



Queensland Government

**Environmental Protection Agency
Queensland Parks and Wildlife Service**

Assessment Report under the
Environmental Protection Act 1994

on the

Environmental Impact Statement

for the

Watershed Project

proposed by

Vital Metals Pty Limited

January 2009

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1. Introduction

This report provides an evaluation of the environmental impact statement (EIS) process pursuant to Chapter 3 of the *Environmental Protection Act 1994* (EP Act) for the Watershed Project proposed by Vital Metals Ltd (the proponent). The Environmental Protection Agency (EPA) as the administering authority of the EP Act coordinated the EIS process. This assessment report has been prepared pursuant to Sections 58 and 59 of the EP Act.

The objective of this assessment report is to:

- (a) address the adequacy of the environmental impact statement and the environmental management plan;
- (b) summarise key issues associated with the potential adverse and beneficial environmental, economic and social impacts of the Watershed Project and the management, monitoring, planning and other measures proposed to minimise any adverse environmental impacts of the project; and
- (c) make recommendations on the suitability of the project to proceed and where so, to make recommendations on necessary conditions for any approval required for the project.

Section 58 of the EP Act lists the criteria that the EPA must consider when preparing an EIS assessment report, while section 59 of the Act states what the content must be. In summary, this assessment report addresses the adequacy of the EIS in addressing the final terms of reference (TOR), the suitability of the draft environmental management plan (EM plan) and other prescribed matters.

This report provides a summary and assessment of the key issues identified through the EIS process, and discusses in greater detail those issues of particular concern that were either not resolved or required specific conditions for the project to proceed.

Delivery of this EIS assessment report to the proponent completes the EIS process under the EP Act.

1.1 Project details

Vital Metals Limited proposes to develop a tungsten resource at the Watershed deposit approximately 23km north-west of Mt Carbine on the boundary between Cook and Marbeeba Shires in north Queensland.

The project would be undertaken on MLA20535, MLA20536, MLA20537, MLA20538, MLA20567, MLA20566, and MLA20576 covering some 1,904ha.

The project site is located on a ridge which forms the watershed between the Palmer River and Mitchell River systems, both of which drain into the Gulf of Carpentaria. The site comprises moderately rugged north-south striking ridges interspersed with prominent mountains and tablelands over granite exposures. Elevation ranges from 550m to 800m above sea level.

There was previous exploration work carried out at the site (including drilling) by the Utah Development Company between 1978 and 1984. This resulted in an inferred resource estimate of 13.9 million tonnes of mineralisation (sheelite) at an average grade of 0.35% of tungsten trioxide (WO₃) for a contained WO₃ content of 48,680 tonnes. Vital Metals acquired the project in 2005 and commenced detailed resource drilling and assessment. In 2007, Vital Metals confirmed indicated and inferred resources of 21.76Mt at a grade of 0.26% WO₃.

The project, as initially proposed in December 2006, involved mining ore above a cut-off grade of 0.1% WO₃ with an expected extraction rate of 1.3Mt to 1.8Mt a year of sheelite bearing material which would produce 6,667t a year of concentrate over a mine life of 10 years. In August 2008 the proponent announced a reduction in the mining and processing rate to 450,000t a year producing 1,540t a year of concentrate containing 65% WO₃. As a result, the projected area of disturbance on the mine site has been reduced from 172.7ha to 120.5ha.

Development of the Watershed tungsten deposit would be by conventional, metalliferous, open-cut mine using diesel powered equipment, mining sheelite ore with a waste to ore ratio of approximately five to one. The open cut would extend to approximately 120m deep. Waste rock would be placed in out of pit landforms on the western side of the deposit.

Processing of the mined material on site would include:

- primary, secondary and tertiary crushing;
- possible use of X-Ray ore sorting;
- size classification by means of screens and cyclones;
- gravity recovery (spirals, in-line pressure jigs and Wilfley tables);
- re-grind of the fines; and
- flotation of the fines.

Water requirements include 350ML per annum for the processing plant and for dust suppression as well as 4ML per annum for the accommodation village. Water would be primarily sourced from a dam (up to 850ML capacity) constructed on the western side of the deposit and supplemented by bores.

It is anticipated that concentrates would be exported. The concentrate would be packaged and hauled to Brisbane by road for despatch.

On-site purpose built accommodation would be provided for the project workforce.

The project site is currently used for low intensity cattle grazing.

Major infrastructure that would be developed for the project includes an accommodation village for up to 50 personnel, a processing plant, workshops and offices, haul roads including a new intersection from the Peninsula Development Road, telecommunications infrastructure, a tailings/waste rock storage facility and a fresh water supply dam.

1.2 Approvals

The following approvals are required for the Watershed Project:

Approval	Legislation (Administering Authority)
Environmental authority (mining activities)	<i>Environmental Protection Act 1994 (EPA)</i>
Interfering with listed flora and fauna species	<i>Nature Conservation Act 1992(EPA)</i>
Waterway barrier works (dam, creek crossings)	<i>Fisheries Act 1994(DPI&F)</i>
Clearing vegetation in watercourses (Riverine Protection Permit)	<i>Water Act 2000 (NRW)</i>
Referrable dam approval	<i>Water Act 2000 (NRW)</i>
Access works to State controlled roads (Peninsula Developmental Road)	<i>Transport Infrastructure Act 1994 (Main Roads)</i>

1.3 Impact assessment process

1.3.1 The EIS process

The EIS for the Watershed Project was conducted under Chapter 3 of the EP Act. The EIS process was initiated by Vital Metals Limited on 11 December 2006 by application to the EPA to prepare a voluntary EIS under section 70 of the EP Act. The EPA approved the application to undertake a Voluntary EIS on 18 December 2006.

The EPA issued a notice of publication of the draft TOR to Vital Metals on 27 March 2007. The EPA placed a public notice on the EPA's website and in the The Courier-Mail on 29 March 2007 and the Mareeba Tablelands Advertiser newspaper on 4 April 2007. The draft TOR was available for public comment from 2 April to 17 May 2007. Vital Metals issued copies of the public notice to affected and interested persons.

Eight submissions were received by the EPA on the draft TOR within the public comment period. These submissions, together with one from the EPA, were forwarded to Vital Metals on 30 May 2007 to which Vital Metals responded on 6 June 2007. The EPA considered all submissions received on the draft TOR and Vital Metals' responses prior to issuing the final TOR on 26 June 2007.

Vital Metals submitted the draft EIS on 22 January 2008 to the EPA for review prior to public notification. The EPA compared the draft EIS to the final TOR and at the request of Vital Metals, extended the decision period on the draft EIS to 18 February 2008 to allow for changes to be made to the submitted EIS. On 25 February 2008 the EPA issued to Vital Metals a notice of decision to proceed with the amended draft EIS. The public notification and submission period was set at the minimum 30 business days.

A public notice was placed on the EPA's website and advertised in The Courier Mail and the Cairns Post on 1 March 2008. The draft EIS was available for public comment from 3 March to 15 April 2008. Vital Metals also issued copies of the public notice to affected and interested persons.

Nine submissions were received by the EPA on the draft EIS within the submission period. Submissions were received from six State government departments and agencies, two from non-government organisations and submission from a member of the public (an affected person). These submissions, together with a submission from the EPA were forwarded to Vital Metals for consideration and response on 30 April 2008. The period for the proponent to submit a response to the comments on the EIS was extended on 28 May 2008 to the 30 September 2008.

Due to the responses provided on the EIS, Vital Metals revised the layout of the mine site which involved relocation of the tailings storage facility to the eastern side of the deposit and using the waste rock dumps to form the tailing storage facility. Information on this change was circulated on 4 July 2008 to key advisory bodies and the affected persons for comment. Comments were received from four agencies and these were forwarded to Vital Metals on 29 July 2008 for consideration in preparing the Supplementary Information Report (SIR).

Vital Metals submitted a response to submissions in a Supplementary Information Report (SIR) to the EPA on 29 August 2008 and a Notice of Amendment of Environmental Impact Statement. The report also described a major downscaling of the project. A revised environmental management plan was submitted on 9 September 2008.

On 2 September 2008, copies of the SIR were issued for review to members of the advisory body who made a submission on the draft EIS. Subsequently, on 9 September 2008, the revised environmental management plan (Attachment D) were issued to the respondents.

Five responses were received on the SIR. Two responses requested further information or clarification of issues addressed in the supplementary report. As a result a request for further information was issued. This also meant that the time for completion of the assessment report was extended to 11 November 2008. Vital Metals provided the requested information (the Information Request Response) on 28 October 2008. Two additional requests for information were issued on 11 November 2008 and 9 December 2008 extending the date for finalising the assessment report to 14 January 2009. Responses to these requests were received on 17 November 2008 and 18 December 2008.

A notice of the decision to allow the submitted EIS to proceed was issued on 14 January 2009.

The EPA, in the preparation of this EIS assessment report, considered submissions and comments from members of the advisory body and other interested parties made at all stages of the EIS process. This EIS assessment report will be available on the EPA's website (www.epa.qld.gov.au).

1.3.2 Consultation program

Public consultation

In addition to the statutory requirements for public notification of the TOR and draft EIS and identification of interested and affected parties, Vital Metals consulted with the Mareeba Shire Council, local organisations, and indigenous interests concerning the project.

Advisory Body

The EPA invited the following organisations to assist in the assessment of the TOR and EIS by participating as members of the advisory body for the Watershed Project:

- Department of Mines and Energy (DME());
- Department of Communities;
- Department of Emergency Services;
- Department of Housing;
- Department of Local Government, Sport and Recreation*;
- Department of Main Roads (DMR);
- Department of Natural Resources and Water (DNRW);
- Department of Primary Industries and Fisheries (DPIF);
- Queensland Treasury;
- Queensland Police Service;
- Department of Aboriginal and Torres Strait Islander Policy;
- Western Yalowie Coroporation;
- Mareeba Shire Council;
- Cook Shire Council;
- Mitchell River Watershed Management Group;
- Queensland Health;
- Queensland Transport; and
- Department of Infrastructure and Planning*.

* Previously the Department of Local Government, Planning, Sport and Recreation and the Department of Infrastructure, respectively.

Public notification

In accordance with the statutory requirements, advertisements were placed in The Courier-Mail and the Mareeba Tablelands Advertiser to notify the availability of the draft TOR and EIS for review and public comment as stated in Section 1.3.1 above. In addition, notices advising the availability of the draft TOR and the EIS for public comment were displayed on the EPA website.

The draft TOR and draft EIS were placed on public display at the following locations during their respective public notification/submission periods:

- EPA website (draft TOR and Initial Advice Statement only);
- Customer Service Centre, EPA Central Office, Brisbane;
- EPA District Office, Cairns;
- Mt Carbine Hotel/Motel;
- Mareeba Shire Council Library; and
- Environmental Licensing Professionals Pty Ltd, Brisbane.

Copies of the draft EIS were available for purchase from Vital Metals and Environmental Licensing Professionals Pty Ltd.

Site visit

An advisory body briefing and site visit was held on 22 April 2008 following the public notification period for the draft EIS.

1.3.3 Environment Protection and Biodiversity Conservation Act 1999

The Watershed Project was referred by Vital Metals in December 2006 to the (then) Commonwealth Department of Environment and Heritage (DEH) for consideration under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). In February 2007, the Department of Environment, Water, Heritage and the Arts (DEWHA) decided that the project was not a controlled action provided it was undertaken in a specified manner. Five conditions were stated concerning the management of impact on the Northern Quoll, Cooktown Orchids and *Corymbia rhodops*. These management requirements will need to be integrated into the project's draft environmental management plan.

2. Matters considered in the EIS assessment report

Section 58 of the EP Act requires, when preparing this EIS assessment report, the consideration of the following matters:

- (a) the final TOR for the EIS;
- (b) the submitted EIS (including the SIR);
- (c) all properly made submissions and any other submissions accepted by the chief executive;
- (d) the standard criteria;
- (e) another matter prescribed under a regulation.

These matters are addressed in the following subsections.

2.1 The final TOR

The final TOR document, issued on 26 June 2007, was considered when preparing this EIS assessment report. While the TOR were written to include all the major issues associated with the project that were required to be addressed in the EIS, they were not exhaustive, nor were they to be interpreted as excluding all other matters from consideration. The TOR stated that if significant matters arose during the course of preparation of the EIS that were not incorporated in the TOR (e.g. currently unforeseen issues that emerge as important or significant from environmental studies) then these issues should also be fully addressed in the EIS.

Where matters outside of those listed in the final TOR were addressed in the EIS, those matters have been considered when preparing this EIS assessment report.

2.2 The submitted EIS

The “submitted EIS” was considered when preparing this EIS assessment report. The “submitted EIS” comprised the:

- (i) draft EIS that was publicly released on 1 March 2008;
- (ii) the proponent’s response to submissions report (Supplementary Information Report and revised EMP) received by the EPA on 9 September 2008 that was provided to relevant advisory body members; and
- (iii) the Information Request Response received by the EPA on 28 October 2008. This response addressed several issues arising from the Supplementary Report that were raised by advisory body members.
- (iv) Two further responses to information requests received on 17 November 2008 and the 18 December 2008.

2.3 Properly made submissions

Ten submissions (including a submission by the EPA) were received on the submitted EIS. Five submissions (including a submission by the EPA) were received on the submitted Supplementary Information Report. All were properly made and all were considered when preparing this EIS assessment report.

2.4 The standard criteria

Section 58 of the EP Act requires that, among other matters, the standard criteria listed in Schedule 3 of the EP Act must be considered when preparing the EIS assessment report. The standard criteria are:

- (a) *the principles of ecologically sustainable development as set out in the National Strategy for Ecologically Sustainable Development;*
- (b) *any applicable environmental protection policy;*
- (c) *any applicable Commonwealth, State or local government plans, standards, agreements or requirements;*
- (d) *any applicable environmental impact study, assessment or report;*
- (e) *the character, resilience and values of the receiving environment;*
- (f) *all submissions made by the applicant and submitters;*
- (g) *the best practice environmental management for activities under any relevant instrument, or proposed instrument, as follows—*
 - (i) *an environmental authority;*

- (ii) *an environmental management program;*
 - (iii) *an environmental protection order;*
 - (iv) *a disposal permit;*
- (h) *the financial implications of the requirements under an instrument, or proposed instrument, mentioned in paragraph (g) as they would relate to the type of activity or industry carried out, or proposed to be carried out, under the instrument;*
- (i) *the public interest;*
- (j) *any applicable site management plan;*
- (k) *any relevant integrated environmental management system or proposed integrated environmental management system;*
- (l) *any other matter prescribed under a regulation.*

The EPA has considered the standard criteria when assessing the project. With regard to criterion (l), there was no other matter prescribed under a regulation that required consideration.

3. Adequacy of the EIS in addressing the TOR

The submitted EIS adequately addressed the final TOR. A revised EM plan was submitted with the SIR and that has also been assessed. This section of the EIS assessment report discusses aspects of the proposal that were subject to particular attention. Where appropriate, recommendations are made regarding changes to the project or conditions that should be applied should the project proceed.

3.1 Waste rock management

The deposit sits under a watershed, which is drained on the western side by Desailly Creek then to the Mitchell River while the eastern side is drained by Prospect Creek and then to the Palmer River. Both rivers ultimately discharge to the Gulf of Carpentaria.

The project, as originally proposed in the draft EIS, included a large fresh water dam on a gully to the western side of the deposit and two waste rock dumps on the eastern side of the deposit. A feature of this proposal was that the dam in the Desailly Creek catchment was to be used not only for water storage but also for the disposal of tailings under the water. This facility was to have a total capacity of over 16 million m³ (5 million m³ design storage allowance – plus 10% for climate change and 10 million m³ tailings) and an embankment 65m high.

Waste rock dumps were to be located on the eastern side in the Prospect Creek catchment with small environmental dams down-slope to collect seepage. In the original design of the waste rock dumps, consideration was given to separately storing reject low grade ore material in the northern dump for possible future re-processing and to keep this material separate as it is likely to have higher sulfide content.

Following comments on the mine design in the draft EIS, the tailings facility was re-designed to separate it from the water storage dam and re-locate it in the Prospect Creek catchment. In the new design, the waste rock dumps would be used to form the containment walls of the tailings storage facility. The revised layout and design was fully described in the SIR. The size of the mining operation was also downsized resulting in a significant reduction in the size of the waste rock dumps and tailings storage facility.

In the latest mine plan, materials that will be placed in the waste rock dumps include interburden and overburden that has an acid rock drainage (ARD) classification of non-acid forming (NAF) and waste rock from the ore sorter with an ARD classification of NAF (80%) or uncertain non-acid forming (UC-NAF) (20%). Testing done to date indicates that the waste rock dump will not need to receive material having an ADR classification of Potentially Acid Forming (PAF). However, during mining, material to be placed in the waste rock dumps will be tested, particularly that from the ore sorter, and should any possible acid forming material be found it will be selectively managed by encapsulation in an engineered 'cell' within the waste rock dump.

Concerns were raised by the DME that the revised, single waste rock dump layout did not provide for the selective storage of low grade ore for future processing. However, the revised and downscaled project involves the processing of ore to a lower grade than was proposed in the draft EIS, which removes the need to selectively store low grade ore.

The waste rock was also assessed for the potential to release heavy metals. Materials to be placed in the waste rock dumps will come from a range of rock types (including arenite, shale, very low grade ore, as well as

silica and albite altered material), which have differing metal content and acid forming capacities (although all are low in sulfur). The EIS provided analysis of the waste rock for potential release through leaching of contaminants, which showed that the low grade silica-albite altered arenite/conglomerate had arsenic (9 samples) and copper (1 sample) levels above the Environmental Investigation Levels (EIL) of the National Environmental Pollution Monitoring level but not above the hazardous waste level. Further analysis reported in the SIR of waste rock (95 samples) that is likely to come from the ore sorter confirmed the results reported in the draft EIS.

The results of leachate testing indicated that copper levels would not exceed EIL and hence no further test work or special management requirements for copper were justified. However, acid, neutral and alkaline leachate testing for arsenic of the various ore sorter waste rock types indicated that levels of arsenic in neutral leachate will exceed EIL levels for all rock types while some rock types may also generate arsenic levels in acid and alkaline leachate above EIL levels.

This assessment agrees with the conclusion made in the draft EIS that the waste rock dump could contain arsenic at levels exceeding the EIL but lower than the levels considered hazardous. Hence, leachate from the waste rock dumps will need to be managed through monitoring and collection. However, no estimates were provided on the possible quantity of leachate from the waste rock dumps.

The SIR based the design parameters for the size of the environmental dams on surface runoff from disturbed areas at a rate of 150m³ per hectare of disturbance resulting in a required capacity of 10,000m³. Further, mention was made in the SIR of the possible treatment and release of leachate collected from the waste rock dump. However, no techniques for treatment were proposed.

The proposed rehabilitation methods included capping with NAF material at post mining slopes of up to 40%. However, undisturbed land slopes in the area are only up to 33%. Consequently, the unconsolidated material of the waste rock dumps would make 40% slopes somewhat prone to erosion. The proposal to reduce or exclude cattle from these areas may assist in retaining vegetation and stabilising the slopes. However, no data has been provided to indicate that the proposed 40% slopes will be stable or that erosion can be controlled to acceptable levels.

Assessment: The EIS adequately addressed matters related to waste rock management except in relation to:

- the collection and treatment of leachate from the waste rock dump;
- the testing and selective handling of any material with acid forming potential;
- the design of an encapsulation cell for the storage of any material with acid forming potential;
- the gradient of batter slopes;
- whether the proposed rehabilitated final landform of the waste rock dumps will achieve the required performance criteria including minimisation of post-closure maintenance and the management of surface water runoff.

In relation to those matters some additional information and environmental management commitments will be needed in a revised EM plan.

3.2 Tailings Storage Facility

As noted above, the draft EIS proposed a large tailings storage facility with an approximate capacity of 16 million m³ in the upper catchment of Diesally Creek (Mitchell River catchment) which was to also be part of the water supply to the ore processing plant.

Submissions on the draft EIS raised concerns with this proposal including:

1. The storage of tailings in a valley is not considered good practice because of the existing drainage pattern provides a mechanism for the long-term erosion and eventual failure of the storage and the movement of tailings downstream.
2. The tailings storage would have a substantial catchment (450ha) and would contain water for extended periods, which would not allow the tailings to dry out. Also, the water would promote leaching of the tailings.
3. No figures were given in the EIS regarding site efficiency (the volume of tailings disposed of per square meter of disturbance) but it could be expected to be low in a tapering valley storage.

4. As the surface of the tailings storage facility would be some 95ha when full, and there is little clay material available on the site, capping the facility would have been difficult. Also, there is little topsoil on the site and up to 20,000 m³ would have been needed to stabilise the cap of the facility.

In response to these concerns, the proponent changed the layout of the mine site. In summary, these changes were:

- a) the tailings storage facility would be relocated to the to the uppermost section of Prospect Creek (Palmer River catchment);
- b) the southern face of the waste rock dump would form the embankment for the tailings storage facility; and
- c) the waste rock would be placed in one mound and not separated into a north and south dump.

Subsequently, in July 2008, the proposed size of the tailings storage facility was reduced by 50% due to a down scaling of the project.

Management intent is to minimise the amount of seepage that occurs through the tailings, and as the waste rock dump forms the embankment, the management of seepage and leachate from both tailings and waste rock is intimately linked. Any seepage from the tailings and the waste rock dump will be captured by under drains and collected in environmental control dams downstream. During mining, it is proposed to either treat the collected leachate or pump it back to the processing plant for re-use.

While the characteristics of the tailings that will be placed in the facility have been adequately described, as has the quality of the tailing liquor (or decant water), the quantity of leachate from this material has not been described. The EIS predicted a net input into the tailings storage facility of 777,000m³ of process water and surface runoff yet the water balance provided no estimate of the quantity of leachate that could be collected in the environmental dam.

The SIR predicted that the decant water will seep into the tailings and ultimately drain to the environmental dam. However, in the groundwater report¹, statements are made that the finer fraction tailings (<150µm) will accumulate on the geofabric between the tailings and the waste rock dump as well as in fissures and other possible paths for movement to groundwater. If this is the case, is it possible that this fine fraction in the tailings will also reduce the permeability of the tailings. However, the proponent considered that as the tailings will consist of coarse spirals (>150µm and <600µm) and finer flotation tails in a ratio of 1.5:1, it will behave as a free draining product. Hence, while the beaching method of tailings disposal will encourage evaporation and the overland flow of water deposited with the tailings to a decant pond in the south-west corner of the tailings dam, some infiltration and drainage from the tailings is likely.

A decant pond on the surface of the tailings facility will collect process water deposited with the tailings and runoff. In the absence of any other process water storage facility DME and EPA were concerned that the decant pond would act as the main storage for process water. Water in the decant water pond could exacerbate the quantity of leachate generated from the facility and extend the period required post mining for the collection of leachate. In response to this concern, the Information Request Response (October 2008) described a process water storage pond to be constructed adjacent to the processing plant. It is intended that the extent of the decant pond would be minimised by pumping of excess water to this process water storage facility. It was also stated that the method of disposal of the tailings by beaching would maximise evaporation. This would minimise the quantity of water reporting to the decant pond. The capping to be applied to the tailings storage facility post mining is discussed in Section 3.5. It is intended that the cap would prevent infiltration and reduce the production of leachate.

DME and EPA are satisfied that the proposed management of the decant pond in combination with the process water storage pond will be adequate to minimise the potential production of leachate from the tailings facility. This assessment considers that there is likely to be some leachate from the tailings and that this leachate would not be suitable for discharge directly to the environment and would require collection and management.

Assessment: The EIS adequately addressed matters related to the management of tailings except that the EM plan should be modified to address the process water pond.

¹ SIR Appendix 4 Assessment of Hydrogeological Regime August 2008 Rob Lait and Associates.

3.3 Combined management of the leachate/seepage from the tailings storage facility and waste rock dump

The design of the tailings storage facility and the waste rock dumps described in the EIS Project Amendment Report provides an underdrainage layer of NAF material to allow leachate to drain and be collected in the environmental dam. As it appears that the existing material that would underlie the tailings storage facility and waste rock dump is relatively impervious, it was argued that a barrier to prevent infiltration is not required. Sufficient information has been provided to support this approach although a groundwater monitoring program will be required to monitor the quality and quantity of groundwater downstream of the facility

Commitments were made to on-going testing of reject and waste material reporting to the waste rock dump as well as tailings, and that if any material is identified as potential acid forming, it will be managed by isolation within an engineered cell within the waste rock dump.

However, the proposal of the northern waste rock dump as the preferred site for disposal of potential acid forming material and the lack of results on the leachate testing of the tailings, raised concerns that in the revised design of the tailing storage facility and the waste rock dump, leachate from potential acid forming material would contaminate other non-acidic leachate in the environmental dam. This concern was raised with Vital Metals in an information request as well as a suggestion that consideration be given to selectively collecting the leachate to provide for better management, should it be needed. In response, the information request response reiterated that none of the proposed waste material was potential acid forming and of low environmental risk and that a more complex leachate collection system was not warranted.

While details of the quality of the leachate that would ultimately drain to the environmental control dams have not been provided, it is likely that leachate from the waste rock dump would be acidic if any of the material in waste rock dump is potential acid forming and contain elevated levels of arsenic. However, the results of leach testing indicate that levels of arsenic are likely to be below ANZECC 2000 trigger level for hazardous waste and the concentration should be below the level for stock water use.

In summary, the EIS has predicted that the waste rock dump and the tailings storage facility at this site should be regarded as having a low risk for both acid drainage and toxic leachate. However, in case the quality of leachate from either the tailings or waste rock dump is worse than has been predicted, the tailings storage facility and waste rock dump should be designed and constructed such that the leachate from the different waste materials may be drained and collected separately. Proposals for how this could be achieved were provided by the EPA in discussions with the proponent and their consultants.

Assessment: The EIS has adequately addressed the management of leachate and seepage except that the design of the tailings storage facility and waste rock dump should be modified to provide for the separate collection of leachate from benign material and material that could be contaminating. The changes should include:

- installation of a pipe to carry leachate from the tailings under the waste rock dumps to a collection facility;
- installation of a barrier in the NAF material in drainage channels under the waste rocks dumps to isolate drainage from the tailings and the waste rock dumps;
- partitioning of the drainage under the waste rock dump to keep drainage from NAF and any potential acid forming material separate;
- installation of suitable leachate collection and treatment facilities both during and post mining; and
- information that demonstrates both during mining and post mining that:
 - the disposal of the leachate is consistent with the waste hierarchy; and
 - where the leachate is disposed of it will not significantly impact on environmental values.

The modified design should be provided in a revised EM plan.

3.4 Underlying geology of the tailings storage facility and waste rock dumps

The draft EIS proposed that construction of the waste rock dump and tailings storage facility would not require a lining due to the low permeability of the underlying rock. Submissions on the draft EIS requested evidence to support that claim. In response, information was provided that showed that the underlying soils were thin and skeletal and that the underlying rock was competent. The EIS documents indicated that groundwater in the competent rock can only occur and move in fractures, joints and along bedding planes. These features can also be hydraulically disjointed. Information provided on the springs found in the project area concluded that: most of the springs are ephemeral; they are only found in steeply incised gullies; they are high in the topography; and the majority appear to be fed by seepages from the soil profile. Also, information collected from 12 bores on the sites indicated that ground water flows are likely to be to the west of the divide and east of the divide.

As the disposal of the tailings involves beaching and any expressed water from the deposited tailings will flow to the decant pond for evaporation or return to the processing plant, it was argued that the amount of water available to contribute to seepage would be small. As previously noted, no information was provided on the quantity of water likely to contribute to seepage from the waste rock dump. Also, while no information was provided in the EIS documents on the structural geology of the area for the tailings storage facility and waste rock dump, the assertion was made that any seepage from the tailings storage facility and waste rock dump is unlikely to find its way into the groundwater. Nevertheless, a groundwater monitoring program (for both depth and quality) has been installed on the site that would be used to monitor any changes due to the project.

The draft EM plan stated that the underlying geology would be addressed during the detailed design and construction phase. However, without detailed information on the underlying geology, a full assessment cannot be made of the feasibility of the site for the proposed tailings storage facility and waste rock dump.

Assessment: The proponent appears to have data relevant to the structural geology of the tailings storage facility and waste rock dump sites (mention is made in the Information Request Response (October 2008) of over 200 bore holes on the project site although it is unclear how many are in the area proposed for the waste rock dump and tailings storage facility). Consequently, details of the structural geology underlying the tailings storage facility and waste rock dump should be provided in a revised EM plan to assess the feasibility of the proposed sites and that the proposed construction methods are appropriate.

3.5 Post mining landform of the tailings storage facility

The proponent has proposed a ‘retain and release’ capping system for the rehabilitation of the tailings storage facility. Such a capping system would pond water on the top during relatively small rainfall events and allow it discharge over the top when the ponded area is full. Furthermore, the proponent considers that the capping design and performance criteria are detailed design issues that are to be dealt with after the project has been approved.

Both the EPA and DME are not in favour of this approach as without a relatively impervious cap on the tailings, infiltration will continue to occur. This water would eventually percolate through the tailings and become leachate to be collected in the environmental control dams downstream. This collected leachate could be of unsuitable quality to discharge and if so, would require treatment. This is not a feasible long-term outcome for management of the tailings.

The design of the capping system is a matter that needs to be assessed prior to approval and should be addressed in the revised EM plan.

Assessment: The EIS has adequately addressed the management of tailings except that a new proposal for a tailings capping system should be provided and assessed in a revised EMP. Matters that should be addressed in the design of the capping system include:

- minimisation of infiltration into the tailings;
- resistance to erosion over the long term;
- the ability to support adequate revegetation that doesn't compromise the other criteria;
- consideration of the requirement for a capillary boundary layer;

- details of water seepage and runoff including a seepage contingency plan; information, monitoring and procedures that demonstrate that any discharge will not significantly impact on environmental values that are affected; and
- a complete water balance for the proposed tailings storage facility.

3.6 Transport of materials

The proposal involves the use of road transport for the movement of materials to site and the transport of product from the site. Submissions on the draft EIS raised concerns that the full impacts of road compared to rail transport were not fully assessed in the EIS, particularly in relation to generation of green house gasses. The SIR explained that road transport was preferred as it would not require double handling of product, is more flexible, and the relatively small quantity of product to be transported to Brisbane could be handled by only two B-Double trucks a week. The relative greenhouse gas foot prints of rail and road transport was not assessed.

The EIS considered that while the comparison of greenhouse footprint of the alternative transport methods were not assessed, the differences are not likely to be significant given the relatively small quantity of materials being transported.

Assessment: This assessment considers that the matter of transport of materials has been adequately addressed in the EIS documents.

3.7 Air quality

Submissions on the draft EIS raised concerns that projected levels of arsenic likely to be present in the dust from the project (208mg/kg) could result, over time, in an increase in levels of arsenic in soils surrounding the site. The response from the proponent concluded that the level of contamination would be very small particularly when the downsizing of the project is taken into consideration. The proponent provided estimated deposition rates of 0.074mg/kg over the 10 year life of the project while the trigger level for environmental investigation is 20mg/kg. However, the way this concentration level was calculated was simplistic and assumed an even dust coating over 20km² surrounding the site. As the winds are predominately from the north and south-east, dust is more likely to be carried to the south and north-west of the site. Also, some concentration of dust is likely in runoff from these areas. Even so, the total quantity of arsenic that could be involved is relatively small, and the likelihood of the mine elevating arsenic levels in soil remote from the site over its 10 years of operation, is very low.

In terms of possible impacts of dust on human health, predicted levels of dust deposition rates and ground level concentration from the activity are within Environmental Protection (Air) Policy 1997 (EPP(Air)) limits. The proponent has committed to achieving a dust deposition level of 50mg/m²/day at any sensitive sites, which would include the mine's accommodation village. This level is considered acceptable. The modelling also indicates that PM₁₀ levels would be well below the EPP (Air) 24hr average of 50µg/m³ as well as the National Environmental Protection Measures (NEPM) at sensitive sites.

Assessment: The EIS has adequately addressed air quality issues. Provided the dust control methods outlined in the EM plan are applied it is unlikely the project will cause unacceptably high levels of arsenic in soils around the site. It is recommended that the commitments made in the EIS documents for levels of dust deposition be used to develop conditions for the environmental authority for the project.

3.8 Water supply

The latest scope for the project would require 350ML/year of process water and 4ML/year of potable water. While the draft EIS initially indicated that the primary water supply source would be from a bore field on a mining lease, the SIR describes the bore field as a back up or supplementary supply to a large dam (about 8,700ML capacity) at the location of the initially proposed process water/tailings disposal dam.

Advice from DNRW is that the taking of ground water would not be regulated under the Mitchell River Water Resource Plan.

DNRW has inspected the site and determined that the proposed dam would not be on a watercourse, and it would therefore intercept overland flow. The taking of overland flow does not need separate approval under the

Mitchell River Water Resource Plan if the taking is done on a mining lease and the dam is regulated under the environmental authority for the mine. However, the dam structure itself requires separate approval.

The dimensions of the proposed dam and storage, having a 55m high dam wall, 8,750ML capacity and 59ha in area, together with the downstream presence of people and infrastructure, means the dam would be a referable structure requiring approval by DNRW. A failure impact assessment would be required.

The EIS acknowledges that there could be impacts to waterways from the mining activities including changes in hydrology due to the dams on the project site (both clean water and sediment/seepage control dams). Commitments are made in the EIS to monitor not only for water quality on a regular basis, but also the condition of the aquatic ecosystem downstream following key stages of the project, or at least every five years. However, those commitments do not appear in the EM plan.

Assessment: The EIS has adequately addressed water supply issues except that a failure impact assessment would be required if the dam is to be built. The proponent must provide details of the dam structure for inclusion in the environmental authority to satisfy the requirements of the Mitchell River Water Resource Plan.

The EM plan should be amended to include an aquatic ecosystem monitoring program. Details of parameters to be measured, location of sites and frequency of monitoring should be described.

3.9 Void Water

While the proposed area of the final pit void at the cessation of mining was not changed due to the downsizing of the project, the depth of the void would be reduced from 200m to 120m. The quality and quantity of water in the final void and any interaction between the void water and groundwater is a matter that required assessment. According to the EIS it will take up to 50yrs after mining ceases for the water level in the void to stabilise at approximately 100m below the surrounding land surface. As the groundwater level in the vicinity of pit is about 37m, inflow from groundwater is likely and the main loss will be from evaporation. The EIS considered that the void water will not contaminate the groundwater, however no modelling was done on the predicted water quality and quantity in the void. Commitments are made to conduct post mine pit water modelling and post closure water balance although no details were provided.

Assessment: The EIS has adequately addressed final void water issues except that modelling should be undertaken of the proposed pit water quality and quantity. Results of the modelling should be presented in the revised EM plan together with the necessary environmental protection commitments to allow the preparation of suitable conditions in the draft environmental authority.

3.10 Pests

A Pest Management Plan has been provided in the EM plan. Nine goals were identified including the control and prevention of introduction of pest flora and species. While a number of objectives and actions are outlined for each of the goals, the DPIF considered that a key objective should be to prevent the spread of flora pests by vehicles entering and leaving the site.

Assessment: It is recommended that objectives and actions outlined in the EM plan in relation to Goal C be expanded with the inclusion of detailed actions for the control of movement of weeds by vehicles.

3.11 Transport and roads

DMR supports, in principle, the proposed upgrading of the turnoff on the Peninsula Development Road into the mine road. However, DMR is not in a position to provide detailed comments on any proposed road related activities until further information is provided that will allow a full assessment of potential impacts.

The information will be required prior to commencement of use of the mine access so the proponent can obtain approvals under section 62 and section 33 of the *Transport Infrastructure Act 1994*. It is likely such approvals will require the proponent to upgrade the intersection on their proposed access to the Peninsula Developmental Road to mitigate the impacts of heavy vehicle movements. To obtain such approval the following information must be provided:

- Detailed drawings showing the exact location and design of the proposed access including road signage, guide posts, lighting, pavement marking and any road surfacing treatments required. The design must

comply with Main Roads “Planning and Design Manual” and “Manual for Uniform Traffic Control Devices” and be prepared by a qualified RPEQ certified engineer.

- Evidence that the proposed design will mitigate the impacts from the development.
- Approximate timing of any road works and details of how traffic will be managed during these works.

In addition, the proponent’s original traffic impact report provided in July 2008 stated the projects ongoing maintenance contribution to Main Roads on the Peninsula Developmental Road should be \$3.93 per tonne. The Department disagrees with the calculations as it ignores the fact that the network between Mt Molloy and the mine access comprises two sections, Mine Access to Mt Carbine, and Mt Carbine to Mt Molloy. Allowing for this correction the Department considers the contribution should be \$5.59 per tonne. This contribution is to be paid to the Department annually for the previous financial years contributions on 1st September. In addition, this amount is to be indexed annually in line with the Cost Escalation Road Input (CERI).

Assessment: The proponent should provide the information required by DMR to obtain an approval for the upgrade to the intersection of the mine access road and the Peninsula Developmental Road. The rate for the ongoing maintenance contribution would also need to be confirmed with DMR.

4. Adequacy of the EM plan for the project

A draft EM plan was included with the draft EIS that was released for public notification. A number of submissions on the draft EIS raised issues that required amendments to the draft EM plan and many of these amendments were agreed to by the proponent in the SIR. An amended EM plan was submitted with the SIR which took into account the redesign of the project, the downscaling of the project and other matters from submissions in the EIS.

However, the latest EM plan does not yet contain the environmental protection commitments that will be necessary when the additional information required by this EIS assessment report is provided and assessed. Consequently, for the purposes of the statutory requirements the latest EM plan cannot be considered adequate.

Section 191(3) of the EP Act states that an “EM plan assessment report may be included in an EIS assessment report for a project that includes a relevant mining activity”. To assist the proponent’s revision of the EM plan an EM plan assessment report has been attached to this report.

The recommendations outlined in this EIS assessment report and the attached EM plan assessment report should be fully integrated into the EM plan and include auditable commitments that will allow conditions to be developed for the draft environmental authority. The revised EM plan, which must meet the content requirements of s203 of the EP Act, must be resubmitted for assessment before the decision under s207 is made on whether to allow the application to proceed to the draft environmental authority stage.

5. Suitability of the project

Project issues and recommendations were outlined in Section 3 above. The EPA has considered the final TOR, the submitted EIS, all submissions on the submitted EIS, and the standard criteria. Despite some areas where the TOR was not fully addressed, the submitted EIS and supplementary information have not identified impacts of sufficient magnitude to prevent the project from proceeding. However, the recommendations of this EIS assessment report and EM plan assessment report should be fully implemented.

6. Recommendations for conditions for any approval

Section 59 of the EP Act states that this EIS assessment report must recommend any conditions on which any approval required for the project may be given. However, section 202 of the EP Act states it is the purpose of the submitted EM plan to propose environmental protection commitments to help the administering authority prepare the draft environmental authority for the application. As the submitted EM plan is not yet adequate and must be revised and resubmitted, there was insufficient information for this EIS assessment report to be able to

recommend specific conditions. The environmental authority will be drafted after the proponent has submitted a satisfactory EM plan.

Disclaimer:

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7. Approved by

SIGNED

Signature

Stuart Cameron
Director, Assessment
Environmental Services
Environmental Protection Agency

23 JANUARY 2009

Date

Enquiries: EIS Coordinator
Development Assessment Unit
Ph. (07) 3227 6446
Fax. (07) 3227 7720