Submission Cover Sheet

Fingerboards Mineral Sands Project Inquiry and Advisory Committee - EES

358

Request to be heard?: No - but please email me a copy of the Timetable and any Directions

Full Name: Martin Fuller

Organisation: West Gippsland Catchment Management Authority

Affected property:

Attachment 1: West_Gippsland_

Attachment 2: West_Gippsland_

Attachment 3:

Comments: See attached submission

West Gippsland
Catchment Management Authority

WGCMA Ref: WG-F-2017-0139-03
Your Ref: EES The Fingerboards
Date: 28 October 2020

OFFICIAL

Fingerboards Mineral Sands Project Inquiry and Advisory Committee

Dear Members Wimbush, Reifschneider, Gibbs and Ginivan,

Regarding: Fingerboards Mineral Sands Project

Thank you for the opportunity to comment on the Environmental Effects Statement for the Fingerboards Mineral Sands Project ('the Project').

The West Gippsland Catchment Management Authority has reviewed the documentation and makes the following submission for consideration by the Inquiry and Advisory Committee.

The Project is located in the north eastern reaches of the Perry River catchment, partly within the West Gippsland Catchment Management Authority (WGCMA) boundary. The Project area is intercepted by a tributary of Honeysuckle Creek, and the land has recently been used for forestry and grazing purposes.

The Project area extends into the Mitchell River catchment, which is within the jurisdiction of the East Gippsland Catchment Management Authority (EGCMA).

The submission below relates solely to those areas of the Project within the West Gippsland Catchment Management Authority boundary. WGCMA understands that EGCMA will also be preparing a submission for the Inquiry and Advisory Committee.

Perry River catchment 'Chain of ponds'

In 2011, the WGCMA commissioned Alluvium Consulting Pty Ltd (Alluvium) to undertake a geomorphic study and stability assessment of major waterways in the Perry River catchment. The study highlighted that the Perry River and its tributaries are of ecological value and geomorphic significance due to their 'chain of ponds' formation.

The 'chain of ponds' are described as a waterway consisting of irregularly spaced, deep pools separated by a grassy depression or shallow undefined channel.

'Chain of ponds' systems were once common across South-eastern Australia but are now very rare. No fully intact 'chain of ponds' systems are known to currently exist as post-European changes to aquatic habitats have resulted in a loss (or at least significant modification) of these environments.

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The Providence Ponds and Perry River catchment is unique in that the catchment still contains sections of intact ponds as well ponds that are recovering from erosion and incision processes. (*Providence Ponds and Perry River Catchment Strategic Directions Statement 2017, WGCMA*)

The Alluvium report stated that:

2.4 Chain of ponds geomorphic significance
In the 'Guidelines for Protecting Australian Waterways' (Bennet et al. 2002) rarity is recognised as an important criterion in the definition of ecological value. Anything that is uncommon, whether biota, river form or process, is of value in the global bio- or geodiversity context … Rivers with unusual natural water chemistry or hydrology are in many cases distinctive of inland Australia and contribute understanding of the continent's history as well as being of significance for their present day characteristics (Dunn 2000).

Remaining intact reaches of chain of ponds are relatively rare and limited in extent. In this context, the Perry River catchment is unique in that almost the entire catchment has the prerequisite geologic and hydrologic characteristics associated with chain of ponds morphology, and there are multiple reaches with intact chain of ponds morphology.

Protection of remnant pond morphology in the Perry River catchment is important not only for the ecosystem values it provides, but also for the purposes of 'geo-conservation'. The basic goal of geo-conservation is the maintenance of the full range of earth features and processes (e.g. 'geo-diversity') (Rosengren 1984).

The Perry River chain of ponds morphology has since been recognised as a priority environmental value to be maintained in the West Gippsland Regional Catchment Strategy (2012) and West Gippsland Regional Waterway Strategy (2014). The chain of ponds system is also recognised as a key aquatic ecosystem asset in Trust for Nature's 2013 Statewide conservation plan for private land in Victoria.

With $1.6 million funding from the Victorian Government, the WGCMA has been working for the past four years with partner organisations (HVP Plantations, Trust for Nature, Gunaikurnai Land and Waters Aboriginal Corporation, Wellington Shire Council, Landcare), researchers and private landholders on a project that incorporates management recommendations from the Alluvium study and assessment report.

The Perry River is a complex river environmentally, hydrologically, and culturally. The Perry River's traditional name is "Goomballa" meaning "Climbing" which can be descriptive of the system itself. This complex system of ponds would have supported Gunaikurnai people for long periods of time even through drought. This was evidenced by the apparent quality of water in ponds and the number of freshwater mussels that still live in these ponds.

The Gunaikurnai Land and Waters Aboriginal Corporation (GLaWAC) Aboriginal Water Unit and Gunaikurnai community members have indicated to WGCMA that the Perry River catchment is an area of particular significance and GLaWAC is keen to continue to visit the area, record, register and protect Cultural Heritage and to build relationships with landholders.

A spatial inventory and baseline condition assessment of the chain of ponds systems of the Perry River and Providence Ponds catchment was undertaken in 2018 *(Frood et. al.[1])* to further inform and monitor the outcomes of integrated catchment management activities. The results of the condition

[1] '*Inventory and condition assessment of the Chain of Pond systems of the Perry River and Providence Ponds Catchment'*, report to the West Gippsland Catchment Management Authority, December 2018, by Doug Frood, Claire McCall and Alison Oates.

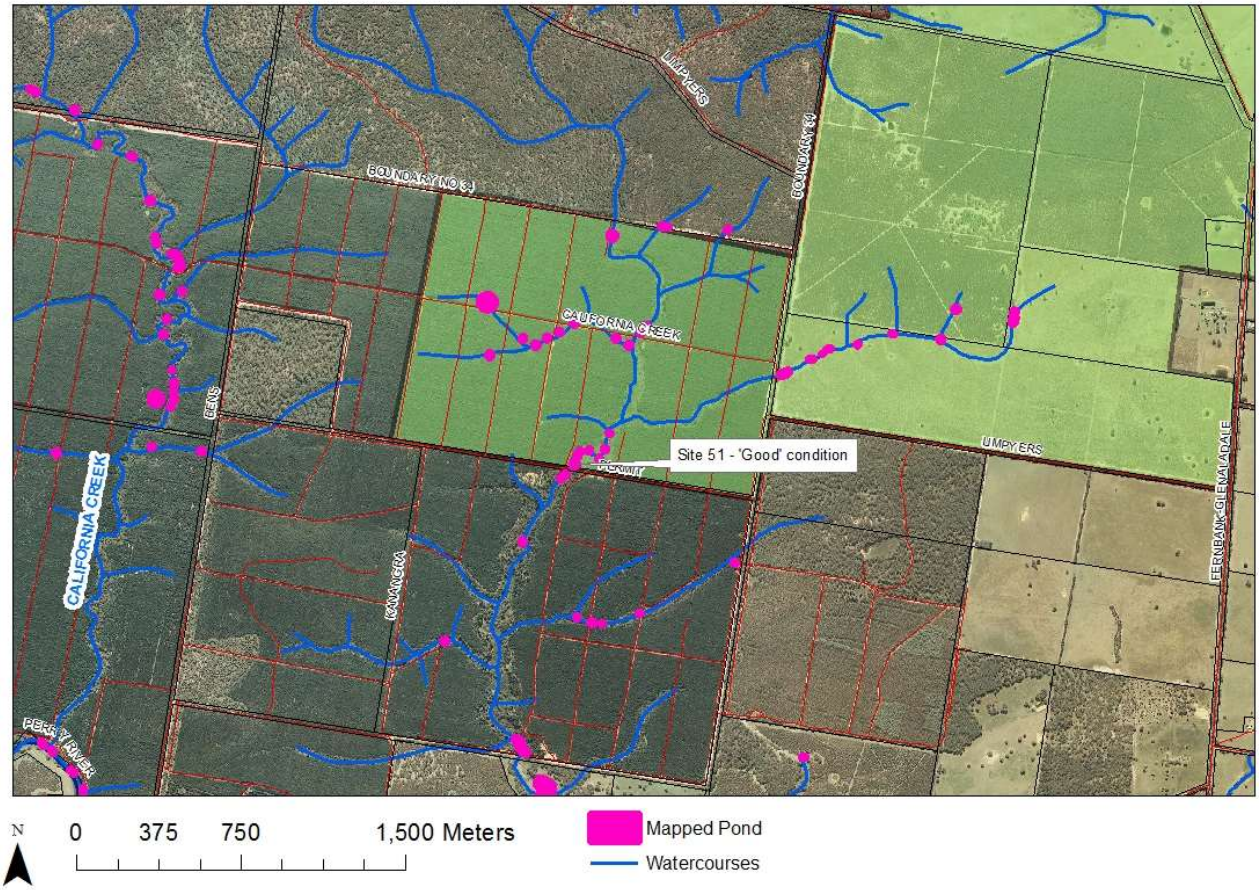
assessment were provided to the Department of Environment, Land, Water and Planning (DELWP) and have been incorporated into the Statewide Victorian Index of Wetland Condition Data Management System (IWCDMS).

Four sites located along Honeysuckle Creek and its tributary were included in the inventory and condition assessment exercise. Two species of vegetation classified as rare and vulnerable conservation status in Victoria were recorded along Honeysuckle Creek: *Cardamine microthrix* (Eastern Bitter-cress) and *Eucalyptus ignorabilis s.s.* (Grey Scentbark).

Figure 1 shows the location of the chain of ponds within the mine area, on a tributary of Honeysuckle Creek. There are 27 mapped ponds are included in the proposed mine area, including site number 51 that was included in the baseline condition assessment and assessed as being in 'good' condition (according to Index of Wetland Condition and Vegetation condition categories).

Mining of this area would result in the permanent loss of these significant geomorphic features.

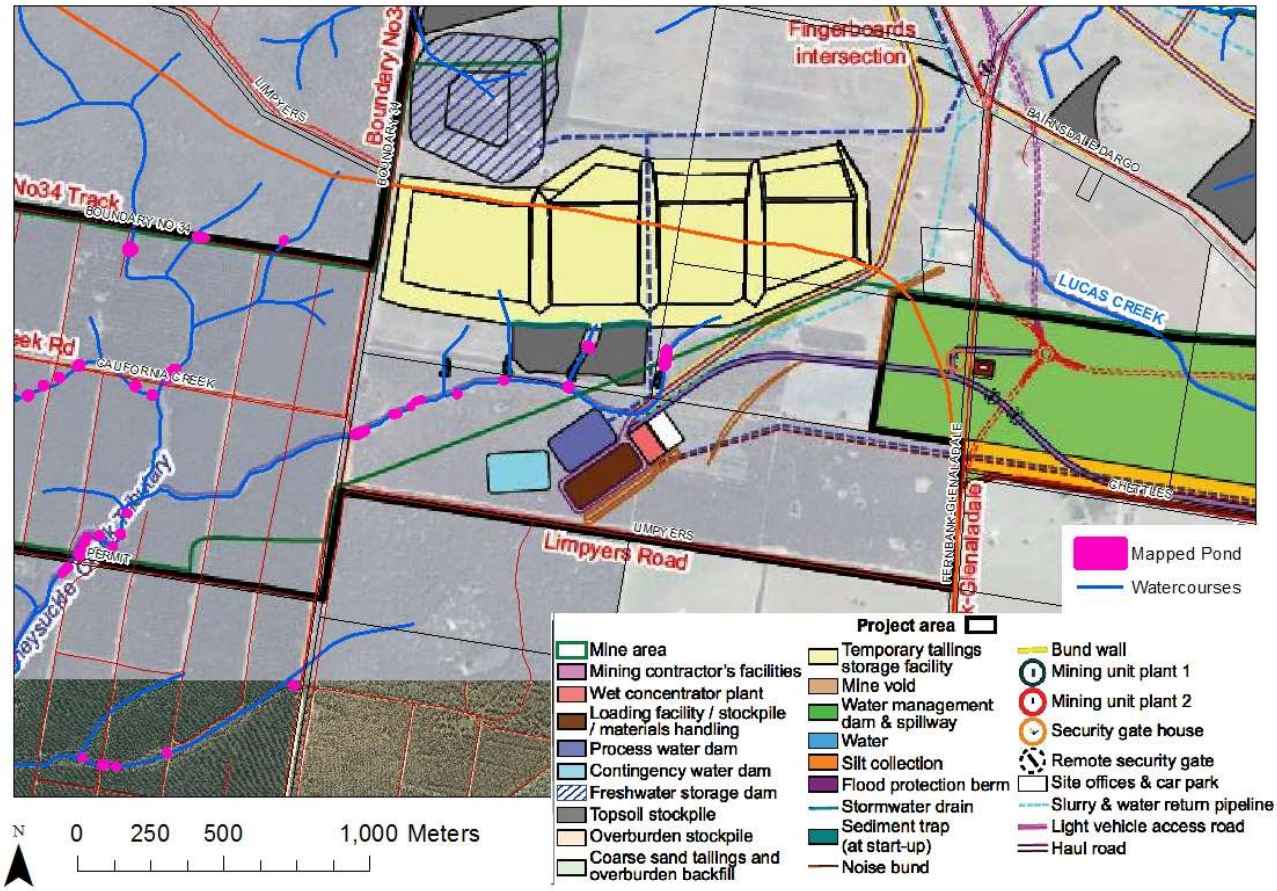
Figure 1 – Location of Chain of ponds in proposed Project area



Erosion and sedimentation have been identified as key threats to the condition of the chain of ponds system. Erosion in the upper catchment as a result of changes to landuse or channel degradation can liberate sediments into downstream environments.

Figure 2 indicates that the mapped ponds are in close proximity to the proposed topsoil stockpile, temporary tailings storage facility, process water dam, wet concentrator plant and overburden stockpile (as shown in Figure 3 from the Map Book).

Figure 2 – Location of Chain of ponds in relation to Project infrastructure

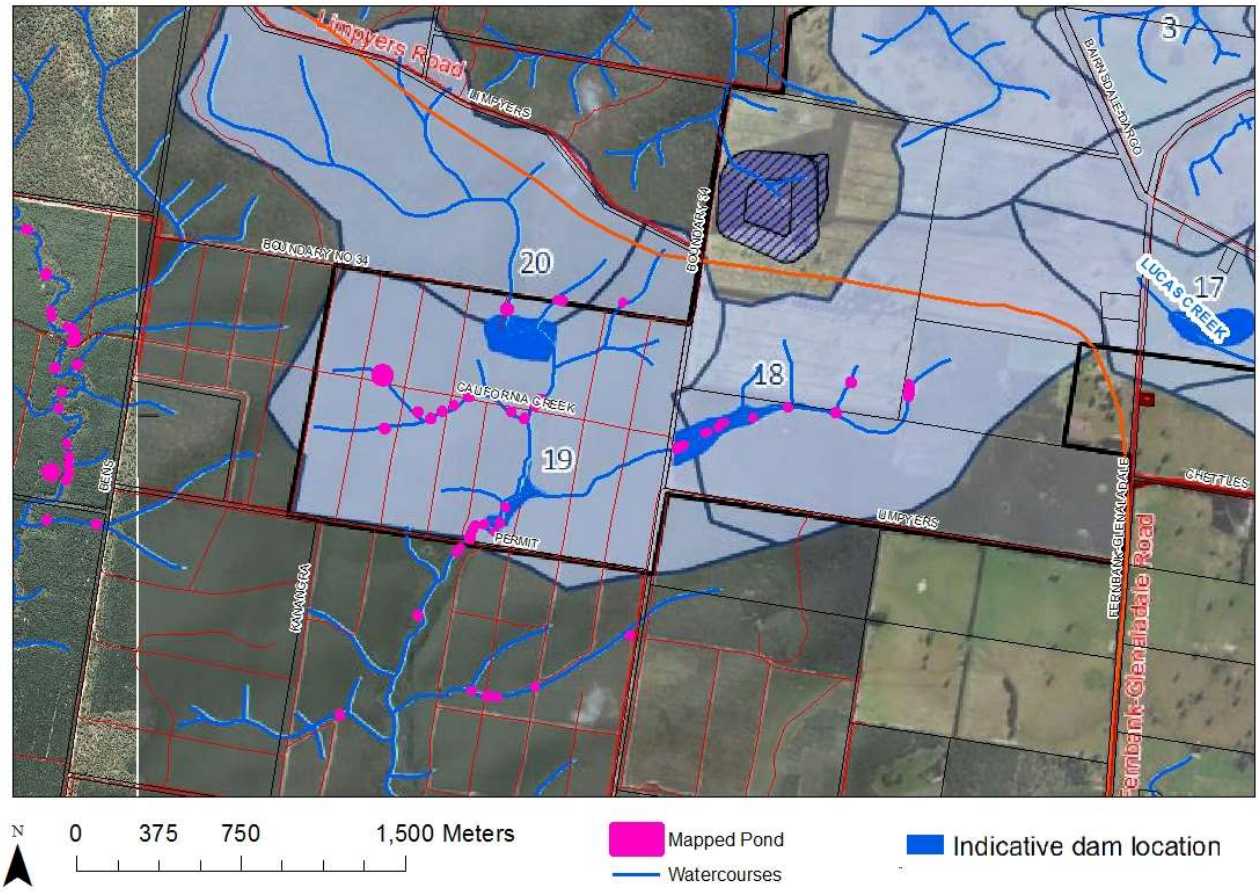


Increased sediment load in the Perry River catchment may result in the permanent loss of some ponds due to infilling. Additional impacts of increased sediment loads are the loss of wetland habitat, altered water regimes and changes to the depth, shape and bathymetry of the wetlands.

Figure 3 shows that the indicative locations for water management dams are mapped ponds. Construction of dams in these locations would result in the permanent loss of these ponds and contribute to the degradation of this rare and significant ecosystem.

Additionally, discharge from water management dams during peak storm events is likely to contain elevated sediment loads, which will negatively impact the ponds further downstream.

Figure 3 – Location of chain of ponds in relation to proposed water management dam locations



Further information on the WGCMA 'Protecting Our Ponds' project can be found here.

Water Management Dams

As seen Figure 3, three of the proposed water management dams are located in the upper reaches of Honeysuckle Creek and Providence Ponds. The construction of these dams would result in the excavation of 14 ponds.

Dam 18 is proposed to be constructed in year 3 and retained until year 16. Dams 19 and 20 would be built in year 16 and retained until years 16. Chapter 11 (Closure) states that these dams may remain in-situ for future agricultural use, meaning that the existing chain of ponds in this tributary of Honeysuckle Creek would be permanently lost.

The proposed water management dams, which retain mine contact water on site, have been designed to hold rainfall generated from a 1% AEP storm event, however modelling within the EES found that these dams are likely to overtop in anything greater than a 10% AEP rainfall event. The proposed installation of a temporary water treatment plant to treat 24 ML/d of stormwater runoff reduces the likelihood of overtopping to a 2.5% AEP event.

The proponent's modelling indicates that the water management dams are not sufficiently sized to retain mine contact water on site, and that the likelihood of spills of contaminated mine contact water into the Perry River catchment, and ultimately the Gippsland Lakes, is 'Possible'.

The risk assessment of mine contact water entering the Perry River catchment was regarded as not warranted and therefore not assessed (Appendix A006 s8.4.4). This assumed that the mechanical processes involved to reduce the discharge risk adequately remove the risk. This is an incomplete assessment because mechanical processes can fail and/or be overwhelmed. Furthermore, the likelihood of discharges to the Perry River catchment was identified as Possible (occurring at 2.5% AEP even with the utilisation of a water treatment facility).

The reliance of a temporary mechanical treatment facility to bring the risk rating to the minimum requirement is unwise and leaves no margin for error or redundancies. This presents a significant risk of mine contact water entering the natural watercourse either through exceedance of water management capacity and/or failure of the mechanical treatment processes. The documentation is silent on measures to mitigate this risk.

Mine contact water was characterised as likely to have aluminium, arsenic, chromium, and copper concentrations which exceed one or more of the water quality objectives adopted. With the exception of copper, these metals are reported to exceed the ecosystem criteria in natural, pre-mining conditions, albeit at a lower level.

The risk of mine contact water entering the Perry River catchment must be adequately assessed prior to the approval of the Project.

Temporary Tailing Storage Facility

The temporary Tailings Storage Facility (TSF) is located almost entirely within the Perry River catchment. This 9.17 GL storage will operate for 5 years and will be built to meet ANCOLD guidelines. There is little to mention about TSF failure in the EES as it is subject to a separate process under the Mineral Resource regulations.

The Perry River and tributaries are predominately a sandy substrate and made up of geomorphically significant chain of ponds watercourse. Failure of the TSF would result in wholescale and long-lasting (possibly permanent) changes to the Perry River watercourses. It would likely result in the loss of the Chain of ponds through scouring and deposition as well as prolonged sedimentation and water quality risks to the Gippsland Lakes.

The EES states that the TSF will not be lined in accordance with the Department of Economic Development, Jobs, Transport and Resources: *Technical Guideline Design and Management of Tailings Storage Facilities* (DEDJTR, 2017), however the documentation acknowledges that tailings seepage water is likely to have aluminium and copper concentrations which exceed the water quality objectives for ecosystem protection.

We note that the proposed water storage dams will be constructed with an engineered liner to reduce interaction with groundwater, and strongly recommend that the TSF also be lined to mitigate the risk of tailings seepage.

The Executive Summary document and Chapter 9 of the EES (9.2.6.1, 9.3.5, Table 9.9 and 9.3.6.1) state that the consequence of a TSF failure would be ‘Extreme’, however Table 9.2 in Chapter 9.1.2 has listed the consequence as ‘Major’.

The ecological risk assessment rating for TSF failure in Table 9.2 was therefore rated as ‘Low’ because the consequence was regarded as ‘Major’, whereas in Table 9.9 the risk rating is ‘Moderate’.

The WGCMA believes that the consequence rating for a TSF failure should be Extreme, given the long-term and potentially irreversible impact that would be widespread in the Honeysuckle Creek and Perry River, with implications for the receiving waterways of the Avon River and Gippsland Lakes.

This inconsistency in the EES documentation needs to be rectified.

Change in flow regime

A 1% increase in annual flow for the Perry River catchment post closure has been predicted from the modelling (Appendix A006 s7.6.3). The seasonality in which this increase occurs in unclear. Is it an overall increase in daily discharge by 1% or is it specific highflow events that increase by much more than 1% but averaged over the year only equal 1% of annual flow? Due to the dynamic nature of the Perry River system and the values and risks associated with the chain of ponds, seasonal and/or flow event increases can have a significant impact on the long-term stability of the waterway.

Further information is required to clarify the expected post-closure increase in annual flow.

Appendix A006 7.6.3 identifies an increase in the Perry River catchment discharges by 13% in year 8 of the mine operation. However, the cited report (Water Technology, 2020c. *Fingerboards Mineral Sands. Surface Water Assessment – Regional Study,* 4 April 2020) states a reduction in flows in year 8.

The report needs to clarify all modelled changes to catchment discharge during the operation of the Project. As discussed above, changes to hydrology are likely to impact on the stability of the waterway, and subsequently to sediment loads, erosion and deposition – which are all identified as key threats to the physical form of the Chain of ponds.

Water Quality

As noted above, uncontrolled discharge from the water management dams and leachate from the TSF will result in mine contact water entering the Perry River catchment. This discharge will contain levels of aluminium, arsenic, chromium that will exceed the ecosystem criteria in natural, pre-mining conditions.

The proponent is proposing quarterly water quality monitoring in the Perry River (sites PR-1 and PR-2). This is not consistent with SEPP guidelines regarding annual trend analysis, which specify a minimum of 11 samples per year.

The EES documentation acknowledges that there are data gaps in baseline flow and quality data in the Perry River catchment, however the proposed surface water monitoring plan (Appendix A006, Table 9.2) states that flow measurement in the Perry River is 'not required'.

There is no regular water quality sampling proposed for the nominated monitoring sites in the Honeysuckle Creek catchment (SW02 and SW03). Water quality monitoring at these sites will be after 'high rainfall', which is not defined. Additionally, there are no water quality targets for these sites.

The proponent is relying on monitoring data for '*further refinement of the potential impact of the rare occasion where sediment laden or mine contact water may be released offsite during storm events that exceed the dam design and management specification*'.

The proposed surface water monitoring plan does not include any monitoring at sites SW02, SW03, PR-1 or PR-2 during an unplanned mine contact water release, so it is unlikely that the monitoring program will inform or mitigate the risk of mine contact water entering the Perry River catchment.

Given the heavy reliance on monitoring to mitigate the risks, the proposed surface water monitoring program is inadequate in its current form.

Permanent landform change

The mine will permanently alter the topography within the Honeysuckle Creek catchment. Aside from the permanent loss of this section of chain of ponds, the catchment will be altered from a defined channel (with chain of ponds) to a large valley infill.

North of the mine area (Boundary No 34 Track) is a tributary of the Honeysuckle Creek with a catchment of 200-300 ha. This catchment will discharge into the mine works and rehabilitated area. It is the only location within the Project area that intercepts a waterway mid-course; all other waterway interventions incorporate the headwaters of the stream.

The valley fill in the Honeysuckle Creek tributary will be lower than the existing ground level. The upstream catchment will therefore discharge to a lower bed level. Changes to downstream bed levels can trigger upstream deepening of channels as a result of energy transfer.

Additionally, there is no indication that a formed channel will be created to drain the new valley infill. Without appropriate controls, the watercourse will likely move around within the alluvium until it finds a preferred course.

Both of these erosion processes will result in loss of private land, and liberation of sediments downstream, which has significant implications for the chain of ponds system.

This risk has not been included or assessed in any of the landform, waterway stability, or flood risk assessments, nor site rehabilitation and closure measures.

The EES needs to include a commitment to rehabilitate the landscape to a physical form as close as possible to the current chain of ponds system, with extensive revegetation and stock exclusion to minimise the impact of erosion and sedimentation on downstream Ponds.

Groundwater

The WGCMA notes that the proponent has utilised available data from robust sources such as the Victorian Aquifer Framework and the National Groundwater Dependent Ecosystem (GDE) Atlas, and that the EES has identified and considered risks to many of the relevant hydrogeological assets. This includes notable assets such as:

- The Latrobe Group Aquifer
- The Boisdale Aquifer
- The Watertable Aquifer (typically housed within the Coongulmerang Formation) and its many dependent ecosystems including:
    - The Mitchell River,
    - The Perry River,
    - Providence Ponds, and
    - Segments of vegetation with the Gippsland Red Gum Grassy Woodland and Associated Native Grassland ecological community

Further, the site investigations and associated modelling of potential impacts to the assets appears to be based on ‘reasonable starting assumptions’, that are consistent with current conceptual models for the hydrogeological setting in the area. Importantly, many of the assumptions regarding interconnectivity between aquifers and, especially, surface ecosystems are consistent with current conceptual understanding.

However, the challenge with the groundwater and GDE assessments lies in testing and monitoring the validity of the important assumptions under what will be a unique and significant change to the hydrogeology of the area. Below are specific examples of areas that the WGCMA would like to see

increased emphasis placed on the ongoing assessment and monitoring to ensure these important assets are protected:

- The impact assessment for “Groundwater extraction and drawdown transmitting to overlying surficial alluvial aquifers leading to reduced groundwater availability for GDEs” (Table 9.6) was rated as unlikely with minor consequence. Under base assumptions, this is likely to hold true. However, if the assumption breaks down under the increased stress then the consequence could rapidly become significant. The modelled maximum drawdown in the Latrobe Group Aquifer is estimated at 14 m, however under current assumptions “the material impact on overlying aquifers is considered negligible”. If the assumptions break down then even a small propagation of this drawdown could have significant implications on other users and GDEs.

- Page 8-59 (8.2.3.8 Groundwater Dependent Ecosystems) states that “Providence Ponds was not mapped as a GDE for the purposes of this assessment. The available local groundwater information indicates the depth to groundwater in the area is approximately 30 m and suggests that the ecosystem is not supported by the regional groundwater system, but rather a shallow perched system. These perched water systems are also likely to support the surrounding Gippsland Red Gum Grassy Woodland and Associated Native Grassland ecology community.”

  The same assumption has been applied to mapped potential GDE’s within the project area, which were subsequently declassified with the project area. This is an important assumption that should be explored further with on ongoing monitoring and research to establish and monitor the function and health of these GDEs. The assumption also highlights the importance of perched watertables in and around the project area. Consequently, it is questioned whether the importance of ecosystems potentially reliant on perched watertables has adequately been addressed in the assessment.

  The Perry River catchment in the vicinity of the Fingerboards was regarded as a losing system with no baseflow (Appendix A0006 s6.4) however the ponds in the Perry River catchment are typically always charged with water. Anecdotal evidence suggests that many of the ponds retained water during the recent drought, which indicates that they Ponds are charged by subsurface flows. They have not been included as GDEs in the assessment and shallow aquifer impacts from the mine have not been adequately assessed or addressed.

  There is commentary within the EES that the Ponds are charged from some subsurface flow, which were identified as possible localised perched aquifers. This is an assumption that requires either further investigation or monitoring during works to test the assumption. Failure to answer this could have significant impacts to these water assets. (Appendix A s7.7.2)

- Page 8-71 states that “Perched groundwater was not identified at similar depths at other drilled locations nearby, suggesting that perched groundwater at MW07 is a localised anomaly.” Due to this ambiguity, the CMA recommends a comprehensive review of all potential GDEs within the potential impact area to assess which ones are likely to be fed by perched aquifers or the regional watertable aquifer. This can then guide impact assessment and, if necessary, mitigation strategies.

- The altered surface topography and a lowering of the ground surface in the Honeysuckle Creek catchment was assumed to have no groundwater impact. This assessment did not include shallow aquifers which are critical for the chain of ponds GDE and is therefore incomplete.

- Shallow aquifer impacts from dewatering of the mine pit have also not been included in risk assessments.

- The assessment identifies groundwater mounding likely to be present at 7km radius from site but does not include shallow aquifer impacts in that risk assessment.

- The EES acknowledges that seepage from tailings storage in the mine void may result in localised rises in groundwater mounding within shallow aquifers. This also likely to be the case as a result of seepage from the un-lined temporary tailings storage dam. The tailing seepage will be contaminated aluminium, arsenic, chromium, and copper. The impacts of neither the quantity nor quality of tailing seepage have not been considered in the EES.

The above examples highlight that the hydrogeological setting in the region is extremely complex and unique, and our current knowledge is insufficient to completely rule out the potential for impacts on groundwater dependent ecosystems.

A greater emphasis on localised GDE assessments and ongoing monitoring must be completed at potential GDE sites in order to fully understand the interactions and reliance on groundwater prior to final approvals for the project and any work commencing.

The groundwater monitoring plan (9.2.8) does not appear to include any specific monitoring of GDEs in or near the project area. This should be explicitly addressed in the monitoring plan.

Flooding

The proponent's flood modelling (Water Technology 2020c) indicates that flood levels in the catchment will be reduced during mine operation.

However, the permanent change to topography following mine rehabilitation will increase the catchment boundary and watershed of the Honeysuckle Creek catchment.

The modelling indicates that peak flows in the waterway downstream of the mine boundary will increase by 12.2m^3/s, which equates to an approximate 20% increase in peak flow rate.

The result of this will be increased flood levels of between 100m and 200mm downstream of the mine area to Honeysuckle Creek. The model did not extend beyond the Honeysuckle Creek confluence, so the downstream impacts have not been identified.

WGCMA does not generally accept any off-site changes in flood flow behavior, including flood extent, depth or velocity. Additional flood modelling is required to demonstrate how these changes to flood level will propagate throughout the catchment, until discharge to Lake Wellington.

Conclusion

The Perry River catchment chain of ponds waterway system unique, and highly valued by the local community and Traditional Owners. WGCMA have invested in a long-term strategic plan and a program of on-ground works to protect and improve the chain of ponds condition. WGCMA has developed strong relationships with the community and our partner organisations through the Protecting Our Ponds project during the past four years and we are continuing to direct Victorian Government investment into protecting and enhancing the chain of ponds systems in the Perry River catchment in the future.

There are a lot of assumptions used to underpin the findings of the EES. Many of the assumptions are well placed in current knowledge and management approaches in a general sense.

However, given the level of disturbance to landforms, watercourses, and groundwater assets, the risks associated with those assumptions being incorrect are significant. Some of these uncertainties have been addressed (at least in part) by recommended monitoring sites/programs, and adaptive management strategies.

Safeguards to ensure the adequacy of the monitoring and adaptive management need to be written into the conditions of any approvals. These need to include collaboration with water and catchment authorities and hold points to prevent over development that leads to negative outcomes.

Appendix 1 includes the WGCMA recommendations for actions required to adequately assess or mitigate risks associated with the project.

Thank you for the opportunity to comment on the EES documentation. Should you require any additional information regarding the WGCMA submission please contact Mr Adam Dunn on [redacted] or via [redacted]

Yours sincerely,

[redacted]

Martin Fuller
Chief Executive Officer

APPENDIX 1 - West Gippsland Catchment Management Authority Submission

Issue	Explanation	Actions required to address or mitigate issue
1. Loss of Chain of Ponds		
Construction and operation	Mine area inclues 27 mapped ponds that will be permanently lost.	Rehabilitation plan needs to include a commitment to reinstate the chain of ponds system.
	1 baseline monitoring site (Pond 51) will be permanently lost.	
Closure and rehabilitation	Proposed valley fill does not replicate the existing geomorphology or hydrology.	
2. Water Management Dams		
Construction and operation	The dams were designed to hold a 1% AEP rainfall event but modelling indicates that mine contact water would spill from the dams in anything greater than a 10% AEP storm event.	Review of dam capcity and/or dam location needed to ensure that mine contact water will not spill in anything up to a 1% AEP rainfall event.
	A temporary water treatment is relied upon to reduce the likelihood of spilling to a 2.5% AEP event.	The reliance of a temporary mechanical treatment facility to bring the risk rating to the minimum requirement is unwise and leaves no margin for error or redundancies. This presents a significant risk of mine contact water entering the natural watercourse either through exceedance of water management capacity and/or failure of the mechanical treatment processes.
	A risk assessment for spill of mine contact water into the Perry River catchment was not undertaken due to an assumption that the temporary water treatment plant would removed the risk of spill.	Risk assessment needs to be completed, acknowledging that the temporary treatment plant can fail and/or be overwhelmed
Closure and rehabilitation	Dams may be retained following closure of the mining, meaning that Ponds will be permanently lost.	Rehabilitation plan needs to include a commitment to reinstate the chain of ponds system.
	Proposed valley fill does not replicate the existing geomorphology or hydrology.	
3. Temporary Tailing Storage Facility (TSF)		
Construction and operation	TSF will not be lined therefore seepage of contaminated tailings water into groundwater is possible. Seepage would have concentrations of aluminium, arsenic and chromium that exceed the water quality objectives for ecosystem protecion.	The proposal must include a requiremnent to line the TSF to prevent leechate entering groudwater or surfacewater systems.
	Ecological Risk Assessment rating of 'Low' does not fully consider the consequences of a TSF failure, which would be long-term, widespread and potentially irreversible for the Perry River, Avon River and Gippsland Lakes	Reassess risk based on an 'Extreme' consequence rating, which better reflects the impact a TSF would have.
4. Change in flow regime		
Construction and operation	Appendix A006 7.6.3 identifies an increase in the Perry River catchment discharges by 13% in year 8 of the mine operation. However, the cited report (Appendix A (App. E)) states a reduction in flows in year 8.	The report needs to clarify all modelled changes to catchment discharge during the operation of the Project.

Closure and rehabilitation	A 1% increase in annual flow for the Perry River catchment post closure has been predicted from the modelling (Appendix A006 s7.6.3), however it's unclear if this is a daily flow increase of 1%, or a specific high flow event averaged across the year. The Chain of Ponds system is highly susecptible to erosion and sedimentation from change to the hydrology.	The report needs to clarify the details of the expected post-closure increase in annual flow.
5. Water quality		
Construction and operation	Quarterly water quality monitoring proposed at PR-1 and PR-2	Increase frequency to a minimum of 11 samples per year as per SEPP guidelines
	No flow measurement proposed for Perry River, despite this being identified as a knowledge gap	Commit to introduce a regular flow monitoring program in the Perry River catchment
	No regular water quality monitoring proposed in Honeysuckle Creek	Commit to a regular water quality monitoring program for sites SW02 and SW03
	No water quality moritoring proposed in the Perry catchment during an unplanned mine contact water release, despite the proponent relying on monitoring data to refine dam design and management.	Commit to water quality monitoring at sites SW02, SW03, PR-1 and PR2 during an unplanned mine contact water release.
6. Permanent landform change		
Closure and rehabilitation	Valley fill will be lower than the existing ground level, resulting in changed hydraulics and potentially upstream bed and bank erosion. There is no indication that a formed channel will be created to drain the new valley infill.	Rehabilitation plan needs to include a commitment to reinstate the chain of ponds system.
	Proposed valley fill does not replicate the existing chain of ponds geomorphology or hydrology.	
	The risk of prolonged erosion both within and upstream of the rehabilitated mine area has not been assessed.	Risk assessment needs to be completed to assess the risk of erosion within and upstream of the rehabilitated area of the Honeysuckle Creek tributary.
7. Groundwater		
Construction and operation	Groundwater Dependant Ecosystems (GDEs) that were assumed to be reliant on shallow perched aquifers have not been assessed.	Prior to final approvals and commencement of work an investigation is needed to identify and quantify groundwater interactions and fully assess the risk of impact to GDEs.
	The hydrogeological setting in the region is extremely complex and unique, and our current knowledge is insufficient to completely rule out the potential for impacts on groundwater dependent ecosystems.	A comprehensive review of the all potential GDEs within the potential impact area is required to assess which ones are likely to be fed by perched aquifers or the regional watertable aquifer. This can then guide impact assessment and if necessary mitigation strategies.
8. Flooding		
Closure and rehabilitation	Modelling indicates that peak flows in the Honeysuckle Creek tributary will increase by 12.2m3/s, which equates to an approximate 20% increase in peak flow rate. This will result in an increased flood level of between 100mm and 200mm downstream of the mine area to Honeysuckle Creek. The model did not extend beyond the Honeysuckle Creek confluence, so the downstream impacts have not been identified. State Planning Policy does not accept any off-site changes in flood flow behavior, including flood extent, depth or velocity.	Additional flood modelling is required to demonstrate how these changes to flood level will propagate throughout the catchment, and what impact this will have on provate property and public infrastructure, until discharge to Lake Wellington.