plant, access roads, pipelines, water supply infrastructure, electricity supply infrastructure, road upgrades and worker accommodation.

6. The Project proponent is Stockman Project Pty Ltd, a wholly owned subsidiary of Independence Group NL (Independence), an Australian resources company listed on the Australian Securities Exchange (ASX) incorporated in 2000. Independence is based in Perth, Western Australia and has a range of operations, development projects and exploration prospects.

### **EES decision**

7. On 16 August 2010, the former Minister for Planning determined that an EES was required for the project under the EE Act. The EES has been prepared by the Proponent in response to Scoping Requirements issued by the Minister for Planning in March 2011.
8. The EES was placed on public exhibition, together with a draft amendment to the East Gippsland Planning Scheme, from 25 March until 8 May 2014.

### **Commonwealth decision**

9. The Project was referred to the former Australian Government Minister for Sustainability, Environment, Water, Population and Communities, and determined to be a controlled action under the EPBC Act. It therefore requires assessment and approval under the EPBC Act. The controlling provisions under that Act relate to listed threatened species and communities (sections 18 and 18A).
10. The accredited EES process under the Commonwealth-Victorian Bilateral Agreement for Environmental Impact Assessment applies to this project. Consequently, the Minister for Planning's Assessment<sup>1</sup> will need to assess the impacts of the project on matters of national environmental significance (NES) in accordance with Schedule 1 Part C of the Agreement, and be provided to the Australian Government Minister.

### **Planning approval process**

11. Stockman have prepared a draft amendment to the East Gippsland Shire Planning Scheme to introduce an incorporated document to facilitate the use and development of facilities and infrastructure outside the Mining Licence area associated with the project. The incorporated document would allow a residential village, car park, bore field, linear infrastructure, localised widening of Limestone and McCallums Roads and vegetation removal, subject to meeting a range of conditions.
12. Stockman intends to request the Minister to approve the Planning Scheme Amendment in accordance with section 20(4) of the *Planning and Environment Act 1987*, such that no further opportunity for public comment would occur on this amendment beyond this EES process.

### **Other approvals**

13. Under Victorian law, the project requires the following approvals:
- i Work Plan for work under the Mining Licence, under the *Mineral Resources (Sustainable Development) Act 1990*
  - ii Works Approvals for sewage treatment and disposal, and construction and operation of a power station, under the *Environment Protection Act 1970*
  - iii An approved Cultural Heritage Management Plan under the *Aboriginal Heritage Act 2006* to manage works in areas of cultural heritage sensitivity
  - iv Consent to remove listed flora and fauna under the *Flora and Fauna Guarantee Act 1988*

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<sup>1</sup> The agreement came into operation on 25 June 2009 and provides for the accreditation of specified Victorian statutory processes to ensure an integrated and coordinated assessment of actions requiring Commonwealth approval.



- v. Authority to take or disturb wildlife under the *Wildlife Act 1975*
- vi Licences for a dam, to take and use water, as well as consents for works on waterway under the *Water Act 1989*.

### **Method**

- 14. The Inquiry may inform itself in any manner it sees fit, but must consider the exhibited EES documents and draft planning scheme amendment, any submissions received in response to the exhibited documents, the Proponent's response to submissions and other relevant information provided to, or obtained by, the Inquiry, having regard to relevant statutory provisions, policies and associated plans.
- 15. The Inquiry must conduct a public hearing and may make other such enquiries as are relevant to its consideration of the potential environmental effects of the project.
- 16. The Inquiry must conduct its hearings in accordance with the following principles:
  - i. The Hearings will be conducted in an open, orderly and equitable manner, in accordance with the rules of natural justice, with a minimum of formality and without the necessity for legal representation.
  - ii. The Inquiry process will aim to be exploratory and constructive, where adversarial behaviour is minimised.
  - iii. Parties without legal representation will not be disadvantaged – cross-examination will be strictly controlled and prohibited where deemed not to be relevant by the Inquiry Chair.
- 17. The Inquiry will meet and conduct hearings when there is a quorum of at least two of its members present including the Inquiry Chair.

### **Submissions are public documents**

- 18. The Inquiry must retain a library of any written submissions and other supporting documentation provided to it directly until five years has passed from the time of its appointment.
- 19. Any written submissions or other supporting documentation provided to the Inquiry must be available for public inspection until the submission of its report, unless the Inquiry specifically directs that the material is to remain *in camera*.

### **Outcomes**

- 20. The Inquiry must produce a written report for the Minister for Planning presenting the Inquiry's:
  - i. findings on the likelihood and significance of environmental effects, and associated risks, of the project's different components and alternatives documented in the EES, including impacts on matters of NES protected under relevant controlling provisions of the EPBC Act
  - ii. conclusions on the feasibility of the project achieving acceptable environmental outcomes in the context of applicable legislation, related policy, relevant best practice, and the principles and objectives of ecologically sustainable development and environment protection
  - iii. recommendations on any modifications to the project and/or specific measures that are needed to prevent, minimise or compensate for adverse effects, in order to achieve acceptable environmental outcomes, in the context of relevant standards, objectives and guidelines established under relevant legislation
  - iv. recommendations on the framework for environmental management for the project, including in relation to the necessary Environment Management Plans required in association with different approvals

- v. recommendations on any conditions or matters that should be incorporated in the approval of a work plan or in any other statutory instrument/ approval applying to the works within the Mining Licence area (e.g. mine, ore processing and waste management and storage facilities during the development, operation, closure and post-closure phases)
- vi. recommendations on appropriate conditions and requirements to be addressed under the East Gippsland Planning Scheme or in any other statutory instrument/ approval with respect to project components outside of the Mining Licence area (e.g. residential village, car park, bore field, linear infrastructure, localised widening of Limestone and McCallums Roads and associated vegetation removal)
- vii. relevant information and analysis in support of the Inquiry's conclusions and recommendations
- viii a description of the proceedings conducted by the Inquiry and a list of those consulted and heard by the Inquiry.

### Timing

- 21. The Inquiry is required to report in writing to the Minister for Planning within eight weeks from its last hearing date.

### Fee

- 22. The members of the Inquiry will receive the same fees and allowances as a panel appointed under Division 1 of Part 8 of the *Planning and Environment Act 1987*.
- 23. The costs of the Inquiry will be met by Stockman.

APPROVED:



**MATTHEW GUY MLC**  
**Minister for Planning**

Date: 15.9.14

## Attachment 1

### **DECISION ON PROJECT: Stockman Base Metals Project**

#### **Decision under Sections 8B(3)(a) and 8B(5) of the *Environment Effects Act 1978***

1. In accordance with section 8B(3)(a) of the *Environment Effects Act 1978*, assessment through an Environment Effects Statement (EES) **is required** for the reasons set out in the attached Notice of Reasons for Decision.
2. The procedures and requirements applying to the preparation of the EES, in accordance with section 8B(5) of the *Environment Effects Act 1978* and the *Ministerial Guidelines for assessment of environmental effects under the Environment Effects Act 1978* (the 'Ministerial Guidelines'), are as follows:
  - (i) The EES is to give particular attention to the investigation of potential environmental effects of the proposed works and relevant alternatives, including associated environmental mitigation and management measures, particularly with respect to:
    - Hydrology, including impacts on groundwater (in relation to both mine dewatering and potential off-site extraction for operational purposes) and surface water (incorporating aspects of water quality and flow), and downstream environments;
    - Biodiversity, including impacts on ecological values of the Alpine National Park associated with potential water supply infrastructure; aquatic environments potentially affected by hydrological change; and noise and other disturbance associated with proposed mining activities on threatened fauna listed under the *Flora and Fauna Guarantee Act 1988*;
    - Tailings and other waste storage and management;
    - Aboriginal cultural heritage in vicinity of the proposed mine and ancillary infrastructure;
    - Indirect effects on the amenity and social functioning of the local community, including in relation to community infrastructure capacity.
  - (ii) The matters to be investigated and documented in the EES will be set out in detail in scoping requirements to be prepared for the project in accordance with the Ministerial Guidelines. Draft scoping requirements will be exhibited for 15 business days for public comment, before being finalised and then endorsed by the Minister for Planning
  - (iii) To inform the preparation of the scoping requirements, the proponent is to firstly provide an evaluation of project options and alternatives in the context of their key environmental issues and other feasibility considerations (including in relation to any advice from agencies and the Minister for Environment and Climate Change), to assist in the refinement of a preferred project scenario for more detailed assessment through the EES process; and then provide a draft study program for the preferred scenario that includes proposed investigations and their scheduling.
  - (iv) The Department of Planning and Community Development (DPCD) will convene an inter-agency group (Technical Reference Group (TRG)) to advise

both itself and the proponent with respect to the studies and preparation of the EES, as well as coordination with statutory approval processes.

- (v) The proponent is to prepare and implement an 'EES Consultation Plan' for informing the public and consulting with stakeholders during the preparation of the EES, having regard to advice from DPCD and the TRG.
  - (vi) The proponent is also to prepare and submit to DPCD its proposed schedule for the studies, preparation and exhibition of the EES, following confirmation of scoping requirements. This is to enable effective administration of the EES process via an agreement on alignment of the proponent's and DPCD's timeframes, including for TRG review of technical investigations and the EES documentation.
  - (vii) The proponent is to apply quality assurance procedures for the EES preparation, to enable completion of the studies to a satisfactory standard.
  - (viii) The EES is to be exhibited for a period of 30 business days.
  - (ix) An inquiry will be appointed under the *Environment Effects Act 1978* to consider the environmental effects of the proposal.
3. The following parties (proponent and relevant decision-makers) are to be notified of this decision under sections 8B(4) and 8B(6) of the *Environment Effects Act 1978*:
- Jabiru Metals Pty Ltd (proponent)
  - Minister for Energy and Resources (decision-maker)
  - Department of Primary Industries (decision-maker)
  - Minister for Environment and Climate Change (decision-maker)
  - Minister for Water (decision-maker)
  - East Gippsland Shire Council (decision-maker)
  - Alpine Shire Council (decision-maker)



**JUSTIN MADDEN MLC**  
**Minister for Planning**

Date:

16 AUG 2010

## Appendix B List of submitters

No.	Submitter
1	John McNaught
2	Graham Symons
3	CWA High Country Branch
4	Omeo Region Business and Tourism Association Inc.
5	Benambra Neighbourhood House Inc.
6	Beverley Kibble
7	BOC Limited
8	Graeme Sinott
9	Rodney O'Connell
10	Department of Environment and Primary Industries
11	Leonie Pendergast
12	Clifton and Kylie Smith
13	Rosalind Crisp
14	Nyah West Garage
15	Omeo Action Group
16	Grinter Transport Services
17	Pat Bloomer
18	Peter Hallam
19	North East Catchment Management Authority
20	East Gippsland Shire Council
21	Michelle Kerin
22	Golden Age Hotel
23	Sonia Buckley
24	Gippsland and Southern Rural Water Corporation
25	DSDBI (Earth Resources Regulation Branch)
26	DSDBI (Minerals Development)
27	Gippsland Environment Group Inc
28	EPA Victoria
29	Goulburn Murray Water
30	John Hermans
31	Victorian National Parks Association
32	VicRoads
33	Christopher McRae

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34	Lenore Richardson
35	Iain and Alisha Prowse-Brown
36	CFA Gippsland Region

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## Appendix C Hearing Document List

No.	Date	Description	Presented by
1	23/6/14	DTPLI presentation	E Bell
2		Proponent opening submission	T Power
3		Forest management Plan for Gippsland - DSE	T Power
4		Mining licence 5523	T Power
5		Hugh Middlemis overheads	H Middlemis
6	24/6/14	Brian Chadwick overheads	B Chadwick
7		Dr Jeff Taylor overheads	Dr J Taylor
8		David Fuller overheads	D Fuller
9		Stockland Point Lonsdale waterways panel report	T Power
10		Upper Goulburn Feral Mercury project	T Power
11	25/6/14	CFA submission and associated photos	A Wakenshaw G McMillan
12		Stephen Newman overheads	S Newman
13		Cameron Miller overheads	C Miller
14		Kerry Spencer overheads and attachments	K Spencer
15		John Mitas overheads	J Mitas
16		Tony Robinson / Dr German Ferrando – Miguel overheads	T Robinson Dr G Ferrando-Miguel
17		East Gippsland Shire presentation	K Nelson
18	26/6/14	Rod Jacobs overheads	R Jacobs
19		Management of Tailings Storage Facilities DPI Nov 2004	T Power
20		Transitional guidelines for native vegetation	T Power
21		Flora and Fauna guarantee order 1994	T Power
22		Additional submission by Bev Kibble	B Kibble
23		Louise Crisp additional submission Gippsland Environment Group	L Crisp
24		John Hermans additional submission	J Hermans
25		Philip Ingamells overheads	P Ingamells
26		VicRoads submission by Andrew Papacostas	A Papacostas
27		VicRoads submissions by Chris Padovan	C Padovan M Bartley
28		VicRoads data on actual maintenance costs	M Bartley
29		Traffic extract from EES re traffic	M Bartley
30	27/6/14	Proponent closing submission	T Power

No.	Date	Description	Presented by
31		Stockman project fact sheet No 1 – March 2012	T Power
32		Stockman project fact sheet No 3 - Nov 2012	T Power
33		Web site extract independence group	T Power
34		Additional matters for Work Plan from Freehills	T Power
35		Additional matters for planning scheme	T Power
36		Draft Incorporated Document	T Power

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## **Appendix D Changes to the Work Plan circulated by the Proponent after the Hearing**



## Contents

1	<b>Governance</b>	<b>2</b>
2	<b>Water - TSF</b>	<b>3</b>
3	<b>Water – mine voids</b>	<b>10</b>
4	<b>Water - borefield</b>	<b>13</b>
5	<b>Environmental management plan</b>	<b>14</b>
6	<b>Bushfire</b>	<b>15</b>
7	<b>Aquatic ecology</b>	<b>17</b>
8	<b>Terrestrial fauna</b>	<b>18</b>
9	<b>Native vegetation</b>	<b>20</b>

# 1 Governance

Issue	Position in Draft Work Plan exhibited with EES	Change suggested to Work Plan	Revised position
1. Project governance arrangements	Table 10-1 of the Work Plan identifies key stakeholder groups.	Propose a new 'Governance' section in Work Plan which identifies and sets parameters for: <ul style="list-style-type: none"> <li>• Appointment and scope of Independent Technical Reviewers with specialist knowledge of Tambo River catchment (explained further below);</li> <li>• Independent Technical Reviewers of dam design under ANCOLD;</li> <li>• Environmental Review Committee;</li> </ul>	Accepted
2. Independent Technical Reviewer (ITR)	N/A	Submissions from DSDBI and the EPA have recommended that an Independent Technical Reviewer be appointed to provide technical review of the Project.	Stockman, DSDBI and the EPA have discussed the intended functions of the ITR. Stockman has circulated for comment a memo outlining the proposed role and functions of each agency and the ITRs. A copy of this memo is attached in <b>Appendix 1</b> .

## 2 Water - TSF

Issue	Position in Draft Work Plan exhibited with EES	Change suggested to Work Plan	Revised position
<p>3. Groundwater monitoring to determine baseline conditions</p>	<p>Water management measures are set out in:</p> <ul style="list-style-type: none"> <li>• Figure 9-6 'Environmental Management Strategy – water', p9-9</li> <li>• Figure 9-9 'Environmental Management Strategy – Tailings and mineral waste management, p9-12</li> </ul>	<p>An additional management action is proposed: a hydrogeological investigation and review be conducted prior to any material effects from the Project to determine baseline conditions, including groundwater EQOs. This should be included within Figure 9-6 (water mitigation measures) and Figure 9-9 (tailings mitigation measures).</p> <p><i>[Recommended by Mr Chadwick]</i></p> <p>An additional management action is proposed: outputs from the groundwater monitoring to determine baseline conditions should be used to populate a local scale model. The model should aim to provide seepage estimates from the various embankment stage rises and identify what engineering works are necessary to achieve seepages that do not pose a risk to maintaining a wet cover.</p> <p><i>[Recommended by Mr Chadwick, URS and EPA]</i></p> <p>Specifically, this will include monitoring of groundwater levels and quality around Monkey's Knob, as requested by the EPA.</p> <p><i>[Recommended by EPA]</i></p> <p>The location of bores at which conformity with derived EQOs will be evaluated needs to reflect the principle in SEPP Groundwater that all practicable measures must be taken to prevent groundwater pollution, but that absolute prevention will not be possible.</p>	<p>Stockman agrees to undertake this monitoring.</p> <p><b>Timing:</b> Stockman will carry out the baseline monitoring prior to lodging the work plan, as the baseline monitoring results and model will influence the detailed TSF design (which is to be included in the work plan at DSDBI's request). Note however that EQOs will not be established prior to lodging the work plan, as this will require a number of monitoring events. The process for establishing the EQOs will be detailed in a monitoring program included in the work plan.</p> <p><b>Governance:</b> The ITR will review and endorse the location of the monitoring bores and the local scale model. This means that the ITR will need to be appointed before the work plan is lodged.</p>

Issue	Position in Draft Work Plan exhibited with EES	Change suggested to Work Plan	Revised position
<p>4. Monitoring of flow and surface water quality in Tambo River and Straight Creek to determine baseline conditions</p>	<p>Monthly monitoring of flow rate and water quality is proposed for the Tambo River, immediately downstream of Straight Creek confluence, plus other locations to be selected down gradient of the TSF (<b>Table 9-3, Stockman environmental monitoring strategy – TSF, p9-33</b>)</p>	<p>A clarification is required to the work plan.</p> <p>Table 9-3 will be amended to clarify that:</p> <ul style="list-style-type: none"> <li>• flow and water quality monitoring will be conducted on the Tambo River upstream of Straight Creek in order to establish background water quality levels and to derive EQOs which are unaffected by the influence of TSF seepage; and</li> <li>• water quality monitoring will be conducted on the Tambo River immediately upstream and downstream of the confluence of Straight Creek to develop EQOs.</li> </ul> <p><i>[Recommended by Mr Fuller]</i></p>	<p>Stockman will undertake monitoring of surface water quality and flow and will develop a Trigger Action Response Plan to identify contingency measures which are to be applied in the event that objectives are not met.</p> <p><b>Timing:</b> the monitoring program and the Trigger Action Response Plan will be incorporated into the Work Plan prior to lodgement. However, the monitoring itself will take place after the work plan is approved. For the avoidance of doubt, the Trigger Action Response Plan will not identify the EQOs (these are to be developed later).</p> <p><b>Governance:</b> The ITR will review the monitoring program and monitoring results to determine whether each is adequate to derive the EQOs. The ITR will also review the Trigger Action Response Plan.</p>
<p>5. Modelling of TSF risk</p>	<p>N/A</p>	<p>Modelling of impacts of TSF embankment failure scenarios based on ANCOLD endorsed methods (mudflow) prior to final design and construction.</p> <p><i>[Recommended by EPA]</i></p>	<p>Stockman accepts that a revised Dambreak assessment consistent with ANCOLD guidelines will be undertaken.</p> <p><b>Timing:</b> this modelling will occur prior to lodging the work plan, as it will be an input to the final detailed TSF design which is to be submitted as part of the work plan.</p> <p><b>Governance:</b> as explained below, the ITR will review and endorse the final detailed TSF design.</p>

Issue	Position in Draft Work Plan exhibited with EES	Change suggested to Work Plan	Revised position
6. Tailings permeability	N/A	<p>Gather data on permeability of tailings and the role of permeability in preventing seepage.</p> <p><i>[Recommended by EPA]</i></p>	<p>Accepted, data has already commenced being collected and this data will inform final design.</p> <p><b>Timing:</b> this data will be gathered prior to lodging the work plan, as it is an input to the detailed TSF design.</p> <p><b>Governance:</b> as explained below, the ITR will review and endorse the final detailed TSF design.</p>
7. TSF design	<p>The Work Plan currently provides that the TSF will be designed and constructed in accordance with ANCOLD (2012) and DPI (2004) guidelines (<b>Section 6.3, Design, p6-7)b</b>)</p>	<p>This will be clarified to ensure that the detailed TSF design is developed and submitted as part of the work plan.</p> <p><i>[Recommended by DSDBI]</i></p>	<p>Accepted</p> <p><b>Timing:</b> Stockman accepts that the detailed design must be prepared and included within the work plan.</p> <p><b>Governance:</b> The ITR will review and endorse the TSF detailed design. For this reason, the ITR must be appointed prior to work plan lodgement.</p>

Issue	Position in Draft Work Plan exhibited with EES	Change suggested to Work Plan	Revised position
<p>8. TSF performance monitoring</p>	<p>Section 6.5.4. identifies that a program is required to monitor the performance of the TSF post-closure [<i>'Instrumentation and monitoring,' p6-19 Work Plan</i>]</p>	<p>Table 9-3 of the Work Plan (p9-32 to 9-33) and Table 5-2 of the Rehabilitation Plan (p5-3) should be amended to incorporate a program to monitor performance of the TSF during operations and post closure. Monitoring should address:</p> <ul style="list-style-type: none"> <li>• Embankment performance: settlement, piezometric levels</li> <li>• Surface and groundwater quality and flows</li> <li>• Erosion</li> <li>• Vegetation establishment</li> <li>• Seepage quantities and qualities</li> <li>• Embankment settlement</li> <li>• Embankment groundwater levels (phreatic surface)</li> </ul> <p>TSF embankment monitoring should be undertaken consistent with ANCOLD Guidelines. Specifically, this would include:</p> <ul style="list-style-type: none"> <li>• Annual inspections by trained staff of the TSF Owner.</li> <li>• Ground and surface water would be sampled and testing results included in a report.</li> <li>• Comprehensive inspection every 5 years from a recognised professional, including a review of surface and groundwater monitoring programs.</li> <li>• Safety reviews every 20 years by specialist firm.</li> </ul> <p><i>[Recommended by Mr Newman, URS]</i></p>	<p>Stockman will undertake monitoring of TSF performance during operations.</p> <p><b>Timing:</b> this monitoring must necessarily occur after lodgement of the work plan as it relates to operations. However, Stockman will prepare a Trigger Action Response Plan and include this within the work plan. This will set out contingency measures available to Stockman if objectives are not met, although it is agreed that EQOs will not be specified in this plan.</p> <p><b>Governance:</b> the ITR will review and endorse the monitoring program and Trigger Action Response Plan.</p> <p>However, monitoring during post closure (e.g. safety reviews every 20 years) should be removed from the Work Plan, as it is not part of the mining operations. This should be managed under arrangements with the State pursuant to the post closure trust fund.</p>

Issue	Position in Draft Work Plan exhibited with EES	Change suggested to Work Plan	Revised position
9. Documents to be included in Work Plan	Not presently included.	<p>The completed Work Plan should include:</p> <ol style="list-style-type: none"> <li>1 Detailed designs and construction methodologies for the TSF, including seepage control measures;</li> <li>2 A Dam Safety Emergency Plan, as per ANCOLD Guidelines;</li> <li>3 Operations, Maintenance and Surveillance Manual, as per ANCOLD Guidelines; and</li> <li>4 A revised Dambreak assessment consistent with ANCOLD guidelines based on the final detailed design.</li> </ol> <p><i>[Recommended by Mr Newman, URS]</i></p>	<p><b>Timing:</b> Stockman will include items 1 and 4 within the work plan. The work plan will include a commitment to develop items 2 and 3, but these will be developed after the work plan is lodged but prior to commencing work on, or use of, the TSF.</p> <p><b>Governance:</b> The ITR will review the detailed design and construction of the TSF and any of the plans that are required to be reviewed to ensure the TSF design meets ANCOLD requirements.</p>
10. Seepage mitigation measures	<p>Measures to mitigate seepage from the expanded TSF are set out in <b>Section 6.3.2 'Expanded TSF seepage control', p6-15.</b></p> <p>The resultant seepage rate can be mitigated by ground works to reduce the permeability of the host rock in areas where the pond will contact directly with the rock. (<b>Section 6.3.2, Seepage – Expanded TSF Seepage Control, p6-15</b>)</p>	<p>A clarification is required to the work plan.</p> <p>This section should be amended to identify that the configuration of seepage control measures should be reassessed during stages 1 and 2 of the TSF lift, after review of collected monitoring data from the TSF.</p> <p><i>[Recommended by Mr Newman, URS]</i></p> <p>This section of the Work Plan requires clarification, as the permeability of the host rock is controlled by fractures/joints and their interconnection within the formation. The permeability of the rock itself is negligible for the purpose of seepage control. The ground works should focus on fracture permeability mitigation measures.</p> <p><i>[Recommended by Mr Chadwick, URS]</i></p>	<p>Stockman accepts this clarification.</p>



Issue	Position in Draft Work Plan exhibited with EES	Change suggested to Work Plan	Revised position
<p>11. External third party review of TSF</p>	<p>The work plan provides that the TSF will be designed and constructed in accordance with ANCOLD 2012 Guidelines and this has been confirmed by Mr Newman. <b>(Section 6.3, Design, p6-7)</b></p> <p>The work plan proposes that a comprehensive inspection of the TSF will be undertaken every 5 years by a recognised professional, as well as safety reviews every 2 years by a specialist firm, both of these in accordance with ANCOLD 2012 Guidelines <b>(Section 6.5.4 Instrumentation and Monitoring, p6-20)</b></p>	<p>A clarification is required to the work plan.</p> <p>Section 6.5.4 of the Work Plan (p6-20) requires clarification to confirm that external third party strategic reviews of the TSF will be conducted at critical phases of the TSF life cycle in accordance with section 2.6 of the ANCOLD Guidelines. This would include third party reviews at the following stages:</p> <ul style="list-style-type: none"> <li>• Concept and feasibility studies;</li> <li>• Design;</li> <li>• Construction;</li> <li>• Operations;</li> <li>• Closure.</li> </ul> <p><i>[Recommended by EPA]</i></p>	<p>Stockman accepts that this clarification.</p> <p><b>Governance:</b> it is proposed that an ITR will be appointed in respect of the TSF and it is the ITR who will carry out these third party reviews for ANCOLD purposes.</p>
<p>12. Water discharge criteria</p>	<p>The draft Work Plan states that:</p> <ul style="list-style-type: none"> <li>• water in excess of the 0.5 m cover will be discharged to the environment if it meets the required discharge criteria, or if not possible, water treatment may be required or a coffer dam built; <b>(p6-7)</b></li> <li>• there will be no planned discharge of supernatant water to the environment during operations <b>(p6-16)</b>;</li> <li>• management objectives include ensuring that any water discharged from the project area meets discharge criteria specified by the EPA. Specifically, this table provides that tailings management will include analysing all waters intended for discharge to the environment to ensure chemistry meets discharge criteria by EPA <b>(p9-12)</b>.</li> </ul>	<p>A clarification is required to the work plan.</p> <p>These sections will be amended to clarify that the criteria for discharge of supernatant water during operations (ie EQOs) cannot be specified at this stage, but will be derived following gathering of relevant monitoring data.</p> <p>In addition, bullet point one on page 6-7 should be clarified so that this refers to construction rather than operation (as it relates to stage 1 of the TSF lift).</p> <p>A further addition is required to the Work Plan to incorporate a Trigger Action Response Plan which identifies the management actions available to Stockman in the event that monitoring indicates supernatant water does not meet the relevant EQOs. For example, the Trigger Action Response Plan will state that supernatant water is not to be discharged from the TSF until a section 30A emergency approval has been obtained from the EPA or until the supernatant water has been treated to bring the water quality within EQO levels.</p>	<p>Accepted by Stockman.</p> <p><b>Timing:</b> The EQOs will not be specified in the Work Plan as these will be derived following the results of the monitoring program. However, the Trigger Action Response Plan will be developed and included within the Work Plan prior to lodging.</p> <p><b>Governance:</b> The ITR will be responsible for reviewing and endorsing the EQOs and the Trigger Action Response Plan.</p>

Issue	Position in Draft Work Plan exhibited with EES	Change suggested to Work Plan	Revised position
13. Treatment of supernatant water	<p>The draft Work Plan acknowledges that passive treatment of supernatant water may be required at the end of mining operations (<b>Section 4.4.1, Above Ground Tailings Storage, p4-4</b>).</p>	<p>A feasibility study be undertaken for the installation of a portable anaerobic bioreactor system (or other suitable treatment plant) to treat supernatant water during closure and until such time as water quality risks are sufficiently minimised.</p> <p><i>[Recommended by EPA]</i></p>	<p>No change is proposed to the work plan. Stockman's view is that it has committed not to discharge supernatant water post-closure unless relevant EQOs for surface water are met. There is no need for the Work Plan to prescribe a method for achieving this commitment, but the Work Plan will include a process to plan and deliver for contingencies (such as treatment) if desired or necessary.</p>
14. Water discharge criteria post-closure	<p>The draft Work Plan provides that:</p> <ul style="list-style-type: none"> <li>provisional criteria for mine closure include compliance with EPA discharge water criteria (<b>Figure 9-19, Mine Rehabilitation and Closure, p9-26</b>).</li> <li>key closure considerations include managing water quality in Lake St Barbara such that water stored in or discharged from the lake is safe and compatible with agreed post-mining beneficial uses (<b>Section 2.5 draft Rehabilitation Plan, p2-18</b>);</li> </ul> <p>the closure / rehabilitation objective for the TSF is that tailings flow-through water meets discharge criteria as agreed with EPA and other stakeholders (<b>Table 5-4 draft Rehabilitation Plan, p5-7</b>).</p>	<p>A clarification is required to the work plan.</p> <p>The reference in the draft Work Plan to 'EPA discharge water criteria' will amended to refer to EQOs.</p>	<p>Stockman accepts this clarification.</p>

Issue	Position in Draft Work Plan exhibited with EES	Change suggested to Work Plan	Revised position
15. Post-closure seepage monitoring	N/A	<p>Post closure seepage monitoring should be conducted at the TSF. This should be included in Table 9-3 of the Work Plan (page 9-32 to 9-33) and Table 5-2 of the Rehabilitation Plan (page 5-3).</p> <p><i>[Recommended by Mr Newman, URS]</i></p>	<p>Post closure monitoring should be removed from the Work Plan, as it is not part of the mining operations. This should be managed under arrangements with the State pursuant to the post closure trust fund.</p>

### 3 Water – mine voids

Issue	Position in Draft Work Plan exhibited with EES	Change suggested to Work Plan	Revised position
16. Groundwater levels in mine voids	<p>Once mining is completed, all the workings, including the paste-filled voids, will be flooded to pre-mining groundwater levels. <b>(Section 4.6 'Paste Backfill', p4-9)</b></p> <p>Table sets out tailings and mineral waste management measures. <b>[Figure 9-9 'Environmental Management Strategy – Tailings and mineral waste management, p9-12]</b></p>	<p>A clarification is required to the work plan.</p> <p>This statement in the work plan is correct. However, Mr Chadwick's view is that it is important to consider that groundwater levels will fluctuate due to seasonal and climatic variability.</p> <p>Therefore, this should be clarified so that the highest elevation for the placement of paste is appropriate to ensure that groundwater levels will maintain a minimum cover in the long term.</p> <p><i>[Recommended by Mr Chadwick, URS]</i></p>	Accepted.

Issue	Position in Draft Work Plan exhibited with EES	Change suggested to Work Plan	Revised position
<p>17. Contribution of springs to Tambo river flow</p>	<p>To establish baseline conditions, an array of groundwater monitoring bores will be drilled downstream of the TSF prior to commencement of tailings deposition (<b>section 6.4.3, 'Groundwater Monitoring', p6-16</b>).</p> <p>Stockman environmental monitoring strategy – mine voids (<b>Table 9-2, p9-30</b>)</p>	<p>The groundwater monitoring plan should also include monitoring at existing bore BEND115 (located on the Tambo River, downstream of Wilga Spring). This is in addition to the monitoring bore network proposed in Table 6.1 of the RPS Aquaterra report (EES, Appendix C1).</p> <p><i>[Recommended by Mr Middlemiss]</i></p>	<p>As re-establishing BEND115 will cause unacceptable environmental impacts, Stockman will commit to drilling a bore in the vicinity of BEND115 to monitor impacts.</p> <p><b>Timing:</b> Stockman will carry out the baseline monitoring prior to lodging the work plan.</p> <p><b>Governance:</b> the location of the groundwater bores will be reviewed and endorsed by the ITR.</p>
<p>18. Water quality monitoring</p>	<p>Table sets out monitoring strategy for mine voids, including water quality monitoring. <b>[Table 9-2 'Stockman environmental monitoring strategy – mine voids, p9-30]</b></p>	<p>A clarification is required to the work plan.</p> <p>Water quality monitoring should also occur post-closure. This is already reflected in the Rehabilitation Plan (p5-4), but is missing from the Work Plan table.</p> <p><i>[Recommended by Mr Newman, URS]</i></p>	<p>Accepted, but it is noted that all post closure commitments will be removed from the work plan (as these are the subject of the trust fund arrangements).</p>
<p>19. Review of options for closure of portals</p>	<p>The Work Plan contemplates that portal plugs will be used at Wilga upon closure, in order to minimise release of water from voids <b>[Section 2.2 'Domain 1: Wilga mine void and associated infrastructure', p2-2]</b></p>	<p>A clarification is required to the work plan.</p> <p>This section should be clarified to state that options for closure of the portals will be reviewed in consultation with DSDBI. A final closure plug design will be developed to suit the realised conditions.</p> <p><i>[Recommended by Mr Newman, URS]</i></p>	<p>Accepted.</p> <p><b>Timing:</b> the final plug design will be developed after the work plan has been approved by DSDBI.</p> <p><b>Governance:</b> the ITR will review and endorse the final detailed plug design.</p>

Issue	Position in Draft Work Plan exhibited with EES	Change suggested to Work Plan	Revised position
20. Plug monitoring	N/A	<p>A clarification is required to the work plan.</p> <p>If a plug is used, Table 5-3 of the Rehabilitation Plan (p5-4) should be amended under 'Engineering' to clarify that this annual visual inspection should include an inspection of the portal plug by trained staff.</p> <p><i>[Recommended by Mr Newman, URS]</i></p>	Accepted.
21. Tailings paste	<p>Geochemistry monitoring will be undertaken to verify and optimise the tailings paste backfill method, ie. to quantify any neutralisation requirements (<b>Table 9-3, Stockman environmental monitoring strategy – TSF, p9-34</b>)</p>	<p>The EPA has indicated that it requires additional information about:</p> <ul style="list-style-type: none"> <li>• the program to flood the mine voids;</li> <li>• the permeability of the tailings paste;</li> <li>• the rate of generation of AMD of tailings paste and the design standard to ensure the tailings paste does not generate acid prior to flooding.</li> <li>• how unfilled voids will impact the flow of Wilga Spring (when it rebounds);</li> <li>• triple bottom line analysis of the relative benefits and disadvantages of backfilling all voids, including declines.</li> </ul>	<p>The testing and monitoring of the geochemical properties will be addressed prior to the backfill method being implemented. Stockman explained during the Panel hearing, through the evidence of Mr Jacobs, that backfilling all voids is not possible.</p> <p><b>Timing:</b> the Work Plan will commit to carrying out oxygen consumption testing prior to use of the tailings paste.</p> <p><b>Governance:</b> it is not envisaged that the ITR will review paste testing results. The tailings paste will be used if testing reveals it has appropriate geotechnical and geochemical properties.</p>

## 4 Water - borefield

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Issue	Position in Draft Work Plan exhibited with EES	Change suggested to Work Plan	Revised position
<p>22. Borefield groundwater monitoring</p>	<p>In order to meet any deficits in production water supply and to provide water for drinking and for other applications (such as fire suppression) which require good quality water, a groundwater borefield is required. <b>[Section 7.2.1, Process water, p7-3 and 7-4]</b></p>	<p>A clarification is required to the Work Plan.</p> <p>This section should clarify that a comprehensive monitoring regime is required to operate the Borefield, with triggers to warn of potential future unacceptable impacts to existing users. This will also be a condition of the GMW extraction licence.</p> <p><i>[Recommended by Mr Chadwick, URS]</i></p>	<p>Stockman accepts this clarification.</p> <p>Note that this monitoring regime is already incorporated into Table 9-5, p9-36. Further clarification of this matter is more appropriate in the GWM extraction licence.</p>

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## 5 Environmental management plan

Issue	Position in Draft Work Plan exhibited with EES	Change suggested to Work Plan	Revised position
23. Management plans	Management strategies will be converted to plans, once the project has gained necessary authorisations and Stockman has made a decision to implement the project ( <b>section 9.5.3, Objectives, targets and plans, p9-7</b> )	<p>A clarification is required to the Work Plan.</p> <p>The Environmental Management Plan will be developed and incorporated into the final version of the Work Plan for approval by DSDBI. This is a requirement of Schedule 15, clause 7, <i>Mineral Resources (Sustainable Development) (Mineral Industries) Regulations 2013</i>.</p>	<p>Accepted.</p> <p><b>Timing:</b> an overarching EMP will be developed and included within the work plan. This will be based on the Environmental Management Framework included within the EES. In addition, the work plan will include detailed information about environmental management for surface water, groundwater and the TSF.</p> <p>The work plan will also commit to the preparation of detailed sub-plans, such as the Bushfire Response Plan and Feral Animal Management Plan, prior to the commencement of construction. The requirement to produce these detailed plans will be included in the work plan.</p> <p><b>Governance:</b> It is not envisaged that the ITR will review these plans, apart from components mentioned earlier relating to the TSF, water and groundwater monitoring arrangements.</p>

## 6 Bushfire

Issue	Position in Draft Work Plan exhibited with EES	Change suggested to Work Plan	Revised position
<p>24. Refuge chambers</p>	<p>Work Plan proposes refuge chambers within the Currawong and Wilga mines as follows:</p> <ul style="list-style-type: none"> <li>• Currawong: one x 20 man refuge chamber, three x 4 man refuge chambers to ensure there is sufficient capacity for all personnel underground</li> <li>• Wilga: one x 12 man, one x 4 man refuge chambers to ensure there is sufficient capacity for all personnel underground.</li> </ul> <p>Plan proposes that the concept of utilising the workings as a refuge of last resort of the entire site workforce be further developed.</p> <p><b>(Section 4.9, Escapeways and refuge chambers, p4-12 and section 7.9, Bushfire Risk Mitigation, p7-5)</b></p>	<p>A clarification is required to the Work Plan.</p> <p>Clarification is required as these refuge chambers were specifically intended to address underground fires. Bushfire management measures will be developed in consultation with the CFA and DEPI following a risk assessment.</p>	<p>Stockman will include detail regarding bushfire management measures within the Bushfire Response Plan, developed in consultation with the CFA and DEPI.</p> <p><b>Timing:</b> The Work Plan will commit to the preparation of the Bushfire Response Plan prior to the commencement of construction, and will include an overview of the Plan's key areas. In accordance with DSDBI's request, the Work Plan will confirm the areas to be cleared for bushfire protection.</p> <p><b>Governance:</b> the ITR will not be involved in bushfire management.</p>
<p>25. Defendable space</p>	<p>The draft Work Plan currently specified Asset Protection Zones to be maintained around the Currawong process plant, administration building and Wilga mine <b>(Table 7-1, Bushfire risk mitigation requirements for mine site Asset Protection Zones, p7-5)</b></p>	<p>In its submission, the CFA recommended that defendable space and vegetation management around mine infrastructure be incorporated into Work Plan.</p>	<p>As noted above, Stockman's view is that it is more appropriate to include this detail in the Bushfire Response Plan (e.g. to accommodate design changes which may impact defendable space provided).</p> <p>However, the Work Plan will confirm the areas to be cleared for bushfire protection.</p>



26. Coordination between  
Bushfire Management Plans

A Bushfire Response Plan is contemplated by the Work Plan (at p9-21) and a Fire Emergency Response Plan is contemplated by the Incorporated Document (at clause 5).

Clarification is required to both the Work Plan and Incorporated Document that a single Bushfire Management Plan will be developed for the Stockman operations. This Plan will also satisfy the requirement for a 'fire response and readiness plan' in clause 6.3 of the MIN5523 mining licence.

Accepted.

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## 7 Aquatic ecology

Issue	Position in Draft Work Plan exhibited with EES	Change suggested to Work Plan	Revised position
27. Road crossings	Management actions identified in <b>Figure 9-8 Environmental Management Strategy – protection of flora and fauna, p9-11</b>	<p>Figure 9-8 of the Work Plan should be amended to insert a new management action which requires all new or upgraded road crossing to allow for fish and crayfish passage.</p> <p><i>[Recommended by Mr Harrow, GHD]</i></p>	<p>Accepted.</p> <p><b>Timing:</b> this clarification will be made in the Work Plan, but the detail regarding aquatic ecology management measures will be set out in the Aquatic Ecology Management Plan which is to be developed prior to the commencement of construction.</p> <p><b>Governance:</b> the ITR will not be involved in aquatic ecology, except to the extent the ITR reviews surface water quality issues.</p>
28. Protection of aquatic ecology	N/A	<p>Mr Harrow's recommended mitigation measures on p8-9 of his witness statement should be incorporated into the EMP, subject to the need to be able to do works in waterways for the TSF and for linear infrastructure that crosses waterways.</p> <p><i>[Recommended by Mr Harrow, GHD]</i></p>	<p>Accepted.</p> <p><b>Timing:</b> this will be set out in the Aquatic Ecology Management Plan which is to be developed prior to the commencement of construction. The work plan will specify a requirement to prepare this plan.</p> <p><b>Governance:</b> the ITR will not be involved in aquatic ecology, except to the extent the ITR reviews surface water quality issues.</p>

## 8 Terrestrial fauna

Issue	Position in Draft Work Plan exhibited with EES	Change suggested to Work Plan	Revised position
29. Feral animals	Management actions to protect an increase of feral animal populations include implementing an invasive fauna reporting system ( <b>Figure 9-8, Environmental Management Strategy – protection of flora and fauna, p9-11</b> )	The Work Plan should be amended to clarify that the invasive fauna reporting system will be combined with a specific Feral Management Plan to implement on-ground control and monitoring of feral animals.  <i>[Recommended by Mr Miller]</i>	Accepted, to the extent of areas impacted by the project.  <b>Timing:</b> a Feral Animal Management Plan will be developed prior to the commencement of construction. The Work plan will specify a requirement to prepare this plan.  <b>Governance:</b> the ITR will not be involved in terrestrial fauna issues.
30. Hollow bearing trees	N/A	Figure 9-8 of the Work Plan (p9-11) should be amended to clarify that surveys of hollow bearing trees at clearance and offset sites should occur prior to construction to ensure that appropriate offsets are in place.  <i>[Recommended by Mr Miller]</i>	Accepted to be undertaken during clearing.  <b>Timing:</b> this will be set out in the Fauna Management Plan which is to be developed prior to the commencement of construction.  <b>Governance:</b> the ITR will not be involved in terrestrial fauna issues.

31. Fauna monitoring

The terrestrial fauna monitoring strategy provides that monitoring of all disturbed areas (including a nominal 50m buffer zone) will be undertaken before commencement of construction and as required during operations.

Specifically, targeted searches will be undertaken for the

- Spotted Tree Frog;
- Giant Burrowing Frog;
- Alpine Tree Frog;
- Alpine Bog Skink;
- Alpine Water Skink.

*(Table 9-7, Stockman environmental monitoring strategy – terrestrial fauna, p9-39)*

Table 9-7 of the draft Work Plan should be amended to include the following additional monitoring:

- reptiles within areas of habitat removal (bogs and streams);
- hollow bearing tree assessment at removal sites;
- within offset site to investigate the success of threatened species habitat offsets;
- amphibian habitat, in particular for the Giant Burrowing Frog and Alpine Tree Frog;
- reptiles within the Dinner Plain site (bogs and streams) and Pendergast site (Montane Grassy Woodland); and
- hollow bearing tree assessment and hollow utilisation by fauna within scattered and large old tree offset sites.

*[Recommended by Mr Miller]*

Agreed, provided clear objectives are established around the purpose and outcome of the surveys in consultation with DEPI.

**Governance:** the ITR will not be involved in terrestrial fauna issues.

## 9 Native vegetation

Issue	Position in Draft Work Plan exhibited with EES	Change suggested to Work Plan	Revised position
32. Monitoring – Montane Swamp	Management actions including the annual monitoring of vegetation health are identified [ <b>Figure 9-8 'Environmental Management Strategy – protection of flora and fauna,' p9-11</b> and <b>Table 9-7 'Stockman Environmental Monitoring Strategy – general,' p9-38</b> ]	These sections should be amended to specifically include areas of Montane Swamp within the Straight Creek Catchment.  [Recommended by Ms Spencer, Ethos NRM]	Accepted.  <b>Governance:</b> the ITR will not be involved in native vegetation issues.
33. Retention of Large Old and hollow-bearing trees	N/A	<b>Figure 9-8 Environmental Management Strategy – protection of flora and fauna, p9-11</b> should be amended to require the retention of Large Old and/or hollow-bearing trees within Fire Protection Zones at Currawong, Wilga and the Accommodation Village sites, and along the linear easement.  [Recommended by Ms Spencer, Ethos NRM]	Accepted where feasible and consistent with Bushfire Response Plan.  <b>Governance:</b> the ITR will not be involved in native vegetation issues.