UNITY
Mining Limited

Big Island Mining Pty Ltd ABN 12 112 787 470

Response to Submissions
for the
Dargues Gold Mine

Modification 3
MP10_0054

Prepared by
R.W. CORKERY & CO. PTY. LIMITED

November 2015

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Big Island Mining Pty Ltd ABN 12 112 787 470

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for the

Dargues Gold Mine

Modification 3

MP10_0054

Prepared for:

Big Island Mining Pty Ltd
ABN: 12 112 787 470
Level 10, 350 Collins Street
MELBOURNE VIC 3000

Telephone: (03) 8622 2300
Facsimile: (03) 8622 2399
Email: darguesinfoline@unitymining.com.au

Prepared by:

R.W. Corkery & Co. Pty. Limited
Geological & Environmental Consultants
ABN: 31 002 033 712

Brooklyn Office:
1st Floor, 12 Dangar Road
PO Box 239
BROOKLYN NSW 2083

Telephone: (02) 9985 8511
Facsimile: (02) 6361 3622
Email: brooklyn@rwcorkery.com

Orange Office:
62 Hill Street
ORANGE NSW 2800

Telephone: (02) 6362 5411
Facsimile: (02) 6361 3622
Email: orange@rwcorkery.com

Brisbane Office:
Suite 5, Building 3
Pine Rivers Office Park
205 Leitchs Road
BRENDALE QLD 4500

Telephone: (07) 3205 5400
Facsimile: (02) 6361 3622
Email: brisbane@rwcorkery.com

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November 2015

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FOREWORD

Unity Mining Limited
ABN 61 005 674 073
Level 10 350 Collins Street
Melbourne VIC 3000
T: +61 (0)3 8622 2300
F: +61 (0)3 8622 2399
E: info@unitymining.com.au
W: unitymining.com.au

20 November 2015

Mr Mike Young
Director, Resource Assessments
Department of Planning and Environment
23-33 Bridge Street
SYDNEY, New South Wales, 2001

Dear Mike

Unity Mining Limited ("Unity") along with its wholly owned subsidiary company Big Island Mining Pty Ltd ("BIM") has much pleasure in presenting our Response to Submissions in relation to our application to modify Project Approval MP10_0054 for the Dargues Gold Mine Project.

Following completion of the exhibition period, a review of the submissions received and consultation with a range of stakeholders, we have decided to withdraw those components of the application that relate to:

1) Processing on-site at the Dargues Gold Mine using cyanide; and

2) Enlargement of the tailings storage facility.

In short, we have taken on board the concerns raised by the community and other stakeholder groups and have withdrawn these two proposed amendments that were of significant concern to the community and stakeholder groups.

As a result of this, we are now only seeking approval for those components of the application that relate to:

1) An amendment to the Project Site to accommodate the recently purchased "Slings" property;

2) A minor increase to the total resource to be extracted and associated extension of the life of the mine;

3) Construction and use of the Eastern Waste Rock Emplacement;

4) Construction and use of a vehicle crossing over Spring Creek to permit direct access between the box cut and the Tailings Storage Facility and proposed Eastern Waste Rock Emplacement; and

5) A range of minor adjustments to the conditions of MP10_0054 to further clarify the intent of the conditions.

Unity and BIM are encouraged by the recent discussions with NSW Government in this regard, as well as the general support the project continues to receive from the community, with the exception of cyanide usage on site and the proposed enlargement of the Tailings Storage Facility.

A number of credible options for off-site concentrate processing are continuing to be actively pursued at this point and we fully expect to be able to announce a successful conclusion for this in the very near future.

The Dargues Gold Mine Project will provide a substantial economic benefit to the local region and for New South Wales, through:

1) the creation of a significant number of jobs and training opportunities during both the construction and operational phases of the project, over a total period of approximately 6 years;

2) substantial benefit to the local community through contribution to the local economy; and

3) royalty and taxation income to the State and Commonwealth.

We look forward to the favourable consideration and approval for the remaining elements of the application that we are seeking approval for, and confirm we are ready to commence the development of the project once these are in place.

Yours faithfully

Frank Terranova
Acting Managing Director
Unity Mining Limited
Director
Big Island Mining Pty Ltd

Kerry Parker
Chief Financial Officer
Unity Mining Limited
Director
Big Island Mining Pty Ltd

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COMMONLY USED ACRONYMS

AHIMS	Aboriginal Heritage Information Management System
AHMP	*Aboriginal Heritage Management Plan*
ANCOLD	Australian National Committee on Large Dams
AVPPEC	Araluen Valley Agricultural Producers & Protectors of the Ecosystems Coalition
BMP	*Biodiversity Management Plan*
CIL	carbon-in-leach
DSC	Dams Safety Committee of New South Wales
EA	*Environmental Assessment*
EECs	endangered ecological communities
EP&A Act	*Environmental Planning and Assessment Act 1979*
GAI	geochemical abundance index
HRD	harvestable rights dam
IBC	Integrated Bulk Container
MCCG	Majors Creek Catchment Guardians
MOD2	modified Project Approval MP10_0054
MUS	Managing Urban Stormwater
NCMG	National Coast Marine Group
NPV	Net Present Value
OEH	Office of Environment and Heritage
RAPs	Registered Aboriginal Parties
ROM	Run of Mine
RWC	R.W. Corkery & Co. Pty Limited
SEPP	*State Environmental Planning Policy*
SOCs	Statement of Commitments
SHSA	Southcoast Health and Sustainability Alliance
TSF	Tailings Storage Facility
TSS	Total Suspended Solids
TLPG	Tuross Lakes Preservation Group
VIC DPI	Victorian Department of Primary Industry
WACC	Weighted Average Cost of Capital

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EXECUTIVE SUMMARY

Big Island Mining Pty Ltd (the Proponent) made an application on 9 July 2015 under Section 75W of the *Environmental Planning and Assessment Act 1979* to modify Project Approval MP10_0054 for the Dargues Gold Mine. The application was placed on public exhibition from 15 July 2015 to 26 August 2015.

Following completion of the exhibition period, a review of the submissions received and consultation with a range of stakeholders, the Proponent **withdrew the following two components** from the Proposed Modification.

- Final processing of gold concentrate on site to produce gold doré or unrefined gold bars using a conventional carbon-in-leach (CIL) processing plant, including:
  - transportation, storage, use and disposal of cyanide within the Project Site; and
  - placement of leached concentrate tailings within the Tailings Storage Facility.
- Construction of an enlarged Tailings Storage Facility.

Approval is therefore sought to modify MP10_0054 to allow for the following components only.

1. An amendment to the Project Site to accommodate the recently purchased "Slings" property;
2. A minor increase to the total resource to be extracted and associated extension of the life of the mine;
3. Construction and use of the Eastern Waste Rock Emplacement;
4. Construction and use of a vehicle crossing over Spring Creek to permit direct access between the box cut and the Tailings Storage Facility and proposed Eastern Waste Rock Emplacement; and
5. A range of minor adjustments to the conditions of MP10_0054 to further clarify the intent of the conditions.

During the public exhibition, submissions were received from:

- 10 government agencies;
- 13 special interest groups; and
- 394 individuals, including 60 submissions by way of support, 330 submissions by way of objection and 4 submissions providing commentary.

Table A provides an overview and response to the principal issues raised during the exhibition period. By necessity, the information provided in **Table A** is brief, with a more detailed response to all issues raised provided in the remainder of this document.

Table A
Overview of Principle Issues Raised

Issue	Response
Tailings Storage Facility	
The Proponent notes that enlargement of the Tailings Storage Facility no longer forms a component of the Proposed Modification and that the facility would be constructed in a manner consistent with the current Project approval. Notwithstanding this, numerous submissions raised concerns in relation to the Tailings Storage Facility as presented in RWC (2015). The following presents brief responses as they relate to the approved Tailings Storage Facility.	
Climate data used	This issue principally relates to the use of rainfall and evaporation data used in the design of the Tailings Storage Facility, in particular the use of data from the Braidwood and Majors Creek Bureau of Meteorology stations. Knight Piésold notes that a design check of the Tailings Storage Facility embankment crest levels was undertaken using rainfall data from the Braidwood and Majors Creek weather stations. This comparison identified that the embankment levels or spillway design concepts were the same for both datasets. In relation to the evaporation data used, Knight Piésold note that standard gridded evaporation data from the Bureau of Meteorology was used. The use of evaporation data from the Braidwood (Wallace St) station was rejected because of the short-term nature of the data set and questions about the accuracy of the data.
Adequacy of the design	This issue principally relates to whether the Tailings Storage Facility has been appropriately designed. The approved Tailings Storage Facility has been designed by Knight Piésold who are experts in the design of such facilities within Australia and worldwide. The design is required to be in accordance with the requirements of the Dams Safety Committee of NSW, which in turn are consistent with the requirements of the Australian National Committee on Large Dams. Knight Piésold have provided information to the Dams Safety Committee of NSW at each stage of the design process and no deficiencies have been identified to date. Knight Piésold note that this process will be ongoing throughout the final design, construction and operational life of the facility.
Suitability of the location of the facility	This issue principally relates to the assertion that the facility should be located in the Shoalhaven Catchment, not the Majors Creek Catchment. As the Tailings Storage Facility would be consistent with the approved facility, the Proponent contends that this issue is no longer relevant.
Potential for catastrophic failure of the embankment	This issue principally relates to concerns that the facility embankment may fail catastrophically. As the Tailings Storage Facility would be consistent with the approved facility and relevant Dams Safety Committee of NSW requirements, the Proponent contends that the risk of catastrophic failure of the facility would be in line with similar facilities throughout NSW.
Tailings composition and “heavy metals”	This issue principally relates to concerns that placement of leached concentrate tailings into the Tailings Storage Facility would result in “heavy metals” being discharged to the environment. While the Proponent questions the validity of the above assertion, as placement of leached concentrate tailings into the Tailings Storage Facility no longer forms a component of the Proposed Modification and the tailings composition would be consistent with the approved Project, this issue is no longer relevant.
Adequacy of the liner and seepage from the facility	This issue principally relates to the life of the proposed HDPE liner and rate of seepage from the Tailings Storage Facility. As the Tailings Storage Facility would be constructed in a manner that is consistent with the approved Project, the Proponent contends that this issue is no longer relevant.

Table A (Cont'd)
Overview of Principle Issues Raised

Issue	Response
Tailings Storage Facility (Cont'd)	
Overtopping of the facility	This issue principally relates to the pollution-related consequences of an overtopping event. In particular, the impact of cyanide or "heavy metals" in supernatant water was commonly raised. This issue was commonly associated with commentary in relation to the adequacy of the climate data used. As the Tailings Storage Facility would be constructed in a manner consistent with the approved Project and neither cyanide nor leached concentrate tailings would be placed within the facility, this issue is no longer relevant.
Rehabilitation and long-term management of the facility	This issue principally relates to concerns in relation to how the Tailings Storage Facility would be rehabilitated and managed post-closure of the Dargues Gold Mine. As the Tailings Storage Facility would be constructed, operated and rehabilitated in accordance with the approved Project, this issue has been previously addressed. In summary, however, the facility will be: • reshaped to form a free draining landform, including a final spillway capable of conveying a maximum probable flood rainfall event; • a suitable cover, incorporating an impermeable barrier/layer and/or store and release cover would be constructed to minimise the potential for infiltration of water into the tailings; and • the facility would be revegetated in a manner suitable for continued grazing activities. In addition, the Proponent notes that the Mining Lease would not be relinquished and the security would not be returned until the relevant government agencies are satisfied that the Tailings Storage Facility has been adequately rehabilitated and does not pose a long-term risk to the environment.
Downstream Impacts	
Drinking water-related impacts	Numerous submissions raised the issue of adverse impacts to Eurobodalla's drinking water supply, as well as that of residents downstream of the Project Site. The principal issues of concern relate to the potential for cyanide or "heavy metal" contamination as a result of seepage from or overtopping of the Tailings Storage Facility. The Proponent notes that the use of cyanide and the placement of leached concentrate tailings into the Tailings Storage Facility no longer form a component of the Proposed Modification. As a result, the risks to drinking water downstream of the Project Site are consistent with those associated with the approved Project. As these matters were the subject of the appeal to the original application for Project Approval and were the subject of consideration in the Land and Environment Court action, the Proponent contends that this issue is no longer relevant.
Surface water-related impacts	This issue principally relates to adverse impacts associated with seepage from or over topping of the Tailings Storage Facility. These issues have previously been addressed in this Executive Summary.

Table A (Cont'd)
Overview of Principle Issues Raised

Issue	Response
Downstream Impacts (Cont'd)	
Groundwater-related impacts	This issue principally relates to risks to groundwater impacts associated with seepage of cyanide or "heavy metal"-laden water from the Tailings Storage Facility. A few submissions also raised the issue of an increase in groundwater drawdown surrounding the Project Site. As the Tailings Storage Facility would be constructed in a manner consistent with the approved Project and neither cyanide nor leached concentrate tailings would be placed within the facility, this issue is no longer relevant. In addition, the Proponent notes that the groundwater assessment presented in the *Environmental Assessment* prepared to support the application for the Proposed Modification indicates that the zone of anticipated groundwater drawdown for the Project is expected to be slightly smaller than presented in the original application.
Erosion and Sediment-related impacts	This issue relates to the ability of the Proponent to manage erosion and sediment control within the Project Site. The issue of the prior performance of the Proponent is addressed below. The Proponent acknowledges that management of erosion and sedimentation is an issue that requires ongoing management. The emphasis that the Proponent places on management of this issue is evidenced by the resources that have been devoted to it, including construction and progressive improvement of a range of sediment control structures and employment of between two and three people during the current period of care and maintenance to operate and maintain the current system. Finally, the Proponent notes *Erosion and Sediment Control Plans* prepared for the Project Site have been and would continue to be prepared in accordance with *Managing Urban Stormwater* by Certified Professionals in Erosion and Sediment Control. Implementation of these plans would be supervised by suitably qualified and experienced independent experts during the construction phase of the Project.
Economic Impacts	
Rehabilitation and security	Similar to the issue of rehabilitation of the Tailings Storage Facility addressed above, this issue principally relates to how the wider Project Site would be rehabilitated and managed post-closure of the Dargues Gold Mine. Prior to commencing mining operations, a new *Mining Operations Plan* will be prepared in consultation with a wide range of government agencies and the community. That document will describe the rehabilitation activities within the Project Site and be required to be assessed and approved by the Division of Resources and Energy. A security bond consistent with a detailed Rehabilitation Cost Estimate will be required to be lodged. The Proponent anticipates that the security bond will be required to be substantially more than the current security, reflecting the greater areas of disturbance required for the operating Mine. Finally, the Proponent notes that the financial modelling for the Project includes an estimate for the rehabilitation of the Project Site following completion of mining operations.
Project viability	This issue principally related to concerns that the Project is not viable and assertions that the Proponent or its successors operator would inevitably be unable to fund its rehabilitation liabilities, leaving a substantial rehabilitation liability for the State. The Proponent notes that its financial modelling indicates that the Project is profitable under a range of operational scenarios, including gold prices substantially less than the current spot price and that adequate resources would be available to appropriately manage and rehabilitate the Project Site.

Table A (Cont'd)
Overview of Principle Issues Raised

Issue	Response
Economic Impacts (Cont'd)	
Agricultural and Tourism impacts	These issues primarily relate to concerns that the Proposed Modification would adversely impact on agricultural or tourism operations downstream of the Project Site. The Proponent notes that adverse impacts on agriculture or tourism would require adverse impacts on surface water or groundwater that would extend a substantial distance downstream from the Project Site. These issues have been addressed previously in this Executive Summary.
Reputational impacts	This issue primarily relates to adverse impacts on the reputation of the tourism or agricultural industries as a result of the Proposed Modification. The Proponent contends that the Project, as approved or as modified, would not adversely impact on the reputation of the agricultural or tourism industries downstream of the Project Site. However, the Proponent does acknowledge that a range of inaccurate and well publicised statements in relation to the potential impacts of the Project have been made by others. These statements have the potential to adversely impact on the reputation of these industries. The Proponent has attempted to correct the record in relation to the inaccurate statements, and will continue to do so.
Project contributions	This issue primarily questions the economic contributions of the Project as modified, including the proportion of residential or locally-based positions. The removal of cyanide processing within the Project Site has resulted in a slight reduction in the anticipated number of employees associated with the Project. In addition, the Proponent reaffirms its commitment to ensure that all positions will be offered on a residential basis, with exceptions only for positions requiring specialist skills and/or qualifications that are not available within the surrounding district.
Planning Matters	
Development Creep	Numerous submissions raised the issue of "development creep," namely that the Proposed Modification would result in further applications to process ore from other locations. The Proponent notes that any future modification of the Project Approval for the Dargues Gold Mine would require further approval under Section 75W of the EP&A Act or any subsequent amendment/replacement of the Act. Such an application would be exhibited and assessed on its merits at the time.
Application of s75W	This issue relates to the assertion that the Proposed Modification is not a matter that is able to be determined under s75W of the EP&A Act. The Proponent has received legal advice that this assertion is not correct.
Other Matters	
Acid rock drainage	This issue principally relates to concerns that waste rock or tailings may be acid generating, with resulting adverse impacts on downstream water quality. The Proponent notes that flotation tailings to be placed within the Tailings Storage Facility are strongly acid consuming. In addition, the characterisation of waste rock was a matter of contention during the NSW Land and Environment Court appeal to the original application for Project Approval. Experts engaged by each party agreed that the waste rock within the Project Site is non-acid forming.

Table A (Cont'd)
Overview of Principle Issues Raised

Issue	Response
Other Matters (Cont'd)	
Proponent's prior environmental performance	This issue principally relates to allegations that the Proponent's prior environmental performance indicates that it is not capable of appropriately managing the Project. The Proponent acknowledges that it failed to adequately manage erosion and sediment controls during the initial stages of the Project and that as a result, sediment-laden water was discharged from the Project Site. This matter has been dealt with by the NSW Land and Environment Court, with the outcome well publicised. The Proponent has previously acknowledged the failures that led to these discharges and has invested significant resources in managing environmental matters within the Project Site since that date. Notwithstanding the above, the Proponent rejects the assertion that it is unable to manage environmental issues within the Project Site.
Biodiversity-related impacts	This issue primarily relates to concerns that the Proposed Modification may result in adverse impacts as a result of pollution of surface or groundwater downstream of the Project Site. Issues associated with pollution of surface water or groundwater have been previously addressed.
Noise-related impacts	This issue alleges that the Proposed Modification would result in unacceptable increased noise impacts. The Proponent notes that the noise assessment for the Proposed Modification determined that the Proposed Modification would result in negligible changes in noise emissions compared with the approved Project during night-time construction and operational stages of the Project. Minor increases of between 1dB(A) and 2dB(A) are expected at four of the residences assessed. However, the anticipated noise emissions would be less than the noise assessment criterion of 35dB(A).

1. INTRODUCTION

Big Island Mining Pty Ltd (the Proponent) made an application on 9 July 2015 under Section 75W of the *Environmental Planning and Assessment Act 1979* to modify Project Approval MP10_0054 (MOD2) for the Dargues Gold Mine. The Project, as approved, is described in the following documents.

- *Environmental Assessment for the Dargues Reef Gold Project* dated September 2010 (RWC, 2010a).
- *Response to Submissions* (RWC, 2010b)
- *Environmental Assessment for the Dargues Reef Gold Project - Modification 1*, dated April 2012 (RWC, 2012a).
- *Response to Government Agency and Public Submissions for the Dargues Reef Gold Project - Modification 1* dated June 2012 (RWC, 2012b).
- *Environmental Assessment for the Dargues Gold Mine - Modification 2* dated July 2013 (RWC, 2013a).
- *Response to Government Agency and Public Submissions for the Dargues Reef Gold Project - Modification 2* dated September 2013 (RWC, 2013b).

The application of 9 July 2015, referred to hereafter as the Proposed Modification, is described in the document *Environmental Assessment for the Dargues Reef Gold Project - Modification 3* dated July 2015 (RWC, 2015). The Proposed Modification as described in that document sought approval for the following.

1. An amendment to the Project Site to accommodate the recently purchased "Slings" property.
2. A minor increase to the total resource to be extracted and associated extension of the life of the mine.
3. Construction and use of the Eastern Waste Rock Emplacement.
4. Construction and use of a vehicle crossing over Spring Creek to permit direct access between the box cut and the Tailings Storage Facility and proposed Eastern Waste Rock Emplacement.
5. Final processing of gold concentrate on site to produce gold doré or unrefined gold bars using a conventional carbon-in-leach (CIL) processing plant, including:
   - transportation, storage, use and disposal of cyanide within the Project Site; and
   - placement of leached concentrate tailings within the Tailings Storage Facility.
6. Construction of an enlarged Tailings Storage Facility.
7. A range of minor adjustments to the conditions of MP10_0054 to further clarify the intent of the conditions.

The application was placed on public exhibition from 15 July 2015 to 26 August 2015. During the public exhibition, submissions were received from:

- 10 government agencies;
- 13 special interest groups; and

- 394 individuals, including 60 submissions by way of support, 330 submissions by way of objection and 4 submissions providing commentary.

Following completion of the exhibition period, a review of the submissions received and consultation with a range of stakeholders, the Proponent withdrew Items 5 and 6 above from the Proposed Modification.

This document has been prepared by RW Corkery & Co Pty Limited on behalf of the Proponent to provide:

- clarification in relation to the amendments to the Proposed Modification; and
- a response to each of the submissions received.

During preparation of this document, specialist input in relation to a range of matters was provided by the following experts. Where those experts provided specialist reports, they have been appended to this document. In other cases, specialists provided text for inclusion in this document.

- Tailings Storage Facility - Simon Smith (B.Eng (Hons), MBA, MIEAust, CPEng), Senior Engineer, Knight Piésold Pty Ltd.
- Aboriginal heritage - Dr Sandra Wallace (PhD Archaeology, BA (Hons 1), MAACAI), Managing Director, Artefact.
- Application of s75W of the *Environmental Planning and Assessment Act 1979* (EP&A Act) - Jennifer Hughes (BSc, LLB.), Partner, Baker & McKenzie.

In order to facilitate review of this document, text drawn from submissions received is presented as *italicised* text. The Proponent's response is presented in non-italicised text. Where appropriate, responses have been tabulated to limit repetition.

2. AMENDMENTS TO THE PROPOSED MODIFICATION

2.1 INTRODUCTION

Following completion of the exhibition period, the Proponent undertook a review of the submissions received. The Proponent also consulted with a range of stakeholders, including the Department of Planning and Environment and Environment Protection Authority. As a result of that review and consultation, the following proposed activities have been withdrawn from the Proposed Modification.

- Final processing of gold concentrate on site to produce gold doré or unrefined gold bars using a conventional carbon-in-leach (CIL) processing plant, including:
  - transportation, storage, use and disposal of cyanide within the Project Site; and
  - placement of leached concentrate tailings within the Tailings Storage Facility.
- Construction of an enlarged Tailings Storage Facility.

As a result of the withdrawal of the above components from the Proposed Modification, the following approved activities that were proposed to be removed from the Project would be retained as described in the following documents.

- Construction and use of the approved processing plant, including the crushing, grinding, gravity and flotation circuits and gold room (Section 2.6.2 to 2.6.4 of RWC (2010a)).
- Construction and use of the approved concentrate loading facility (Section 2.6.5 of RWC (2010a)).
- Construction and use of the approved Tailings Storage Facility (Section 2.7 of RWC (2010a)).
- Transportation of the concentrate from the Project Site to the Kings Highway using semi-trailers (Section 2.9.3 of RWC (2010a)).

Figure 1 presents the amended Project Site layout incorporating all components or activities to be retained should the Proposed Modification, as amended, be approved.

Finally, given the delays experienced since commencement of the Proposed Modification and the anticipated timeframes to recommence construction and subsequently mining operations, the Proponent proposes to amend the proposed end date for mining operations from 31 December 2022 to 31 December 2024.

This Section provides a detailed description of the amendments to the Proposed Modification, including those sections of RWC (2015) that are no longer relevant. All other aspects of the Proposed Modification not described in this Section remain unchanged.

2.2 FINAL PROCESSING OF FLOTATION CONCENTRATE

2.2.1 Activities for which Approval is no Longer Sought

The approved Project includes processing of gold ore to produce a concentrate that will to be transported from the Project Site at a rate of up to 30 000tpa. The Proposed Modification, as described in Section 2.5.4 of RWC (2015), sought approval for the following activities.

- A carbon-in-leach (CIL) circuit, comprising a number of leach tanks and associated infrastructure, including a cyanide destruction circuit.
- An elution circuit and associated infrastructure.
- Modification to the approved gold room and associated infrastructure, in particular to accommodate the elution circuit, and more frequent operation of the room in light of the increased throughput that final processing of gold ore would require.
- A bunded cyanide store and management area.

Approval for these activities is no longer sought. As a result, the activities described in Section 2.5.4 of RWC (2015) and background information presented in Sections 2.5.1 to 2.5.3 of that document no longer form a component of the Proposed Modification.

2.2.2 Approved Activities that would Continue

The following approved activities would continue. Cross references to where the approved activities are described are provided in parenthesis.

- Mining and transportation of up to 355 000tpa of gold-bearing ore to the ROM Pad (Section 2.4 of RWC (2010a)).
- Crushing, screening and grinding of that material (Section 2.6.3 of RWC (2010a)).
- Gravity separation and flotation of ground ore to produce a gravity and flotation concentrate (Section 2.6.4 of RWC (2010a)).
- Processing of the gravity concentrate within the gold room to produce gold doré (Section 2.6.4 of RWC (2010a)).
- Storage, loading and transportation of flotation concentrate at a rate of up to 30 000tpa or four loads (eight movements) per day using road registered semi-trailers from the Project Site to the Kings Highway (Sections 2.6.4 and 2.9.3 of RWC (2010a)). The approved transportation route for flotation concentrate includes the following roads.
  - Majors Creek Road.
  - Araluen Road.
  - Captains Flat Road.
  - Coghill Street.
  - Wallace Street.

2.3 TAILINGS MANAGEMENT

2.3.1 Activities for which Approval is no Longer Sought

The Proposed Modification, as described in Section 2.6 of RWC (2015), sought approval for the following activities.

- Placement of an additional approximately 0.32Mt of flotation and leached concentrate tailings, for a total of 1.22Mt of tailings, into the Tailings Storage Facility. Concentrate tailings are those tailings that would have been produced by the carbon-in-leach plant.
- Placement and recycling of process water containing residual cyanide.
- Modification of the Tailings Storage Facility design to incorporate the following.
  - A larger storage capacity, including an increase in the area of the facility and the height of the embankment.
  - Downstream construction of the embankment.

Approval for these activities is no longer sought. As a result, the activities described in Section 2.6 of RWC (2015) no longer form a component of the Proposed Modification.

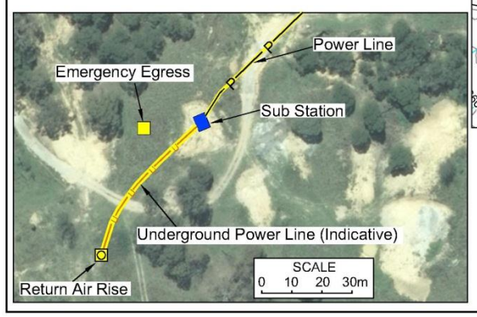
Y:\Jobs 531 to 1000\752\Reports\75238_MOD3_EA_2014\CAD\752EA_MOD3.dwg_1 Amended Proposed Layout-19.11.2015-9:27 AM

TN
MN

See Detail Right
See Detail Left
See Detail Below Left

Proposed Eastern Waste Rock Emplacement
WRESB1
SB2
SWP1
TSFSB1
Paste Fill Holes
Emergency Egress
SB1
Spring
Return Air Rise
Creek
Tailings Storage Facility
Site Access Road
Approved Tailings Storage Facility Access Road (to be replaced by Proposed Tailings Storage Facility Access Road)
Decline Path Projected to Surface (Indicative only)
Existing Site Access Track (Emergency Access only once Site Access Road finalised)
Majors Creek Road

SCALE 1:8 000 (A3)
100 0 100 200 300 400 m
Base Map Source: Geo-spectrum (Australia) Pty Ltd



Detail

Clean Water Diversion Channel
Office and Core Processing Area
+701m
+700m
Mine Infrastructure Area
Proposed Eastern Waste Rock Emplacement
Proposed Sediment Basin WRESB1
SWP1
SB2
Clean Water Diversion Channel
+695m
Processing Plant Area
+702m
+701m
ROM Pad / Southern Temporary Waste Rock Emplacement
+706m
+700m
+692m
+705m
Proposed Tailings Storage Facility Access Road
SCC-SB2
SCC-SB1
SCC-SB3
+690m
Box Cut
+680m

SCALE 1:4 000
50 0 50 100 150 200 m

REFERENCE

- Project Site Boundary
- Contour (m AHD)(Interval = 5m)
- Contour (m AHD)(Interval = 10m)
- + 692 Spot height (m AHD)
- Watercourse / Drainage Line
- Sealed Road
- Unsealed Road
- Existing Dam/Water Storage
- Long Term Sediment Basin
- Approved Harvestable Rights Dam (Indicative Location)
- Catchment Boundary
- Existing Transmission Line (Above ground)
- Approved Transmission Line (Above ground)
- Approved Transmission Line (Underground)
- Approved Pipeline (Indicative)
- Approved Road/Track (Sealed/Unsealed)
- Fence (note: fences not co-incident with cadastral boundaries)
- Soil Stockpile (Indicative location)
- Clean Water Diversion Structure (Indicative location)
- Proposed Modified Infrastructure

Figure 1
PROPOSED PROJECT SITE LAYOUT - AMENDED

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2.3.2 Approved Activities that would continue

The following approved activities would continue. Cross references to where the approved activities are described are provided in parenthesis.

- Construction of a Tailings Storage Facility with the following design parameters (Section 2.7.2.2 of RWC (2010a)). **Appendix 1** presents the *Final Design Report* prepared for the Project by Knight Piésold in November 2011, referred to hereafter as Knight Piésold (2011). That report will be reviewed to ensure that the design of the facility is consistent with any guidelines or standards that may have been adjusted since the design was completed.
  - Maximum area of disturbance - approximately 9.3ha.
  - Maximum area within the upslope diversion structure – approximately 12ha.
  - Maximum embankment height – approximately 28m above the natural surface.
  - Slope of outer face of the embankment – 1:3.5 V:H.
  - Storage capacity – 0.89Mt of tailings.
  - Up slope clean surface water diversion channel capable of diverting a maximum probable flood around the facility (Condition 3(25A) of MP10_0054).

It is noted that the Proposed Modification seeks approval for extraction of up to 1.6Mt of gold-bearing ore. The Proponent anticipates that approximately 0.18Mt of concentrate would be removed from the Project Site for final processing elsewhere. As a result, approximately 1.42Mt of tailings would be produced, with approximately 0.52Mt to 0.63Mt of tailings to be placed into completed stopes as paste fill, with the remaining tailings placed into the Tailings Storage Facility.

The placement of tailings within the approved Tailings Storage Facility would occur as described in Section 2.7.4 of RWC (2010a) and would be non-acid forming, with a strongly negative acid generation potential.

As identified by GHD (2015) (prepared to support the submissions of Palerang and Eurobodalla Councils - see Section 3.7.4), the environment risk associated with the approved processing methodology and resulting tailings composition may be managed "using relatively simple [management] measures."

Finally, it is noted that Section 4.3.2 of RWC (2015) identified that the Proposed Modification as described in that document would disturb an additional 19.5ha of native-dominated pasture, of which an additional 7.0ha would be disturbed by the enlarged Tailings Storage Facility. As the Tailings Storage Facility is not proposed to be modified, the Proposed Modification, as amended, would result in the following additional disturbance.

- Community 4 – Regenerating Wattles - 0.2ha (unchanged).
- Community 7 – Native-dominated Pasture – 12.5ha (down from the originally proposed 19.5ha).

Table 1 presents the amended total areas of disturbance associated with the Proposed Modification.

Table 1
Vegetation Communities – Comparison of Approved and Proposed Disturbance

Vegetation Community	Area to be disturbed (ha)			Total Area within Gaia (2010) Survey Area (ha)
	Original Application[1]	Modification 2 (2013)	Modification 3	
1 – Ribbon Gum – Snow Gum Grassy Open Forest	0.1	0.1	0.1	28.2
2 – Fragmented Ribbon Gum – Snow Gum Grassy Open Forest	0.1	0.1	0.1	7.1
3 – Woody Weeds Shrubland	0.1	0.1	0.1	30.1
4 – Regenerating Wattles	-	-	0.2	18.5
5 – Exotic Vegetation	0.2	0.2	0.1	5.6
6 – Native Grassland	0.2	0.2	0.2	0.2
7 – Native-dominated Pasture	23.6	25.3	37.8	280.1
8 – Exotic-dominated Pasture	-	0.3	0.5	2.5
9 – Largely Disturbed Land	2.2	2.2	0.5	23.1
10 – River Peppermint Open Forest	-	-	-	1.3
Total	**26.5**	**28.5**	**46.6**	**396.6**

Note 1: Areas of disturbance are consistent with Figure 4.17 of RWC (2010a). This does not include minor areas between individual infrastructure items

Source: After RWC (2015) – after Table 21

Section 4.3.6 of RWC (2015) identifies that the Proponent proposes to increase the on-site Biodiversity Offset Area to include an additional 40ha of Native-dominated Pasture. Given the reduction in the proposed additional disturbance of this community from 19.5ha to 12.5ha, the Proponent proposes to reduce the additional area of this community within the on-site Biodiversity Offset Area to 30ha.

2.4 AMENDED LIFE OF THE PROJECT

Condition 2(5) of MP10_0054 identifies that approved mining operations may be undertaken until 31 August 2018. Section 2.2 of RWC (2015) identifies that no increase to the approved rate of production of 355 000tpa is sought. Given the increase in the amount of ore to be extracted and the fact that the production rate is expected to ramp up gradually in the early years of mining operations and ramp down towards the end of the approved mine life, the Proponent anticipates that between 5 and 6 years will be required for mining operations. In addition, the Proponent anticipates that between 1 and 2 years will be required for initial financing and construction operations prior to the commencement of mining operations. As a result, the Proponent originally sought to extend the completion date for mining operations from 31 August 2018 to 31 December 2022. Following further review of the Project and taking into account potential delays in the approval process, the Proponent now proposes to extend the completion date for mining operations from 31 August 2018 to 31 December 2024.

2.5 AMENDED MODIFICATIONS REQUIRED

2.5.1 Introduction

Section 2.1.3 of RWC (2015) identifies the modification to the conditions of MP10_0054 and the approved Statement of Commitments that were to be sought. In light of the proposed amendments to the Proposed Modification described in Sections 2.1 to 2.5, the following subsections reproduce the proposed amendments, with proposed additions underlined and proposed deletions presented in ~~strikeout~~ text. Changes to the text presented in RWC (2015) are presented in **bold red** text.

2.5.2 Conditions of MP10_0054

The Proponent anticipates that the following modifications to the conditions of MP10_0054 will be required to facilitate the Proposed Modification, as amended.

- Definitions.
  - EA Environmental Assessment titled Environmental Assessment for the Dargues Reef Gold Project, and Specialist Consultant Studies Compendium Volume 1 and 2, dated September 2010, prepared by R. W. Corkery and Co Pty Limited, including the Response to Submissions, and additional information from Gaia Research Pty Ltd dated 5 May 2011;

    Environmental Assessment titled Environmental Assessment for the Dargues Reef Gold Project, Modification 1, dated April 2012, prepared by R. W. Corkery and Co Pty Limited, including the Response to Submissions;

    Environmental Assessment titled Environmental Assessment for the Dargues Gold Mine, Modification 2, dated July 2013, prepared by R.W. Corkery and Co Pty Limited, including the Response to Submissions; and

    Environmental Assessment titled Environmental Assessment for the Dargues Gold Mine, Modification 3, dated **July** 2015, prepared by R.W. Corkery and Co Pty Limited, including the Response to Submissions.

  - Response to Submissions.

    The Proponent's responses to issues raised in submissions, including those titled:

    - Response to Government Agency and Public Submissions for the Dargues Reef Gold Project, dated December 2010;
    - Response to NSW Office of Water Submission Dated 16 December 2010 for the Dargues Reef Gold Project, dated December 2010;

- Response to DECCW Issues, dated 2 March 2011;
- Response to Submission Received 15 April 2011, dated 20 April 2011;
- Letter from Cortona Resources Limited, dated 15 December 2010;
- **Response to Government Agency and Public Submissions – Modification 1 dated June 2012;**
- **Response to Agency and Public Submissions – Modification 2 dated September 2013; and**
- Response to Submissions – Modification 3 dated <date to be confirmed>.

~~– RTA Roads and Traffic Authority.~~

– RMS Roads and Maritime Services.

- Schedule 2, Condition 5.
  - The Proponent may carry out mining operations on the site until 31 ~~August 2018~~ **December 2024**.
- Schedule 2, Condition 6.
  - The Proponent shall not:
    - process more than 355 000 tonnes of ore at the site in a calendar year;
    - process more than ~~1.2~~ 1.6 million tonnes of ore at the site over the life of the project;
    - use any **cyanide or** mercury on site to process or extract gold from the project; or
    - process or smelt any ore other than that extracted from the site.
- Schedule 3, Condition 15.
  - The Proponent shall ensure compliance with the emission standards for Group 6 treatment plants under Schedule 3 of *Protection of the Environment Operations (Clean Air) Regulation 2010* (non-ferrous metal production). ~~any pollutant limits in the EPL set after further assessment of the potential air quality impacts associated with the gold smelting process (refer to Condition 17 below).~~
- Schedule 3, Condition 24 - no change to approved condition proposed.
  - The Proponent shall ensure **that the ~~capacity~~ permeability** of the tailings storage facility **basin is designed to meet the requirements of the Environmental Guidelines – Management of Tailings Storage Facilities (VIC DPI, 2004) and that the walls, floor and final capping of the tailings storage facility is designed to be equivalent to 600mm clay of permeability 1 x 10^{-8}m/s.**

Note: An alternative permeability standard may be acceptable following completion of an appropriate risk assessment undertaken in accordance with the Environmental Guidelines – Management of Tailings Storage Facilities (VIC DPI, 2004) to the satisfaction of OEH and the ~~Director General~~ Secretary.

Comment: The Proponent recommends that the term "capacity of the of the tailings storage facility" be replaced by the term "permeability of the tailings storage facility basin" as the VIC DPI guideline requirements in relation to freeboard are not necessarily consistent with those of the Dams Safety Committee of NSW. The Proponent contends that the revise form of words preserves the original intention of the condition.

- Schedule 3, Condition 32
  - The Proponent shall implement the offset strategy outlined in Table 9, described in the EA, and shown in Appendix 4 to the satisfaction of the ~~Director General~~ Secretary.

    Table 9: Biodiversity Offset

Community Type	Area (ha)
Ribbon Gum Forest*	8.7
Fragmented Ribbon Gum Forest*	7.1
Regenerating wattles	7.6
Exotic vegetation	5.1
Natural Temperate Grassland**	0.2
Native – dominated pasture	265.7***
Exotic pasture	2.5
Largely disturbed land	3.9
River Peppermint Open Forest	1.3
TOTAL	312.1
* Listed as an EEC under the Threatened Species Conservation Act, 1995 ** Listed as a CEEC under the Environment Protection and Biodiversity Conservation Act, 1999 *** Increased by 30ha from 235.7ha in MOD2 for 265.7ha for MOD3	

- Schedule 3, Condition 37.
  - The Proponent shall prepare and implement an Aboriginal Heritage Management Plan for the project to the satisfaction of the ~~Director General~~ Secretary. The Plan must:

    (a) be prepared in consultation with OEH and the Aboriginal community;

    (b) be submitted to the ~~Director General~~ Secretary for approval prior to construction; and

    (c) include a:

    - program for fencing ~~the 5~~ identified Aboriginal sites;

- program for the recording, salvage and surface collection of any Aboriginal objects/sites that may be encountered within the project area;
- description of the measures that would be implemented if any Aboriginal skeletal remains are discovered during the project; and
- protocol for the ongoing consultation and involvement of the Aboriginal community in the conservation and management of the Aboriginal heritage of the objects/sites.

- Schedule 3, Condition 40 – no change to approved condition proposed.
  - The Proponent shall:

    (a) keep accurate records of the:

    - amount of concentrate transported from the site (on a monthly basis); and
    - the date and time of loaded truck movements from the site; and

    (b) provide the ~~**Director General**~~ **Secretary** with a summary of these truck movements on a quarterly basis.

- Schedule 3, Condition 41.
  - The Proponent shall ensure that:

    (a) a maximum of 4 concentrate trucks exit the site per hour;

    (b) the dispatch of concentrate from the site is limited to between the hours of 7am to 10pm Monday to Saturday and 8am-10pm Sundays and Public Holidays;

    (c) all heavy vehicle movements to or from the site are prohibited between the hours of 7am – 8.30am and 3pm-5pm on school days; and

    (d) a bus is operated from Braidwood to offer mine workers transport to and from the site each day; and

    (e) all reasonable and feasible measures are implemented to minimise the project's contribution to the traffic on Majors Creek Road, Araluen Flat Road, Captains Flat Road, Coghill Street and Wallace Street.

- Appendix 1 – Schedule of Land.
  - Replace the table in Appendix 1 with **Table 1** of **RWC (2015).**
  - Replace the figure on p23 with **Figure 2** of **RWC (2015).**

- Appendices 2, 3, 4 and 7.

  Replace figures on pp24, 25, 27, 29, 30 and 56 with suitable figures showing the proposed modified layout and revised Project Site boundary.

2.5.3 Statement of Commitments

Appendix 2 presents the revised Statement of Commitments originally presented in Appendix 1 of RWC (2015). The statement has been amended to further identify and retain commitments that were associated with the Land and Environment Court action. The statement has also been amended in light of submissions received and to remove any additional areas of potential conflict with the Project Approval, other licences or statutory requirements.

2.6 ANCILLARY MODIFICATIONS TO RWC (2015)

Finally, it is noted that the above amendments to the Proposed Modification will result in a range of statements presented in Section 2 of RWC (2015) no longer being accurate. The following clarifies the principal matters that are affected by the above amendments to the Proposed Modification. All additions are underlined and deletions presented in ~~strikeout~~ text. References to the relevant sections of RWC (2015) are presented in parenthesis.

Objectives of the Modification (Section 2.1.1 of RWC (2015))

The Proponent's objectives in modifying MP10_0054 are as follows.

- To maximise the efficiency of the mining and material handling operations.
- To ensure that waste rock remains available in a convenient location for mining purposes and during rehabilitation activities.
- To ensure that processing operations are undertaken in the most cost effective manner~~, in particular, to remove the requirement for two separate processing facilities, with duplicate Tailings Storage Facilities and other infrastructure to be established~~.
- To ensure that the Project Site includes all areas of Proponent-controlled land.
- To minimise, to the maximum extent practicable, the overall environmental impact of the Project.
- To develop the Project in the most robust manner possible to ensure sufficient resources are available to manage the Project in a manner that is consistent with best practice and to maximise the benefits for the community, local businesses, the Proponent's employees and contractors and the Proponent's shareholders.

Overview of the Proposed Modification (Section 2.1.2 of RWC (2015))

This Proposed Modification would include the following components or activities.

- An amendment to the Project Site to accommodate the recently purchased "Slings" property.
- A minor increase to the total resource to be extracted and associated extension of the life of the mine.
- Construction and use of the Eastern Waste Rock Emplacement.
- Construction and use of a vehicle crossing over Spring Creek to permit direct access between the box cut and the Tailings Storage Facility and proposed Eastern Waste Rock Emplacement.

- ~~Final processing of gold concentrate on site to produce gold doré or unrefined gold bars using a conventional carbon-in-leach (CIL) processing plant.~~
- ~~Construction of an enlarged Tailings Storage Facility to permit storage of additional tailings that would be produced as a result of the additional ore to be processed and the on-site final processing of gold concentrate.~~
- A range of minor adjustments to the conditions of MP10_0054 to further clarify the intent of the conditions.

Section 2.3.3 – Layout of the Eastern Waste Rock Emplacement

The Proponent has reviewed the waste rock balance for the Project, taking into account the most recent mine plan and amendments to the Proposed Modification and has confirmed that the waste balance used to inform the design of the Eastern Waste Rock Emplacement remains valid. However, a typographical error was identified in Section 2.3.3 of RWC (2015) as follows. No other adjustments to that Section, including to Figure 5, are required.

In summary, the emplacement would have the following design criteria.

- Maximum elevation ..... approximately 721m AHD.
- Footprint ..... approximately 6ha.
- Design capacity ..... approximately 350 000~~t~~m^3 or ~~150~~ 630 000~~m^3~~t.
- Number of lifts ..... three.
- Lift height ..... between 3m and 4m.

Modified Employment, Capital Cost and Economic Contributions (Section 2.8 of RWC (2015))

During its review of the Project, the Proponent revised its assumptions in relation to the employment, capital cost and economic contributions of the Project, assuming that the Proposed Modification is granted. As a result of the withdrawal of final processing of gold concentrate within the Project Site and enlargement of the Tailings Storage Facility, the employment, capital cost and economic contributions of the Project as modified would be as presented in RWC (2010a) and as follows.

- Direct full-time employment.
  - Site establishment – approximately ~~120~~ 100 full-time equivalent positions.
  - Operations – ~~approximately 100 full-time equivalent positions (80 positions)~~ approximately 80 full-time equivalent positions. It is the Proponent's intention that all these positions be residential, with no positions offered on a fly in/fly out roster.
- ~~Capital cost – the proposed carbon-in-leach plant would have an additional capital cost of approximately $10.42 million.~~
- Capital cost – approximately $42 million.
- Economic contributions.
  - ~~Local and regional economies – $6 million to $10 million per year.~~

  - Local and regional economies – $3 million to $7 million per year.
  - State and national – $10 million to $31 million per year.
- Taxes and royalties – $1 million to $8 million per year to the State and national governments.

3. GOVERNMENT AGENCY SUBMISSIONS

3.1 INTRODUCTION

Submissions were received from the following government agencies. This section provides a response to the issues raised by each agency.

- Dams Safety Committee of NSW.
- Department of Primary Industries – Agriculture.
- Department of Primary Industries – Water.
- Department of Primary Industries – Fisheries.
- Environment Protection Authority.
- Eurobodalla and Palerang Shire Councils.
- Division of Resources and Energy.
- Office of Environment and Heritage.
- Water NSW.

Where relevant, text extracted from the submissions is presented in *italics*, with responses to issues raised provided in normal test.

3.2 DAMS SAFETY COMMITTEE OF NSW

The Dams Safety Committee of NSW is constituted under the *Dams Safety Act 1978* to ensure the safety of dams in NSW. The Committee describes its functions as follows.

- "To protect the safety, welfare and interests of the community from dam failure by ensuring that risks from prescribed dams are tolerable;
- To ensure that Dams Safety Committee of NSW requirements are met, that risk are regularly reviewed, and further reduced if reasonably practicable;
- To protect the security of dams and their stored waters from the effects of mining or other activities."

The Proponent notes that the design of the Tailings Storage Facility is to remain as approved and that the Committee has previously advised the Proponent that the design meets the requirements of the Committee for construction.

Notwithstanding the above, the Proponent notes that the facility, as approved, would remain a "prescribed" dam and that the Proponent would be required to continue to consult with the Dams Safety Committee of NSW during the construction, operation and closure of the facility.

3.3 DEPARTMENT OF PRIMARY INDUSTRIES – AGRICULTURE

The submission from the Department of Primary Industries – Agriculture identified that the Department's only concern was the ongoing use of the "Slings" property should it be incorporated into the Project Site.

The Proponent notes that no mining-related activities that would be inconsistent with the current land use, namely grazing, are proposed within the "Slings" property. However, a section of the property would be incorporated into the on-site Biodiversity Offset Area. As identified in Section 4.3.6 of RWC (2015), the objectives of the Biodiversity Offset Strategy, as approved by the Land and Environment Court are to:

- "re-establish a vegetation community, namely native grassland, that has been very extensively disturbed regionally;
- protect and enhance an area of remnant forest that was later reclassified as Tablelands Basalt EEC, without allowing that community to replace the grassland community;
- provide for an ongoing beneficial use of the Biodiversity Offset Area; and
- provide an example of appropriate agricultural land management for surrounding farmers".

These objectives are consistent with the ongoing use of the Biodiversity Offset Area specifically and the "Slings" property more generally for grazing purposes, subject to an appropriate management plan. As a result, the Proponent proposes that the existing land uses would continue following receipt of approval for the Proposed Modification, assuming it is granted.

3.4 DEPARTMENT OF PRIMARY INDUSTRIES – FISHERIES

Department of Primary Industries – Fisheries requested that the detailed design of the culvert under the proposed Spring Creek crossing be submitted to the Department for approval prior to construction.

The Proponent agrees to this request.

3.5 DEPARTMENT OF PRIMARY INDUSTRIES – WATER

Department of Primary Industries – Water noted the following.

- *The proposal for increased groundwater take will require an increase in the licensed entitlement held at the site [under the Water Act 1912 or following gazettal of the Water Sharing Plan for the South Coast Groundwater Source under the Water Management Act 2000].*

  The Proponent acknowledges this requirement and will ensure that appropriate licences are obtained.

- *The revised groundwater model predicts depressurisation to be less than previously predicted with no impact on private bores.*

  Noted.

- *The sensitivity analysis on the groundwater model indicated significant uncertainty in the fault hydraulic parameters used in the model. … It is recommended a review of the groundwater model be completed prior to commencement of mining operations with the additional data collected since preparation of AGE (2013). This would be with the aim of reducing the uncertainty of mine inflows and associated impacts, and adequately informing preparation of the Water Management Plan and potential licensing requirements.*

  The Proponent concurs that ongoing verification of the groundwater model will be critical to ensure that the Project's groundwater impacts are adequately understood to ensure that the compensatory flow program and licenced extraction limits are appropriate.

  Condition 3(30) of MP10_0054 requires the *Water Management Plan* include "a program for the ongoing verification and refinement of the groundwater model." Section 9.6 of the approved *Water Management Plan* identifies that the groundwater model would be reviewed in the following circumstances.

  - ''Should the observed groundwater drawdown diverge by more than 15% from the modelled groundwater drawdown.
  - Should the measured reduction in baseflow in Majors or Spring Creeks diverge from the modelled reduction in baseflow.
  - Within 12 months of intersecting groundwater within the mining operations and every two years after that."

  The model has already been reviewed once in preparation for the Proposed Modification.

The Proponent notes that only limited additional data would be available prior to the commencement of mining operations. As a result, the Proponent contends that the existing commitment to review the groundwater model within 12 months of intersecting groundwater and every two years thereafter will allow the model to be updated once additional data is available and will allow progressively more accurate estimation of mining-related impacts. The Proponent contends that this adequately addresses DPI-Water's comment.

- *Section 4.4.3.1 of the EA indicates groundwater levels would be fully recovered within 10 years of mining which was consistent with the previous EA, however Appendix 10 states post-mining groundwater levels will recover within 10 to 20 years.*

  Section 6.5.1, paragraph 2 of AGE (2013) states that "The recalibrated model predicts the water level will fully recover within 10 years of the end of mining, similar to AGE (2010)." Section 6.6 of that document identifies that all model runs undertaken for the sensitivity analysis indicate full recovery of groundwater levels within 20 years of the cessation of mining. As a result, the Proponent contends that groundwater levels would be expected to recover within 10 years, but that in the event that some of the assumptions used in the groundwater model are not accurate, that groundwater recovery would take no longer than 20 years.

- *It is recommended specific triggers be developed for potential seepage from the TSF and incorporated into a contingency response plan.*

  Additional groundwater monitoring and sampling is recommended for potential cyanide and acidic seepage.

  The Proponent notes that groundwater trigger values are presented in Table 21 of the current version of the *Water Management Plan* and that this plan and the associated triggers would be reviewed in accordance with Condition 5(4) of MP10_0054.

  Finally, the Proponent notes that monitoring groundwater for cyanide or acid leachate will not be required as cyanide processing has been removed from the Proposed Modification and the approved tailings stream is non-acid forming.

- *Clarification is requested of* the *proposed TSF liner construction and the permeability to be achieved.*

  The Proponent notes that the Tailings Storage Facility is to remain as approved and no changes to the design of the facility as described in Section 2.7.2.2 of RWC (2010a) are proposed.

- *Construction of the proposed Spring Creek crossing is recommended to be carried out in accordance with DPI Water's Guidelines for Controlled Activities on Waterfront Land.*

  Noted.

3.6 ENVIRONMENT PROTECTION AUTHORITY

3.6.1 Climate and Rainfall Data

The EA has used different data sets to model the Harvestable Rights Dam Calculations (EA Appendix 2), Stormwater Management Requirements (EA Appendix 2), Groundwater Modelling (EA Appendix 10) and the design of the Tailings Storage Facility (EA Appendix 7) and none of the data sets utilise data collected from on-site.

The EA does not make use of data collected from an on-site weather station that has been in place for a number of years. In an assessment of the premises following rainfall events in 2013, Cardno (2013) noted "an assessment of the various data showed significantly higher rainfall received at the on-site gauge compared with other available gauges. Considering this and the ideal location of the on-site gauge, it is recommended that data from the on-site rainfall gauge be adopted for the design of Erosion and Sediment Control measures, in preference to the Queanbeyan data previously used'.

The TSF design in the EA relies on rainfall from the Braidwood weather station, when the data in surface water assessment (EA Appendix 2) uses Majors Creek Rainfall data for calculations of the harvestable rights dams and the groundwater report (EA Appendix 10) notes the difference between annual average rainfalls at Braidwood and Majors Creek as 719 mm and 944 mm respectively. The groundwater report also uses a model to infill the missing years from the Majors Creek rainfall data, thus creating a data-set that is arguably the most representative of the location of the tailings dam available. No justification for the use of the Braidwood data has been provided.

The EPA has observed a difference in the range of 20%in the annual rainfall between the Braidwood and Majors Creek rain gauges. The EPA notes that data based on the Majors Creek rainfall gauge predict a 72 hour 1 in 100 year Average Exceedance Probability storm event is approximately 30% larger than that predicted for the corresponding event based on the Majors Creek rainfall gauge. Accordingly, the EPA considers that the rainfall data that has been used to model water balances and derive the TSF sizing has not been based on the most representative information available and the rainfall conditions likely to be experienced on site.

The following response has been prepared by Knight Piésold.

It is acknowledged that the approved Tailings Storage Facility design (see **Appendix 1**) uses climatic data sourced from the Braidwood (Wallace Street) weather station. This station is located approximately 12km north-northeast of the Project Site. Climatic data are available

from 1920 to present with some minor gaps. In contrast the Majors Creek weather station is located 2km south-southwest of the Project Site. Climate data are available from 1898 to 2015 with 74 complete years of data and 44 years of incomplete data. A comparison of the two datasets is shown in **Table 2**.

Table 2
Comparison of Braidwood and Majors Creek rainfall data

Category	Braidwood	Majors Creek
Average Conditions	Annual Rainfall = 724 mm.	Annual Rainfall = 942 mm.
1:100 yr ARI Wet Sequence	Annual Rainfall = 1570 mm.	Annual Rainfall = 1720 mm.
Storm Data	Storms calculated using co-ordinates of site and BOM storm calculations methodology.	
Source: Knight Piésold		

Of note, the average and 1 in 100 year climatic data derived from the weather station data are used to model the facility water balance, whilst the storm data used in calculation of the design freeboards and in selection of the facility embankment crest levels are calculated using the actual co-ordinates of the site and the Bureau of Meteorology storm calculations methodology.

A design check of the facility embankment crest levels was carried out using the equivalent data from the Braidwood and Majors Creek weather stations, as shown in **Table 3**. This comparison shows that using the Majors Creek rainfall dataset rather than the Braidwood data does not affect the embankment levels or spillway design concepts. As such the design of the tailings storage facility would not change which ever dataset is used.

As a result, Knight Piésold will use the latest rainfall averages from both the Majors Creek and Braidwood stations during the final design of the Tailings Storage Facility and the design will be adjusted as required to meet the requirements of the Dams Safety Committee of NSW based on a whichever dataset provides the worst case rainfall scenario.

Table 3
Embankment Crest Level Design – Comparative Rainfall Datasets

Page 1 of 2

Category	Design using Braidwood Rainfall Data	Using Majors Creek Rainfall Data
Average Conditions	Average Annual Rainfall = 724mm Pond at minimum size (nominal 5 000m^3) except for last year which peaks at 14 800m^3.	Average Annual Rainfall = 942mm Pond at minimum size (nominal 5 000m^3) except for last year which peaks at 18 400m^3.
1 in 100 year ARI Wet Sequence	Average Annual Rainfall = 1 570mm. Maximum Pond in last year = 44 200m^3. Capacity = 66,000m^3 on tailings surface without ponding against embankment.	Average Annual Rainfall = 1 720mm. Maximum Pond in last year = 63 800m^3. Capacity = 66,000 m^3 on tailings surface without ponding against embankment.

Table 3 (Cont'd)
Embankment Crest Level Design – Comparative Rainfall Datasets

Category	Design using Braidwood Rainfall Data	Using Majors Creek Rainfall Data
Storm Data	Storms calculated using coordinates of site and BOM storm calculations methodology.	
	<u>Required levels (based on storm plus maximum pond size under average conditions)</u> • 1 in 100 year 72 hour storm Pond RL = 714.2m. • 1 in 1000 year 72 hour storm Pond RL = 714.9m. <u>Critical Spillway and Embankment Design Condition.</u> • Spillway Invert Design RL = 715.1m	Change in target volume = 3 600 m3. • Under average conditions the maximum pond volume using the Majors Creek rainfall data is larger by 3,600m^3. • Horizontal Capacity between RL714.9m (pond level under 1 in 1000 year event for the base case design) and RL715.1m (spillway invert level) is 20 300m^3. • As a result, no change to spillway or embankment is required to contain the 1 in 1000 year 72 hour storm condition.
Total Freeboard Check	Design based on starting pond level of RL 714.8 m (0.6 m above 1 in 100 year storm level). Level to flood route 1 in 100 000 year storm through spillway is RL 715.6m which is 0.4m below embankment crest of RL 716.0 m.	Allowance of pond at RL 714.8 m suitable for this configuration as well.
Source: Knight Piésold		

3.6.2 Whole of Site Water Management, Discharges and Pollution Limits

3.6.2.1 Water Balance Changes Arising from Modification

The EA does not provide a full consideration of the implications of the modification to the project as a whole. … For example, the amount of water allocated for dust suppression on the Haul Road, (18 ML/year) is no longer required as the Haul Road has been sealed. Sources and flows of operational water within the project site have also changed with groundwater interception rates changing from an estimated 9- 10L/s to 8-11 L/s (EA Appendix 10). This impacts on the sizing of the raw water dam and its potential to contain water from the workings. This also impacts on the ability of the process water pond to contain water from both the newly enlarged TSF and the increase in groundwater interception. The process water pondis also planned to be used to contain leachate from the Run of Mine (ROM) pad. Without design criteria provided on its capacity and engineering standards, it is unclear whether the size of the dam will be the same as prior to the modification.

If approved, the premises will use 7 harvestable rights dams totalling 38 ML of storage, the current 7 ML in sediment basins, 3 sediment basins associated with the Eastern Rock Emplacement, 3 sediment basins associated with the new road, one external TSF basin, the TSF supernatant pond, raw water dam, process water dam, seepage collection pond, two leachate collection ponds associated with the ROM pad and a processing plant collection pond.

Additionally the box-cut/mine workings intercepts groundwater that requires dewatering for continual operation of the mine. The EA does not demonstrate how this complex water management system will operate to protect the environment.

It is further noted that the maps used in the EA are not comprehensive, do not contain all water storages or sediment ponds or use inconsistent terminology with regard to sediment basin names and include no detail of the processing area that would allow consideration of the full extent of the on-site development.

The Proponent notes the following in relation to comments the above.

- The proposed changes to the Tailings Storage Facility have been withdrawn from the Modification. As a result, no changes to the water balance of the Tailings Storage Facility are anticipated.
- The Site Access Road is sealed for approximately 800m from the intersection of Majors Creek Road, however, the remainder of the Site Access Road, and all other hardstand areas, haul roads and the ROM Pad remain unsealed, and would require dust suppression. The Proponent contends that the volume of water allocated for dust suppression would not change as a result of the Proposed Modification, as amended.
- There are six (not seven) harvestable rights dams, each of which have been previously approved. Three approved harvestable rights dams that are described in RWC (2010a) would not be constructed. As a result, the remaining six dams would be enlarged slightly to reflect the increase in the Proponent's Harvestable Right and the reduction in the number of dams. The Proponent contends that these changes would not alter the complexity of management of water within the Project Site.
- The Proponent notes that the approved *Water Management Plan* incudes detailed information in relation to the Project's water balance and that this plan will be required to be updated in consultation with the Environment Protection Authority following receipt of approval for the Proposed Modification, assuming it is granted. As a result, the Proponent contends that the information presented in RWC (2015) is presented to an appropriate level of detail to enable the application for the Proposed Modification to be determined

3.6.2.2 Water Discharge, Ambient Water Quality Assessment and Design Standards

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The EA has not adopted the water management standards that the EPA, (the environmental regulator of the premises) has prescribed (see Appendix 1 and 2). "Procedures to ensure that discharges from sediment basins at the premises will be managed to meet the ambient water quality of the receiving environment and ensure that there are no long term impacts to the environment" were requested previously by the EPA (Appendix 1).

The EA has not included such an assessment, and has not provided a justification for discharging at 40mg/L Total Suspended Solids (TSS) after 40mm of rain over a 5 day period. The EA does not include the volume that would be discharged, nor the conditions when discharges will occur for example estimating river flow at the time of discharge to derive dilution ratios. Instead the EA relies on Managing Urban Stormwater (MUS) as a benchmark for standards of water management on site and discharge of water from multiple sediment and erosion control basins across the premises.

As discussed above, the EA should be considering the environmental values including the water quality objectives of the receiving environment to determine the sizing of sediment basins and discharge performance criteria. The EA should also consider all of the practical measures that can be taken to restore or maintain those environmental values. Under the current proposal to manage sediment-laden stormwater at the premises there is a risk of cumulative impact to the receiving environment: The EA does not include any quantification of the cumulative risks of sediment discharges from the site. The overall cumulative impacts from the site, particularly if 3 or 4 sediment basins overflow at 40mg/L TSS at the same time during construction are not addressed in the EA. There is no acknowledgement of these cumulative impacts or consideration of a solution. The EA does not include criteria developed through a transparent process that minimises impact to the receiving waters.

The EA modification adds 7 new sediment basins with discharge points with water quality parameters that have not been shown to meet the ambient water quality objectives for the receiving waters of Spring and Majors Creeks. Currently detention times of 20 days apply at the site, and the EPA has observed irrigation occurring to sodden paddocks. The EA nominates rainfall durations of 5 days for most sediment basins with one of the sediment basins nominated to a meet a 10 day rainfall period.

The construction of the proposed infrastructure is likely to cause Spring and Majors Creek to be polluted with sediment-laden stormwater based on the design standards proposed in the EA. The environmental values of Spring and Majors Creek include ecosystem protection and drinking water supply. The EA does not include information on the likely impact of proposed discharges on maintaining those environmental values and does not explore all of the practical measures to prevent and/or control the discharge of sediment-laden water from the construction sites and accordingly maintain the environmental values. For example, the EA could have included larger sediment basins to reduce the number of incidents of sediment-laden discharge per year. The EA could also have identified a water balance for the site and used this to inform utilisation of stormwater that is captured on the site rather than relying on discharge to the environment.

The Proponent notes that it has consistently highlighted the fact that the Erosion and Sediment Control Plans for the Project have been prepared in accordance with the relevant guidelines, namely *Managing Urban Stormwater – Volumes 1, 2C and 2E*. Those guidelines identify the required standards for sediment and erosion control structures in NSW, including the required sizing for sediment basins. Fundamental to management of erosion and sedimentation under those guidelines is:

- that developers are required to minimise the generation of sediment-laden water through preventing run on to disturbed areas;

- that sediment-laden water that is generated is to be captured and retained on site for treatment prior to discharge to natural drainage (referred to as a controlled discharge);
- that a higher degree of management is required for longer-term activities in sensitive areas than for short-term activities in less sensitive areas; and
- that in the case of a rainfall event that exceeds the guideline requirements, taking into account the above, that discharges from the sediment basin are permissible (referred to as an unconditional discharge).

The Proponent and its advisors met with the EPA on 18 August 2015 to discuss the above issues. At that meeting, the EPA indicated that it would consider the Proponent's comments and that it would provide a detailed response in writing.

A response was received from the EPA on 21 October 2015 indicating that all controlled discharges from the Project Site would be the subject of an Ambient Water Quality Assessment. As a result, the Proponent has committed to ensuring that there would be no controlled discharges to natural drainage from sediment basins during the life of the Project. Rather that water would be removed from the sediment basins and used for operational purposes. See also Section 3.6.2.1.

3.6.3 Groundwater

The EA doesn't present any information to demonstrate that the potential impacts of the proposal on the environmental values of groundwater and the potential impacts on Groundwater Dependent Ecosystems, in particular from the TSF, the process water dams, the eastern waste rock emplacement, TSF seepage dam, and the eastern waste rock emplacement leachate collection dams. If any impacts to the environmental values are demonstrated the EA must present the practical measures that can be taken to meet or restore the environmental values of the receiving groundwater.

The Proponent notes the following in relation to the Environment Protection Authority's comments re impacts on groundwater and potential impacts on Groundwater Dependent Ecosystems.

- The Tailings Storage Facility and associated infrastructure and the Process Water Pond would be as approved, as a result, the Proposed Modification would not result in any changes to the approved level of groundwater-related impacts.
- The Land and Environment Court proceedings determined that waste rock within the Project Site is non-acid forming and does not generate a saline leachate. As a result, the Eastern Waste Rock Emplacement and associated sediment basin would not result in an increase in the risk of adverse groundwater quality impacts. Furthermore, the Eastern Waste Rock Emplacement would not incorporate a leachate collection dam.

As a result, the Proposed Modification as amended would not result in any additional adverse impacts to groundwater quality-related matters. Furthermore, the Proponent notes that the *Water Management Plan* identifies a range of groundwater quality triggers and responses to be implemented in the event that those triggers are exceeded.

3.6.4 Tailings Storage Facility

3.6.4.1 Location of the Tailings Storage Facility

Given the significant changes that the introduction of cyanide use has on the makeup of tailings and presence of cyanide in the supernatant, the EPA considers that an assessment that addresses the most appropriate location of the TSF within the current mine site or at another external location would have been appropriate. It is expected that any proposal to place a tailings storage facility at the head of a drinking water catchment would look at the site water balance, proposed physical, chemical and rheological characteristics of the proposed tailings. The EA should have undertaken a risk assessment that looked at a number of options for the design and placement of the TSF and involved consultation regarding those options with the downstream water users and other key stakeholders that informed the ultimate decision regarding the design and location of the TSF.

In light of the removal of cyanide processing, placement of leached concentrate into the Tailings Storage Facility and modification to the approved design of the Tailings Storage Facility, the Proponent contends that the issues raised above are no longer relevant. Notwithstanding this, Knight Piésold note that the Tailings Storage Facility design takes into account the matters identified by the Environment Protection Authority.

3.6.4.2 Design Capacity in Comparison to the Approved Tailings Storage Facility

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The rainfall and evaporation data used in the calculations and sizing of the TSF is not representative of the situation on site and under-represents the rainfall that the licenced premises receives. The data set used is different to the one used for sizing the harvestable rights dams without any justification about the use of different data sources. This is a significant issue that underpins the assumptions regarding the TSF, its size, location and behaviour during different rainfall events. Additionally, internal water management proposed in the EA suggests that water from the eastern waste rock emplacement sediment basin will be pumped into the TSF (page 27). It does not appear that this has been accounted for in the modelling.

The issue of use of rainfall data is addressed in Section 3.6.1.

The approved TSF was proposed to contain 800 000t of tailings, with the TSF built to contain a capacity of 900 000t (Page 56). The EA further states that the modified TSF would require the capacity to store approximately 1 220 000t. Table 12 (Page 62) notes that the cumulative tailings capacity after final lift is 1 213 000t, therefore, 7000 tonnes less than the required capacity. The capacity and contingency provisions for the TSF should be clearly provided in the EA.

In light of the removal of the proposed modification to the approved design of the Tailings Storage Facility, the Proponent contends that this issue is no longer relevant.

3.6.4.3 Classification

The tailings dam is significantly larger than the approved version and now contains acid generating tailings, heavy metals and residual cyanide. It has now been reclassified to a high C category. The mapping, modelling and assumptions behind this classification have not been provided in the EA, and therefore the detail behind how this classification has been determined is not available to the regulator or the community.

In light of the removal of cyanide processing, placement of leached concentrate into the Tailings Storage Facility and modification to the approved design of the Tailings Storage Facility, the Proponent contends that the issues raised above are no longer relevant. In addition, the Proponent notes that the classification of the Tailings Storage Facility under the Dams Safety Committee guidelines is a matter that is administered by the Committee.

3.6.4.4 Construction Time and Pollution Control Design

The length of construction time for the TSF (at least 6 months) suggests that the sediment and erosion control standards applied, including basin sizing, standard and discharge criteria will not protect the downstream environment from sediment discharge.

The Proponent has allowed for a period of six months in the project development schedule to construct the Tailings Storage Facility. This six month period allows for the full extent of construction related activities to be completed and includes:

1. marking out and surveying of Stage 1 of the facility basin and embankment;
2. wombat capture and relocation;
3. sediment basin and diversion drain construction;
4. stripping and stockpiling of topsoil and subsoil;
5. embankment construction;
6. liner conditioning and testing;
7. fence construction;
8. decant tower installation; and
9. tails deposition line placement and decant return line installation.

The period when sediment basins would be required extends from the commencement of stripping and stockpiling of topsoil and subsoil (Item 4) to the completion of the embankment construction (Item 5). The estimated time to complete these actions is approximately 4 months.

Finally, the issue of controlled and unconditional discharges and associated water quality criteria are addressed in Section 3.6.2.2.

The Proponent anticipates that, consistent with the Erosion and Sediment Control Plan presented as Attachment 3 of SEEC (2015) (Appendix 2 of RWC, 2015) the sediment basin requirements during the initial stages of construction of the Tailings Storage Facility would be as follows:

- Sediment Basin 1.
  - Located downslope of the facility embankment.
  - Installed prior to ground disturbing activities commencing.
  - Collection of sediment-laden water from within the footprint of the facility downslope of Sediment Basin 2, prior to the embankment being constructed.
  - Once the embankment reaches a height where it becomes internally draining, the sediment basin will capture water runoff from the downstream face of the embankment wall only.
- Sediment Basin 2.
  - Located upslope of the facility embankment.
  - Maintained until liner construction commences.
  - Collection of water from upslope of the embankment construction works and downslope of the clean water diversion drains.

The Proponent notes that Sediment Basin 1 would only be required to its full design capacity for a period of approximately 6 weeks, being the period from commencement of grubbing of the embankment footprint to the embankment reaching a height where it becomes internally draining. Once it becomes internally draining the capture area for Sediment Basin 1 would consist of the downstream embankment wall only, a very minor capture area. Sediment Basin 2 would be required for the same period, after which it would be used primarily to keep the embankment construction area dry.

During construction sediment basins are planned to collect the 5 day 85th percentile rainfall depth (42mm). The EPA has previously recommended higher standards and greater capacity because the TSF will take a longer period to build and is directly adjacent to Spring Creek (Appendix 1). It appears from the documentation in the EA that every time the premises experiences greater than 42mm of rainfall in a 5 day period each of these construction sites are going to discharge sediment to Spring Creek. Further it appears that the clean water diversions are sized to a 2yr 6hr ARI which equates to 10mm per hour, indicating that overflow will travel onto construction areas and sediment basins in a 60mm/hr storm event.

The Proponent notes that the 5-day 85th percentile rainfall depth criteria has been sourced from *Managing Urban Stormwater*. The assumed depth of 42.4mm was determined by SEEC (2015) based on rainfall data from the BOM-operated Majors Creek weather station (Station 70061). This rainfall depth compares with the assumed 5-day 85th percentile rainfall depth of 25.8mm assumed for the report *Site Assessment, Stabilisation and Rehabilitation after Rain Events* prepared by Cardno in 2013. That document states that this lower rainfall depth was 'appropriate for a construction phase of 6 to 12 months and a sensitive receiving environment'. Cardno were approved as independent experts by the Environment Protection Authority to prepare this assessment and the report was accepted by the Authority as a component of the Pollution Reduction Program.

Given the construction periods discussed above and the conservative design criteria, the Proponent contends that the proposed design criteria are appropriate for construction of the facility.

The TSF (EA Appendix 7 page 16) maximum pond recovery time of 7 days is nominated to recover the 1 in 100yr event volume (DSC3F) based on the consequence category however there is no information on how pond recovery within this timeframe could be achieved. No procedures are included in the EA to demonstrate this is a practical recovery time and excess surplus sediment-laden water and supernatant can be effectively managed.

The pond recovery time referenced by the Environment Protection Authority relates to the recovery time for the active decant pond during operation of the Tailings Storage Facility. This water would be used within the processing plant and would not be discharged to natural drainage. The Environment Protection Authority would have appeared to have assumed that this applied to emptying of the sediment basins following a rainfall event.

Clean water diversions around the TSF appear to be 1 in 10 for stage 1 of the TSF and 1 in 100 for final TSF. This suggests that clean water will run into the TSF and add to the volume reasonably frequently. This has not been included in the TSF design and capacity modelling.

Condition 3(25A) of MP10_0054 states that the clean water diversion around the Tailings Storage Facility shall be designed, constructed and maintained to prevent the probable maximum flood from the catchment upstream of the facility from entering the facility. Knight Piésold state that the approved design which predates the drafting of condition 3(25A) allows for the diversions identified by the Environment Protection Authority. The revised design will incorporate the required maximum probable flood diversions.

Furthermore, Knight Piésold state that the design for the Tailings Storage Facility conservatively assumed the following.

- Water balance calculations - it was assumed that the run-off from the upstream catchment is diverted during the various water balance simulations.
- Flood events – it was assumed that clean water diversion drains would fail and that the full catchment above the facility embankment reports to the facility.

Application of ambient water quality objectives should drive discharge concentration of cyanide. The EA states that in the event of a TSF overflow cyanide concentration will be 0.007mg/L, however, in the absence of naturally occurring cyanide being present in downstream receiving waters, a nil cyanide concentration would apply.

In light of the removal of cyanide processing within the Project Site, the Proponent contends that this issue is no longer relevant.

3.6.4.5 On-going Management

There is no information on the proposed dewatering options, apart from a basic statement that tailings water will be taken from the supernatant pond and sent back through the processing plant. It is understood that some thickening will also occur. It is expected that the EA would include consideration of the various options for dewatering tailings based on site water balance and tailings density targets.

The Proponent notes that thickening or dewatering of the tailings would occur to 64% solids by weight before the tailings are discharged to the Tailings Storage Facility. Any water released from the tailings once settled within the Tailings Storage Facility would flow to the decant pond which would be maintained at a target volume of approximately 5ML. Additional water would be recovered via the underdrainage collection system. The amount of water recovered from the tailings would be a function of consolidation of the tailings and evaporation from the Tailings Storage Facility. It is not evident what other options for dewatering of tailings would be available.

3.6.4.6 Makeup of Tailings

Once cyanide is used in processing, tailings become concentrated with heavy metals. The tailings will contain metals such as Silver, Arsenic, Boron, Copper, with high concentrations of iron and sulphur. The EA states that these tailings are acid generating, producing 28.6kg/t of sulphuric acid. There is nothing in the EA on the environmental or health risk posed by the acid generating potential of the tailings, the consequences of acid generation potential on how metals and cyanide behave chemically in the TSF and potential impacts on the integrity of the liner. There is also no information on the makeup of the tailings liquor such as predicted total cyanide concentrations, pH, EC concentrations or concentrations of heavy metals.

In light of the removal of cyanide processing, placement of leached concentrate into the Tailings Storage Facility and modification to the approved design of the Tailings Storage Facility, the tailings composition and associated risks would remain as approved. In addition, as identified by GHD (2015) (prepared to support the submissions of Palerang and Eurobodalla Councils - see Section 3.7.4), the environmental risk associated with the approved processing methodology and resulting tailings composition may be managed "using relatively simple [management] measures."

3.6.4.7 Legacy of Tailings in Upper Deua Catchment

The protection of the environment and community health of the legacy created by placing, operating and leaving heavy metal tailings and residual cyanide in the Tailings Storage Facility at the top of the catchment of the upper Deua River has not been adequately addressed. The decision to locate the TSF in this valley and not include any remediation or pollution controls for the life of the mine that will prevent pollution to the downstream catchment, either through ground or surface water is inconsistent with principles of sustainability and requirements for mine closure.

In light of the removal of the proposed modification to the approved design of the Tailings Storage Facility, the Proponent contends that this issue is no longer relevant. Notwithstanding the above, the Proponent strongly disagrees that the Proposed Modification, either as presented in RWC (2015) or as amended and described in this document failed to "include any remediation or pollution controls [to] prevent pollution to the downstream catchment." Substantial controls were described in Sections 2.6.5 to 2.6.7 of RWC (2015) and in Knight Piésold (2015).

3.6.4.8 Particulate or Gaseous Emissions

An assessment of the potential for particulate dust or gaseous emissions for example hydrogen cyanide from the TSF has not been included in the EA. This potential for dust or gaseous emissions has also not been included in the risk assessment.

In light of the removal of cyanide processing within the Project Site, the Proponent contends that the issue of emissions of hydrogen cyanide is no longer relevant.

Impacts associated with emissions of particulates from the Project Site, including the Tailings Storage Facility, were assessed by Pacific Environment (2015) and are summarised in Section 4.10.7 of RWC (2010a). In summary, that assessment concluded that the Proposed Modification has limited potential to result in increased air quality-related impacts.

3.6.4.9 Control of Seepage

Seepage from the TSF has been estimated at between 0.031L/s and 0.187L/s. The consequences of seepage into groundwater or the surrounding porous soils has not been addressed in the EA. The engineering standards applied to seepage management are stated as 3 x 10^{-8}m/s with a 1.5mm HDPE layer. These standards are lesser [sic] than the TSF, and yet the sump is designed to collect supernatant before it enters the surrounding environment. This lesser standard has not been justified in the EA. The seepage collection pond also appears to be undersized.

In light of the removal of the proposed modification to the approved design of the Tailings Storage Facility, the Proponent contends that seepage controls would be in accordance with the approved Project.

Section 6.8 of Knight Piésold (2011) presented an assessment of the anticipated seepage from the approved Tailings Storage Facility. In summary, the assessment determined that the facility, as described in that document and assuming that the underdrainage system is fully operational, would achieve a seepage rate of 0.036L/s or an equivalent permeability of 3.9×10^{-10}m/s. Conservatively assuming that the seepage collection system is non-operational, Knight Piésold (2011) determined that the facility would achieve a seepage rate of 0.15L/s or an equivalent permeability of 1.6×10^{-9}m/s.

3.6.4.10 Risk associated with Tailings Dam Failures

The EA also does not address the risk imposed by the presence of heavy metal tailings, should the TSF fail at all. The sole focus of the risk assessment is cyanide and what happens if the dam overtops, with dilution being relied upon to manage concentrations of cyanide in the receiving waters.

The Proponent notes that the risk of failure of the Tailings Storage Facility embankment is a matter addressed by the following guidelines, both of which were considered by Knight Piésold (2015).

- *DSC3A – Consequence Categories for Dams* and *DSC3F – Tailings Dams* published by the Dams Safety Committee of New South Wales.
- *Guidelines on the Consequence Categories for Dams* published by the Australian National Committee on Large Dams.

Notwithstanding the above, the Proponent notes that the Tailings Storage Facility design would be in accordance with the approved design and the risks associated with failure of the Tailings Storage Facility would remain consistent with the approved Project.

3.6.5 Process Water Pond

The process water pond plays a significant role in water management on the premises. The EPA expects that the process water pond will be constructed to be a large structure as it is planned to receive leachate from the 2 ROM pad leachate dams, input from the raw water dam, including groundwater pumped out of the boxcut, noting that the interception rate has increased from 9L/s to 11L/s (EA Appendix 10). The pond also receives supernatant from the TSF and is therefore a crucial piece of infrastructure in the whole of mine water and tailings management. However the EA does not present any information on the sizing and design criteria of this pond. The process water pond should meet the same performance standards as the TSF with regard to both sizing and lining.

The Proponent agrees that the Process Water Pond is a critical component of the water management system within the Project Site. The indicative design criteria for the pond is as follows.

- Design – the pond will be a turkey's nest-type dam with no surface catchment or run on. As all inputs and outputs will be controlled, water levels within the process water pond would be able to be managed relatively simply.
- Freeboard – minimum 1.0m
- Lining – the Process Water Pond will be fully lined to meet the requirements of Condition 3(25) of MP10_0054, namely a permeability of 1 x 10^{-9}m/s. This will be achieved through the use of an HDPE Liner.

3.6.6 Risk Assessment

The risk assessment for the TSF should include a systematic assessment of the likelihood and consequences of identified hazards and encompass all aspects of its design, construction, operation and closure. With the introduction of cyanide use and full processing on the site, the risk of environmental harm from the TSF has significantly increased. This is because the characteristics of the tailings material has changed to sulphide rich, acid generating tailings, combined with all forms of cyanide. The risk assessment provided does not address the possible impacts to downstream aquatic organisms and human health based on failure of the TSF. The EPA notes that the following is absent from the risk assessment:

In light of the removal of cyanide processing, placement of leached concentrate into the Tailings Storage Facility and modification to the approved design of the Tailings Storage Facility, the Proponent notes that a number of issues raised by the Environment Protection Authority are no longer relevant. The following presents a response to each of the issues raised as they relate to the Proposed Modification as amended.

1. Assessment of the risk of other pollutants including reagents and heavy metals from the TSF;

   As the processing methodology, tailings composition and Tailings Storage Facility design will remain as approve, the risks associated with the Tailings Storage Facility remain unchanged. The Proponent notes that GHD (2015) (see Section 3.7.4) identifies that the risks associated with the approved processing and tailings management operations are "relatively limited" and "able to be managed using relatively simple measures."

2. *Assessment of acid balanced tailings water and the impact this has on chemical reactions between metals and cyanide in the TSF;*

   The tailings to be placed within the Tailings Storage Facility would be non-acid forming, with a negative acid producing potential. As a result, the risks associated with this issue remain unchanged.

3. *Consequences of catastrophic failure of sodium cyanide storage, including a dilution study that clarifies the actual risks in context of drinking water impacts and ambient water quality impacts, and impacts to personnel;*

   No longer relevant.

4. *Location within a drainage line where any failure of the TSF will result in contaminated water and tailings directly entering existing drainage lines that feed Majors Creek and downstream;*

   This matter is addressed as part of the assessment undertaken to determine the consequence category for the Tailings Storage Facility in accordance with *DSC3A – Consequence Categories for Dams and DSC3F – Tailings Dams* published by the Dams Safety Committee of New South Wales. An assessment of the consequence of a failure of the approved Tailings Storage Facility design is presented in Appendix J of Knight Piésold (2011). That assessment determined that a consequence category assessment of *Significant* is appropriate under the above guideline.

5. *Proposed containment system, now that acid generating mineral tailings will be combined with WAD cyanide and supernatant within the TSF;*

   The proposed containment system would remain in accordance with the approved Project and are described in Section 6.8 of Knight Piésold (2011). As a result, the risks associated with this issue remain unchanged.

6. *Long term risk of heavy metals being left in perpetuity at the top of the catchment;*

   The Proponent presumes that the Environment Protection Authority is making reference to incorporation of leached concentrate into the tailings stream. As this no longer forms a component of the Proposed Modification, this issue is no longer relevant.

7. *Proximity of surface water and groundwater resources and their use;*

   The proximity of surface water and groundwater resources and their use remain unchanged from the original application. As a result, the risks associated with this issue remain unchanged.

8. *Seepage and its management, including modelling of seepage;*

   This issue is addressed in Section 3.6.4.9.

9. Volatilisation of cyanide;

No longer relevant.

10. Risk and consequence of embankment failure;

See comment to Item 4 above.

11. Risk and consequence of human error in tailings management;

The Proponent notes that an operational manual will be prepared for management of the Tailings Storage Facility, including detailed procedures for operation, management and inspection of the facility. Summary procedures are presented in Sections 6.10 and 8.1 of Knight Piésold (2011). It is noted that monitoring of a range of parameters would be undertaken daily, weekly, monthly, quarterly and annually. In the event of human error adversely impacting on the facility, this monitoring would detect that issue and would be rectified. As a result, this is not a risk that was considered in the risk assessment.

12. Emergency response plan.

An emergency response plan will be included in the operations manual for the Tailings Storage Facility. Section 9 of Knight Piésold (2011) presents an overview of the procedures that would be implemented in a range of potential scenarios, including:

- tailings pipeline failure;
- power failure;
- earthquake events;
- extreme rainfall; and
- dam break/overtopping.

3.6.7 Use of Cyanide in Processing

As cyanide processing no longer forms a component of the Proposed Modification, the matters raised are largely no longer relevant. The following presents a response to those components that relate to matters other than the use of cyanide in processing operations.

The EA focuses on cyanide and its risks to the environment however, there are a number of chemicals used in the gold recovery process (Table 8). The EA should include information on the likely discharge concentrations of all of these chemicals as part of the environmental assessment of the project.

As the processing operations and associated reagents would be consistent with the approved Project, the concentration of these reagents would be unchanged from the approved Project.

3.6.8 Eastern Waste Rock Emplacement Site and Basin

The likely chemical makeup of the waste rock is unclear. Of particular importance, is whether the waste rock is likely to have any sulfidic ore in it that could potentially lead to acid run-off. It is noted that the ROM Pad is designed to have leachate ponds collecting run-off, however, it is unclear whether the pollution control measures for the eastern rock emplacement meet the standards required for leachate collection and management.

The EA raises the use of waste rock as capping and filling material for the TSF. It is the understanding of the EPA that the company had previously committed to capping the TSF with clay material. This is a current consent condition (Schedule 2, Condition 24) that has not been nominated for alteration with respect to capping standards. There is nothing in the report about the suitability of this material for use in the TSF and this must be included in the EA.

The capping and cover design should be determined based on the characteristics of the particular tailings, the topographic, hydrogeological, geotechnical and climatic characteristics and the desired final landform. For example, if the TSF contains sulphidic materials, exclusion of oxygen would be a critical consideration; often this will involve use of an anoxic or impermeable capping material.

In relation to the acid generating potential of the waste rock within the Project Site, Section 2.5.2 of RWC (2015) states this material is non-acid forming. This matter was tested in the Land and Environment Court action for the original application for Project Approval and this conclusion was upheld.

In relation to the use of material within the Eastern Waste Rock Emplacement, the Proponent notes that the final design of the cap for the Tailings Storage Facility has yet to be determined, but that such a cap would typically comprise an impermeable barrier or store and release cover underlain by a capillary break comprising coarse, competent rock. As a result, the Proponent anticipates that both clay material and waste rock will be required during rehabilitation of the Tailings Storage Facility.

3.6.9 Soil Stockpiles

There are a number of new soil stockpiles located around the premises. For example, the drawings within the EA show a soil stockpile located on the eastern side of the box-cut which appears to be almost the length of the box-cut and directly adjacent to Spring Creek.

Soil stockpiles that are located in an inappropriate location erode, slump, generate dust and most importantly lead to mobilisation of soil during rainfall events, resulting in pollution of waters with sediment. At present the EA simply states "Soil stockpiles would be established upslope of the emplacement in locations where they would not be subject to erosive surface water flows" (p28). The expansion of soil being stored on-site and its potential as a pollution

source, both to air and water has not been adequately addressed in the EA. No updated air assessment has been undertaken to factor in the locations of new stockpiles and how these may add to dust loads coming from the premises, nor whether changes in dust monitoring is required. The mitigation measures proposed are reliant on appropriate weather conditions to facilitate stabilisation. If these soil stockpiles are surplus to requirements on site, they should be appropriately managed as waste and removed from the premises.

The Proponent notes that of the eight soil stockpiles shown on Figure 4 of RWC (2015), six have already been constructed. Indeed, the stockpile referred to on the eastern side of the boxcut has been revegetated and is used as a vantage point by officers of the Environment Protection Authority when inspecting the Project Site.

The Proponent notes that in accordance with the sediment and erosion control plans for the Project, all soil stockpiles are treated to achieve a C-factor of 0.1 (effectively equivalent to a 60% vegetative cover) within 10 days of being established and that cover is maintained until the stockpile is fully revegetated. As a result, the stockpiles do not result in dust emissions. Furthermore, all soil stockpiled on site will be required for rehabilitation operations at the end of mine life and will be utilised at that time.

3.6.10 Air Impacts

The air assessment in the EA is a letter that supplements the PAE Holmes (2010) report produced for the initial approval. The Proponent now seeks to amend Schedule 3, Condition 15 - The Proponent shall ensure compliance with the emission standards for Group 6 plants under Schedule 3 of POEO, Clean Air Reg. Removing the following words: "any pollutant limits in the EPL set after further assessment of the potential air quality impacts associated with the gold smelting process (refer to Condition 17 below)".

The EPA does not support modification of this condition as doing so would be inconsistent with requirements of the Clean Air Regulation and potentially reduces the standards that should apply to this premises. No information has been provided in the EA on the gases produced by electrowinning cells, calcining oven and furnace as part of the gold smelting process that has now been proposed to increase in frequency of use. The EA contains no details of air pollution controls that have been proposed and no assessment of the potential for odour from fugitive emissions, particularly from sulphur dioxide that is identified in the CSIRO report (EA Appendix 5) as being resultant of the cyanide destruction process and other fugitive emissions from the various reagents and cyanide now being used on the premises. The Environmental Assessment contains no information on the volatising cyanide from the TSF, dust emissions from the TSF that could potentially include heavy metals nor dust emissions from the approximate 6ha of soil stockpiles on site.

The Environment Protection Authority raises a range of issues that are addressed separately as follows.

- Amendment to Condition 3(15) of MP10_0054 in relation to emissions from the gold room.

The Proponent notes that the proposed gold room would be classified as a Group 6 facility under Clause 32 of *Protection of the Environment Operations (Clean Air) Regulation 2010* because it will be constructed and operated after 1 September 2005. Schedule 3 of the regulations identifies emissions criteria for "Non-ferrous metals (excluding aluminium): primary production" that would apply to the facility. It is not clear how referencing these requirements would be inconsistent with the Regulations nor how the Environment Protection Authority could justify emissions criteria more stringent than those referenced in the Regulations.

- Fugitive emissions from the CIL plant and cyanide destruction circuit or emissions of hydrogen cyanide.

  As cyanide processing no longer forms a component of the Proposed Modification, these matters are no longer relevant.

- Particulate emissions from the soil stockpiles.

  This matter has been addressed in Section 3.6.9.

3.6.11 Bunding

Bunding is crucial to the on-site management of chemical reagents, in particular cyanide. The EA does not contain sufficient detail on bunding design and capacity for all reagents and the pipelines that are transporting supernatant or other waste water around the premises. Bunding must take into consideration the capacity displaced by other tanks within the same bunded area and any foundations. If the liquid to be stored is classed as a dangerous substance, bunding design should make allowances for the trajectory of a liquid leak, assuming a full tank with an elevated point of leakage. Additional measures could include a splatter shield, or have a conservative distance between the tank and the bund wall; half the height of the tank would normally be appropriate. The EA should capture the requirements of the relevant Australian Standards including AS 445281997: The Storage and Handling of Toxic Substances.

The EPA notes that packing groups do apply regardless of whether the substance is intended to be transported or not. The EA does not include an assessment of the various chemicals that require bunding and their classification, in accordance with the assessment process outlined in the Australian Code for the Transport of Dangerous Goods by Road & Rail (2014) Edition 7.3 "Dangerous Goods Code".

Section 2.5.4.4 of RWC (2015) identifies that all reagents classified as toxic would be stored and handled in accordance with AS 4452 *The Storage and Handling of Toxic Substances.* Furthermore, Table A6-1 of Appendix 6 of RWC (2015) presents the class and packing group for all reagents proposed to be used within the Project Site.

3.6.12 Hazardous and Offensive Industry Assessment

The Proponent only appears to have assessed whether the activity is 'Hazardous' or 'Potentially Hazardous' with no mention of 'Offensive' or 'Potentially Offensive' industry. Whether or not the development proposal includes potentially offensive chemicals or activities is of relevance to the community and regulators.

Clause 3 of *State Environmental Planning Policy No 33 – Hazardous and Offensive Development* defines a potentially offensive industry as follows.

> "a development [that] …would emit a polluting discharge (including for example, noise) in a manner which would have a significant adverse impact in the locality or on the existing or likely future development on other land."

The Proponent contends that the Project, as approved ,or as modified would not emit a polluting discharge, including noise, odour, dust or vibration that would significantly impact on existing or potential future land uses surrounding the Project Site. As a result, an assessment as an offensive development is not required.

At present the EA includes lists of other reagents and chemicals, however, cyanide is the only one assessed as being hazardous. It would be appropriate to include an open and transparent assessment of all chemicals, fuels and reagents used on site and their storage volumes in a comprehensive hazardous and offensive industry assessment.

Table A6-1 of Appendix 6 of RWC (2015) identifies that cyanide is the only material that triggers the threshold for a preliminary hazard assessment under *Hazardous and Offensive Development Application Guidelines – Applying SEPP 33.*

3.7 EUROBODALLA AND PALERANG SHIRE COUNCILS

3.7.1 Introduction

Eurobodalla Shire and Palerang Councils jointly funded an assessment of the Proposed Modification by Dr Peter Beck of GHD Pty Ltd (GHD, 2015). Each Council prepared separate submissions and appended GHD (2015) to their submissions. The following subsections address the specific issues raised separately by Eurobodalla Shire and Palerang Council and provide a consolidated response to GHD (2015).

3.7.2 Eurobodalla Shire Council

3.7.2.1 Location within the Eurobodalla Drinking Water Catchment

The Proponent acknowledges that the Project Site is located within the catchment of Majors Creek which forms a component of the Deua River catchment.

3.7.2.2 Use and Management of Cyanide

Matters related to use and management of cyanide within the Project Site are no longer relevant as cyanide has been withdrawn from the Proposed Modification.

3.7.2.3 Development Creep

As this is the third modification proposed, and since the Proponent has identified a range of other deposits in the area, Council is concerned about project creep.

Council is concerned that, … the Proponent will seek further modifications, not only to significantly increase the scale of operations from additional gold deposits in the Majors Creek area, but to process ore from other mines.

The Proponent notes that no other economically viable mineral resources have been identified within Exploration Licences or Mining Leases controlled by the Company and that if any were, further Development Consent would be required to extract those resources. As a result, an application under the *Environmental Planning and Assessment Act 1979* would be required and Eurobodalla Shire Council and other stakeholders would be able to make submissions on that application should they wish to do so.

3.7.2.4 Proponent's Environmental Record

The Proponent acknowledges that it failed to adequately manage erosion and sediment controls during the initial stages of the Project and that as a result, sediment-laden water was discharged from the Project Site. This matter has been dealt with by the Land and Environment Court, with the outcome well publicised. The Proponent has previously acknowledged the failures that led to these discharges and has invested significant resources in managing environmental matters within the Project Site since that date.

Notwithstanding the above, the Proponent rejects the assertion that it is unable to manage environmental issues within the Project Site.

3.7.2.5 Lining of the Tailings Storage Facility

The seepage control and underdrainage collection features of the Tailings Storage Facility would be unchanged from the approved facility and is described in Section 6.3 of Knight Piésold (2011). In summary, the approved seepage control and underdrainage collection features for the facility would include the following.

- A cut-off trench.
- A low permeability clay liner.
- A partial geosynthetic liner.
- An underdrainage collection system and sump.
- An upstream toe drain on the embankment.

Knight Piésold, however, note that subsequent designs for the Tailings Storage Facility liner incorporate a full basin geosynthetic liner.

Section 3.6.4.9 describes the seepage assessment completed by Knight Piésold (2011) for the approved facility.

3.7.2.6 Location of the Tailings Storage Facility

In light of the removal of the proposed modification to the approved design of the Tailings Storage Facility, the Proponent notes that this is no longer an issue.

3.7.2.7 Application of Drinking Water Catchments Regional Environmental Plan

This Plan was repealed and replaced with the *State Environmental Planning Policy (Sydney Drinking Water Catchment) 2011* (Drinking Water SEPP). In addition, Clause 5 of the repealed Plan and Clause 5 of the Drinking Water SEPP exclude the Deua River Catchment from operation of either instrument. As a result, the Project Site does not and did not comprise an area to which the repealed Plan or the Drinking Water SEPP applies.

3.7.2.8 Matters Raised by Dr Beck of GHD

A detailed response to relevant matters raised by Dr Beck is presented in Section 3.7.4.

3.7.2.9 Conclusion

In concluding its submission, Eurobodalla Shire Council state that the current prohibition on the use of cyanide within the Project Site embodied in Condition 2(6)(d) of MP10_0054 "is an essential condition for the protection of the Deua River and its tributaries" and that Council "strongly objects to the use of cyanide at the Project site".

As the use of cyanide no longer forms a component of the Proposed Modification, the Proponent contends that it has removed the principal grounds for Eurobodalla Shire Council's objection.

3.7.3 Palerang Council

3.7.3.1 Cyanide Processing

Matters related to use and management of cyanide within the Project Site are no longer relevant as cyanide has been withdrawn from the Proposed Modification.

3.7.3.2 Tailings Storage Facility

The expanded Tailings Storage Facility (TSF) presents a significant, on-going problem for both the local environment and the downstream catchment area.

In light of the removal of the proposed modification to the approved design of the Tailings Storage Facility, the Proponent contends that this issue is no longer relevant.

The current mine approval, which only includes facilities for the initial processing and concentration of ore, involves the use of relatively benign processes and, more importantly, requires that ore concentrate be shipped away from the site for further processing. The critical factor here is that it is the subsequent stage in the processing of the ore that generates the most toxic waste products. At the moment, a significant proportion of these waste products, primarily heavy metals such as arsenic, cadmium, chromium, copper, mercury and lead, are exported offsite with the ore concentrate, never to return.

As noted in the Report, by carrying out processing on-site, these toxic waste products are also concentrated and retained on-site in the TSF. Further, as by-products of the CIL process, they will often be present in more soluble forms and will thus be more mobile in the environment. These heavy metals do not degrade with time. They are there forever, and will ultimately leach into the surface or groundwater system. The only question is when, and in what concentration.

This is an unavoidable, and in Palerang's view an unacceptable consequence of approving onsite CIL processing of ore concentrate

As processing of flotation or gold concentrate on site no longer forms a component of the Proposed Modification, the Proponent contends that this matter is no longer relevant. The Proponent notes Council's comment that the approved processing operation is a relatively benign process.

3.7.3.3 Post-Operation Management

The longevity of toxic heavy metals in the TSF amplifies the issue of its maintenance beyond the life of the mine. There does not appear to be any plan, nor any commitment to monitor or manage the TSF to mitigate any risk of discharge once operations have ceased.

The Proponent notes that as holder of Mining Lease 1675 and Environment Protection Licence 20095, it is required to monitor and manage all aspects of the operation of the Project to ensure that there is no unacceptable adverse environmental impacts associated with it, including following the completion of mining operations. Monitoring of the Tailings Storage Facility would include inspections and monitoring which would continue throughout the life of the facility and following rehabilitation.

In addition, monitoring of water quality, both groundwater and surface water and aquatic ecology is described in the approved *Water Management Plan*. The Proponent anticipates that the requirements of this Plan would continue following the completion of mining operations until Lease and Licence relinquishment.

The Report [GHD, 2015] raises serious concerns over the design of the TSF itself, and its long-term integrity, suggesting that it is not a case of whether or not the TSF might fail, but rather when it would fail. Even if the structure proved stable for 100 years, the certain prospect of failure at some point beyond that is hardly an acceptable legacy to leave for future generations.

The Proponent notes that the Tailings Storage Facility, whether the approved design or that proposed in RWC (2015), must be designed to comply with the requirements of the Dams Safety Committee of NSW. The Guidelines published by the committee are consistent with those published by the Australian National Committee on Large Dams and identifies:

- the required methodology to determine the hazard classification for structures including tailings storage facilities; and
- construction standards to be achieved to ensure the long-term stability of the structures.

As a result, to suggest that the Tailings Storage Facility is likely to fail is not an accurate statement.

3.7.3.4 Geographical Considerations

As a result, pollution events very quickly impact the entire downstream catchment area, as was seen during the sediment releases from the site early in the original construction phase. This characteristic of the site increases significantly the risks associated with any failure to contain a pollution event.

The location of the Project Site has been described in detail in RWC (2010a) and other documents. The Proponent acknowledges that the Project Site is located in the upper reaches of the Majors Creek catchment and that the Majors Creek State Conservation Area and Araluen Valley are located downstream of the Project Site.

In relation to Council's statement that "pollution events very quickly impact the entire downstream catchment area", monitoring of aquatic ecology by Cardno Ecology Lab before and after the sediment releases in 2013 determined the following (Cardno, 2013).

- No major changes to the in-stream habitat or substratum were observed.
- Biological indicators did not indicate any major change in the aquatic ecosystem.
- There was also no decline in fish abundance or diversity.
- Data collected following the sediment release does not show a major change in the aquatic habitats or the aquatic ecosystem compared with baseline date.

As a result, the Proponent rejects the statement that that incident impacted the entire downstream catchment area.

The Report suggests that the present proposal fails to appreciate the full extent of the risks associated with the geography of the site and as a result does not include satisfactory risk mitigation measures for a range of possible pollution events.

This issue is addressed in Sections 3.7.4.10.

3.7.3.5 Reputational Impact

In addition to the potential for direct environmental impact that would accompany the proposed CIL processing plant, there is the reputational risk to downstream agricultural and aquacultural operations. The Araluen Valley is best known for its stone fruit orchards and areas further downstream for various aquacultural pursuits. The mere presence of an upstream mining facility that has the potential to release unnatural levels of toxic substances into the water supply for these operations will have a direct impact on the image of their product, with the obvious flow-on effect to their commercial viability.

As cyanide processing no longer forms a component of the Proposed Modification, the Proponent contends that this matter is no longer relevant. Nevertheless, the Proponent strongly rejects Council's assertion that the Project as approved or as modified would result in reputational damage to downstream agricultural operations. This issue is addressed further in Sections 5.9.3 and 5.9.4.

3.7.4 Supporting Assessment by Dr Beck of GHD

3.7.4.1 Cyanide and Gold Recovery

This section is no longer relevant as cyanide processing has been removed from the Proposed Modification. However, the Proponent notes that GHD (2015) states the following in relation to the approved processing methodology. With the withdrawal on on-site cyanide processing, the proposed processing methodology would be in accordance with the approved methodology.

> *"The previous proposal would have resulted in the use of mostly benign substances or very small quantities of substances of environmental concern, therefore posing only a relatively limited risk to human health and the environment during and post operation of the mine. ... The resultant risk during development, operational, care and maintenance, closure and post closure phases would have been able to be managed using relatively simple measures. Also, any failure in infrastructure or management measures would not have posed a significant long term risk due to toxic substances to human health and the environment".*

The Proponent acknowledges the statement that the approved processing and tailings management operations posed limited environmental risks. As the Proposed Modification has been amended to remove the use of cyanide, placement of leached concentrate into the Tailings Storage Facility or modification to the design of the Tailings Storage Facility, the Proponent presumes that these comments would now apply to the Proposed Modification as amended.

3.7.4.2 Risks Associated with Cyanide

This section is no longer relevant as cyanide processing has been removed from the Proposed Modification.

3.7.4.3 Adequacy of Proposed Processing Operations and Environmental Controls

Section 6.1 of GHD (2015) principally focuses on the use and management of cyanide within the carbon-in-leach processing plant. As that component of the Proposed Modification has been withdrawn, the following provides a response to those comments that associated with non-cyanide related aspects of the Proposed Modification.

As noted, the Proponent proposes to only construct primary containment infrastructure that would only contain a single failure event.

Reference is made throughout RWC (2010a) and RWC (2015) to the fact that all storage containers and other tanks would be constructed and bunded in accordance with AS4452 *Storage and Handling of Toxic Substances.* That commitment remains unchanged as a result of the removal of the use of cyanide from the Proposed Modification.

Also the Proponent contends that detailed management, monitoring, response and mitigation plans would only be provided after approval for Modification 3 was granted. This hinders the ability of an independent reviewer to assess the adequacy of the risk assessment undertaken by the Proponent and evaluate whether the Proponent's management, monitoring, response and mitigation plans adequately address the relevant risks identified.

Preparation of detailed management plans is typically a matter that is left until after granting or modification of a Project Approval. However, in the present case, a range of detailed management plans have already been approved and are available online from the Proponent's website. As required by Condition 5(4) of MP10_0054, these plans would be reviewed and if required revised in consultation with relevant government agencies, including Palerang and Eurobodalla Councils, following granting of any modification. As a result, the Proponent contends that ample information is available to assess the adequacy of risks associated with the Proposed Modification.

The environmental assessment report places a significant burden on inspections and observations of critical elements of the mines operational and waste storage infrastructure on staff at the site. The report provides no details on the minimum training, procedures and experience of these operators to fulfil these inspection and observation tasks … The proposed plant does not appear to include sufficient redundancy to deal with foreseeable human error.

The Proponent notes that a range of management measures would be implemented to manage critical aspects of the Project, including for example the following.

- Engineering measures, including bunding and compliance with design and construction codes, including those of the Dams Safety Committee of NSW, as well as relevant Australian and industry standards.

- Certification and supervision of the design and construction of the processing plant and Tailings Storage Facility.
- Automated monitoring and shutoff of pumps and valves.
- Scheduled operational (daily), on-site engineering (weekly and monthly) and independent consultant engineering (annually) inspections and testing and maintenance.
- Detailed procedural manuals describing operational procedures.

As a result, the Proponent rejects the suggestion that insufficient redundancies have been included or that over-reliance is placed on operators.

Finally, the Proponent notes that required staff competencies would not typically be a matter relevant to an application under the EP&A Act.

In terms of the design and management approach used, the TSF would not be compliant with minimum requirements of a landfill facility that could accept the concentrated tailings waste. The concentrated tailings stream exceeds the concentration criteria for non-controlled aqueous liquid wastes.

As modification of the Tailings Storage Facility no longer forms a component of the Proposed Modification, the Proponent contends that this statement is no longer relevant. However, the Proponent notes that the facility is not a landfill and the Solid Waste Guidelines do not therefore apply.

The environmental assessment did not consider the risk of long term leachate discharge from the TSF into the environment and this risk was therefore not adequately addressed. The scale of any impact would be dependent on the composition of the leachate, the quantity of leachate leaking from the TSF and the streamflow at the time and point of discharge, as well as the distance to the nearest groundwater user.

As the design of the Tailings Storage Facility and the composition of the tailings to be placed within it would be consistent with the approved Project, the Proponent contends that this issue is no longer relevant. Notwithstanding this, the Proponent notes that during rehabilitation of the Tailings Storage Facility, a suitable impermeable barrier/layer and/or store and release cover would be installed on the Tailings Storage Facility to minimise the potential for infiltration of water into the tailings. As a result, long-term generation of leachate from the facility is unlikely to be a significant risk. As a result, a formal assessment of the risk of that aspect of the Project was not undertaken.

Finally, the Proponent notes that GHD (2015) states that the approved processing methodology would result in "only a relatively limited risk to human health and the environment during and post operation of the mine" and post mining management of the facility would be "able to be managed using relatively simple measures.*"* As the Proposed Modification as amended would include processing and tailings storage operations as approved, the Proponent presumes that the above comments are no longer relevant.

3.7.4.4 Consequences of Failure of Proposed Controls

By far the most significant consequence would result from a catastrophic failure of the TSF dam. Even modern well designed dams have failed, in some cases without warning.

The Proponent notes that the Tailings Storage Facility has been designed and would be constructed in accordance with the requirements of the following guidelines.

- Dams Safety Committee of New South Wales – DSC3A – Consequence Categories for Dams.
- Dams Safety Committee of New South Wales – DSC3F – Tailings Dams.
- Australian National Committee on Large Dams (ANCOLD) – Guidelines on the Consequence Categories for Dams.

As a result, the Proponent contends that the risk of catastrophic failure of the Tailings Storage Facility would be unchanged from the approved Project and would be in line with the above guidelines.

3.7.4.5 Extension of Mine Life

The longer mine life may raise the risk profile of the site slightly over that of the approved mine but this incremental increase is insignificant in the context of the significant risk increase due the proposed use of a CIL Plant with cyanide leach for gold extraction from the ore.

The Proponent notes that GHD (2015) determined that the proposed increase in mine life would pose an insignificant increase in the risk associated with the Proposed Modification compared to the use of cyanide within the Project Site. As that component has been withdrawn, the Proponent contends that the extended mine life is no longer an issue of significant concern for GHD.

3.7.4.6 Increase in Total Production

The increase in ore extraction would in itself not significantly affect the risk profile of the site if it occurred within the context of the mine operations as approved. If the extra ore were mined in the context of the approved mine operations then an additional volume of about 400,000t of relatively benign flotation tailings would be deposited in the Tailings Storage Facility …Similar to the proposed longer mine life, the proposed increase in the ore reserve to be mined may raise the risk profile of the site slightly over that of the approved mine but this incremental increase is insignificant in the context of the significant risk increase due the proposed use of a CIL Plant with cyanide leach for gold extraction from the ore.

As the use of a CIL plant and placement of leached concentrate tailings within the Tailings Storage Facility no longer forms a component of the Proposed Modification, the Proponent contends that the increase in total production is no longer an issue of significant concern for GHD.

3.7.4.7 Construction of an Enlarged Tailings Dam

The TSF as approved was only storing relatively benign flotation tailings solids that were not chemically modified, did not contained toxic compounds and had element concentrations around the background levels normally found in rock.

The Proponent notes that GHD (2015) determined that storage of flotation tailings only would not pose a significant risk to the environment. As storage of leached concentrate within the facility has been withdrawn from the Proposed Modification, the Proponent contends that the extended mine life is not an issue of significant concern for GHD.

Correct design of the embankment and installation should be independently verified.

The Proponent has engaged Knight Piésold to design the Tailings Storage Facility. Knight Piésold are experts in the design of such facilities within Australia and worldwide. In addition, the design and construction of the facility will be required to be reviewed and approved by the Dams Safety Committee of New South Wales prior to construction commencing, following completion of each stage and audited annually. In addition, the Proponent notes that the Dams Safety Committee reviewed the Tailings Storage Facility Final Design Report (Knight Piésold, 2011) at its February 2012 meeting and confirmed in writing on 3 February 2012 that the "overall design conforms to the Committee requirements".

.The environmental assessment report that supports the proposed Modification 3 does not consider the risk of a catastrophic failure of the TSF dam and also under-estimates the potential for leakage of the TSF. Therefore the report presents the potential risk profile of the site in a highly optimistic light.

The risk of catastrophic failure of the Tailings Storage Facility is required to be taken into consideration when determining the Hazard Rating for the facility at the outset of the design stage in accordance with the following guidelines.

- Dams Safety Committee of New South Wales – DSC3A – Consequence Categories for Dams.
- Dams Safety Committee of New South Wales – DSC3F – Tailings Dams.
- Australian National Committee on Large Dams (ANCOLD) – Guidelines on the Consequence Categories for Dams.

As a result, the Proponent rejects the assertion that these matters and the associated risks associated with them have been understated for either the approved Tailings Storage Facility design or that presented in RWC (2015).

The TSF as proposed under Modification 3 presents a significant long term hazard to the downstream catchment aquatic and terrestrial ecosystem, human health, agriculture, tourism and fishing industries that has to be monitored, managed and if necessary mitigated or cleaned up.

As the design of the Tailings Storage Facility and the composition of the tailings to be placed within it would be consistent with the approved Project, the Proponent contends that this issue is no longer relevant. In addition, the Proponent notes that GHD (2015) states that the approved processing methodology would result in "only a relatively limited risk to human health and the environment during and post operation of the mine" and post mining management of the facility would be "able to be managed using relatively simple measures*"*.

The TSF as proposed in Modification 3 would represent a significant long term hazard that will need long term monitoring, management and if necessary mitigation. This represents a long term environmental liability that requires resources and funding devoted to the task (RRG 2008). This aspect does not appear to have been considered by the Proponent.

This issue has been addressed above. In summary, the Proponent notes that it will be required to manage the approved Tailings Storage Facility until all relevant government agencies are satisfied that the closure criteria have been achieved and the Mining Lease and associated security bond have been returned.

UML (2014) indicates that the Dargues Reef Ore body has not been closed out at depth and that future exploration is planned to establish the depth to which recoverable gold reserves extent. Therefore should additional reserves be identified it would be logical for Unity to apply to modify the TSF to take additional tailings. This would involve raising the dam wall above the currently approved height. Under this scenario, should the proposed Modification 3 be approved the TSF could receive higher volumes of waste tailings and higher masses of cyanide, toxic heavy metals and sulphides.

This would be a matter for future applications to modify MP10_0054 and is not a matter that is relevant to this application.

3.7.4.8 Consequence of Leachate Discharge

The environmental assessment report acknowledges that leakage of leachate from the Tailings Storage Facility would occur. … The report did not consider the risk posed to or potential impacts this leachate discharge would have on the down-steam catchment. The Proponent's risk assessment that accompanied the application for the proposed Modification 3 only considered the risk posed by discharge from the TSF via the emergency spillway during a storm event and then only considered cyanide.

As the design of the Tailings Storage Facility and the composition of the tailings to be placed within it would be consistent with the approved Project, the Proponent contends that this issue is no longer relevant. In addition, the Proponent notes that GHD (2015) states that risks associated with the approved tailings management operations would be relatively benign and able to be managed "using relatively simple measures."

A basic assessment of the data from relevant stream gauges should have been undertaken to demonstrate the long term leachate discharge from the TSF was adequately considered. A preliminary assessment was undertaken using the data from two monitoring points (stream gauges, 217002 (Deua River at Wamban) and gauge 218008 (Tuross River at Eurobodalla) to assess mean flow conditions in the catchment potentially impacted by the proposed Modification 3. The preliminary assessment utilised the following flow regimes:

- *Mean Daily Minimum Flow: 43 ML/day.*
- *Mean Daily Base-flow: 397 ML/day.*
- *Mean Daily Flow: 793 ML/day.*

Based on the estimates leachate discharge rates in the report of up to 0.187 L/sec and the concentrated waste tailings stream contaminant concentrations it is possible for the chromium concentrations to exceed the drinking water criteria (at gauge station 217002) under daily minimum flow conditions and the ANZECC 99% protection criteria under the following circumstances:

- *Mean Daily Minimum Flow, cyanide, arsenic, cadmium, chromium, copper, mercury and lead.*
- *Mean Daily Base-Flow, arsenic, chromium, copper and lead.*
- *Mean Daily Flow, arsenic, chromium, copper and lead.*

As the design of the Tailings Storage Facility and the composition of the tailings to be placed within it would be in accordance with the approved Project, the Proponent contends that this issue is no longer relevant.

Notwithstanding the above, the Proponent is unsure how GHD (2015) arrived at the conclusion reached. The following presents a back calculated example for the statement that the Proposed Modification would result in an exceedance of the drinking water guideline criterion for chromium at the Deua River at the Wamban gauge.

- Worst case seepage rate .....0.187L/s or 269L/day.
- Mean Daily Minimum Flow at the Wamban gauge ..... 43 000 000L/day.
- Resulting dilution factor .....159 851.
- Australian Drinking Water standard – chromium .....0.05mg/L.
- Required chromium concentration in seepage water.....7 992mg/L.

A concentration of 7 992mg/L chromium is clearly many orders of magnitude in excess of what would reasonably be expected to be contained in leachate from the Tailings Storage Facility.

Considering that the performance of the liner may deteriorate over time a preliminary evaluation was conducted that increased the defects in the HDPE liner and increase the permeability of the clay liner to reflect potential weathering effects due to leachate leaks. This analysis indicated that leachate discharge volume may increase to around 4L/s with peak discharge potentially as high as 20 L/s as the liner ages.

As the design of the Tailings Storage Facility and the composition of the tailings to be placed within it would be consistent with the approved Project, the Proponent contends that these comments are no longer relevant. However, it is unclear how or why GHD (2015) assumed a seepage rate two orders of magnitude higher than the worst case scenario calculated by Knight Piésold. As a result, the Proponent rejects this assertion.

3.7.4.9 Tailings Composition

The report appears to focus on cyanide as the only primary contaminant of concerning associated with the disposal of waste tailings into the TSF but does not assess risk posed by other potential toxic and reactive metals and inorganic compounds (Hargrave et. al. 2000). Table 9 and 10 of the Environmental Assessment Report present the chemical composition of the flotation and concentrated waste tailings streams. This information was utilised to compile the analysis of the waste streams and the various contaminant masses to be disposed of into the TSF and is presented in Table 3. The concentrated waste tailings contain a range of other contaminants and toxic compounds that need to be considered. [GHD (2015) lists a range of elements and discusses the solubility of each based on assumed pH within the tailings].

As the design of the Tailings Storage Facility and the composition of the tailings to be placed within it would be consistent with the approved Project, the Proponent contends that these comments are no longer relevant. Supporting this assertion is the statement by GHD (2015) that risks associated with the approved tailings management operations would be relatively benign and able to be managed using "using relatively simple measures."

Notwithstanding the above, the Proponent contends that the analysis presented by GHD (2015) is simplistic and based on flawed assumptions. For example, GHD (2015) assume highly alkaline conditions in the Tailings Storage Facility of between pH 9 and pH 13 and draw a range of conclusions re the solubility of metals as a result. In reality, such alkaline conditions are highly unlikely to occur. As a result, the conclusions re the solubility of the various metals, are fundamentally flawed.

Finally, Table 9 of RWC (2015) presents the chemical composition of the flotation tailings that would be placed into the Tailings Storage Facility. The table presents the geochemical abundance index (GAI), a measure of how enriched a particular element is compared to the average crustal abundance, for a range of elements. For most elements, the GAI is zero indicating that these elements are not enriched compared to the average crustal abundance. Elements with a GAI of greater than 1 include the following.

- Silver – GAI = 2.
- Boron – GAI = 2.
- Molybdenum – GAI = 3.
- Antimony – GAI = 4

Each of these elements is identified in Table 3 of GHD (2015) as having a low mobility. As a result, the Proponent contends that the proposed and approved tailings stream would not result in unacceptable solubility of metals in leachate.

3.7.4.10 Risk Assessment Limitations

Toxic and Harmful Substances

The risk assessment appeared primarily focused on cyanide. The proposed use of a CIL Plant using cyanide to process the ore on site would lead to significant concentration and geochemical alteration that affects the mobility and toxicity of a range of potential contaminants of concern that could adversely impact human health and environment on site and down-stream catchment.

The Proponent notes that the proposed use of cyanide has been removed from the Proposed Modification. Issues associated with the solubility of metals within the Tailings Storage Facility have been addressed previously.

Monitoring, Management and Response Measures

The environmental site assessment report does not provide sufficient information to allow for an independent assessment of the adequacy of the proposed monitoring, management and response measures. The Proponent contends that this detail is not required to inform the decision as to whether to grant approval of the proposed Modification 3. Given the limitations of the risk assessment as set out in this section and the lack of information there is currently insufficient information to form a view on the risks posed by the proposed modifications and the measures proposed to ensure the mine will operate in a safe and responsible manner that considers all relevant risks.

Until there is a clear demonstration that all of the relevant risks factors, scenarios and dimensions have been adequately assessed in detail, and appropriately detailed monitoring, management and mitigation plans provided, no decision can be made on whether the proposed Modification 3 can occur on site in a safe and sustainable manner over the full lifecycle of the project.

The Proponent notes that a range of Management Plans have been prepared for the Project and approved by the relevant government agencies. These plans are publicly available and would be required to be reviewed and amended, if required, in consultation with those same agencies. As a result, the Proponent contends that adequate information is available within the approved plans and RWC (2015) to enable the application to be determined.

Catastrophic TSF Dam Failure

As noted in previous sections the proposed modified TSF is considered to present the most significant short, medium and long term risk to human health and the environment. The risk assessment undertaken by the Proponent did not consider a failure of the TSF dam in the risk evaluation.

This issue has been addressed previously in Section 3.7.4.4.

Inadequate understanding of subsurface conditions and overreliance on assumptions was a key contributing factor in the catastrophic failure of the Mount Polly tailings dam failure on 4 August 2014. Appendix 7 of the Environmental Assessment Report provides information on the tailings dam design but provides no information on the geotechnical investigation on which the design is based and indicates that the dam design and stability assessment was based on numerous assumed rather than measured parameters.

Section 2.7.2.1 of RWC (2010a) describes the geotechnical assessments that have been undertaken within the footprint of the approved Tailings Storage Facility. In summary, these include:

- Three cored boreholes, each to approximately 30m depth. Two were located in the vicinity of drainage lines approximately where the TSF embankment would be constructed and one in the area of the final decant /pond.
- Nine packer tests, three in each borehole at nominal depths of 5m, 10m and 25m.
- A series of 28 test pits along the proposed embankment alignment, within the footprint of the Tailings Storage Facility basin and downstream of the proposed embankment alignment.
- Laboratory testing of samples collected.

The site investigation concluded the following.

- Shallow horizons of alluvium and/or colluvium were encountered in proximity to the creek alignment overlying weathered granite.
- Weathered "granite" was intersected to depths of between 7m and 20m, overlying competent bedrock.
- Groundwater was encountered at depths of between 1.6 m and 2.9 m below the base of the creek.
- In situ permeability testing using packer tests indicated an in situ permeability of 1.5×10^{-7}m/s to 2.3×10^{-6}m/s.
- The sub-surface conditions are considered suitable for construction of the proposed TSF embankment and associated infrastructure.

No reference to the tailings dam design being in accordance for DSC 2012 as no reference to the document is made in Appendix 7. … The environmental assessment report appears to have been prepared without reference to relevant Australian Commonwealth and State Guidelines.

Section 2.1 of Knight Piésold (2015a) states that the Tailings Storage Facility has been designed in accordance with the following guidelines.

- Dams Safety Committee of New South Wales – *DSC3A – Consequence Categories for Dams.*
- Dams Safety Committee of New South Wales – *DSC3F – Tailings Dams.*

- Australian National Committee on Large Dams (ANCOLD) – *Guidelines on the Consequence Categories for Dams.*
- Australian National Committee on Large Dams (ANCOLD) – *Guidelines on Tailings Dams.*

The environmental assessment report does make reference to the Victorian Department of Primary Industry (DPI) 2004 Management of Tailings Storage Facilities guidance document but it appears that the relevant requirements set out in that document were not adequately considered in the report.

The Proponent notes that the Victorian Department of Primary Industry 2004 guideline *Management of Tailings Storage Facilities* is referenced in Condition 3(24) of MP10_0054 in relation to the permeability of the basin of the facility. Other aspects of the design of the Tailings Storage Facility have been completed in accordance with the requirements of the Dams Safety Committee of NSW.

Long Term Leaching from Tailings Storage Facility

Table 5.2 of Appendix 7 of the environmental assessment report notes that the designers assumed that the clay liner permeability of 10^{-8} m/s rather than basing the design on measures permeability from appropriate field and laboratory testing.

Section 3 of Knight Piésold (2011) identifies the geotechnical site investigations that were undertaken over a three week period during the initial design phase of the Tailings Storage Facility. That work included:

- drilling of three boreholes using diamond coring techniques;
- test pitting at twenty eight locations;
- *in situ* permeability testing; and
- laboratory testing of selected samples.

In situ permeability testing determined typical permeability of between 1.5×10^{-7}m/s and 2.3×10^{-6}m/s, with laboratory permeability testing indicating that remoulded samples were capable of achieving a permeability of between 8×10^{-7}m/s and 6×10^{-10}m/s. In addition, the geosynthetic liner will provide an effective permeability of 1×10^{-11} m/s.

The clay liner construction method described in Appendix 7 suggests that only a single compaction event is proposed to achieve the assumed clay liner permeability of 10^{-8} m/s.

The Proponent is not aware of where the impression that only a single pass would be used to construct the clay liner for the Tailings Storage Facility. However, the Proponent notes that the design criteria are related to a performance specification to achieve a specified permeability and the methodology used to achieve that is generally not specified as long as the criteria has been achieved and is verified through testing.

Experience suggests that the rate of leakage from the TSF is likely to be higher than the ideal conditions assumed by the Proponent and will increase over time due to the degradation of the HDPE liner and erosion of the clay liner. The Proponent's risk assessment did not consider this risk dimension. The long term leakage and consequent leachate discharge into the environment needs to be estimated and the resultant risk evaluated to demonstrate that the new TSF proposed in Modification 3 does not pose an unacceptable risk to human health and the environment.

As the Tailings Storage Facility would be constructed in a manner consistent with the approved facility, this issue is not longer relevant.

Sustainability Principles

The economic analysis in the report only considered the development, operational and closure phase of the mine lifecycle but did not appear to consider the long term post closure phase.

The Proponent notes that Section 2.14.2 of RWC (2010a) states that the long-term rehabilitation objective for the Project is as follows.

> "Provide a low maintenance, geotechnically stable, non-polluting and safe landform which blends with surrounding landforms and provides land suitable for the final land use of nature conservation and/or agriculture."

This objective is embodied in the current *Mining Operations Plan* that has been prepared for the Project and would be a key component of future *Mining Operations Plans*. In addition, the Proponent notes that it will be required to provide a security for rehabilitation of the site and that security will not be released until the relevant government agencies agree that all mine closure and relinquishment requirements, including those to ensure the long-term stability of the site, have been achieved. As a result, the Proponent disagrees that it has not considered the long-term post closure phase of the mine.

3.8 DIVISION OF RESOURCES AND ENERGY

The Division of Resources and Energy states that it has no objection to the Proposed Modification. The Division notes that a revised *Mining Operations Plan* and *Rehabilitation Cost Estimate* will be required. The Proponent acknowledges this requirement.

3.9 OFFICE OF ENVIRONMENT AND HERITAGE

3.9.1 Aboriginal Heritage-related Matters

As raised in our previous correspondence dated 23 March 2015, OEH requests that a revised Aboriginal Heritage Management Plan (AHMP) is completed by a qualified archaeologist. The Aboriginal Heritage Management Plan must include the recommendations outlined in Appendix 11 of the Modification 3 Environmental Assessment (Mod 3 EA) and a detailed salvage strategy for Aboriginal sites GT OS1 and GT OS2.

The Proponent acknowledges this request and notes that it is consistent with the requirements of Condition 5(4) of MP10_0054.

We note that the Statement of Commitments (SoCs) relating to Aboriginal Heritage have been removed on the basis that they are addressed by the original conditions of approval. While the intent of the SoCs is reflected in the conditions of approval some of the specific details are not. OEH recommends that the steps outlined for Aboriginal Heritage in the SoCs are included in the AHMP.

The Proponent acknowledges this request and will ensure that specific measures identified in the Statement of Commitments are reflected in the revised *Aboriginal Heritage Management Plan,* including the submission of an updated site card to the AHIMS following salvaging of the identified artefacts.

We are still concerned that no further site inspections for Aboriginal Heritage have occurred since June 2011. We therefore request that all Aboriginal sites are inspected prior to impact as conditions may have changed. The current condition of each site must be recorded and an updated site card submitted to the OEH Aboriginal Heritage Information Management System (AHIMS).

The Proponent acknowledges this request and will ensure that sites to be impacted are inspected and objects salvaged in accordance with the procedures to be outlined in the revised *Aboriginal Heritage Management Plan.*

We disagree that Aboriginal consultation has been completed in accordance with OEH guidelines. The consultation process cannot be considered continuous as there has been a gap in the consultation process of six months or longer. According to Appendix 11, the last communication between the consultant and Registered Aboriginal Parties (RAPs) was in June and July of 2013. In addition, the May 2015 report (Appendix 11) does not record whether the letter report dated 4 February 2015 has been sent to the RAPs, nor whether there were any responses.

The following response has been prepared by Dr Sandra Wallace, Managing Director of Artefact.

Aboriginal consultation has been undertaken for the Project over an extended period. The consultation was initiated in 2010 during the original assessment by Archaeological Surveys and Reports Pty Ltd in accordance with the Director-General's Requirements issued at that time. The Director-General's Requirements specified that as a Part 3A Project, the *Draft Guidelines for Aboriginal Cultural Heritage Impact Assessment and Community Consultation* published by the then Department of Environment and Conservation in 2005 (2005 Guidelines) should be used as a guide for assessment and consultation. The 2005 Guidelines refer to the 2004 *Interim Community Consultation Requirements for Applicants* also published the then Department of Environment and Conservation (2004 Guidelines).

Both the 2004 and 2005 Guidelines were used as a guide for the consultation undertaken by Artefact since becoming involved in the Project in 2011. These Guidelines were also identified in the *Aboriginal Heritage Management Plan* prepared by Artefact for the Project in 2011 and

subsequently revised in 2013. This Plan was prepared in consultation with Office of Environment and Heritage and has been approved by the Department of Planning and Environment.

It is noted that the 2005 and 2004 Guidelines do not specify that consultation must restart after a gap of six months. The requirement referred to by Office of Environment and Heritage is a requirement of *Aboriginal Cultural Heritage Consultation Requirements for Proponents* published in 2010 which are intended for use during an application for an Aboriginal Heritage Impact Permit.

Finally, it is noted that the current application received significant media coverage prior to and during the exhibition period. As result, it is likely that any person, whether Aboriginal or non-Aboriginal, with an interest in the area would have been aware of the Proposed Modification. Indeed, two individual submissions raised the issue of Aboriginal heritage downstream of the Project Site. No submissions raised the issue of Aboriginal heritage within the Project Site.

Notwithstanding the above, Artefact will submit the latest modification report (dated May 2015) and a project update to all Registered Aboriginal Parties with a request for any further comments (within 28 days) and will provide that information to Office of Environment and Heritage and the Department of Planning and Environment once received.

We note that the proposed harvestable rights dam HRD-E(r) will not be constructed due to its location within the proposed eastern waste rock emplacement (Mod 3 EA, July 2015 page 78). This is in contrast to the Mod 3 EA dated February 2015, which stated that dam HRD-E(r) was located within the unsurveyed 'Slings' property which is in the southwest section of the project site. How is it that this dam is now located near the eastern waste rock emplacement? Has the proposed location of dam HRD-E or the eastern waste rock emplacement changed since February?

The Proponent notes that the approved HRD-E is located with the proposed footprint of the Eastern Waste Rock Emplacement. The original version of the *Environmental Assessment* provided to Office of Environment and Heritage identified that a replacement dam (HRD-E(r)) was to be constructed within the "Slings" property. The Proponent has since determined that that component of the Proposed Modification would not be constructed and it was removed from RWC (2015).

We acknowledge that Figure 1 in Appendix 11 has been updated to clearly show the dimensions of recorded sites and their proximity to the proposed works. We recommend this type of mapping occur for all recorded Aboriginal sites within the project area.

Noted.

3.9.2 Biodiversity-related Matters

As raised in previous correspondence and during the March 2014 site visit, OEH requested that the Proponent address a number of issues to reduce environmental risks associated with this project.

These included:

- *The requirement to offset biodiversity impacts stemming from this modification - in addition to previously negotiated offsets.*

  We note a new offset area has been identified in Figure 16 (Section 4.3.2). The new offset area of 33 hectares to offset the additional 19.5 ha of modified development provides a new offset ratio of 1.7: 1 which in itself is low. However the overall offset package of 7: 1 is still considered adequate.

Noted.

- *The request to consider the erosion risks associated with the culvert on the access road traversing Spring Creek and potential accumulative impacts on endangered ecological communities downstream.*

  This appears to have been considered however the Department of Planning and Environment should ensure that the NSW Office of Water is satisfied that there will be no further erosion of the downstream far bank.

Noted.

Section 4.3.5.2 - Cyanide-related Impacts

The exclusion of terrestrial fauna by the use of a 1.8m high fence is supported, provided that the construction of the fence makes it impervious to small mammals. We would recommend wire mesh with holes no greater than 20mm. This will not be sufficient to keep out reptiles and amphibians. No threatened reptiles or amphibians have been identified on site, however potential impacts for local populations of native species also need to be avoided or mitigated.

The Proponent notes that, the fence to be constructed around the Tailings Storage Facility would have the following design characteristics.

- 2.4m high chain link fence, comprising 1.8m above ground and 0.6m buried and swept back away from the facility.
- Incorporation of wire mesh with holes <20mm extending from ground level to approximately 0.6m above ground level.

It is unlikely that the Mallard duck is the most susceptible bird species to Cyanide as it is larger in body mass than most of the threatened birds listed in the assessment of significance. The use of LD50 data from one species as a predictor of LD50 for another species is not always accurate. Griffiths et a/2014 refers to a study which compared LD50 for Little Brown Bats and 2 mouse species which found a threefold variation between 2 species of mice with one of them being similar to the bat.

The assertion that Bat foraging would be low over the tailings dam is not consistent with the findings of Griffiths et al (2014). That study found evidence of the presence and relative activity of bats above Cyanide storage dams at mine sites. Furthermore, echolocation buzz calls recorded in the airspace directly above the tailings dam provided indirect evidence of foraging and/or drinking.

This matter is no longer relevant as cyanide has been withdrawn from the Proposed Modification.

Appendix 9 - Ecology Assessment

The Ecology Assessment includes an assessment of significance for a number of threatened species and endangered ecological communities (EECs). However, in relation to the impacts of this project modification on threatened species, it does not appear that any field surveys have been conducted to determine how any of the threatened species may be using the site. Of greatest concern is the lack of knowledge of how the threatened fauna species are using the existing waterbodies. This knowledge is critical in determining what the risk of cyanide ingestion will be for the new tailings dam.

The Proponent acknowledges that there were no ecology surveys undertaken specifically for the purposes of the Proposed Modification. Page A9-6 of EnviroKey (2015) identifies that:

> "EnviroKey have a good understanding of the biodiversity of the study area. While no specific flora and fauna surveys have been conducted implicitly to inform this letter report, EnviroKey have conducted flora and fauna monitoring across the Project Site in accordance with the Biodiversity Management Plan (BMP) since Autumn 2014. The results of this monitoring can be viewed online at. Data collected during the flora and fauna monitoring as well the data contained within Gaia (2010), were considered in the preparation in this letter report."

The section on impact assessments also fails to evaluate the cumulative impacts of the project on threatened species as it only focuses on the potential impacts of modification 3. The assessment does not incorporate the cumulative impacts of the original approval and the modification. Furthermore, the impact assessment focuses on the impacts associated with the removal of vegetation rather than the potential impacts of the gold mine and treatment processes, which may have significant impacts. These impact types are currently in different sections but should be combined, to assess the total impacts on species.

The Proponent notes that cumulative impacts associated with the Proposed Modification are addressed on page A9-20 to A9-22 of EnviroKey (2015). Mr Steve Sass, author of that document confirmed by email to the Proponent on 9 October 2015 that the impact assessment presented in that report was a cumulative impact assessment, not an assessment of the additional impacts only.

Appendix 3 – ToxConsult 2015b

The report by ToxConsult (Appendix 3) assumed that the tailings storage facility discharge of WAD cyanide would be 30mg/L, however it is not clear within the EA how the Proponent will ensure that this concentration will not be exceeded. There has been no analysis as to whether the concentration of cyanide would exceed 30mg/L during dry periods where evaporation was high.

Appendix 3 describes the LD50(mg CN-/kg bw) for various species which have been tested in various studies. However there is no comparison of how the ingestion of water containing a cyanide concentration of 30mg/L would equate to mg CN-/kg bw.

Given that there is such a wide variation in LD50 for different species it seems difficult to estimate what the LD50 would be for native species such as Gang Gangs or Bats. While we acknowledge that it is difficult to find cyanide studies on Australian wildlife, it is important to recognise that the Mallard duck (Anas platyrhynchos) is not native to Australia (though it does now live here). Many Australian ducks and migratory birds are smaller in body mass and may be more likely to be affected from ingesting cyanide.

The potential impacts to bats were based on previous rat studies. As the effects of cyanide appear to be related to the weight of animals, the assumption that microbats are comparable to lab rats is not necessarily accurate. For example, microbats range in weight around 20g and lab rats commonly weigh over 500g.

There has been no discussion on the potential impacts to the local reptile and amphibian population.

As the use of cyanide within the Project Site has been removed from the Proposed Modification, the Proponent contends that these comments are no longer relevant.

The tailings storage facility is likely to contain a range of other heavy metals that are potentially toxic to native fauna. These potential impacts have not been discussed or considered in the modification 3 EA.

As the design of the Tailings Storage Facility and the composition of the tailings to be placed within it would be in accordance with the approved Project, the Proponent contends that these comments are no longer relevant.

OEH considers the risks to wildlife (both threatened and protected species) from cyanide and other chemicals in the tailings dam has not been sufficiently assessed and mitigated for in the EA. The Proponent discusses vague cyanide poisoning mitigation measures in the EA but the lack of detail about how and at what frequency these measures will be implemented does not provide enough confidence to offset the risks of impacts.

As the use of cyanide within the Project Site has been removed from the Proposed Modification, the Proponent contends that these comments are no longer relevant.

Statement of Commitments (SoCs)

- *Table 9 - Condition 32 will have to be updated to include the new areas needed to offset the expansion of the tailings dam.*

This has been addressed in Section 2.5.2.

- *SoC 5.9a should not be removed as it is not reflected in the approval conditions of Modification 2. The offsite offset has always been part of the offset requirements, whereby;*

  Identify and implement an off site biodiversity strategy that would:

  – *Ensure the protection and enhancement of a minimum of 35.5 ha of Tableland Basalt Forest in similar condition to the community within the project site;*

  – *Include a Biodiversity Offset area within the vicinity of the project site but outside the area of predicted groundwater drawdown;*

  – *Be implemented in perpetuity and be described in the Biodiversity Management Plan for the project as amended.*

  Alternatively, ensure that funding to an equivalent amount that would have been required under the abovementioned offsite Biodiversity offset Strategy is made available in perpetuity for the management of Tableland Basalt Forest matters in the vicinity of the project site.

The Proponent acknowledges that the Off-site Biodiversity Offset Area is not identified in the Conditions of MP10_0054 and that Statement of Commitments 5.9a should remain. This matter is addressed in Section 2.5.3.

3.10 WATER NSW

Water NSW has expressed concern in relation to transportation of sodium cyanide, a Class 6.1 chemical under the *Australian Code for Transportation of Dangerous Goods by Road and Rail,* within the catchment.

NSW Water has requested that the following conditional requirements be imposed on the Project.

- *"Schedule 3 Condition 40 also include the monitoring of hazardous chemical transport, reporting and measures to manage any spills within Sydney's drinking water catchment.*
- *There be a requirement for Water NSW to be notified of any incidents related to the transport of hazardous chemicals through the Sydney drinking water catchment."*

As the use of cyanide within the Project Site has been removed from the Proposed Modification, the Proponent contends that these comments are no longer relevant.

4. SPECIAL INTEREST GROUP SUBMISSIONS

4.1 INTRODUCTION

Submissions were received from the following special interest groups. This section provides a response to the issues raised by each group.

- ACT Conservation Council.
- AVPPEC.
- Braidwood Greens.
- Coastwatchers Association.
- Eurobodalla Greens.
- Majors Creek Catchment Guardians.
- National Coast Marine Group.
- Nibago Pty Ltd.
- Southcoast Health and Sustainability Alliance.
- Town Plan.
- Tuross Community Garden.
- Tuross Lakes Preservation Group.

In addition, one individual, Ms Jackie French, provided a submission as a special interest group. For the sake of completeness, that submission is addressed in this section as well.

Where possible, and to prevent repetition, relevant issues have been tabulated and cross references to other sections of this document or to other documents have been provided. Where this is not possible, relevant text has been extracted from the submissions is presented in *italics*, with responses to issues raised provided in normal test.

4.2 ACT CONSERVATION COUNCIL

Firstly, all planning should commence with identification of the environmental values to be protected and implementation of adequate protections should be part of the planning. Secondly, the community and its organisations should be consulted early, and transparently, and genuinely, in order that developments have appropriate community consent.

Neither of these principles are met by the current proposed modifications to the Dargues Creek Gold Project.

The Proponent notes the following in relation to the issues raised by the Conservation Council.

- Identification of environmental values.

  A range of documents have been prepared describing the environmental values of the Project Site and surrounding areas, including RWC (2010a, 2012a, 2013a and 2015a), as well as numerous reports prepared by a range of experts, including in

relation to biodiversity, aquatic ecology, surface water, groundwater, air quality, noise and vibration. As a result, the Proponent contends that the environmental values surrounding the Project Site are well understood.

- Consultation with the community.

  Section 3.2 of RWC (2015) describes the consultation undertaken for the Proposed Modification. That consultation is the latest in a program of consultation that has been ongoing since 2008. The Proponent contends that at all times it has been transparent in its dealings with the community and others and has provided information in a manner that it hopes is easily understood. This consultation has been undertaken in an environment where the Proponent's statements have, on occasion, been misrepresented or misinterpreted. Notwithstanding this, the Proponent will continue to engage in consultation with the community through a range of formal and informal mechanisms as it develops the Project.

Sediment from potential spillages of cyanide from the mining processes and the tailings dam is still a major risk to wildlife in dry periods. While deep pools in the reserves are fed by springs linked to the Major's Creek fault, they shrink to about a third full in drought. In drought times the deep pools are the only safe water available for wildlife for the surrounding area of about 60 square kilometres. These pools are now approximately one third full of sediment. If a drought hits before a coursing flood, the death toll from local and migratory species might be massive.

The Proponent notes that Condition 3(22) of MP10_0054 requires that it offset any loss of baseflow within Majors Creek. In addition, the proposed enlargement of the Tailings Storage Facility no longer forms a component of the Proposed Modification.

It is important to note that long-term weather patterns point to increased volatility of rainfall in the area including short but large rainfall events.

The issue of Climate Change is addressed in Section 5.4.

It is significant that the proposed modification now includes use of cyanide whereas the initial proposal did not include on-site carbon-in-leach processing.

It is a breach a community trust to gain acceptance for a proposal – the gold mine project – including on the basis that a process would not be used – use of cyanide on-site – then to introduce it later through a modification.

Cyanide is now being proposed as a means to increase the cost-effectiveness of the mine. However, the cost to the environment has not been measured, nor the cost of the long-term monitoring and maintenance of the site that would have to continue long after the mine has closed. The cost to human populations in terms of water quality, agricultural produce and recreational pursuits from a potential future leak of cyanide would also outweigh the cost-effectiveness of a relatively short-term mining and processing operation.

The risk posed by the introduction of cyanide into the environment at the Project Site is too great for the Project to proceed. The mine at Dargues Creek should not go ahead in any form given that proponents now, and into the future, will require cyanide to be economical. The cost to humans and the environment is too great.

The use of cyanide processing no longer forms a component of the Proposed Modification.

4.3 AVPPEC

4.3.1 Introduction

Araluen Valley Agricultural Producers & Protectors of the Ecosystems Coalition (AVPPEC) prepared a submission comprising a letter and submission from AVPPEC and eight supporting documents. It is noted that a number of the supporting documents state that they were prepared at the request of the Environmental Defenders Office for AVPPEC, Coastwatchers Association Inc. and Majors Creek Catchment Guardians Inc. This subsection provides a response to the AVPECC submission and each of the supporting documents. Separate responses have been provided to the Majors Creek Catchment Guardians Inc. and Coastwatchers Association Inc. submissions in Sections 4.5 and 4.7 respectively.

4.3.2 AVPPEC

AVPPEC raise a number of issues that have been addressed elsewhere in this document. **Table 4** presents cross references to sections where relevant information is presented. Additional relevant information is presented elsewhere in this document. Where an issue has not explicitly been addressed elsewhere, a brief description and response is provided in **Table 4**.

Table 4
Response to Issues Raised by AVPPEC

Page 1 of 2

Issue	Where Addressed / Response
Commitment re the use of cyanide	The use of cyanide no longer forms a component of the Proposed Modification
Prior performance of the Proponent	See Section 5.13.
Adverse water quality, biodiversity and agricultural impacts downstream of the Project Site	See Sections 5.7, 5.6.2 and 5.9.3 respectively
Location of the Tailings Storage Facility	Enlargement of the Tailings Storage Facility no longer forms a component of the Proposed Modification.
Risk of contamination by heavy metals	The Proponent presumes that this is a reference to placement of leached concentrate tailings into the Tailings Storage Facility. This activity no longer forms a component of the Proposed Modification.
Use of rainfall data	See Section 3.6.1 and 4.3.10.
Climate Change	See Section 5.4.

Table 4 (Cont'd)
Response to Issues Raised by AVPPEC

Issue	Where Addressed / Response
Bushfire	The submission states that the risk of bushfire impacting on reagent storage is significant. The Project Site largely comprises cleared grazing land, with sections of native and other vegetation. The processing plant and associated infrastructure would be located within a concrete sealed area, surrounded by hardstand. Bushfire is not expected to adversely impact on the operation of the Project, nor on the management of reagents, hydrocarbons or tailings
Solvency of the Company	The submission states that the auditor's report in the 2014 December statement to the ASX that the company is at risk of not being able to meet its liabilities. The Proponent assumes that this issue relates to commentary presented in the Independent Auditors Report presented on Page 67 of the Proponent's 2014 Annual Report to shareholders. That issue related to the losses incurred by the Proponent in FY2013/2014. The Independent Auditors Report and associated Financial Report presented in the 2015 Annual Report includes no such commentary, indicating that the issues identified in 2013/2014 had been satisfactorily resolved and that the Proponent has adequate resources to meet its liabilities.
Performance of the Henty Gold Mine	The submission states that the Proponent was fined by the Tasmanian EPA for a "major spill." The Proponent notes that it has received a single Environmental Infringement Notice for $650 since mid-2009. See Section 5.10 for a more detailed discussion.
Development creep	See Section 3.7.2.3.
Air quality impacts	See Sections 3.6.10 and 5.5.

4.3.3 Economists at Large

4.3.3.1 Introduction

Economists at Large (Barnett, 2015) prepared a report which while not referenced by the submission from AVPPEC, was included with the AVPPEC submission on the Departmental website. As a result the Proponent presumes that the report forms a component of the AVPPEC submission. For convenience, the following subsections correspond to those presented in Barnett (2015).

4.3.3.2 Adequacy of Impact Assessment

Given large range of values presented as possible, there is insufficient information in the assessment regarding the assumptions and methodology used to arrive at the estimates provided. Specifically, it is difficult to understand why some impacts have increased while others (taxes and royalties) remain unchanged.

For example, the proponent presents a range of values for taxes and royalties of between $1 million to $8 million. Given the magnitude of difference involved, decision makers should pay attention to assumptions underpinning these estimates and why the range is so wide.

Royalties in NSW are calculated at 4% ex mine value less allowable deductions. The proponent's estimated range of royalty figures may be particularly sensitive to the allowable deductions and how these might differ under the proposed modification. There is insufficient information to understand what ex mine value the proponent is assuming and what would be considered allowable deductions. Decision makers should attempt to understand these issues.

Key assumptions that will affect the figures provided include:

- *Mine life.*
- *Annual ore tonnages, grades and recoveries over the life of the mine.*
- *Gold price.*
- *Exchange rates.*
- *Costs (including allowable deductions which will reduce royalty values).*
- *Whether figures* are in real or nominal values (the latter will overstate the actual benefits).

Economic contributions at local, regional, state and national level appear to have been derived from input-output analysis. If these figures were arrived at using input-output analysis, they are likely to be of little use to decision makers. The Australian Bureau of Statistics no longer publishes input-output tables and notes several shortcomings with their use, stating "While I–O multipliers may be useful as summary statistics to assist in understanding the degree to which an industry is integrated into the economy, their inherent shortcomings make them inappropriate for economic impact analysis. These shortcomings mean that I–O multipliers are likely to significantly over–state the impacts of projects or events"5.

Finally, jobs are not generally considered a benefit in benefit-cost analysis. Instead, employment is seen as cost to the project, against which any benefits (revenue) should be considered. This is important because the project's employment makes anybody employed unavailable (or available at a higher price) to other employers in the economy. Perhaps more importantly, if a project isn't viable or does not go ahead as planned, the jobs will not materialise. Decision makers and communities should pay more attention to the viability of the project than claims about jobs or net benefits.

The Proponent notes that the key assumptions used in the cost model for the Project have been independently audited by Deloitte Touche Tohmatsu and was determined to be adequate for placing an overall Net Present Value (NPV) on the Project.

4.3.3.3 Adequacy of Risk Assessment

Barnett (2015) raises a number of issues in relation to the adequacy of the risk assessment for the Proposed Modification that have been addressed elsewhere in this document. **Table 5** presents cross references to sections where relevant information is presented. Additional relevant information is presented elsewhere in this document. Where an issue has not explicitly been addressed elsewhere, a brief description and response is provided in **Table 5**.

Table 5
Response to Issues Raised by Barnett (2015)

Issue	Where Addressed / Response
Eurobodalla water supply	See Sections 3.7.2 and 3.7.4.
Value of work by J French	The Proponent acknowledges Ms French's literary contribution. However, it contends that the Proposed Modification is not of a nature that would prevent Ms French from continuing her literary and other works.
Tourism	See Section 5.9.4
Agriculture	See Section 5.9.3
Rehabilitation and decommissioning	Barnett (2015) identify the fact that costs for rehabilitation of the Project have not been identified in RWC (2015). The Proponent notes that a security for rehabilitation will be required to be provided prior to mining operations commencing and that an estimated amount for that security, determined in accordance with the Rehabilitation Cost Estimate tool of DRE, has been included in the audited financial model for the Project. As result, the Proponent contends that there is no benefit in providing a cost estimate in RWC (2015).

4.3.3.4 Cost Benefit Analysis

Barnett (2015) identifies that RWC (2015) does not include a cost – benefit analysis in accordance with the document *Guideline for the use of Cost Benefit Analysis in mining and coal seam gas proposals.* The Proponent notes that that document states that:

- the Guideline applies to those projects that require approval via the Gateway Process under the Strategic Regional Land Use Plans; and
- that preparation of a cost – benefit analysis is optional.

As the Project does not require approval via the Gateway Process, the Guideline does not apply.

4.3.3.5 Present Versus Future Value Of The Mine Site

It is difficult from figures presented to know if the proponent is using present discounted (real) figures or nominal figures. The use of nominal figures leads to overestimation of the claimed value of the mine. Project valuation and economic modelling typically uses discounted (real) values to allow for the 'time value of money'. In other words, ten dollars earned in ten years time is not worth as much as ten dollars earned today.

The Proponent notes that the cost model used for the Project is a Net Present Value (NPV) model. The numbers used are represent nominal cash inflow and outflow amounts which are then discounted based on a calculated Weighted Average Cost of Capital (WACC) over the life of the Project. As previously noted, this model has been independently audited by Deloitte Touche Tohmatsu.

4.3.4 Submission of Dr Hopkins

Dr Hopkins states that he has been engaged by the NSW EDO on behalf of three organisations, including AVPPEC. Dr Hopkins goes on to state that:

> *"The matter of greatest concern to residents in the catchment appears to be the possible release of cyanide from the tailings storage facility and its effect on the water supply to towns and dwellings downstream. My comments refer only to this aspect of the assessment."*

As the use of cyanide no longer forms a component of the Proposed Modification, this submission is no longer relevant. Notwithstanding the above, Dr Hopkins raises a number of issues which have been addressed elsewhere in this document. **Table 6** presents cross references to sections where relevant information is presented. Additional relevant information is presented elsewhere in this document. Where an issue has not explicitly been addressed elsewhere, a brief description and response is provided in **Table 6**.

Table 6
Response to Issues Raised by Dr Hopkins

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Issue	Where Addressed / Response
Rainfall Predictions	See Section 3.6.1.
Dilution on Release	Dr Hopkins states that correlating the area of a catchment with the anticipated dilution may not accurately reflect the level of dilution that may occur because rainfall may not fall evenly across the catchment. The Proponent acknowledges this statement. The analysis referred to by Dr Hopkins does not rely on the fact, that: *"by the time it reaches the mouth of the Moruya River the contaminated water will constitute only 0.18% of the flow [of the Moruya River".* Rather, the analysis merely references the areas of each catchment. Furthermore, the Proponent notes that any discharge to Spring Creek would constitute only a small fraction of the contribution of water from Spring Creek. As a result, the proportion of water "contaminated water" in the event of a discharge from the Project Site would be very substantially less than the overall contribution from Spring Creek.
Societal Risk	Dr Hopkins states that the determination of societal risk for the SEPP 33 analysis is flawed because the Proponent has demonstrated that it is unable to appropriately manage the Project. The Proponent rejects this assertion as without basis.
Catastrophic release from the Tailings Storage Facility	See Section 3.7.4.4.

Table 6 (Cont'd)
Response to Issues Raised by Dr Hopkins

Issue	Where Addressed / Response
Precautionary approach	Dr Hopkins recommends adopting a precautionary approach to construction of the Project and notes that the Proponent has already shown a willingness to do so.
Project should be subject to same requirements as if constructed in the Shoalhaven Catchment	The Proponent notes that the requirement to comply with the ANZECC (2000) requirements for the protection of 95% of species is more stringent than the equivalent drinking water guidelines. As a result, the Proponent contends that it is already subject to controls that are more stringent than those related to the Sydney Water Catchment. In addition, the Proponent notes that the Drinking Water SEPP explicitly excludes the Moruya/Duea Catchment.

4.3.5 Submission of Professor Hose

Professor Hose provided a letter report to AVPPEC. That letter report focuses on two aspects of the Proposed Modification, namely toxicological impacts associated with the use of additional reagents and adverse impacts on stygofauna.

The Proponent notes that as cyanide leaching operations and placement of leached concentrate within the Tailings Storage no longer form a component of the Proposed Modification, the issues associated with toxicity of reagents would be in accordance with the approved Project.

Professor Hose provided expert evidence for the appellants to the original approval. In the joint expert report prepared with experts from both parties, the following was agreed.

Toxicology impacts

- The presence of reagents in seepage from the TSF into groundwater is unlikely to constitute a substantial toxicity risk.
- Some parameters in the tailings supernatant are expected to be above the ANZECC (2000) aquatic ecosystem trigger values but that dilution of any supernatant waters (via overtopping or seepage) would be such that those parameters would be within the receiving ecosystem trigger concentrations.

Stygofauna impacts

- The zone of impact on the aquifers will be localised which will provide some biodiversity protection for stygofauna ecosystems.

In light of these comments and the fact that the Proposed Modification, as amended, is broadly consistent with the approved Project, the Proponent contends that Professor Hose's concerns in relation to toxicological and stygofauna impacts have largely been addressed through the removal of cyanide processing and placement of leached concentrated into the Tailings Storage Facility.

4.3.6 Submission of Mr Hosking

The submission of Mr Hosking focused on the suitability of the rainfall data used for the design of the Tailings Storage Facility. This issue has been addressed in Section 3.6.1.

4.3.7 Submission of Professor Lake

Professor Lake provided a letter report to AVPPEC. That letter report focuses on the following aspects of the Proposed Modification.

- Acid Mine Drainage from the Eastern Waste Rock Emplacement and Tailings Storage Facility.

  The issue of acid generation from waste rock was addressed during the appeal to the original application, with experts from all parties agreeing that waste rock within the Project Site is non-acid forming. In addition, Section 2.6.3.2 of RWC (2015) identifies that the flotation tailings has a net acid generation potential of approximately negative 110kg/t of H_2SO_4, namely that it is strongly acid consuming, not acid forming.

- Overtopping of the Tailings Storage Facility.

  As the Tailings Storage Facility would be constructed in accordance with the approved Project, the risk of overtopping of the facility remains unchanged.

4.3.8 Submission of Dr Milne-Home

The submission of Dr Milne-Home provided a range of background information in relation to the groundwater assessment prepared for the original application for Project Approval, as well as subsequent updates of that assessment undertaken for the application for MOD1 and the Proposed Modification (presented as Appendix 10 of RWC (2010a)).

4.3.9 Submission of Professor Noller

The submission of Professor Noller addressed a range of issues, initially following the structure of RWC (2015) and concluding with a range of other issues. Professor Noller was appointed in 2007 as Lead Author of the Australian Government *Leading Practice Sustainable Development Program for the Mining Industry Handbook on Cyanide Management* and stated that he is an acknowledged expert on cyanide management in gold mining.

The following responses have been structured to reflect the structure of Professor Noller's submission.

- Eastern Waste Rock Emplacement and waste rock composition.

  Professor Noller raised the issue of management of potentially acid forming waste rock within the emplacement. The issue of acid generation from waste rock was

addressed during the appeal to the original application, with experts from all parties agreeing that waste rock within the Project Site is non-acid forming.

- Spring Creek Crossing.

  Professor Noller recommended monitoring for metals and metalloids within Spring Creek prior to the commencement of mining operations. The Proponent notes that this is a component of the approved *Water Management Plan*.

- Final processing of gold concentrate.

  As the use of cyanide within the Project Site no longer forms a component of the Proposed Modification, this issue is no longer relevant. Significantly, however, Professor Noller did not express an opinion on the suitability or otherwise of the use of cyanide within the Project Site, rather, simply recommending that the Proponent advise the community of its progress towards obtaining certification under the Cyanide Code.

- Tailings Storage Facility.

  As enlargement of the Tailings Storage Facility and placement of leached concentrate within the facility no longer form a component of the Proposed Modification, this issue is no longer relevant.

- Tailings composition and application of NEPM Guidelines.

  The Proponent acknowledges Professor Noller's comments in relation to the application of the 1999 Australian soil contamination guidelines which were updated in 2013, namely after Knight Piésold (2011) was completed. Notwithstanding this, as the composition of tailings within the Tailings Storage Facility would be in accordance with the approved Project, the use of these guidelines for the composite tailings stream (which will no longer occur) is not relevant.

- Baseline assessment of aquatic species.

  The Proponent has undertaken three rounds of baseline aquatic ecology monitoring within Spring and Majors Creeks, both upstream and downstream of the Project Site.

4.3.10 Submission of Dr O'Loughlin

4.3.10.1 Introduction

The submission of Dr O'Loughlin focuses on issues associated with the design of the Tailings Storage Facility as described in Knight Piésold (2015). As the enlargement of the Tailings Storage Facility no longer forms a component of the Proposed Modification, these issues are no longer relevant. Notwithstanding that, and for the record, the following response has been prepared by Knight Piésold to address the criticisms of Dr O'Loughlin.

4.3.10.2 Use of Rainfall Data

The KP analysis of water balance in the Tailings Dam was claimed to be based on historical rainfall and evaporation data for Braidwood. This was done on a month-by-month basis, where the calculations kept track of all water inputs and outputs. KP stated that they "used" rainfall data from the BOM site at Braidwood (Wallace Street, Weather Station 069010). The data is listed in Appendix 7, Table 4.1.

However, the monthly rainfall amounts used by KP are markedly different from the official BOM data published on the BOM website. The discrepancies are not minor, and range from minus 36% to plus 70% for individual months.

Rainfall at Braidwood (mean, mm)
Official BoM data vs values used by KP in Appendix 7

	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Ann
BOM.	70	67	70	59	61	65	46	47	51	65	68	67	735
KP	65	43	64	38	48	52	63	80	54	70	74	73	724
Error (%)	7	36	9	36	21	20	37	70	6	8	9	9	1

The following response has been prepared by Knight Piésold.

The analysis of rainfall data from the Braidwood (Wallace Street) weather station was originally carried out by Knight Piésold for the *Bankable Feasibility Study* in 2009. In comparison to the data provided by Dr O'Loughlin, currently published monthly rainfall data from the Braidwood (Wallace Street) weather station to November 2015 and for the year 2009 only is presented in **Table 7**. This data demonstrates that even within the course of 2015 since Dr O'Loughlin prepared his response, the reported mean rainfall has changed from 735mm to 719.9mm per annum, and that there are also differences in the reported monthly averages. Furthermore, as an example, the rainfall records for the year 2009 show a total rainfall for the year of only 439 mm (a -39% variance from mean) and monthly variances of between -77% and +21%. This suggests that as the length of the dataset increases, so the reported data will change.

As a result, Knight Piésold will use the latest rainfall averages from both the Majors Creek and Braidwood stations during the final design of the Tailings Storage Facility and the design will be adjusted as required to meet the requirements of the Dams Safety Committee of NSW based on a whichever dataset provides the worst case rainfall scenario.

Table 7
Braidwood (Wallace St) Rainfall Data

Data period	Jan	Feb	Mar	Apr	May	Jun	July	Aug	Sept	Oct	Nov	Dec	Ann
Dec 1998 to Nov 2015	69.7	67.5	69.4	55.4	56.4	65.9	46.1	48.7	50.1	62.2	63.7	64.8	719.9
2009 only	28.4	30.6	27.2	44	25.4	25.2	15.2	11.4	60.8	74.6	28.6	67.4	438.8
Source: Bureau of Meteorology													

4.3.10.3 Use of Evaporation Data

KP also listed in Table 4.2, Appendix 7, the monthly evaporation data used in water balance calculations. These errors far exceed the errors for rainfall, when compared with the BOM evaporation data for the Braidwood Weather Station. The KP report overstates monthly evaporation by between 23% and 158%. The annual evaporation quoted by KP is 1615mm, versus the published BOM figure of 1003mm. This is an overstatement of 61%.

These errors are systematic.

Evaporation at Braidwood (mean, mm)
Official BoM data vs values used by KP in Appendix 7

	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Ann
BOM.	146	107	93	63	40	27	31	53	78	105	120	140	1003
KP	230	180	150	100	80	65	80	90	110	130	165	235	1615
Error (%)	58	68	61	59	99	141	158	71	41	23	38	68	61

The following response has been prepared by Knight Piésold.

In preparing the design for the Tailings Storage Facility, Knight Piésold carried out a review of published evaporation data and adopted values interpolated from Class A pan evaporation data presented in the *Climatic Atlas of Australia*. This data was preferred in preference to the Braidwood (Wallace St) data because that data was only available from 1996. In addition it was considered that within Australia, average annual evaporation of the order of 1 000mm is recorded only in the alpine areas of NSW and Victoria (typically above 1 100m elevation), parts of Tasmania, and the south-west corner of WA. As a result, Knight Piésold determined that the Braidwood (Wallace St) dataset is potentially an unreliable dataset.

A more recent comparison of evaporation data sourced since completion of Knight Piésold (2011) from gridded data produced by the BOM through their internet website and the evaporation data presented in Knight Piésold (2011) is summarised in **Table 8**.

The comparison suggests that the data adopted for the Tailings Storage Facility design is of the order of 5% greater than the more recently published data. Engineering judgement exercised by Knight Piésold at the time of final design precluded the use of the raw Braidwood (Wallace St) data and resulted in adoption of other data presented by the BOM. The assertion that not adopting the Braidwood dataset was incorrect, in the opinion of Knight Piésold, in itself reflects poor engineering judgement on behalf of Dr O'Loughlin.

Table 8
Evaporation Data

Month	Average Evaporation (mm)	
	Sourced 2015	**Sourced 2011**
January	222	230
February	177	180
March	149	150
April	95	100
May	64	80
June	47	65
July	52	80
August	78	90
September	105	110
October	144	130
November	175	165
December	219	235
Total	**1 527**	**1 615**
Source: Knight Piésold		

4.3.10.4 Combined Impact of Incorrect Rainfall and Evaporation Data

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The combined effect of these two errors is to make the water balance calculations totally incorrect. It is important to note the bias in the evaporation figures. They are grossly overstated in every month. This results in a conclusion that the Tailings Dam is far less likely to discharge contaminated water than would actually be the case.

This difference between KP's water balance modelling and what would have been predicted if they used correct evaporation data in their calculations, is neither marginal nor trivial. In a water balance analysis, the net amount (evaporation minus rainfall) determines how a dam or reservoir of this type behaves, month by month. Because of the bias in the KP analysis, the Environmental Assessment concluded that the level of contaminated water in the Tailings Dam would stay within the design freeboard, and would not discharge over the spillway during wetter periods.

KP's use of incorrect rainfall and evaporation data renders that report a total nonsense. The predicted behaviour of the tailings dam, based on that modelling, has no credibility.

The following response has been prepared by Knight Piésold.

Based on the responses provided in Sections 4.3.10.2 and 4.3.10.3, Knight Piésold refutes the claim that the predicted behaviour of the Tailings Storage Facility has no credibility. In addition to this it should be recognised that operating parameters pertinent to the Facility will be monitored regularly, the facility will be audited annually, and each stage of construction after Stage 1 will be designed to reflect measured operating conditions and parameters recorded during operation of the facility.

4.3.10.5 Inappropriate Selection of Braidwood Weather Station

Although the monthly rainfall figures used by KP are incorrect, as described above, KP's total annual rainfall is close to the official BOM value (724mm vs 735mm). However, official BOM data for Majors Creek Weather Station (070061) shows that the average annual rainfall in that location is significantly higher (30%).

The Majors Creek rainfall is 945 mm compared to 735 mm at Braidwood. This is 30% greater than the rainfall at Braidwood. This significant difference is probably due to the orographic effect of the coastal escarpment adjacent to Majors Creek and the mine site.

Best practice hydrologic design requires that data from the nearest Weather Station should always be used in preference to one further away. In this case, the Dargues Mine Tailings Dam site is 3 km from the Majors Creek Weather Station, much closer than the Braidwood station 12 km away. KP's water balance modelling should have used the weather data from Majors Creek rather than Braidwood.

If KP had used rainfall data from Majors Creek instead of Braidwood, and used appropriate evaporation data in their water balance modelling, the results would have been totally different from those presented in their report. A "back of the envelope" calculation shows that the Knight Piésold modelling scenario used a net annual evaporation of 890 mm (1615 –725), whereas the actual net annual evaporation is only 53 mm (998 –945). This huge difference is similar to the difference between a desert and a humid temperate environment. This means that the KP design was for a Tailings Dam in inland arid conditions of central Australia, rather than moist coastal conditions on the escarpment 50 km from the ocean.

The decision by KP in choosing to quote (but not actually use) Braidwood rainfall data instead of data from Majors Creek where the Tailings Dam would be situated, means that the results of the dam's water balance modelling have no credibility. And as stated above, the data errors in KP's modelling results in their conclusions being heavily biased to falsely indicate that the Tailings Dam will seldom if ever discharge its contaminated contents into Spring and Majors Creek. Those conclusions are clearly incorrect.

This issue is addressed in Section 3.6.1.

4.3.10.6 Inappropriate Hydrologic Modelling

The KP analysis of the behaviour of the Tailings Dam used several scenarios to predict the quantity of liquefied slurry stored in the dam, month by month. These were meant to simulate the behaviour during dry, average and wet years. The calculations purported to use BOM data from the Braidwood Weather Station, but the actual figures used were incorrect, as described above. However, even if correct input data had been used, the hydrologic modelling applied in the Tailings Dam design was inadequate and inappropriate.

An acceptable hydrologic analysis must include a simulation of the dam's behaviour using official and accurate BOM data. The longer the period of record, the more reliable is the analysis based on that data. The KP report ignored the chance to use that historical data to verify the behaviour of the Tailings Dam.

A hydrologic analysis used to design a dam's capacity is only as good as the empirical data used in the calculations. For this reason, a quantitative record of observations (e.g. of rainfall at a site) is far preferable to a simulated string of data. This is especially true if there exists a long period of weather data that has been through a strict process of quality control, such as the BOM data. To not use that data impacts on the design of the Tailings Dam. The KP report should have used the 100 plus years of BOM rainfall and evaporation data to run a simulation model of the behaviour of the Tailings Dam. This would have shown how the Tailings Dam would have operated, with actual rather than simulated inputs.

In contrast to the analysis done by KP, the consultant reports provided by SEEC (Volume 1 Part 4, 2010 and Appendix 2, 2015) on harvestable water at the site did use the best available BOM daily rainfall data from Majors Creek, and sound hydrologic analysis, as the basis for their conclusions. The SEEC conclusions about water harvesting are therefore credible.

The following response has been prepared by Knight Piésold.

The Tailings Storage Facility is designed to meet stringent freeboard requirements relating to the flood handling capacity of the facility and defined by the consequence category assigned to the facility. Of note the approved Tailings Storage Facility is rated a High C facility which requires an environmental containment freeboard sufficient to contain the rainfall run-off volume produced by a 1 in 100 year 72-hour storm event. In fact, at the request of the Proponent, the facility was designed to contain the rainfall run-off volume produced by a 1 in 1000 year 72-hour storm event, which meets the environmental containment freeboard criterion for a High B category facility (as defined by the Dams Safety Committee of NSW).

A design check of the facility embankment crest levels recommended in Knight Piésold (2015) was carried out using the equivalent data from the Braidwood and Majors Creek weather stations, as shown in **Table 7**. This comparison shows that using the Majors Creek rainfall dataset in preference to the Braidwood data does not change the embankment levels or spillway design concepts.

Knight Piésold refutes the assertion that the report is a "total nonsense" and note that the Tailings Storage Facility design would be the same regardless of which dataset was used. However, in light of community and regulatory authority concerns, Knight Piésold will use the most recent rainfall averages from both the Majors Creek and Braidwood stations during the final design of the Tailings Storage Facility and the design will be adjusted as required to meet the requirements of the Dams Safety Committee of NSW based on a whichever dataset provides the worst case rainfall scenario.

4.3.10.7 Capture of Spilled Contaminated Water

The Victorian Government provides guidelines for the management of Tailings. The aim of the Guidelines is

> *"to encourage the adoption of the best industry standards and practice in tailings management and to minimise the cost of the operations to current and future generations".*

Emergency spillways are required for all new large Tailings Storage Facilities and all new TSFs storing contaminated tailings, as provided in this case. However, the Victorian guidelines require that the spillway should lead to an emergency overflow dam, kept empty during normal operations. The Proponent has NOT included this fail-safe feature in the project.

NSW guidelines may not require such an emergency overflow dam, but it is surely bad engineering judgment to omit such a structure that would improve environmental protection downstream.

The following response has been prepared by Knight Piésold.

The Tailings Storage Facility design has been carried out in accordance with guidelines published by the Dams Safety Committee of NSW and the Australian National Committee on Large Dams. Based on the consequence category assigned to the facility, storm storage capacity equivalent to a 1 in 100 year 72-hour storm event is required in addition to the maximum operating pond level under average conditions during each stage of operation. However, the design of this facility incorporates storm storage capacity one order of magnitude higher than that required, equivalent to a 1 in 1000 year 72-hour storm event.

It is noted also that guidelines published in Western Australia, the state with the largest number of gold mines in the country, do not require provision of an emergency overflow dam.

In summary, the guidelines published by the Victorian Government are considered not to be applicable to the design of this facility and furthermore it is considered by Knight Piésold that the suggestion that these guidelines should apply over the relevant Dams Safety Committee of NSW and ANCOLD guidelines reflects poor engineering judgement.

4.4 BRAIDWOOD GREENS

The submission of the Braidwood Greens raises a number of issues that have been addressed elsewhere in this document. **Table 9** presents cross references to sections where relevant information is presented. Additional relevant information is presented elsewhere in this document. Where an issue has not explicitly been addressed elsewhere, a brief description and response is provided in Table **9**.

Table 9
Response to Issues Raised by the Braidwood Greens

Page 1 of 2

Issue	Where Addressed / Response
Development Creep	See Section 5.12.1
Use of cyanide	The use of cyanide no longer forms a component of the Proposed Modification.
Biodiversity impacts	The approved and proposed additional areas of disturbance are presented in Table 21 of RWC (2015) and will not result in the Project Site becoming “barren, devoid of most vegetation and wildlife” over large areas.
Groundwater	The groundwater impacts associated with the Proposed Modification are described in Section 4.4 of RWC (2015) and will not result in significant additional groundwater drawdown or adverse groundwater quality impacts.

Table 9 (Cont'd)
Response to Issues Raised by the Braidwood Greens

Issue	Where Addressed / Response
Use of PAX	This issue was examined during the Land and Environment Court action associated with the original approval. The joint experts statement indicates that "PAX toxicity is unlikely to constitute an ecotoxicity risk".
"Mists" from the Tailings Storage Facility	Finally, the Proponent is not aware of a mechanism that may result in fog or mist transferring particulate or any other matter from the Project Site.
Biodiversity management	Relocation of wombats is to occur prior to construction of the Tailings Storage Facility. This has yet to commence.
Vibration	The transmission of vibration from blasting operations is well understood and is addressed in Section 6.2.6.5 of RWC (2010a).
Downstream impacts	See Sections 5.7, 5.9.3 and 5.9.4.

4.5 COASTWATCHERS ASSOCIATION

The submission of the Coastwatchers Association raises a number of issues that have been addressed elsewhere in this document. **Table 10** presents cross references to sections where relevant information is presented. Additional relevant information is presented elsewhere in this document. Where an issue has not explicitly been addressed elsewhere, a brief description and response is provided in **Table 10**.

Table 10
Response to Issues Raised by the Coastwatchers Association

Issue	Where Addressed / Response
Development Creep	See Section 5.12.1.
Application of s75W	See Section 4.11.
Downstream impacts	See Sections 5.7, 5.9.3 and 5.9.4.
Heavy metals	The Proponent presumes that this issue relates to placement of leached concentrate tailings into the Tailings Storage Facility. As this no longer forms a component of the Proposed Modification, this is no longer an issue.
Remediation of the Tailings Storage Facility	See Sections 3.6.4.7, 3.7.4.7.
Adequacy of the Risk Assessment	See Section 3.7.4.10.
Eurobodalla's water supply	See Section 3.7.2 and 3.7.4.
Use of cyanide	The use of cyanide no longer forms a component of the Proposed Modification.
Overtopping of the Tailings Storage Facility	See Section 5.7.1.
Pastefill	The use of pastefill was the subject of a previous application to modify MP10_0054 and is not a matter relevant to this application.

Table 10 (Cont'd)
Response to Issues Raised by the Coastwatchers Association

Issue	Where Addressed / Response
Process plant surface water controls	The Proponent has consistently committed to ensuring that the Processing Plant would be included within a "potentially contaminated water circuit" and that surface water within that area would be retained on site under all circumstances, including a maximum probably flood rainfall event. See for example Section 2.5.4.4 of RWC (2010a) and the Executive Summary of RWC (2015). This would be achieved by: • bunding all storage tanks in accordance with AS1940 and AS4452; • constructing the process plant within an concrete sealed and bunded area; • directing all surface water within the contaminated water circuit to the process water pond; and • ensuring that in the event of a catastrophic failure of all other controls or a rainfall event such as a maximum probably flood rainfall event, that all surface water would initially be collected within the ROM Pad Collection Basin, with overflow from that structure directed to the box cut and the underground mine.
Rehabilitation of the Project	Mine closure is overseen by the NSW Division of Energy and Resources. The Applicant will be required to prepare a *Mining Operations Plan* provide a security which will not be returned until all relevant government agencies have been satisfied that the Project Site has been adequately rehabilitated.
Use of rainfall and evaporation data	See Sections 3.6.1, 4.3.10.2 and 4.3.10.3.

4.6 EUROBODALLA GREENS

The submission of the Eurobodalla Greens raises a number of issues that have been addressed elsewhere in this document. **Table 11** presents cross references to sections where relevant information is presented. Additional relevant information is presented elsewhere in this document. Where an issue has not explicitly been addressed elsewhere, a brief description and response is provided in **Table 11**.

Table 11
Response to Issues Raised by the Eurobodalla Greens

Issue	Where Addressed / Response
Use of cyanide	The use of cyanide no longer forms a component of the Proposed Modification
Modification of the Tailings Storage Facility	Modification of the Tailings Storage Facility no longer forms a component of the Proposed Modification
Heavy metals	The Proponent presumes that this issue relates to placement of leached concentrate tailings into the Tailings Storage Facility. As this no longer forms a component of the Proposed Modification, this is no longer an issue.

Table 11 (Cont'd)
Response to Issues Raised by the Eurobodalla Greens

Issue	Where Addressed / Response
Overtopping of the Tailings Storage Facility	The Eurobodalla Greens submission refers to "one to two spills per year" from the Tailings Storage Facility. The test that the submission refers to relates to discharges from sediment basins constructed in accordance with the requirements of *Managing Urban Stormwater,* not discharges from the Tailings Storage Facility. See also Section 5.7.1.
Impacts on Tourism and Agriculture	See Sections 5.9.3 and 5.9.4.
Prior performance of the Proponent	See Section 5.13.
Performance of the Henty Gold Mine	The submission states that the Proponent was fined by the Tasmanian EPA for a "major spill." The Proponent notes that it has received a single Environmental Infringement Notice for $650 since mid-2009. See Section 5.10 for a more detailed discussion.
Development Creep	See Section 5.12.1.

4.7 MAJORS CREEK CATCHMENT GUARDIANS

The submission of the Majors Creek Catchment Guardians (MCCG) raises a number of issues that have been addressed elsewhere in this document. **Table 12** presents cross references to sections where relevant information is presented. Additional relevant information is presented elsewhere in this document. Where an issue has not explicitly been addressed elsewhere, a brief description and response is provided in Table **12.**

Table 12
Response to Issues Raised by the MCCG

Issue	Where Addressed / Response
Use of rainfall and evaporation data	The MCCG submission relies on the report prepared by Dr O'Loughlin. A response to that report is presented in Section 4.3.10.
Social licence to operate	The MCCG refers to the Proponent's previous commitment not to use cyanide within the Project Site. As the use of cyanide no longer forms a component of the Proposed Modification, the Proponent contends that this issue is no longer relevant.
Social impact assessment	The Proponent notes that the Proposed Modification is an application to amend an already approved Project. As a result, a formal social impact assessment would not typically be required for such an application.
Prior performance of the Proponent	See Section 5.13.

Table 12 (Cont'd)
Response to Issues Raised by the MCCG

Issue	Where Addressed / Response
Dispersibility of on-site soils	The Proponent is well aware of the dispersibility of the soils within the Project Site and has implemented a range of measures to assist with the management of these soils, including: • applying a K-factor of 0.06 and assuming Type D (dispersible) soils when preparing the various *Sediment and Erosion Control Plan*s for the Project; and • implementing an adaptive management approach to sediment control to identify measures that are most effective for the particular soils within the Project Site. An example of an adaptive management measure that has been implemented has included initially trailing lining of the diversion structures to prevent erosion. Following undercutting of some of the liners, the Proponent has subsequently trialled ripping gypsum into the floor and walls of the sediment basins, with positive results to date.
Suitability of the soils as basement for the Tailings Storage Facility	Section 2.7.2.1 of RWC (2010a) describes the geotechnical assessments that have been undertaken within the footprint of the approved Tailings Storage Facility and Section 3.7.4.10 of this document discusses this issue in more detail.
Consistency with the objectives of the Project	The MCCG submission principally addresses the introduction of cyanide processing and change in the nature of the tailings to be placed within the Tailings Storage Facility. The submission alleges that this is not consistent with the objectives of the approved Project embodied in Section 2.1.1 of RWC (2010a). While the Proponent does not concur with the assertion, it notes that cyanide processing and the associated change to the tailings composition no longer forms a component of the Proposed Modification. As a result, the Proponent contends that this issue is no longer relevant.
Application of s75W and whether the Proposed Modification should be a new application	See Section 4.11.
Risk of catastrophic failure of the Tailings Storage Facility	The MCCG submission states that the liner of the Tailings Storage Facility has a life of 30 to 300 years and that failure of the liner would result in catastrophic failure of the facility. Modification of the Facility no longer forms a component of the Proposed Modification. Notwithstanding this, the Proponent notes that the approved Tailings Storage Facility would be capped and rehabilitated to form a free draining landform in accordance with accepted guidelines for rehabilitation and closure. As a result, seepage from the facility is expected to be negligible following completion of rehabilitation operations.
Increased night-time visual impacts	As construction of the carbon-in-leach processing plant no longer forms a component of the Proposed Modification, and the processing plant would be constructed as approved, the Proponent contends that this issue is no longer relevant.
Increased noise impacts	Section 4.2 of RWC (2015) presents an assessment of anticipated noise impacts associated with the Proposed Modification.
Increase in the amount of ore to be extracted	The Proponent notes that this objection is contrary to the objects of the *Mining Act 1992* and refutes the claim that the proposed increase in ore to be extracted is contrary to the objectives of the approved Project.

Table 12 (Cont'd)
Response to Issues Raised by the MCCG

Issue	Where Addressed / Response
Construction and use of the Eastern Waste Rock Emplacement and Spring Creek Crossing	The Proponent notes that MCCG have objected to this component of the Proposed Modification on the basis that is it contrary to the objectives of the approved Project, but provide no justification for that position. The Proponent disagrees with the assertion.

4.8 NATIONAL COAST MARINE GROUP INC

The submission of the National Coast Marine Group (NCMG) raises a number of issues that have been addressed elsewhere in this document. **Table 13** presents cross references to sections where relevant information is presented. Additional relevant information is presented elsewhere in this document.

Table 13
Response to Issues Raised by the NCMG

Issue	Where Addressed / Response
Surface water and groundwater-related impacts	See Section 5.7.
Development Creep	See Section 5.12.1.
Application of s75W	See Section 4.11.

4.9 NIBAGO PTY LTD

The submission of Nibago Pty Ltd (Nibago) raises a number of issues that have been addressed elsewhere in this document. **Table 14** presents cross references to sections where relevant information is presented. Additional relevant information is presented elsewhere in this document.

Table 14
Response to Issues Raised by Nibago

Issue	Where Addressed / Response
Impacts to biodiversity downstream of the Project Site	See Section 5.6.
Impacts to sites of Aboriginal heritage significance downstream of the Project Site	See Section 5.3.

4.10 SOUTHCOAST HEALTH AND SUSTAINABILITY ALLIANCE

The submission of the Southcoast Health and Sustainability Alliance (SHSA) raises a number of issues that have been addressed elsewhere in this document. **Table 15** presents cross references to sections where relevant information is presented. Additional relevant information is presented elsewhere in this document. Where an issue has not explicitly been addressed elsewhere, a brief description and response is provided in **Table 15**.

Table 15
Response to Issues Raised by the SHSA

Issue	Where Addressed / Response
Impacts on health, business, farming, wildlife and tourism related to the use of cyanide	The use of cyanide within the Project Site no longer forms a component of the Proposed Modification.
Location of the Project and risks associated with the use of cyanide and "heavy metals."	The Proponent notes that as the use of cyanide and the placement of leached concentrate tailings into the Tailings Storage Facility no longer form a component of the Proposed Modification.
Prior performance of the Proponent	See Section 5.13.
Climate change	See Section 5.4.
Development Creep	See Section 5.12.1.

4.11 TOWN PLAN

Town Plan provided a submission that largely addressed the application of s75W of the EP&A Act and associated matters. A detailed response has been prepared by Baker & McKenzie and is presented as **Appendix 3**. For convenience, **Table 16** presents the issues raised by Town Plan and a brief overview of the response by Baker & McKenzie.

Table 16
Response to Issues Raised by the SHSA

Page 1 of 2

Issue	Where Addressed / Response
Matters addressed by Baker & McKenzie	
Application of s75W	Town Plan state that the Proposed Modification is not able to be determined under s75W as it does not have "limited environmental consequences". Baker & McKenzie in response state that the test under s75W is whether the application is a proper "modification" and not simply whether the proposed changes would only result in minor or minimal environmental consequence. Baker & McKenzie note that the Proposed Modification, as amended, would not result in a "radical transformation" or a "new and different project" and that the proposed amendments to the approved Project are less substantial than those that have previously been accepted by the Land and Environment Court as capable of being determined under s75W of the EP&A Act. As a result, it is Baker & McKenzie's opinion that the Proposed Modification can be clearly dealt with under s75W.
Initial determination to accept application under Part 3A	Town Plan contends that the Minister is required to make a determination to accept an application under Part 3A.

Table 16 (Cont'd)
Response to Issues Raised by the SHSA

Issue	Where Addressed / Response
Matters addressed by Baker & McKenzie (Cont'd)	
Land subject to the Modified Application	Town Plan contends that the proposed increase in the area of the Project Site is beyond what is capable of being determined under s75W. Baker & McKenzie in response state that the additional land does not mean that the application cannot be dealt with under Part 3A.
Environmental Assessment	Town Plan contends that the Environmental Assessment does not address the question as to whether the application 'meets the test for assessment' under s75W. Baker & McKenzie in response state that it was not necessary for the *Environmental Assessment* to address this specific issue, but that the letter report presented as **Appendix 3** may be used to address this point.
Additional matters	
NSW Integrated Mining Policy	The Proponent notes that a range of components of the Integrated Mining Policy were released in October 2015, after the application for the Proposed Modification was submitted. The Proponent anticipates that the Policy will apply to the Project moving forward, however that it would be unreasonable to apply the Policy retrospectively.
Proposed amended conditions	The Proponent notes the following in relation to the commentary provided by Town Plan in relation to the proposed ancillary amendments to the conditions of MP10_0054. • Condition 3(40) – relates to the movement of concentrate. To be retained. • Condition 3(41) – hours of operation for concentrate movements and provision of a bus are to be retained.

4.12 TUROSS COMMUNITY GARDEN

The submission of the Tuross Community Garden raises a number of issues that have been addressed elsewhere in this document. **Table 17** presents cross references to sections where relevant information is presented. Additional relevant information is presented elsewhere in this document. Where an issue has not explicitly been addressed elsewhere, a brief description and response is provided in **Table 17**.

Table 17
Response to Issues Raised by the Tuross Community Garden

Issue	Where Addressed / Response
Use of cyanide and placement of leached concentrate tailings into the Tailings Storage Facility	The use of cyanide and placement of leached concentrate tailings into the Tailings Storage Facility no longer form components of the Proposed Modification.
Impacts on surface water and groundwater downstream of the Project Site	See Section 5.7

Table 17 (Cont'd)
Response to Issues Raised by the Tuross Community Garden

Issue	Where Addressed / Response
Catastrophic failure of the Tailings Storage Facility	See Section 3.7.4.4.
Use of climate data	See Sections 3.6.1, 4.3.10.2 and 4.3.10.3.
Overtopping of the Tailings Storage Facility	The submission refers to "one to two spills per year" from the Tailings Storage Facility. The text that the submission refers to relates to discharges from sediment basins constructed in accordance with the requirements of *Managing Urban Stormwater,* not discharges from the Tailings Storage Facility. See also Section 5.7.1.
Management of the Tailings Storage Facility post closure	The submission notes that seepage from the Tailings Storage Facility would be pumped back to the facility and requests that passive methods be implemented during any period of non-operation of the Project and post closure. The Proponent notes that it will be required to manage the facility during any period of care and maintenance, including pumping of seepage water back to the Tailings Storage Facility, management of the sediment and erosion controls and general maintenance of the site. As a result, management of seepage during periods of care and maintenance would be undertaken in a similar manner to during the operational phase of the Project. During rehabilitation of the Tailings Storage Facility, it would be reshaped and capped with an impermeable layer and/or a store and release cover. This would ensure that the final landform is a free draining landform with seepage into the tailings pile prevented to the greatest extent possible. As a result, the Proponent contends that there would be no long-term seepage-related issues associated with the facility.
Adequacy of sediment and erosion controls	See Section 5.7.3.
Impacts on Tourism and Agriculture	See Sections 5.9.3 and 5.9.4.
Solvency of the Company	The submission states that auditor's report in the 2014 December statement to the ASX that the company is at risk of not being able to meet its liabilities. The Proponent assumes that this issue relates to commentary presented in the Independent Auditors Report presented on Page 67 of the Proponent's 2014 Annual Report to shareholders. That issue related to the losses incurred by the Proponent in FY2013/2014. The Independent Auditors Report and associated Financial Report presented in the 2015 Annual Report includes no such commentary, indicating that the issues identified in 2013/2014 had been satisfactorily resolved and that the Proponent has adequate resources to meet its liabilities.
Performance of the Henty Gold Mine	The submission states that the Proponent was fined by the Tasmanian EPA for a "spill." The Proponent notes that it has received a single Environmental Infringement Notice for $650 since mid-2009. See Section 5.10 for a more detailed discussion.
Development Creep	See Section 5.12.1.

4.13 TUROSS LAKES PRESERVATION GROUP

The submission of the Tuross Lakes Preservation Group (TLPG) raises a number of issues that have been addressed elsewhere in this document. **Table 18** presents cross references to sections where relevant information is presented. Additional relevant information is presented elsewhere in this document. Where an issue has not explicitly been addressed elsewhere, a brief description and response is provided in **Table 18**.

Table 18
Response to Issues Raised by the TLPG

Issue	Where Addressed / Response
Use of cyanide	The use of cyanide no longer forms a component of the Proposed Modification
Development Creep	See Section 5.12.1
Location of the Tailings Storage Facility	Modification of the design of the Tailings Storage Facility no longer forms a component of the Proposed Modification
Impact on the downstream catchment of the Tailings Storage Facility	See Sections 5.6, 5.7 and 5.15.
Risk of contamination by heavy metals	The Proponent presumes that this is a reference to placement of leached concentrate tailings into the Tailings Storage Facility. This activity no longer forms a component of the Proposed Modification.
Catastrophic failure of the Tailings Storage Facility	See Section 5.15
Issues raised by GHD (2015)	See Section 3.7.4
Agreement not to use cyanide as part of the previous Land and Environment Court negotiations	The use of cyanide was not a matter that was discussed

4.14 MS JACKIE FRENCH

Ms Jackie French provided a range of submissions, both as an individual and a special interest group. This section provides a response to the issues raised in Ms French's submission as a special interest group only. Ms French's submission as an individual is addressed in Section 5.

The submission of the Ms French raises a number of issues that have been addressed elsewhere in this document. **Table 19** presents cross references to sections where relevant information is presented. Additional relevant information is presented elsewhere in this document. Where an issue has not explicitly been addressed elsewhere, a brief description and response is provided in **Table 19**.

Finally, the Proponent notes that Ms French makes a number of allegations in her submission regarding the conduct of the Proponent, its employees and various government departments. The Proponent states that at all times its employees and agents have acted in a professional and appropriate manner, despite the fact that they have been subjected to a range of challenging and difficult circumstances. The Proponent does not propose to provide further commentary on these matters in this document.

Table 19
Response to Issues Raised by Ms French

Issue	Where Addressed / Response
Use and accuracy of rainfall and evaporation data	See Section 3.6.1 and 4.3.10.
Impact of 2013 discharge of sediment.	The submission alleges that the Proponent failed to appropriately monitor surface water downstream of the Project Site following the 2013 discharge of sediment-laden water and that that event has resulted in filling of pools within the Majors Creek Conservation Area. This issue has previously been addressed in Section 5.5 *Response to Submissions – Modification 2* RWC (2013b). In summary, that Section notes the following. • Aquatic ecology surveys within Spring and Majors Creeks were undertaken by Cardno Ecology Lab on four occasions before and after the discharge. Those surveys identified that there were no major changes to the in-stream habitat or substratum observed at the sites visited on Majors Creek downstream of the Project Site and that biological indicators do not indicate any major change in the aquatic ecosystem as a result of the discharge event. • The Proponent is not aware of a mechanism where a limited number of discharges from the Project Site could result in "filling" of "vast pools" with sediment within the Majors Creek Conservation Area. • The Proponent notes that Ms French has previously recorded substantial elevated sediment levels in Majors Creek in a blog dated March 2007 following an intense rainfall event as follows. "*[a] flash flood down the gorge, all mud and logs and froth, a wall of water higher than I am and a roar like 1,000 helicopters*." (source: http://www.jackiefrench.com/march07.html - accessed September 2013) The event described occurred prior to the commencement of construction operations within the Project Site.
Use of cyanide	The use of cyanide no longer forms a component of the Proposed Modification.
Ability to contact downstream water users	Ms French states that there is a lack of practical means to contact downstream residents in the event of a catastrophic failure of the Tailings Storage Facility because some areas have limited mobile coverage. The Proponent notes that those who have registered on the Downstream Water Users Register have the option of indicating their preferred contact method. In addition, the *Pollution Incident Response Management Plan* identifies contact methods to be used in the event of an emergency. These include: • Telephone (landline and mobile). • Email. • Public announcements via radio, television or loud speaker. • Door knocking. The Proponent also notes that catastrophic failure of a structure such as the Tailings Storage Facility is unlikely to be without warning and sufficient time would be available to notify residents.

Table 19 (Cont'd)
Response to Issues Raised by Ms French

Issue	Where Addressed / Response
Level of detail included within RWC (2015)	The Proponent contends that RWC (2015) was prepared in a manner and to a level of detail consistent with the requirements of the Department of Planning and Environment and that the document contains sufficient information to allow determination of the application.
Failure to assess conservation values downstream of the Project Site	A range of environmental monitoring is conducted downstream of the Project Site, including: • bi-annual aquatic ecology surveys; • monthly surface water and quarterly groundwater sampling; and • quarterly groundwater monitoring, including at two locations on Ms French's property.
Structural failures within onsite infrastructure	The submission refers to "structural collapses" observed on site. The Proponent presumes that the issue referred to is either: • a minor slump that has occurred in the left hand wall of the Boxcut; or • minor erosion at the inflow point to the ROM Pad Containment Basin. The Proponent is aware of both of these issues and states that neither pose a risk to the environment or safety of any person and these issues are being actively managed.
Compliance with conditions of Approval	The Proponent contends that it has complied with the conditions of the Project Approval.
Refusal to accept responsibility for discharge of sediment-laden water	The Proponent notes that it admitted guilt at the first opportunity to do so during the preceding's in the Land and Environment Court.
No assessment of impacts of a failure of the Tailings Storage Facility.	As the enlargement of the Tailings Storage Facility no longer forms a component of the Proposed Modification, the facility would be constructed in a manner consistent with the approved facility. In addition, a dam break assessment, including areas of inundation is included Knight Piésold (2015) for the Tailings Storage Facility as proposed in RWC (2015).
Risks associated with a rupture of the pipe to the Tailings Storage Facility	This is addressed in Section 2.4.2 of RWC (2015).
Seepage from the Tailings Storage Facility	See Section 5.15.5.
Ongoing management of erosion and sediment within the Project Site	See Section 5.7.3.
Discharge of "heavy metals"	The Proponent presumes that this issue relates to placement of leached concentrate tailings into the Tailings Storage Facility and potential remobilisation of this material. As the placement of leached concentrate tailings into the Tailings Storage Facility no longer forms a component of the Proposed Modification, this is no longer an issue.
Emergency management	See Section 5.10.
Compliance with the Clean Air Regulations	The submissions states that no details are provided as to how gold room emissions will comply with the Clean Air Regulations. Section 2.5.4.3 of RWC (2015) states that a suitable scrubber will be installed to ensure compliance with the relevant regulations.

Table 19 (Cont'd)
Response to Issues Raised by Ms French

Issue	Where Addressed / Response
Presence of katabatic winds	The Proponent notes that an automated weather station, capable of recording both wind speed and direction, has been operating at the Project Site since 2010. A review of data from this weather station does not show evidence of 'katabatic winds'. The Proponent provides access to all data from this weather station to the public via its website.
Absence of a bushfire disaster plan	The Proponent notes that a copy of the approved *Bushfire Management Plan* is available on its website.
Employment	Section 2.6 identifies that the Project as modified would result in approximately 100 jobs during construction and 80 jobs during operation.
Social licence to operate	See Section 5.14.
Alleged use of the term "degraded farmland"	The Proponent has not referred to the area downstream of the Project Site as "degraded farmland" in RWC (2015) or any other documentation prepared in relation to MP10_0054 and is unaware of where this term has come from.
Impacts on threatened species and endangered ecological communities	Office of Environment and Heritage reviewed RWC (2015) and raised a number of matters in relation to the proposed Biodiversity Offset Strategy (see Section 3.9.2). No issues were raised in relation to the adequacy of the assessment its self. See also Section 5.6.
Economic impacts	The Proponent notes that the Proposed Modification is a modification to an approved activity. In addition, the Proponent has withdrawn the components of the Proposed Modification that were of greatest concern to the community. As a result, the Proponent contends that the economic impacts of the Proposed Modification, as amended, would be largely positive. See also Sections 4.3.3 and 5.9.

5. GENERAL PUBLIC SUBMISSIONS

5.1 INTRODUCTION

This section provides a response to the public submissions received following the exhibition period. As indicated in Section 1, the following public submissions were received in relation to the Project.

- Supporting submissions – 60 individual members of the general public or private companies supporting the Project.
- Opposing submissions – 331 individual members of the general public or private companies opposing the project, of which a small number were a proforma submissions.
- Comment only submissions – 4 individual members of the general public or private companies provide submissions that were neither objections to the Proposed Modification or in support of the application.

In order to facilitate preparation of a response to these submissions, each submission has been provided with a submission number, with the submission number and name of the respondent presented in **Appendix 4**. It is noted that the submissions are arranged in the order that they were received from the Department of Planning and Environment.

In addition, to limit repetition and allow the matters raised in the submissions to be adequately and efficiently addressed, each submission was reviewed and the matters raised were categorised as follows. Where relevant, sub-categories have also been identified. **Appendix 4** presents the categorisation of each submission. The categorisation is presented in no particular order of priority. It is acknowledged that classification of individual submissions is subjective and that individual respondents may classify issues raised in their own submission in a manner different to the way that they are classified in this document.

This subsection initially provides a range of comments from those submissions that were in support of the Proposed Modification. The remainder of the subsection provides, for each category or sub-category of objection raised, selected extracts from a range of submissions in *italics*, as well as a consolidated response to that issue. Typically every tenth submission was selected when assembling the comments to be reproduced to ensure a representative selection of comments are presented and to avoid the perception of bias in the information presented. Again, the Proponent acknowledges selection of text for inclusion in this document is a subjective process and that individual respondents may have selected different sections of their submission for inclusion or may object to the fact that their submission was not included. However, the intention of this subsection is to provide a response to the issues raised rather than to each individual submission.

5.2 SUBMISSIONS IN SUPPORT

Sixty submissions were received in support of the Proposed Modification. The following provides selected extracts from a range of those submissions. In selecting the following extracts, emphasis has been placed on those respondents residing in the vicinity of the Project Site and surrounding areas. In summary, the respondents almost universally noted the economic and employment benefits associated with the Project and the Proposed Modification, as well as the flow on effects for community building and resilience. In addition, respondents noted that they were generally satisfied that the Proponent could appropriately manage environmental risks associated with the Proposed Modification.

I'm in full support of Unity Mining to develop and mine the Dargues reef ore body. Unity have proven they can mine in a safe and environmentally sensitive way at Henty. The project will provide great employment opportunities for the people of the region and could lead to further discoveries of gold and or base metals.

Submission No I-12 – Shearer

I support the development of the mine as I see it as an incredibly important driver of growth for Braidwood and district. In a town lacking any one major employer, the mine would drastically improve the local employment landscape by both providing opportunities for the many locals who commute to Canberra for work to instead work locally and the introduction of 'new'

workers into town stimulating population growth. Despite early challenges with environmental issues, I have every confidence that Unity appears to demonstrate the ability to operate the mine in a responsible and sustainable manner.

Submission No I-14 – Name withheld

This mine will be a significant advantage to the community in Braidwood. it will bring jobs - badly needed - and more money into the community at the local shops, support business and in sponsorships which Unity already engages in.

Submission No I-60 – Name withheld

I feel that as long as the mining company follow all environmental rules in their operation at Dargues reef , it should be allowed to open and the community and the mine will prosper This area need a business like Unity mine.

Submission No I-165 – Moon

I would like to make it known that I fully support the Dargues Reef Gold Mine. I believe the economic benefits to the region are substantial and job creation needs to be encouraged. I have no reservations at all concerning the operation of a processing plant onsite and have complete faith in Unity Mining's ability to conduct operations safely for both people and the environment. I live on the edge of the Morton National Park which is and will always be pristine wilderness. There is also a very large open cut mine nearby and the benefits it provides to the local region are tremendous . If such a large mine can coexist with a National Park then I can see no reason why a much smaller operation in what is historically a Gold mining area cannot be approved.

Submission No I-192 – Mckellar

As a 32 year resident of Braidwood I have watched with interest the developments surrounding the possibility of the operation of Dargues Gold mine.. Since the involvement of Unity Mining and their proposal to use Cyanide in the final extraction process I have taken a reasonably close professional interest as well as considering our local employment needs and any business which may support our local populace.(youth employment especially). ... Comments as to the potential of a dam breakage are, in my mind, misguided. The engineered drawings of the support wall are professional and well within risk parameters. ... The oversight of the operation will ensure near total safety. Any risk will be managed and is minimal. This mine could be defined as a boutique operation, well managed and certainly well monitored The directors of unity mining have always been open and prepared to answer any and all questions put to them by any member of the community-including myself. ...As a professional in the bottled water industry for some 25 years I am well aware of care, process and risk in business.

Submission No I-199 – Richardson

Ever since Tallaganda shire became Palerang Council employment for the young has gone out the window ...The Dargues Reef Gold project would be great for the Braidwood area as to bring money and employment, I have been to the mine site as I have a very small business of

supplying drinking water which I have done about ten times over the time workers have been on site. I urge the decision makers to think about the Braidwood district and the people who work away as there is no work here. I fully support the Mine. Regards Steven.

Submission No I-210 – Hockey

As a small rural town with limited employment opportunities, this mine would benefit the area financially. The flow on effect to our schools, shops, etc. would create a ripple effect that would exponentially increase the boost to his small rural economy. I am confident that all the potential environmental impacts have been addressed and the risk to the area is insignificant.

Submission No I-237 – Name withheld

The environmental mitigation measures for the proposed mine appear to be adequate and adequately consider the chance of any impact on surface and groundwater, endangered ecological communities and endangered species. With this in mind, it is important to consider both the local and regional economic benefit that would be afforded to the community, as a result of this development. It is my understanding that the local community stands to benefit significantly from this proposal and that these benefits will be sustained over the medium to long term. On this basis, the economic benefits of this project should be taken into consideration, as they likely outweigh any potential environmental impacts and, with the correct conditions in place, this could be a very beneficial project for the community.

Submission No I-316 – Name withheld

The Braidwood District is in dire need of employment opportunities for people from all skill levels. Instead of people and shires taking the "not in my back yard" principle to any development how about supporting employment, better roads, better wages, vibrant town including new shops. Mines bring new life to existing industries, fuel suppliers, hydraulic hose repairers, vehicle repairers just to mention a few. I have had a first hand site inspection of the Dargues facility which I urge all to take. This will allay many of the fears people may have about spillages. Future is bright for this facility with support.

Submission No I-363 – Dempsey

5.3 ABORIGINAL HERITAGE

Two objections identified the potential for sites of Aboriginal heritage significance downstream of the Project Site or along the Deua River to be impacted by the Proposal.

"The Deua National Park runs alongside the beautiful pristine Deua River, it is a magnificent national park with Aboriginal Yuin rock engravings that are sacred to the local Aboriginal descendants. The Deua river near Stewarts Crossing, has several deep water holes that are sacred women's sites for the Yuin Brinja and Murramurang people. These sites have been recorded from elders and held in documents at the Moruya library. There are axe grinding grooves along the river. ... Therefore the Aboriginal community of Moruya are very concerned about the Dargues Reef Mine and its potential to destroy sacred sites…"

Submission No I-134 – Fay

There are countless Aboriginal sites along the river including women's sites on the Deua River used by Kyora Yuin people before they were hounded form their land to make way for European colonisation.

Submission No I-24 – Fay

The Proponent acknowledges the significance of the identified sites, including cultural significance to the Aboriginal custodians of those site as well as the wider community, both Aboriginal and non-Aboriginal.

The Proposed Modification would not result in direct impacts to sites of Aboriginal heritage significance other than those identified in Section 4.6.5 of RWC (2015).

In relation to indirect impacts to sites located downstream of the Project Site, the Proponent contends that the Proposed Modification, as amended, would not significantly increase the potential for surface-water related impacts. As a result, no indirect impacts to sites of Aboriginal heritage or cultural significance are expected.

5.4 CLIMATE DATA USED

Forty one objections raised the issue of the accuracy of the climate data used in the EIS and by Specialist Consultants studies, as identified in the following extracts.

"The ridge on which the mine sits is frequently subjected to heavy rainfall that does not fall elsewhere. Long term rainfall records for properties surrounding the site reveal that Unity estimates of magnitude of stormwater levels are too low."

Submission No I-90 – Faber

"The Majors Creek area has a history of sudden, high rainfall events which can break previous records and the positioning of the TSF makes it vulnerable to flood rain...."

Submission No I-158 – Wallace-Crabb

"My main concern is the changing weather pattern predicted for our future climate, namely heavier rain showers meaning more flooding. The unforeseen freak weather events as happened in the Lockyer Valley not long back was never expected and had devastating effects on land, stock and human lives."

Submission No I-274 – North

"There is evidence that the Miner's estimation of rainfall levels is not robust, and certainly does not take into account likely fluctuations in rainfall patterns as a result of climate change."

Submission No I-291 – Davidson

"I am very concerned that according to data provided in the report commissioned by council the data used by the mines Proponent may not reflect the levels of rainfall that need to be designed for at the mine site."

Submission No I-361 – Kowal

"The ridge on which the mine sits is subject to particularly heavy rainfall that does not always occur further downstream. Long term rainfall records for properties surrounding the site reveal that Unity Mining's estimates of magnitude and frequency of stormwater levels are way too low. There is also much evidence of increasing frequency of irregular heavy rainfall events in our region."

Submission No I-227 – Tribolet

The submissions raise two principal issues as follows.

Rainfall and evaporation data

This issue is addressed in Sections 3.6.1, 4.3.10.2 and 4.3.10.3.

Climate change

The issue of climate change was addressed in Sections 4.8.5 and 5.2.26 of the Response to Submissions for the original application. That document noted that the Project would result in a 5 year mining operation (increased to 5 to 6 years should the Proposed Modification be approved), followed by a brief period for rehabilitation operations. Climate change by contrast is likely to result in a gradual change in climate pattern over decades to centuries.

In addition, the Proponent notes that fluctuations in annual rainfall, including extreme dry and extreme wet conditions, have been taken into account through the use of long-term rainfall data in preparing the water balance for the Proposed Modification (see Section 3.6.1).

Finally, the Proponent notes that it has taken extreme rainfall events into account in the design of the following components.

- The approved Process Water Pond would be a "Turkey's Nest" dam, with no surface catchment and a minimum 1m freeboard.
- The approved Tailings Storage Facility is designed to retain a 1 in 1 000 year rainfall event without overtopping.
- The approved clean water diversion upslope of the Tailings Storage Facility will be capable of diverting a maximum probably flood rainfall event around the facility without over topping.

5.5 AIR QUALITY

Ten objections raised the issue of impacts to air quality, including both greenhouse gas and pollution impacts, as identified in the following extracts.

"Community concerns relate to air quality and wind borne pollution with the possibility of heavy metals being blown around the area. Given the likelihood of drier times and heavier rain events in the future pollution is inevitable if the modification were to proceed."

Submission No I-204 – Altenburg

"Majors Creek frequently has heavy, pervasive and long lasting mists. At the mine site they both reduce visibility and blanket dams including the tailings . There is therefore I believe valid concern over the possibility of particulates and dissolved solids being carried form the tailings in a smog or other colloidal dispersion and subsequently deposited on roofs collecting rainwater. Mention has also been made of dust suppressants, in the context of mine dust settling on roofs. Since these are typically quaternary amines and related organo-nitrogen compounds they too present a risk, although some have been tested for carcinogenicity. For the safety of water supplies in Majors Creek and the locality it is imperative that efficient dust settling is effected and monitored."

Submission No I-249 – Sander

The Proponent notes that the air quality assessment presented in Section 4.10 of RWC (2015) determined that the Proposed Modification would not result in a significant increase in the air quality impacts compared with the Proposed Modification. Furthermore, Section 4.10.7 of RWC (2010a) identified that the approved Project would result in suspended and deposited dust concentrations substantially less than the relevant criterion. Finally, the Proponent contends that particulate emissions from the Project Site would consist of silicate minerals, not minerals containing heavy metals. As a result, the Proponent rejects the assertion that the Proposed Modification would result in unacceptable levels of particulate emissions generally or heavy metal emissions specifically.

Finally, the Proponent is not aware of a mechanism that may result in fog or mist transferring particulate or any other matter from the Project Site.

5.6 BIODIVERSITY

5.6.1 Bioaccumulation of Pollutants

Five objections raised the issue of bioaccumulation of heavy metals and other contaminants.

"An accumulation of small spills will be deadly too, as the heavy metals gradually build up in the soil of the riverside farms and orchards, to harm today's children and children as yet unborn."

Submission No I-143 – Planert

"The science presented to us failed to take into account the 'food chain'. That is that tiny creatures that die from the ingestion of a substance may then be eaten by bigger creatures etc. And so larger doses of the poison are passed on."

Submission No I-178 – Wallace-Crabb

The Proponent notes that the adequacy of the surface water and groundwater assessments and nature of associated impacts have been addressed elsewhere, including in 3.5.2.2, 3.5.3, 3.7.4 and 5.6.

The Proponent is not aware of a situation where the Project, as approved or as modified, could result in bioaccumulation of pollutants without first triggering a response and remedial action under the *Water Management Plan*. As a result, bioaccumulation of pollutants downstream of the Project Site is extremely unlikely.

5.6.2 Impacts Downslope/Downstream of the Project Site

Forty one objections raised the issue of impacts to biodiversity downslope or downstream of the Project Site.

"We are also caring for and rehabilitating the extensive middle Jembaicumbene wetland, part of our property, and itself only just recovering from the major 1860s alluvial gold extraction which completely destroyed it leaving nothing but 100 acres of gravel pits and mullock heaps for over a century. The wetland is now home to platypus, black swans and a tremendous variety of birds and wildlife. Our property will shortly become a major tourist attraction, and already attracts visitors from all over the world. All of this relies on clean water - our animals and ourselves drink the fresh springwater from our wells, and the pristine brooks which traverse our property water our trees and the wildlife. A single chemical accident at Dargues Reef Mine puts all of this, including our own lives and those of all our alpacas, horses, goats, sheep, llamas, and all the wombats, kangaroos, possums, birds and everything else that grazes in the fields and drinks from the ponds and brooks, at risk of a quick and horrible death, and potentially destroys our farm and everything on it for decades and possibly centuries to come."

Submission No I-121 – Davis

"A similar gold mine's tailings, the Gold King Mine in Colorado last week has had horrendous downstream impacts, killing flora, fauna and poisoning the drinking water. The Colorado Governor has declared this a Disaster. This is too big a risk to take on our fragile environment."

Submission No I-198 – Murphy

"The (Deua) river passes through the Deua National Park which is a sensitive environmental area, where wildlife should be protected from industrial pollution… Heavy metal pollution from the mine could harm the Deua River and the Moruya River all the way to the Batemans Bay marine Park."

Submission No I-240 – Rees

"The EA maps show it is on a hill above a village, on the edge of steep escarpment and at the headwaters of an important river system… It is also located in a highly sensitive, biodiverse area of NSW, and threatens wildlife drinking the water in Conservation Reserves and National Parks. Heavy metal pollution could also be carried into Batemans Marine Park by the Moruya River."

Submission No I-372 – Name Withheld

"Unity, and its previous incarnation, Cortona, has refused of several occasions to survey either the area 1-6km directly below their site. This is one of NSW most important migratory bird corridors as well as a wild like (sic) corridor for species between the Monga and Deua national parks. Unit (sic) refers to the area below their site as 'degraded farmland', thus dismissing of NSW most important arras (sic) of wildlife refuge. The Majors Creek National Park Reserve, the Majors Creek gorge, and the Araluen Scarp Grassy Forest, and the Neverbreak Hills Voluntary Conservation Area, proclaimed in 2013 and adjacent to the Major's Creek Conservation Area are areas of considerable biological richness, on both numbers of species and habitats…

…The five kilometres directly below the proposed Dargues Reef Mine ranges from rainforest dominated by Backhousia myrifolia (one of the few such 'dry temperate rainforest remnants in Australia) to grasslands with rich populations of orchids, to dry sclerophyll and wet sclerophyll forest, each with their own unique but interlocking communities of plants and animals. Several, such as the Araluen Scarp Grassy Forest, do not exist elsewhere.

In 2006 the NSW Scientific Committee, established by the Threatened Species Conservation Act, has made a Final Determination to list the Araluen Scarp Grassy Forest in the South East Corner Bioregion as an Endangered Ecological Community in Part 3 of Schedule 1 of the Act…I ask that before there is any consideration of approval of the Dargues Modification an in-depth assessment be made of the risk to these species."

Submission No I-397 – French

The Proponent notes that adverse impacts downslope/downstream of the Project Site could reasonably be expected to occur only in the event of discharge to surface water or groundwater. As a result, such impacts would be limited to the riparian corridor associated with the Majors and Araluen Creeks and the Deua River. The Proponent therefore disagrees that widespread impacts could be expected downstream of the Project Site.

Furthermore, the adequacy of the surface water and groundwater assessments and nature of associated impacts have been addressed elsewhere, including in Sections 3.6.2.2, 3.6.3, 3.7.4 and 5.7.

Finally, the Proponent notes the following in relation to the specific issues raised by the above submissions.

- Impacts on Jembaicumbene Creek and associated wetlands are not expected because that creek lies in the Shoalhaven Catchment, not the Majors Creek catchment.

- Comparisons with the recent discharge of waste water from the Gold King Mine are not valid because that Mine is an historic mine that was abandoned in 1923 and is in a geological formation that is strongly acid forming. By contrast the Dargues Gold Mine is a modern operation in a highly regulated mining environment, would be required to be full rehabilitated prior to release of any rehabilitation security and is not in an area of acid forming rocks.
- The Proponent commenced a program of downstream baseline monitoring of both water quality and aquatic ecology in 2012 and 2011 respectively within the Project Site and up to 13km downstream of it.
- The Proponent has not referred to the area downstream of the Project Site as "degraded farmland" in RWC (2015) and is unaware of where this term has come from.

5.6.3 Impacts Surrounding the Project Site

Fourteen objections raised the issue of impacts on biodiversity surrounding the Project Site.

"The risk of a significant environmental impact that will affect surrounding land and water and all living things that rely on them, is surely cause for concern and sufficient justification to block the proposed modification. This is an area of great natural beauty…"

Submission No I-255 – Name Withheld

"The survival of the extraordinary number of species directly below the mine site is due to the steepness and roughness of the terrain, which has meant that it has not been logged or affected by earlier mining. It is possibly the only remnant of the original ecology present before the disturbances of farming and gold mining. Will this too be destroyed by this mine. This ecology is too precious to be destroyed just for profit, the modification should be rejected."

Submission No I-284 – Hayman

These issues are addressed in Section 5.6.2 and 5.6.3.

5.7 WATER

5.7.1 Surface Water

Eighty seven objections raised the issue of surface water contamination, including heavy metal contamination and other pollutants.

"No system is ever foolproof and any failure of the tailings dam at Dargues Creek Mine will have a serious impact on downstream water quality and the aquatic environment. The Deua River Rivercare Group has been working over the last 10 years to improve water quality and the aquatic environment of the Deua River. The work has been carried out on a voluntary basis using funds raised by the group. The work has been supported by Eurobodalla Shire Council

because of the positive impacts on the riparian environment. Repair of the river has seen an increase in aquatic and adjacent terrestrial diversity as well as protecting water quality. The river water is used to provide part of the Shire water supply. Heavy metal contamination has a long term impact on human health and to risk any pollution of a municipal water supply is foolhardy."

Submission No I-9 – Bain

"I object to the 3rd modification of the Dargues Reef Gold Mine Development Application on the grounds there is a pollution risk to a river that provides water for food production, drinking water for almost 40,000 residents, runs into an estuary and ocean that is used for recreational and commercial fishing and oyster production and in flood that water runs over and covers prime agricultural land that should this modification be approved, could contaminate soils that grow our food."

Submission No I-46 – Bayley

"As a resident I have concerns about the water quality in this natural and pristine environ of the Deua River, the National park and the waterways downstream. Many of us also rely on the clean water of the Deua River for wellbeing and livelihood. I have specific concerns about the tailings dam and the fact that a failure of the proposed system would see real damage to such a clean waterway, not to mention the damage to drinking water supply to Moruya and beyond."

Submission No I-86 – Goddard

"Accidents do happen and when they do, it poses a great risk to us who rely on this river system for our drinking water. Not to mention the pollution threatening the local orchards, gardens and wildlife."

Submission No I-208 – Wu

"The risk of a significant environmental impact that will affect surrounding land and water and all living things that rely on them, is surely cause for concern and sufficient justification to block the proposed modification."

Submission No I-255 – Name Withheld

"I am concerned about the potential for significant contamination from heavy metals to our waterways if there is any failure in Unity Mining's tailings facility. The water quality can be compromised..."

Submission No I-280 – Spain

"The site sits at the head of one of the most pristine waterways in NSW, and is totally unsuitable for this kind of operation."

Submission No I-330 – Turner

"I am appalled and outraged that, as with the original development application for the mine, there is no reference to or assessment of the risks posed to the drinking water supply for the almost 40 000 residents of Eurobodalla Shire who rely on water drawn from the Deua River

system. Water is far more important than gold It is clear that the proposed modification creates a pollution risk that is unacceptable to residents along the entire Moruya River catchment. … The EA maps show it is on a hill above a village, on the edge of steep escarpment and at the headwaters of an important river system. Spring Creek, Majors Creek, Araluen Creek, and Deua/Moruya River are all used for domestic water supplies and agricultural purposes Pollution in these waterways would threaten the orchards and market gardens of the Araluen Valley and the water supply to Eurobodalla Shire.… Heavy metal pollution could also be carried into Batemans Marine Park by the Moruya River."

Submission No I-372 – Name Withheld

The submissions relating to potential impacts to surface water downstream of the Project Site may be classified as follows.

- Concerns relating to a failure of the Tailings Storage Facility generally and associated surface water impacts.
- Concerns relating to discharge of heavy metals from the Tailings Storage Facility specifically.
- Concerns in relation to the prior performance of the Proponent (see Section 5.13).
- Concerns in relation to the security of the water supply for Eurobodalla Shire Council (see Section 3.7.2).

In relation to concerns re a failure of the Tailings Storage Facility, the Proponent notes that enlargement of the Tailings Storage Facility no longer forms a component of the Proposed Modification. As a result, the risk of failure of the Tailings Storage Facility remains unchanged. Further information in relation to the design standards for the facility and associated risks are presented previously in this document, including in Sections 3.6.4 and 3.7 (various subsections). In summary, however, the Proponent notes the following.

- The Tailings Storage Facility would be constructed in accordance with the requirements of the Dams Safety Committee of NSW who to date have not raised any concerns in relation to the design or location of the facility.
- The facility would be lined to limit seepage of water through the base of the facility. In addition, underdrainage and seepage collection rates would be monitored and near field monitoring bores would be constructed and monitored to identify any unacceptable levels of seepage. In the event that trigger values identified in the *Water Management Plan* are exceeded, the Proponent would determine the cause of the unacceptable seepage and would rectify the issue. Potential measures available include installation of further lining or seepage collection structures either within the Tailings Storage Facility or downslope of it.
- The facility would be designed to contain rainfall events up to a 1 in 1 000 year ARI event. In addition, the facility would include a spill way during operation capable of safely conveying a 1 in 100 000 ARI event, with a final spillway capable of safely conveying a maximum probable flood. As a result, the facility would be unlikely to fail as a result of an extreme rainfall event.

- Finally, the facility would be reshaped and capped with an impermeable layer and/or a store and release cover following the completion of mining operations. This would ensure that the final landform is a free draining landform with seepage into the tailings pile prevented to the greatest extent possible. As a result, the Proponent contends that there would be no long-term seepage-related issues associated with the facility.

In relation to discharge of heavy metals, the Proponent presumes that this relates to the Proposal to place leached concentrate into the Tailings Storage Facility. As this no longer forms a component of the Proposed Modification, the Proponent contends that this is no longer an issue.

Finally, the Proponent notes that the use of cyanide and the placement of leached concentrate tailings into the Tailings Storage Facility no longer form a component of the Proposed Modification. As a result, the risks to drinking water downstream of the Project Site are consistent with those associated with the approved Project. As these matters were the subject of the appeal to the original application for Project Approval and were the subject of consideration in the Land and Environment Court action, the Proponent contends that this issue is no longer relevant.

5.7.2 Groundwater

Twenty three objections raised the issue of groundwater pollution and contamination, as identified in the following extracts.

"There is also no indication that the Proponent has considered the possibility of cyanide and heavy metals entering groundwater, which is inherently difficult to monitor."

Submission No I-42 – Spijer

"Design and situation of Tailings dam threatens streams & groundwater systems."

Submission No I-231 – Jasprizza

Submissions relating to potential impacts to groundwater primarily focused on groundwater quality-related issues and potential impacts associated with the use of cyanide and heavy metals/placement of leached concentrate into the Tailings Storage Facility. The proponent notes that these activities no longer form a component of the Proposed Modification.

Issues associated with the design of the Tailings Storage Facility have been addressed elsewhere in this document.

5.7.3 Sedimentation

Seven objections raised the issue of sediment contamination, as identified in the following extracts.

"The EPA says that sediment and erosion control needs to meet higher standards. The sediment dams must be an adequate size and the safe discharge of flocculent treated water should be a priority. Currently this treated water is pumped onto grassland but contamination of Majors Creek is possible due the sites unique combination of sudden severe storms, long periods of rainfall and soil porosity".

Submission No I-160 – Name Withheld

"Soil structure extremely susceptible to erosion, as evidenced by EPA breaches during construction during normal rainfall conditions. TSF bund wall and levee mounds to divert runoff are inadequate to withstand a heavy rainfall event, particularly if the ground is already saturated."

Submission No I-195 – Gardiner

The Proponent acknowledges that management of erosion and sedimentation has previously been an issue within the Project Site (see Section 3.7.3.4 and 5.13) and that this issue requires ongoing management. The emphasis that the Proponent places on management of this issue is evidenced by the resources that have been devoted to it, including construction and progressive improvement of a range of sediment control structures and employment of between two and three people during the current period of care and maintenance to operate and maintain the system.

Finally, in relation to the Erosion and Sediment Control Plans presented in Appendix 2 of RWC (2015), the Proponent notes that these have been prepared in accordance with Landcom (2004) and related publications by Certified Professionals in Erosion and Sediment Control. Implementation of these plans would be supervised to suitably qualified and experienced independent experts during the construction phase of the Project.

5.7.4 Non-contamination Impacts

Ten objections raised the issue of non-contamination impacts of the Proposal on groundwater and surface water, as identified in the following extracts.

"Unity estimates the water table will drop as a result of processing procedures and will take 50 years to return to its current level. This is unacceptable when existing below-groundwater is already under threat because of global warming."

Submission No I-157 – Hooker

"Prolonged drought conditions would mean accessing large amounts groundwater, thereby depleting precious water reserves essential to nearby landowners and environmental needs."

Submission No I-195 – Gardiner

The Proposed Modification would not result in substantial changes to the volume of groundwater to be extracted nor to the extent of drawdown of the groundwater table.

5.7.5 Monitoring

Eight objections raised the issue of environmental monitoring and water testing on lands surrounding and downstream of the Project Site.

"The Proponent does not have to do water testing beyond its own area, and people will have to test water and soil at their own cost, which is an unreasonable expectation for day-trippers and campers coming from Canberra. The expectation would be placed on the campers to source appropriate equipment that tests for the right contaminants, and operate that equipment correctly. This is not a reasonable expectation and places tourists at a higher risk of exposure."

Submission No I-325 – Thomsen

"The company refused to test the creek on our property during and after the previous pollution events so they did not see that as the water reaches the pools, the pollution can be even worse than on the steep land immediately below the mine site as the water slows and the heavy material settles and fills the pools."

Submission No I-397 – French

The Proponent notes that Sections 7.3, 8.2 and 9.2 of the approved *Water Management Plan* identify that aquatic ecology, surface water and groundwater monitoring would be undertaken upstream of the Project Site, within the Project Site and up to 13km downstream of the Project Site. That Plan would be reviewed following granting of approval for the Proposed Modification, should it be granted. In addition, Section 12 of that document identifies the procedures to be implemented should a complaint be received in relation to water quality. Depending on the nature of the complaint that section identifies that "where appropriate, further sampling [at the Proponent's cost] would be undertaken to test the veracity of the complaint."

5.8 CYANIDE

5.8.1 Introduction

A substantial number of submissions raised objections in relation to the use of cyanide within the Project Site. As a result of the level of community concern that this issue has raised, the Proponent has withdrawn this component from the Proposed Modification. As a result, the Proponent contends that this issue is no longer relevant. Notwithstanding this, the following presents a very brief overview of the issues raised and limited commentary, where relevant.

5.8.2 Biodiversity Impacts

Forty-seven submissions addressed the issue of the biodiversity impacts associated with the use of cyanide. These included the impacts of cyanide on surface water, soils and sediments and the associated ecological communities and flora and fauna species surrounding and downstream of the Project Site.

While the use of cyanide within the Project Site has been removed from the Proposed Modification, residual issues associated with biodiversity-related impacts are presented in Section 5.6.

5.8.3 Long-term Impacts

Fifty-eight submissions addressed the issue of the long-term impacts of cyanide. These included the build-up of cyanide in soils and sediments surrounding and downstream of the Project Site, and the long-term effects of cyanide remaining in the Tailings Storage Facility after decommissioning.

While the use of cyanide within the Project Site has been removed from the Proposed Modification, the Proponent notes that cyanide is not a compound that persists in the environment and long-term impacts would have been unlikely.

5.8.4 Previous Community Commitments

Eighty-four submissions addressed the issue of the Proponent's previous community commitments regarding cyanide and considered the proposed use of cyanide on-site a breach of these previous commitments.

5.8.5 Risk of Discharge or Spill

Sixty-one submissions received addressed the risk of a cyanide discharge or spill from the processing plant, Tailings Storage Facility or during transportation. These included risks of discharges or spills as a result of human error, traffic accidents, structural issues associated with the Tailings Storage Facility or processing plant and overflow or failure of the Tailings Storage Facility due to heavy rainfall.

While the use of cyanide within the Project Site has been removed from the Proposed Modification, the Proponent contends that the proposed measures would have adequately managed the identified risks and that the remaining measures will adequately manage the remaining reagents to be used within the Project Site.

5.8.6 Storage

Nine submissions addressed the issue of the safety of the proposed cyanide storage facilities and procedures, including the risk of discharge, spillage or hazard to human health through improper storage and recycling.

The Proponent notes that all chemicals and reagents, including those that would continue to be used within the Project Site will be stored in accordance with the following Australian Standards.

- *AS4452 The Storage and Handling of Toxic Substances.*
- *AS1940:1993 Storage and Handling of Combustible and Flammable Liquids.*

5.8.7 Transport

Seven submissions addressed the issue of the safety of the proposed cyanide transport procedures, including the risk of discharge, spillage or hazard to human health through road accident or human error.

The Proponent notes that all chemicals and reagents, including those that would continue to be used within the Project Site will be transported in accordance with the requirements of the Australian Dangerous Goods Code.

5.8.8 Contamination of Water

One hundred and thirty-five submissions addressed the issue of the contamination of groundwater and surface water by cyanide. These included the impacts of potential cyanide contamination on water used for drinking, agriculture and recreation as a result of leakage or failure of the Tailings Storage Facility or processing plant.

While the use of cyanide within the Project Site has been removed from the Proposed Modification, residual issues associated with contamination of water impacts are presented in Section 5.7.

5.8.9 General Objections

One hundred and nine submissions opposed the use of cyanide on-site, but did not reference specific issues to be addressed.

The Proponent has acknowledged the level of community concern that the use of cyanide within the Project Site has raised and has withdrawn that component from the Proposed Modification.

5.9 ECONOMIC IMPACTS

5.9.1 Rehabilitation and Security Bond

Thirty-three objections raised the issue of rehabilitation security, including the ability of Unity Mining to pay for end-of-mine remediation or remediation from accidents or disasters.

"Unity Mining Limited is barely solvent and will not be able to pay for any remediation in the case of accidents and disasters."

Submission No I-48 – Kaminskas

"The $3 million bond provided by Unity is totally inadequate and it will fall to tax payers and future generations to take responsibility and have to live with any toxic leakage. Unity Mining will be long gone by then."

Submission No I-139 – Name Withheld

"There is no capacity except through you and I, the taxpayer to remedy downstream damage. The company's bond only covers reparations on site. Thus reparations for damage done which could be air quality, downstream pollution to crops and water, truck carrying cyanide accident etc. will all require the company to be sued. There have been numerous instances where the reparation bond was set far too low at other mining sites with the result that the company walks away leaving an un-remediated wasteland, we do not need another at this site."

Submission No I-306 – Hayman

"I believe if pollution occurs after the mine has ceased extracting gold then the cost of cleaning up the mess will fall on the tax payer and not the company that caused the problem. The gold price was about US$1,900/oz in 2011 has slumped to about US$1,130/oz today. This type of market volatility has historically tempted miners to cut costs and take short cuts."

Submission No I-336 – Name Withheld

The Proponent notes that prior to commencing mining operations that it will be required to prepare a new *Mining Operations Plan* for the Project in consultation with a wide range of government agencies and the community. That document will describe the rehabilitation activities within the Project Site and be required to be assessed and approved by the Division of Resources and Energy. A Rehabilitation Cost Estimate will be required to be lodged. The Proponent anticipates that that security will be required to be substantially more than the current security, reflecting the greater areas of disturbance required for the operating Mine. That estimate will be prepared using the Division's standard tool, amended to reflect site-specific issues as required.

Finally, the Proponent notes that the financial modelling for the Project includes an estimate for the rehabilitation of the Project Site following completion of mining operations. As a result, the Proponent rejects the assertion that it does not or will not have the resources available to adequately rehabilitate the Project Site.

5.9.2 Project Viability

Thirteen objections raised the issue of the viability of the Project.

"I have read the company's environmental application and sure, on paper it looks good but in my experience companies go into receivership and the new owner, while trying to recoup value for Proponents can fail to carry out all the controls originally agreed upon."

Submission No I-8 – Hatch

"The demand for gold and the price of gold is at its lowest for several years. All major Australian gold companies have suspended exploration, laid off staff and seen their share price plummet. If the big companies cannot make a go of it in the current economic climate, it follows that small companies like "Unity Mining" would be unviable. There have always been small companies which buy up unused or distressed gold mines, tidy up the bookwork and sell them again. Sometimes the company may even process the ore but usually for a limited time. These companies walk away from the mine after 4-5 years, declare themselves bankrupt and the community and its officials are left to do the remediation. I fear that "Unity Mining" falls into this category.

Submission No I-120 – Summerhayes

"The gold price was about US$1,900/oz in 2011 has slumped to about US$1,130/oz today. This type of market volatility has historically tempted miners to cut costs and take short cuts."

Submission No I-336 – Name Withheld

The Proponent states that its financial modelling indicates that the Project is profitable under a range of operational scenarios, including gold prices substantially less than the current spot price and that adequate resources would be available to appropriately manage and rehabilitate the Project.

5.9.3 Agricultural Impacts

One hundred and twenty-one objections raised the issue of the economic impact associated with potential impacts to agriculture associated downstream of the Project Site.

"The EA maps show it (the Project Site) is on a hill above a village, on the edge of steep escarpment and at the headwaters of an important river system. Spring Creek, Majors Creek, Araluen Creek, and Deua/Moruya River are all used for domestic water supplies and agricultural purpose. Pollution in these waterways would threaten the orchards and market gardens of the Araluen Valley and the water supply to Eurobodalla Shire."

Submission No I-75 – Name Withheld

The Araluen Valley, which is directly below Majors Creek has already had a negative impact on the local employment: a historic peach orchard has shut its doors and has begun to bulldoze the fruit trees: and pickers, packers, tractor drivers, pruners have no jobs.

Submission No I-102 – Craze

"Any pollution in these waterways would also endanger the orchards and market gardens of the Araluen Valley."

Submission No I-108 – Monahan

"Let us also consider what this region is quickly becoming Australia wide, and also internationally known for... Its food, its food commerce, its organic produce and Moruya has won best farmers market in Australia 2 years in a row. This good news has reached the UK press and it is a huge benefit to our region. This region is already a place for local, seasonal and organic food, this movement and commerce should be supported by the local and federal government and encouraged, for all the right reasons. But should there be any pollution from this mine, it will kill this industry, and you will lose far more livelihoods than will have been created. this should not go ahead."

Submission No I-111 – Dolphin

"The Araluen valley has a thriving peach industry, cattle farming and environmental tourism. If the cyanide and tailings dam were to ever threaten these endeavours it would spell the closure of all these businesses & jobs."

Submission No I-172 – Birk

"Araluen Valley has niche market stone fruit orchards, located directly downstream of the mine within 8km of the mine's proposed tailings dam. These orchards, along with cattle production, are the backbone of the rural enterprises along the catchment. Currently, this productive valley and the Deua waterway generate significant income and support an increasing level of employment, which will be put at risk if the proposed modifications are approved."

Submission No I-245– Rault

"Most people on the Deua are growing organic food. We have a clean clear running river but if this modification is approved it puts all of this in jeopardy."

Submission No I-270 – Jasprizza

"I am concerned about the potential for significant contamination from heavy metals to our waterways if there is any failure in Unity Mining's tailings facility. The water quality can be compromised and will affect the food production and water quality in the Araluen, Deua and Moruya Rivers. Food production is a long term industry in the area where as mining is dependent on the gold price and there is no guarantee that Unity Mining will be around for the long term."

Submission No I-280– Spain

"Pollution in these waterways would threaten ours and other market gardens along the Deua River.. I as a residence of this river catchment have not been consulted on the consequences of an accident happening to the TSF. It would mean we could not use the water from the river to grow our vegetables and fruits trees and the current tank water situation on our property would not be enough to sustain our sustainable practices in periods of drought.."

Submission No I-315 – Name Withheld

"The RRR Garlic of Majors Creek, is part of a rapidly expanding new Garlic growing arigcultual (sic) industry of Braidwood. This is our fifth year in production, developing our business plan to export to mainland China. In the GHD report at point 6.1.1 headed, advice of risks associated with cyanide operation at the site, and I quote in part "The most significant consequences of a small scale cyanide release would probably be community concerns AND REPUTATIONAL DAMAGE DUE TO PERCEPTION." MY organically grown garlic already has a reputation of being Green and Clean organically grown, superior garlic. My major customers are Hong Kong, Chinese. These clients are already, after mainetream (sic) media exposure, asking if my garlic is safe! And the Dargues Reef site has not started production! Australian Grown Garlic is hard to purchase, we cannot keep up with demand in Australia and our export plans will be under threat if Unities Modifications to process on site are allowed to proceed. Where do you want your food grown? Who is going to compensate me for the loss of my business reputation. Or will I be forced out of the garlic growing business."

Submission No I-339 – Clarke

"I live on the Deua River and I would like to continue to trust the water I use to grow food plants for my family as well as the animals we graze for our own meat production."

Submission No I-354 – Name Withheld

The Proponent acknowledges the significant concern in relation to agricultural impacts associated with the Proposal. Issues raised may be classified as follows.

- Concerns re pollution of surface water or groundwater downstream of the Project Site (see Section 5.7).
- Concerns re actual damage or reputational damage to the agricultural industry, particularly those operations that are marketing their produce as organic.

In relation to potential adverse impacts to the agricultural industry downstream of the Project Site, the Proponent notes that it has previously addressed the issue of surface water and groundwater impacts. In the absence of such impacts, the Proponent is not aware of a mechanism whereby the Project could adversely impact on food production downstream of the Project Site.

In relation to alleged potential for reputational impacts to agricultural operations, the Proponent contends that the Project, as approved and as modified, would be managed without adverse impacts to downstream water quality. As a result, the Project would not adversely impact on the reputation of downstream agricultural operations. However, the Proponent does acknowledge that a range of inaccurate and well publicised statements in relation to the potential impacts of the Project, as approved and as modified, have been made by others. These statements have the potential to adversely impact on the reputation of downstream agricultural operations. The Proponent has attempted to correct the record in relation to the inaccurate statements, and will continue to do so.

Finally, the Proponent notes that there are abundant examples of mining operations and agricultural communities coexisting and benefiting from each other. Examples include the following.

- Off-farm employment and income for farmers and agricultural workers, increasing the security of employment and maintaining the standard of living.
- Business opportunities to supply equipment, services or labour to local mining operations.
- Increased economic activity, including support for local service providers, which in turn results in improved access for agricultural operators.
- Increased opportunity (and funding) for cooperation to manage district-scale issues such as weeds, pests, fire, transportation, education and social and sporting opportunities.

5.9.4 Tourism Impacts

Thirty-two objections raised the issue of the economic impact of potential impacts to tourism surrounding the Project Site.

"In addition to this the potential impacts on the tourism industry in Moruya downstream of a spill over of the proposed tailings dam could be catastrophic if it results in fish kills and pollution of the waterway. The town of Moruya relies a great deal on the influx of summer tourists who come to fish, swim and paddle in the river and the customers that this brings to local businesses."

Submission No I-19 – Name Withheld

"Given the risk to the environment and potential pollution of the waterways, holiday makers such as ourselves will no longer see the Araluen Valley as a tourist destination."

Submission No I-75 – Name Withheld

"The river and its clean water are also extremely important for fishing, tourism and nature conservation. These are the big draw cards and economic bases of this undeveloped south coast region and it is not acceptable to allow the introduction of cyanide processing into this healthy natural system."

Submission No I-83 – Potter

"The proposed changes to the existing development approval threaten far more jobs and income than the six to ten million dollars per year that Unity predicts will be added to the local and regional economy. Mines can only offer short term financial benefits, whilst agriculture and tourism can bolster the regional economy for a long time."

Submission No I-285 – Bennett

The issues raised in relation to tourism impacts largely noted the adverse impacts that may be experienced by tourism operators downstream of the Project Site in the event of a pollution incident that impacted surface water.

Issues associated with surface water and groundwater impacts are addressed in Section 5.7. In the absence of such impacts, the Proponent is not aware of a mechanism whereby the Project could adversely impact on tourism downstream of the Project Site. Furthermore, the Proponent notes that similar to agricultural operations, there are numerous examples of mining operations and tourism co-existing, including the support offered by local mining companies to regional events in Orange, Parkes and West Wyalong in NSW.

5.9.5 Project Contributions

Thirty objections raised the issue of the economic contributions from the Proposal to the surrounding and extended communities, including job security and royalties.

"Australia's economy has for a long time relied on primary production and resource extraction. This is changing, as other 'industries' contribute increasingly to the economy. For instance, the arts & recreation sector now employs more people than does the mining sector (ABS); the former presents far less of a threat to the safety and wellbeing of people not employed in the sector than does the latter, and does far less damage to the environment. When you consider the argument often used that "we need this mine to provide jobs", it ignores the impact such a mine can (and often does) have on the jobs of others in the area, such as agriculture and tourism. It is also important to bring up the issue of where the economic benefits of the enterprise are -- much of the benefit of mining ends up overseas."

Submission No I-42 – Spijer

"Unity Mining suggests that the NSW Government will receive 10 million dollars in royalties over the life of the mine. Pretty insignificant against the 100 or 1,000 million dollars needed to properly clean up following a catastrophic failure of the tailings storage facility."

Submission No I-284 – Hayman

Mr Andrew McIlwain addressed the Council meeting and made promises of 120 local jobs, and increased income to the local community. He claimed that all of these jobs would go to the local community, and that the company would provide the required training. He promised that no FIFO workers would be employed.

However, before the mine suddenly ceased operations, due I believe to the fall in the gold price, there were a number of FIFO workers employed. I assume they were people with the required technical skills and expertise. They stayed for shifts of 8 days, I believe, then left for wherever they came from. A few local people were employed by the mine, while others made some money from renting property to mine employees, and from providing basic services. This of course all ended when the mining operation closed. Meanwhile the rest of the community continued to function as usual, with no significant gains from the mine. If there had been, there would be a more vocal group in favour of the mine.

The claim that 120 local jobs will be provided requires further investigation. I wonder, where are the 120 fit, suitable and currently unemployed people, in our local community, waiting to fill these jobs? If these 120 people are currently employed in other work, how will they be replaced? When the mine closes from time to time as the gold price fluctuates (this is a common pattern with gold mines), what will they do while they wait to be re-employed?"

Submission No I-293 – Murray

Section 2.8 of RWC (2015) identifies the economic and employment contributions that the Project as described in that document would make. Section 2.6 of this document presents the amended contributions that would result should the Proposed Modification, as amended, be approved. The Proponent stands by the published contributions, as well as its commitment to ensure that all positions will be offered on a residential basis. Exceptions to this policy would only apply be where persons with specialist skills and/or qualifications are not available within the surrounding district or, for other reasons, are not able to relocate.

In relation to the statement about FIFO workers being employed at the Mine during the initial construction stage, the Proponent notes that these workers were employed by the earthmoving contractor, a Goulbourn-based company, undertaking the initial earthworks. The contractor employees car pooled from Goulburn or were accommodated in Braidwood for the duration of the contract. All employees of the Dargues Gold Mine resided within the Palerang Shire during their employment.

5.9.6 Other Impacts

Fifteen objections raised the issue of other economic impacts, ranging from the allocation of Mine profits to impacts on real estate values and businesses within the surrounding communities.

"These supposed economic benefits are only applicable to the company and shareholders as it reduces the cost per tonne for the extraction of the gold, and therefore creates more profit for the company and therefore shareholders."

Submission No I-346 – Coe

"There is real potential for significant drops in real estate value downstream if this application is approved."

Submission No I-364 – Priddle

I directly employ eight staff, but the flow on effect of my work employs many hundreds, including actors, directors, musical composers, choreographers, set designers, editors, book designers, booksellers and more. I write an average of six books a year, usually one substantial work as well as smaller works for children, except during the six months of pollution episodes in 2013 and this year, where time – and potentially millions of dollars for NSW – have been wasted responding an error ridden and inadequate proposal by a mining company with a local record of repeated broken promises.

Submission No I-397 – French

The Proponent notes that the Project, as approved, would directly contribute between $3 million and $7 million per year to the local and regional economy. In addition, approximately 80 new jobs would be created. The resulting indirect impacts would include increased economic activity in surrounding communities and flow on indirect employment. The Proponent rejects the assertion that the benefits of the Proposed Modification as modified would flow only to the Proponent.

Finally, the Proponent notes that commentary in relation to real estate values surrounding mining operations being adversely impacted is not borne out by experience in other areas with mining operations. In summary, the value of property is effected by many factors, of which increased employment and economic activity is a significant factor in supporting real-estate values.

5.10 EMERGENCY MANAGEMENT

Seven objections raised the issue of the risk of unforeseen emergencies occurring within the Project Site, including natural disasters and bushfires.

"Greater safety procedures, monitoring, and data reporting to appropriate authorities needs to be scrutinised in detail along with occurrences especially on-site accidents and spillages. Extreme weather occurrences are increasing and are more unpredictable. Flooding and dilution of waste due to extreme rainfall events increases the possible risks of toxic overflows from tailing facilities endangering everything downstream. Drought – dust suppressants are suggested to reduce water consumption, but vary in effectiveness. Some can cause contamination of vegetation, fine particles on waste storage may be ingested by workers, locals, and fauna."

Submission No I-317 – Name Withheld

As Unity has mismanaged accidents both at Dargues and Henty and been reprimanded by the NSW and Tasmanian EPAs for their lack of strategies in dealing with spillages and other accidents, it is crucial that Unity provide compensation and detailed strategies for dealing with disaster, from an overturned truck spilling cyanide into Spring Creek, bushfire, or human error.

Submission No I-397 –French

The Proponent notes that the withdrawal of cyanide processing and the proposed enlargement to the Tailings Storage Facility from the Proposed Modification means that the risk profile for the Project as modified would be largely unchanged from the approved Project.

Notwithstanding the above and in recognition that this is an issue of concern for the community, the Proponent notes that it has prepared, and would update prior to onsite operations recommencing, the following documents that would guide emergency management within the Project Site.

- *Pollution Incident Response Management Plan*

  The Plan has been prepared in accordance with the document *Environmental guidelines: Preparation of pollution incident response management plans*

published by the Environment Protection Authority. The Plan focuses on management of pollution-related incidents within the Project Site, including:

- a description and likelihood of the hazards and an inventory of pollutants
- pre-emptive actions to be taken and safety equipment to be maintained on site;
- communication procedures;
- actions to be taken in the event of an emergency; and
- training and required competencies for employees and workers.

- *Emergency Response Plan*

  The Plan has been prepared to manage the risk of unforeseen emergencies within the Project Site, with particular emphasis on safety-related risks. The document outlines the identified risks, management measures to be implemented and responsible personnel. The document also describes the procedures to be implemented in the event of an emergency.

In addition, the Proponent has designed the Project in a manner that would ensure that there are multiple engineering and other measures to minimise the risk of an emergency, including an emergency involving discharge of a pollutant, within the Project Site. These include and will include the following.

- Bunding and storage of chemicals and hydrocarbons in accordance with:
  - *AS4452 The Storage and Handling of Toxic Substances; and*
  - *AS1940:1993 Storage and Handling of Combustible and Flammable Liquids.*
- Construction of the processing plant within a concrete sealed, bunded area.
- Establishment of a potentially contaminated surface water catchment which would include all areas of reagent storage and use in the vicinity of the processing plant and separate management of surface water within that area.
- Design of the processing plant area such that all surface water would flow to the box cut, not to natural drainage, in the event of an extreme rainfall event that overwhelmed the storage capacity in that area.
- Design and management of the Tailings Storage Facility in accordance with the requirements of the Dams Safety Committee of NSW and industry standards.

In relation to the commentary regarding environmental incidents at the Henty Gold Mine in Tasmania, the Proponent notes the following.

- On 22 May 2014, an Integrated Bulk Container (IBC) containing 1000L of a widely used, undiluted flocculent was placed on an asphalt sealed truck unloading area.
- As the material had been placed in the incorrect location, a forklift operator was instructed to move the IBC to the appropriate location. In doing so, the IBC was breached by the fork of the forklift.

- The contents of the IBC were discharged to an asphalt sealed area, from where it flowed to a surface water drain and then into the Henty River.
- As required, the incident was immediately reported to the Tasmanian Environment Protection Authority and Hydro Tasmania as required
- Following an investigation of the incident, and taking into account the circumstances, the Tasmanian Environment Protection Authority elected not to prosecute the Proponent. Rather, an Environmental Infringement Notice was issued for a total of $650.
- No other infringement notices have been issued in the period 1 July 2009 to the present.
- In providing copies of this documentation to the NSW Environmental Defenders Office, the Tasmanian Environment Protection Authority noted that.

> "the Company accepted responsibility for the incident and have paid the penalty. They were diligent at the time in their response to the incident, and afterwards in taking actions to minimise the chance of such accidents occurring again".

5.11 COMPLETENESS OF THE ENVIRONMENTAL ASSESSMENT

Fifteen objections raised the issue of information allegedly not being addressed or not adequately covered in RWC (2015).

"The EA concentrates on cyanide risks but there are number chemicals used in gold recovery process. Details of discharge concentrations on all of these chemicals are needed for full assessment of the environmental risks of project".

Submission No P-A – Pro Forma

"The Proponent's assessment fails to take into account the economic burdens of the project imposed on the local and regional community, including the increased risk and consequences of contamination of water supplies, the perpetual burden of contaminated tailings dam, and the reduction (possibly in perpetuity) of available agricultural land…The Proponent's environmental impact assessment is deficient in that it fails to properly assess a number of key environmental impacts and as a consequence the project's proposed environmental safeguards are not adequate to mitigate the risks."

Submission No I-358 – Sack

"There has been no full environmental assessment of the whole Deua catchment including the Deua National Park, Bateman's Bay Marine Park and Eurobodalla shire's water supply."

Submission No I-146 – Read

The Proponent contends that RWC (2015) adequately addresses all risks associated with the Proposed Modification. Matters related to specific issues identified by the submissions are identified elsewhere in this document.

5.12 PLANNING MATTERS

5.12.1 Development Creep

Forty objections raised the issue of 'modification creep' and the potential impacts of future modifications, as identified in the following extracts.

"Other gold prospecting licenses are active across the region, and it would only need one more modification application to extend the Dargues processing plant to accommodate any such new mines."

Submission No I-108 – Monahan

"My main concerns about the Dargues Reef mine are…The possibility of the mine processing ore from other mines. On Wednesday August 19, during a visit to the site, Andrew McIlwain said he would "Never say never about anything" when I asked him if this was a possibility."

Submission No I-110 – Doherty

"The mine will close or be put on indefinite hold in 2018, 2022 or more likely years after that, since Unity repeats that there are 'excellent opportunities' to mine gold over its seven other sites, enough to keep it busy for years, 'modifying' its project accordingly. Its stated intention not to mine beyond Dargues 'in this modification' means just that. There is no end in sight…"

Submission No I-130 – Muller

"This company has had a changed narrative from day 1, with a range of statements to various audiences re their now proposed modification to process with cyanide on site. This is to make the enterprise "more robust" to if not approved, "we will still mine and process elsewhere". Their scanty EA for modification 3 is evidence of the distain this company has for the requirements demanded by communities in respect of companies wishing to operate within their midst with potentially dangerous activities.

"This processing plant will fundamentally change the economics of further processing of ore in the greater area. Other gold prospecting licences are active across the region; it would only need one more Modification by Unity to extend the processing to include ore from other sites, thus greatly enhancing the risk of further heavy metal or cyanide contamination."

Submission No I-185 – Hayman

"Other gold prospecting licences are active across the region, which means Dargues could be "modified" again and again to accommodate any new mines, extensions to Dargues to include other gold bearing lodes in the vicinity or processing of ore from other mines."

Submission No I-195 – Gardiner

The Proponent notes that any future modification of the Project Approval for the Dargues Gold Mine would require further approval under Section 75W of the EP&A Act or any subsequent amendment/replacement of the Act. Such an application would be exhibited and assessed on its merits at the time.

While the Proponent acknowledges the concern that the potential for future modifications to the Project has raised within sections of the community, it is noted that it would be unreasonable for the Company to waive its rights to adjust its operations in the future.

5.12.2 Application of Section 75W

Twenty-six objections raised the issue of the application of Section 75W of the EP&A Act, including the need for a new application and the viability of the Project without the modification.

"The proposed modification differs from the original application so significantly that it should be considered anew. The (now repealed) Part 3A process under which it was first approved should be abandoned if the applicant means to change their activities so significantly."

Submission No I-169 – Parsons

"This modification is not necessary. It is a cost cutting exercise as confirmed by the EA. Unity Mining has officially stated the project is viable without this modification. There are other alternatives rather than this high risk construction in an inappropriate site."

Submission No I-197 – Stacey

"The proposal cannot properly be considered to be a mere modification of the project as approved in 2011. The alterations to the project proposed do not have "limited environmental consequences beyond those which had been the subject of [the original project] assessment"1. The proposal is significantly different to that originally approved: The disturbance area of the project has increased from 33.1 ha to 46.8 hectares (including a new waste rock emplacement (approx. 6 ha) and an increase in the proposed tailings dam from 9ha to 16ha) The resource extraction is proposed to increase from 1.2 million tonnes to 1.6 million tonnes. This is a 33% increase.

- *The size, nature and purpose of the proposed tailings dam will be radically different.*
- *The proposal introduces new categories of environmental risks associated with the proposed on-site cyanide processing operations, including transportation, storage and handling risks as well as issues associated with the introduction of contaminated concentrate into the tailings storage facility.*
- *The proposed creek crossing for heavy vehicles, the contaminated concentrate pipeline, and the paste/fill pipeline create new potential hazards. Characterisation of the proposal as a "modification" is misleading as it understates the nature and effect of the additional environmental impacts of the proposal. Additionally, due to this characterisation:*

- *the statutory regime does not provide a rigorous and transparent process for ensuring that those impacts are properly assessed by the Proponent and considered by all relevant parties; and*
- *the cumulative impacts of the proposal (including the two prior modifications) are not properly considered."*

Submission No I-358 – Sack

This issue is addressed in Section 4.11.

5.13 PRIOR PERFORMANCE OF THE PROPONENT

Eighty-nine objections raised the issue of the prior environmental performance of the Proponent.

"Already Unity Mining have had environmental breeches in their construction phase, which have contravened the NSW Government Environment Protection Legislation and the small fine of little consequence to Unity Mining. With Unity Mining's current track record it is not an 'if there is a breech with the cyanide processing' it will be when there is a breech."

Submission No I-6 – Colman

"Three years ago Coastwatchers and SERCA won stringent conditions for a proposed gold mine by Big Island Mining Pty Ltd to operate above our valley home. The sediment dams failed in the first three day rainfall. In the six months before work halted in 2013, large drifts of sediment filled the deep holes of the gorge to about a third of their depth. Much is still there. The company was convicted in the Land and Environment Court for three pollution events… Given the history of work on the site in 2013, a major failure or series of small failures seems inevitable. `World's best practice conditions' failed in 2013. Why will it be different now?"

Submission No I-30 – McGarry

"Unity have been at court and prosecuted for 3 pollution incidents. There is no confidence at all that there will not be another."

Submission No I-46 – Bayley

"This company has a poor history of environmental compliance, being convicted by the Land and Environment Court for three pollution events when the sediment dams failed and large drifts of sediment filled the deep holes of the gorge to about a third of their depth."

Submission No I-57 – Name Withheld

"In the first 6 months of operation, Unity Mining had five environmental breaches, three of which resulted in them being prosecuted and fined. Big Island Mining Pty Ltd was convicted after pleading guilty to three water pollution offences which occurred at the Dargues Gold Mine at Majors Creek in February and March 2013, and was fined almost $200,000. The Land and Environment Court found that while the environmental harm caused by the incidents was

low, practical measures were available to minimise that harm and there appeared to have been a substantial failure to implement these measures. The Court found that the harm was foreseeable and the mine shared culpability with e specialist contractor for the pollution. With such an abysmal track record to date, before any processing is to commence, how can we allow such a company to interfere with our water supply and environment?"

Submission No I-72 – Birk

"Unity has a record of misleading at best and lying at worst about its practices. Toxic waste chemicals resulting from drilling through rock, in work already completed at the mine-site, have been illegally dumped at the Braidwood tip."

Submission No I-157 – Hooker

"The mining company has already had five pollution incidents from this site in six months. They were prosecuted and fined by the NSW Land and Environment Court in three of these cases. Unity cites its good record at the Henty Mine, but that site was constructed by a different company. The Dargues Reef Mine is the first test of their ability to develop a mine. In 2014 Unity Mining was fined by the EPA in Tasmania for spillage at Henty where there was no contingency plan to deal with it. Unity has failed to properly close down and remediate its Bendigo site."

Submission No I-181 – Name Withheld

"As stated in the EA by Corkery and Co. July 2015, inadequate erosion and sediment works in the initial bulk earthworks phase of the project resulted in a failure in 2013, polluting Spring and Majors Creeks three times. Unity was fined a meagre $200,000 by the EPA for its breaches. Enforcement and penalties do not provide enough deterrent to change the mining culture of it being cheaper and easier to breach and pay the fine than to spend money installing failsafe infrastructure."

Submission No I-239 – Ewin

"Unity Mining is a company and Dargues Reef gold mine is an operation which has a track record of failing N.S.W. environmental standards (such as in September 2014 at Major's Creek)."

Submission No I-336 – Name Withheld

The Proponent acknowledges that it failed to adequately manage erosion and sediment controls during the initial stages of the Project and that as a result, sediment-laden water was discharged from the Project Site. This matter has been dealt with by the Land and Environment Court, with the outcome well publicised. The Proponent has previously acknowledged the failures that led to these discharges and has invested significant resources in managing environmental matters within the Project Site since that date.

5.14 SOCIAL IMPACTS

Thirty objections raised the issue of the Project's community impacts, including its social licence to operate, community needs and the existing social setting of the community.

"The original community acceptance of this mine was based on assurances that cyanide would not be used and deposited in the tailings storage facility. To ask to go back on this once-firm commitment is a betrayal to the community, and a relinquishing of the mine's social licence to operate."

Submission No I-169 – Parsons

"I've watched this proposal tear apart the local community already and it is only in the discussion phase! Unity Mining's plans for economic growth in this area do not benefit the local community. We cannot guarantee jobs will go to locals and we can guarantee that property values will plummet around and downstream of the mine. Why should local people who have lived here in excess of thirty years lose what they have worked for, for the benefit of a corporation from far away. I also believe that the mine has the potential to take resources away from the local community. Our community has small and sufficient police, fire and ambulance resources for our needs. How will we cope with, for example, an accident at the mine, or a spill where people are injured? This would take away much needed resources from the town. Will the mine have it's own fire and ambulance crews on site..?"

Submission No I-189 – Baker

"Unity Mining does not have a Social Licence to operate… There is ample evidence that the Miner, Unity Mining has not conducted honest consultation and negotiation with the residents of Majors creek in good faith… Overall, information given to the community by Unity Mining has been inconsistent, conflicting and selective. It is clear that the overwhelming majority of the community do not want the mine to proceed if it is going to use cyanide processing, and without an honest and open consultation with the community about any modifications to the approval previously granted."

Submission No I-291 – Davidson

The Proponent acknowledges the concern that the Proposed Modification has generated, with 330 submissions by way of objection being received from respondents who identify themselves as residing in the local community, downstream of the Project Site, elsewhere in NSW and internationally. However, the Proponent also notes that 61 submissions by way of support of the Proposed Modification have also been received. Section 5.2 provides a brief overview of the issues raised in support.

In relation to the specific issues raised, the Proponent notes that it has amended the Proposed Modification to remove the principal components of concern for the community, namely:

- the use of cyanide within the Project Site:
- placement of leached concentrate tailings into the Tailings Storage Facility; and
- enlargement of the facility.

As a result, the Proponent rejects the assertion that the Project lacks a social licence to operate and that it would provide no benefits for the local community, resulting in unacceptable social impacts.

5.15 TAILINGS STORAGE FACILITY

5.15.1 Introduction

The Proponent notes that the proposed enlargement of the Tailings Storage Facility has been removed from the Proposed Modification. The following subsections describe a range of submissions received in relation to the Proposed Modification as presented in RWC (2015), as well as responses to those aspects of the issues raised that are relevant to the approved design of the facility.

5.15.2 Adequacy of Design

Seventeen objections raised the issue of the adequacy of the Tailings Storage Facility design, including the volume of the facility and its lining and capping specifications, as identified in the following extracts.

The GHD report engaged by ESC has shown that the proposed TSF in Mod 3 is in fact an entirely different type of tailings dam and liner to the one originally approved, presenting significantly higher hazard over a longer period of time.

Submission No I-239 – Ewin

"Beck (GHD, 2015) found the report "confusing in regard to some critical design elements of the tailings storage facility, particularly in relation (to) the proposed clay liner and cap material specifications". If a professional engineer is confused how is a lay person able to make an objective evaluation?...In a damning comment Beck states that the "tailings storage facility would not be compliant with minimum requirements of a landfill facility that could accept the concentrated tailings waste"

Submission No I-284 – Hayman

"I object to this proposal on the grounds that there is a risk that a tailings dam will not be sufficient to withhold any overflow leakage of toxic substances such as arsenic and other heavy metals that it may attract."

Submission No I-275 – Name Withheld

The Proponent notes that the enlargement of the Tailings Storage Facility has been withdrawn from the Proposed Modification. Notwithstanding this, the Dams Safety Committee of NSW is the relevant agency charged with overseeing construction and operation of prescribed dams in NSW. The Committee has not identified any deficiencies in the design of the approved or previously proposed facilities.

5.15.3 Location of the Facility

Sixty-three objections raised the issue of the adequacy of the Tailings Storage Facility, including the volume of the Facility and its lining and capping specifications, as identified in the following extracts.

"Instead of the heavy metals lead, zinc, cadmium, uranium and other potentially deadly heavy metals being trucked, these heavy metals will sit in a tailings dam on the steep site at the top of the Major's Creek/Deua/Morura (sic) catchment, above Eurobodalla's water supply, and farms and businesses and households."

Submission No I-30 – McGarry

"This modification will allow the heavy metals lead, zinc, cadmium, uranium to sit in a tailings dam on the steep site at the top of the Major's Creek/Deua/Morura (sic) catchment, above Eurobodalla's water supply, and farms and businesses and households. An overflow/cyanide spill from the tailings dam would be deadly to anyone and anything living below the tailing dam. You cannot have a tailing dam built in this location."

Submission No I-57 – Name Withheld

"The EPA has stated that the tailings dam should be moved to a safer location."

Submission No I-150 – Large

"Additionally, the Majors Creek area has a history of sudden, high rainfall events which can break previous records and the positioning of the TSF makes it vulnerable to flood rain....in fact, one engineer has said that the TSF was in the worst possible place it could be if such a rainfall event were to occur."

Submission No I-158 – Wallace-Crabbe

"Recent studies show that cyanide trapped in gold-mine tailings causes persistent release of dangerous metals (e.g. lead) into the groundwater and surface water. This TSF is located in a drainage line where any breach will lead to contaminated water draining into the Majors Creek, Araluen Creek, Deua and Moruya River water systems."

Submission No I-337 – Name Withheld

"This tailings facility is located in a drainage line where any breach will lead to contaminated water draining into the Majors Creek, Araluen Creek, Deua and Moruya River water systems. Downstream water used for drinking or agriculture could become contaminated with dangerous heavy metals."

Submission No I-311 – Goggs

The proponent notes that the location of the Tailings Storage Facility is consistent with that presented in the original application for Project Approval and that the facility will be constructed in accordance with the approved design.

Notwithstanding the above, the Proponent notes that the majority of the objections to the construction of the facility in the approved location related to the use of cyanide and placement of leached concentrate tailings within the facility. These actions no longer form components of the Proposed Modification.

5.15.4 Risk of Failure or Discharge

Eighty-eight objections raised the issue of failure of or discharge from the Tailings Storage Facility, including the risk and consequences of failure or discharge of cyanide or heavy metals.

"If there was any overflow from the proposed tailings dam (a distinct possibility given the failure of the mine's sediment dams in heavy rain events), the consequences would be severe if not fatal."

Submission No I-22 – Faulkne

"I have specific concerns about the tailings dam and the fact that a failure of the proposed system would see real damage to such a clean waterway, not to mention the damage to drinking water supply to Moruya and beyond."

Submission No I-86 – Goddard

"Unity has acknowledged that the TSF may fail and discard the tailings solids as a result of poor construction, or seismic activity in excess of design criteria, or erosion as a result of failure of the emergency spillway . However, these possibilities have not been included in the risk assessment done by the company. These risks are real. In Australia, the Ranger's uranium mine tailings dam has spilled into the Magellan Creek wetlands more than once, and there are many overseas examples of what can go wrong."

Submission No I-108 – Monahan

"I understand that it is not a case of if the tailings dam will fail but when it will fail. Plastic lines cannot last forever!"

Submission No I-139 – Name Withheld

"There was a serious tailings dam breach in Romania in 2000 by an Australian Company where a cyanide spill occurred and a number of accidents in PNG with cyanide and Australian Companies, should this Dargues mine be sold to an overseas company could we suffer these problems?"

Submission No I-154 – Hand

"I can only imagine how the scene would unfold if, god forbid, the dam was to fail. A breach in the dam is noticed, several frantic calls are made to the council who in turn make several more frantic calls as they are passed from person to person until they can find the person in charge of the unfolding drama and more phone calls are made as they try to establish the protocols and on and on it goes. By which time, the spill is well on its way down the mountain and it's all too late."

Submission No I-278 – Huntee

"I am opposed to any process that uses dangerous chemicals which I understand will be held indefinitely in a dam. I am concerned about evaporation into the atmosphere as well as the 'ticking time bomb' effect of the impending failure of the dam."

Submission No I-301 – Annetts

"Little attention has been paid in the EA to the possible impacts to human health and downstream aquatic organisms resulting from a catastrophic failure of the TSF such as a breach of the wall. Unity has acknowledged that the TSF may fail and discard the tailings solids as a result of poor construction, or seismic activity in excess of design criteria, or erosion as a result of failure of the emergency spillway but that these possibilities have not been included in the risk assessment done by the company. Unity merely says that the consequence category of a TSF breach is "significant" and that the design criteria are appropriate for this rating. This is not acceptable. A model of what could happen in a TSF failure needs to be included. The claim by Unity CEO that structures built in Australia do not fail because they are well built is incorrect and basically just ignorant."

Submission No I-328 – Kay

"I would like to know the Proponent's response to Dr Beck's contentions at page 12 of his report to council: "TSF dam failures are estimated at 1 in 1000 probability, which suggests that the risk of the TSF dam at the site failing during the operational life of the mine may be around 1:200 based on industry statistics. Therefore the risk falls into the "could occur" category. The consequence of such a failure could be that several thousand to tens of thousands of tonnes of waste tailings are released into the catchment. As the concentrated tailings are to be co-disposed with the flotation tailings these would be entrained in the tailings mass released into the catchment. As the concentrated tailings are finer than the flotation tailings they would travel further and concentrate at the leading edge deposition. Most tailings dam failures rend to coincide with significant weather events and therefore the failure could occur in a period of active streamflow that would allow the tailings to migrate considerable distances down gradient of the site. This could result in the concentrated waste tailings being collected in a particular part of the catchment impacting aquatic and terrestrial flora and fauna and affect the livelihood and health of the community in the catchments downstream of the site." It is this contention, of "could occur" that is the most serious all made and I would like to know what the Proponent's response to it is."

Submission No I-386 – Cormick

The Proponent notes that the Tailings Storage Facility has been designed and would be constructed in accordance with the requirements of the following guidelines.

- Dams Safety Committee of New South Wales – DSC3A – Consequence Categories for Dams.
- Dams Safety Committee of New South Wales - DSC3F – Tailings Dams.
- Australian National Committee on Large Dams (ANCOLD) – Guidelines on the Consequence Categories for Dams.

As a result, the Proponent contends that the risk of catastrophic failure of the Tailings Storage Facility would be unchanged from the approved Project and would be in line with the above guidelines.

5.15.5 Risk of Leakage

Forty-three objections raised the issue of leakage of the Tailings Storage Facility, including the risk and consequences of leakage, as identified in the following extracts.

"Seepage from Unity Mining's proposed enlarged tailings storage facility that will risk heavy metals i.e. lead, zinc, uranium, arsenic and copper, permanently polluting Majors Creek, Araluen Creek, Deua River and Moruya River."

Submission No I-132 – Searson

"Recent studies show that cyanide trapped in gold-mine tailings causes persistent release of dangerous metals (e.g. lead) into the groundwater and surface water. This TSF is located in a drainage line where any breach will lead to contaminated water draining into the Majors Creek, Araluen Creek, Deua and Moruya River water systems… More information on seepage from the TSF through the liner is required before Unity can dismiss either long term impacts from cyanide use or possible impacts at some distance downstream of the mine."

Submission No I-75 – Name Withheld

"The risk of toxic leaks over centuries from toxins which do not need to be here is belittled, even though the liner of the TSF has a life of 25-350 years according to the manufacturer."

Submission No I-259 – Illfield

"I am a former Director of an Environmental Consulting firm and have significant experience with Tailing Storage Facilities, biological surveys and risk assessments. Clay-lined TSFs are common and are problematic. In my experience, every TSF will leak (sooner or later - typically within 5 - 10 years of construction). It will then release sediments and possibly metals to the environment (via both surface water and groundwater). There are hundreds of TSFs across Australia in this situation right now. In that context, the Proponent's aim to process on-site and build a TSF may potentially create a significant risk to amenity, wildlife, land use and livelihoods."

Submission No I-355 – Name Withheld

There has been no guarantee from any mine owner, or anyone with authority, that leaching and spill over from any tailings dam, existing or in the proposed 'modification', will not occur.

Submission No I-373 – Name Withheld

This issued is addressed in Section 3.7.4.8.

5.16 NOISE IMPACTS

Eleven objections raised the issue of noise impacts of the Proposal, including the impacts of construction, operational and traffic noise, as identified in the following extracts.

"In documents prepared for the Proponent on this subject previously, surface noise measurements were overlaid on old maps of the Creek that showed the original 'paper roads', and therefore gave a potentially misleading representation of where mine noise would be of most nuisance. It must also be emphasised that the transmission of noise and vibration through sub surface strata of varying density and elasticity is complex and difficult to predict. For this reason it is no coincidence that several residents on the line of major former mine workings have experienced noise and vibration nuisance despite their distance from the mine site, which has not adequately been acknowledged. It is also important to recognise that noise nuisance has a subjective component, evidenced by the irritation caused by a dripping tap at night. In this context acceptable urban noise levels should not be applied at the Creek, where at night in particular there is extremely low noise background. This observation is not novel, and is recognised in basic acoustics work. In relation to the crusher there has I believe been work on active silencing, which is particularly suitable where noise signatures are relatively constant."

Submission No I-279 – Sanderson

"I believe that my life will be effected adversely by the noise of the proposed mine operations. One reason I live here is for the quiet. Crushing machinery, blasting, truck movements and the constant hum of industry will be noise pollution and will be relentless."

Submission No I-310 – Lee

The Proponent acknowledges that perceived impacts associated with noise, particularly night-time noise are subjective and emissions that one person would find acceptable may be unacceptable to others. Notwithstanding this, the Proponent notes that Section 4.2.5 of RWC (2015) identifies that the Proposed Modification would result in negligible changes in noise emissions compared with the approved Project during night-time construction and operational stages of the Project. Minor increases of between 1dB(A) and 2dB(A) are expected at four of the residences assessed, however, the anticipated noise emissions would be less than the noise assessment criterion of 35dB(A).

In addition, the Proponent notes that the procedures described in the approved *Noise Management Plan* would continue to operate. These would include, but not be limited to the following.

- Enclosing the primary and secondary crusher within a building engineered to achieve a minimum 12dB noise reduction.

- Regular and effective maintenance of all equipment.
- Maintain an open dialogue with the surrounding community and neighbours to ensure any concerns over noise or vibration are addressed.
- Undertake attended noise monitoring quarterly following the recommencement of onsite operations and make the results of the monitoring publicly available.
- Undertake continuous unattended monitoring following the recommencement of onsite operations to enable noise emissions to be actively managed.
- Investigate any exceedances of the noise assessment criteria and implement management measures to prevent a recurrence of the exceedance.

5.17 VISUAL IMPACTS

Four objections raised the issue of visual impacts of the Proposal, including the visual impacts of above-ground infrastructure and light pollution impacts as identified in the following extracts.

"In reference to "visual amenity", 4.11 page 140 of the Environmental Assessment Modification 3, 2.10.4 on page 85 states that two alternative locations for the proposed waste rock emplacement were rejected as they "are in direct line of sight of the village of Majors Creek" and they "would result in adverse visual amenity". Our home is residence R108, figure 20, page 141. It is one of the closest houses to the proposed mine site. The proposed eastern rock emplacement and larger tailings dam will be clearly visible from our house. However, no sight lines from our house have been included in figure 20, nor any mention made of adverse visual impacts on us by the proposal. The statement in 4.11.3 that "the additional impacts would be negligible, if indeed they can be viewed at all" is totally incorrect. Verbal agreement by Unity Mining to supply trees to us to screen the site indicates tacit agreement that the proposed modifications will have an adverse effect on us."

Submission No I-373 – Spring

The impact of night time light pollution due to 24 hour mining activity on the local community appears to have been dismissed as a consideration.

Submission No I-268 – Lemin

Section 4.11.3 of RWC (2015) states that that section provides an update of the visual amenity assessment presented in RWC (2010a). For consistency, visual amenity sections presented in that document were updated and revised versions presented in RWC (2015).

The Proponent acknowledges submission of Mr and Mrs Spring and the fact that Residence 108 will have views of the processing plant and, possibly the Waste Rock Emplacement. This issue was acknowledged in Section 3.2.6 of the *Response to Submissions* for the original application (RWC, 2010b). In light of the above, the Proponent reiterates the commitment made in that document and in Commitment 12.6 of the Statement of Commitments as follows.

> "Consider any reasonable request by a potentially affected resident for assistance to create a visual screen adjacent to their residence through planting of fast growing vegetation and/or landscaping where such a screen would effectively reduce the visual impact of the Proponent's activities during the life of the Project."

In relation to visual impacts associated with night-time operations, the Proponent notes that the Proposed Modification would not result in changes to night-time operations, with the exception of one to two haul truck movements per hour on the proposed Eastern Waste Rock Emplacement rather than on the approved Temporary Waste Rock Emplacement and ROM Pad. The Proponent contends that this would result in a negligible change to the night-time visual amenity of the Project Site because the Eastern Waste Rock Emplacement is located in a valley and is less visible than the approved Temporary Waste Rock Emplacement and ROM Pad.

5.18 HUMAN HEALTH IMPACTS

Fifty-eight objections raised the issue of impacts on human health, including impacts from contaminated water, soil and air.

"The Deua River Rivercare Group has been working over the last 10 years to improve water quality and the aquatic environment of the Deua River. The river water is used to provide part of the Shire water supply. Heavy metal contamination has a long term impact on human health and to risk any pollution of a municipal water supply is foolhardy."

Submission No I-9 – Bain

"Many small spills of heavy metal from the ore may pollute the Deua and Moruya river systems for generations. Do not risk our farm health and children's health with such a dangerous proposal."

Submission No I-123 – Sullivan

"I believe it is reasonable to expect that our drinking water is kept safe and not so threatened; it is reasonable that food growing in the area below the mine be kept safe; and reasonable to protect the health and livelihoods of local people. I advocate putting these well beings above additional profits for the mine. Projects such as this mine when willing to undertake practices that risk damage to others need to be held accountable for possible 'unseen' costs to health and wellbeing."

Submission No I-162 – Brunskill

"My company currently produces around $30000 worth of chemical-free food annually with plans to expand with the acquisition of what is prime growing land. This quality of soil is the same on many agricultural businesses which are based on the river. If the river is poisoned, that will lead to food being poisoned, and eventually our customers. A rather daunting proposition really, don't you think? This could lead to potentially mutant humans. Could Unity Mining confirm this is not going to happen? This obviously doesn't even consider the prospect of people becoming sick and contaminated from simply swimming in the river, let alone the effect it will have on the flora and fauna which habituate the valley."

Submission No I-193 – Gribble

"Heavy metal poisoning is a real threat. Heavy metal poisoning is something that can and does occur. I personally am a witness to that. My son has suffered years of debilitating illness as a result of heavy metal poisoning. We have no idea where and how he was exposed to this. I would like to express my extreme concern about any possibility of this ever happening to another person, let alone many people being exposed to potential poisoning through water, soil or agriculture."

Submission No I-233 – Bird

"Potential health issues impacting on the residents of Majors Creek and surrounds including respiratory problems from dust and the sulphuric smell that is emitted from cyanide. Hearing problems from the constant noise of blasting and crushing of ore. Nervous system problems associated with cyanide exposure."

Submission No I-377 – Harrison

Submissions relating to human health impacts are primarily related to the following issues which have been addressed elsewhere in this document.

- Drinking water-related impacts (see Section 3.7.2).
- Contamination of agricultural products or land (see Section 5.9.3).
- Discharge of cyanide (see Section 5.8.5).
- Discharge of heavy metals (see Section 3.6.4.6).
- Particulate, gaseous and odour-related impacts (see Section 3.6.4.8).
- Noise-related impacts (see Sections 5.16).

5.19 TRAFFIC IMPACTS

Fourteen objections raised the issue of the traffic impacts of the Proposal, including increased traffic movements and degradation of roads, as identified in the following extracts.

"I am concerned about road safety on the Braidwood to Majors creek road, some upgrading and widening work has been done but many parts of the road are narrow and in poor condition and an increase in traffic of large trucks mining equipment employees & support services will increase the risk of accident, The road cannot support this type of traffic increase safely, I had

the disturbing experience of nearly being run of the road by two mine associated vehicles in the past, I am extremely distressed at the thought of anyone, especially a local community member being killed or injured because of inadequate and poorly considered infrastructure."

Submission No I-84 – Rothwell

"A processing plant would encourage existing and new mining developments in NSW and beyond bringing increased traffic on our inadequate road systems."

Submission No I-247 – Tozer

The Proposed Modification as amended would not result in a change in the approved traffic-related impacts associated with the Project.

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