WATER TECHNOLOGY
WATER, COASTAL & ENVIRONMENTAL CONSULTANTS

Expert Witness Statement of Michael Cheetham

In the matter of the Fingerboards Mineral Sand Project EES

Kalbar Operations Pty Ltd

January 2021

1 INTRODUCTION

I was engaged by Kalbar Operations Pty Ltd to provide expert services in a Fluvial Geomorphic, Landscape Stability and Sediment assessment at the proposed Fingerboards Mineral Sands Mine location. I conducted a site inspection on the 10th to 12th of July 2018 to visually assess the site and I revisited the site on the 9th December 2020.

Statement of Engagement, Qualifications and Experience:

- I, Michael Cheetham, have prepared this Witness Statement at the request of Kalbar Operations Pty Ltd.
- I am a Principal Scientist (Geomorphologist) at Water Technology Pty. Ltd. I hold a PhD in Geomorphology and I have 15 years' experience in geomorphologic consultancy and research.
- A copy of my curriculum vitae is provided in Appendix A of this report.
- This statement is prepared as an independent and impartial report.
- I accept that I have an overriding duty to the Inquiry and Advisory Committee to assist impartially on matters relevant to my area of expertise, that my paramount duty is to the Inquiry and Advisory Committee and not to any party to the proceedings (including the entity retaining me), and that I am not an advocate for any party.
- I have made all the inquiries that I believe are desirable and appropriate and no matters of significance which I regard as relevant have to my knowledge been withheld from the Committee.

2 SCOPE

2.1 Role in preparation of the EES

My role was as a fluvial geomorphologist engaged to conduct an investigation aimed at answering two of the key Scoping Requirements for the environment effects statement (**EES**), namely:

1. Potential erosion, sedimentation and landform stability effects during construction, operations, rehabilitation, decommissioning, and post-closure.

   What is the expected behaviour of the landforms, gullies, and tributaries, within the context of the various mine phases (construction, operation, rehabilitation, decommissioning, and post-closure)?

2. Potential erosion, sedimentation and landform stability effects of the project including the direct impact of mining on waterways and their subsequent rehabilitation.

   What are the likely impacts of the mining project on the adjacent waterways (including sediment transport) and how can they be rehabilitated?

My assessment was focused largely on geomorphic condition and trajectory (likely future changes) with reference to sedimentary characteristic and hydrology. My assessment is set out in the report entitled "Fingerboards Mineral Sands: Landscape Stability and Sediment Transport Regime Assessment" included as Appendix C to Appendix A006 of the EES (**Report**). My Report describes the findings of the geomorphic landscape stability assessment, sediment characterisation and sediment transport regime investigation.

I also presented the findings of the initial assessment at a technical reference group meeting in Traralgon on the 17th of the October 2018.

2.2 Other persons who assisted

Simon Hof, Senior Engineer (BEng): Project Manager and contributor to hydrological and hydraulics components of the EES. His work contributed to Site Surface Water Assessment (Water Technology 2020a, Appendix E to Appendix A006 of the EES) and Regional Surface Water Assessment (Water Technology 2020b, Appendix F to Appendix A006 of the EES). This work informed my assessment.

Tom Atkin, Senior Engineer (BEng): Tom acted as a field Assistant and contributed to GIS analysis and mapping components of the project.

James Weidmann, Senior Engineer (BEng): James contributed to the hydrology and hydraulics components of the EES. His work contributed to Site Surface Water Assessment (Water Technology 2020a, Appendix E to Appendix A006 of the EES) and Regional Surface Water Assessment (Water Technology 2020b, Appendix F to Appendix A006 of the EES). This work informed my assessment.

Chris Delaney, Engineer (BEng): Chris contributed to the hydrology and hydraulics components of the EES under the supervision of Simon Hoff and later James Weidmann.

2.3 Instructions

Instructions given to me to prepare this statement are included in Appendix B.

2.4 Methodology

The methodology for undertaking my assessment is detailed in section 2 of the Report and included a desktop assessment, site inspection, sediment sampling and hydraulic modelling. The report was produced with reference to the additional analysis undertaken as part of the Site Surface Water Assessment (Water Technology 2020a) and Regional Surface Water Assessment (Water Technology 2020b).

3 FINDINGS

3.1 Summary of opinions

I adopt my Report as the basis of my evidence before the Inquiry and Advisory Committee, subject to the following specific addition to the recommendations:

- A recommendation for 10 years monitoring post closure is made in the Report. In making this recommendation, I had assumed that This was based on a large amount of vegetation being established within the gullies that, by mine closure should be 15-20 years old. However, other areas where vegetation is less than 5 years old by closure and is relied upon for an erosion stabilisation function, should be monitored for 20 years post closure. The frequency of monitoring of these areas can be greatly reduced after 10 years.

The key assumptions made in preparing my report include:

- My interpretations of risks to gully stability and landscape stability assume that the recommendations made in my report are adopted, including but not limited to:
  - Early revegetation of the gullies in the areas between the dams and the mining lease boundary is undertaken, and that this vegetation is maintained for the life of the mine or until maturity to a point where it is self-sustaining.

  - Dams remain on site until the vegetation downstream has reached maturity to a point where it is self-sustaining and of sufficient density to control erosion.
  - Dams are deconstructed in such a way that does not initiate erosion and the areas downstream are revegetated and maintained as above.
- It was assumed that exposed bed and bank sediments were indicative of bed and bank sediments within the exposure's vicinity. This is a typical assumption for this level of assessment.
- Linear rates of erosion were assumed in assessing the speed at which head-cuts were retreating up the gully. This is a typical assumption for this level of assessment.
- The final landform provided by Kalbar is conceptual and it is assumed that details such as specific watercourse paths and grading will be included in the mine closure planning stage. This will require careful planning to ensure stable grades are incorporated, along with other factors that will contribute to stability such as stock exclusion and revegetation.

Conclusions are presented in Section 8 of my Report. However, in my opinion they key findings of the assessment are:

- The condition assessment and subsequent analysis found that waterway instabilities were present, but none appear to be occurring rapidly and none were of any immediate concern.
- With the intention to retain run-off from the site in onstream dams, the hydraulic conditions that drive change within each waterway are likely to be much less erosive. As such, once the dams are built it is unlikely that these instabilities will pose a threat.
- The existing waterways within the operation mine boundary (those to be removed) are highly disturbed (cleared and grazed) and are considered degraded from a geomorphic perspective. With an appropriate rehabilitation plan and a commitment to maintenance, an increase in stream health and environmental value is a realistic target of the final landform. Section 8 of my report details my recommended rehabilitation actions and maintenance durations, with the caveat that I now recommend 20 years post closure monitoring for vegetation that is less than 5 years old, as detailed above.
- A revegetation programme for revegetation of all gullies downstream of mining activities should be commenced at the first autumn or winter after environmental approval. This will have many benefits, including:
  - Mitigating the effects of moderate increases in flow velocity resulting from mine operations and the final landform.
  - Controlling and mitigating the effects of tunnel erosion downstream of the pit boundary where soil treatment is not planned, to increase landscape stability.
  - Mitigating the effects of uncontrolled flow releases from the dams by reducing sediment transport and encouraging deposition.
  - Mitigating the effects of sediment starvation by reducing sediment transport and encouraging deposition.
  - Providing an established vegetated buffer at the site prior to mine closure (in some cases, 20 years old).

3.2 Additional work undertaken since preparation of the report

3.2.1 Assessment of upstream tributaries of Honeysuckle Creek

Submission 358 expresses concerns regarding the intersected portion of the unnamed tributary of Honeysuckle Creek with the mining area to the north of the pine plantation. This is a valid concern, as topographic changes to the area, during the operational stages of the mine and in the final landform, may result in a substantial increase in stream slope. As such, I have revisited the site to inspect this area again. I have also reviewed the topography again and considered the implications. A response to these concerns is included in Section 3.3.1.

3.2.2 Geomorphic interpretation of additional modelling of the Perry River Catchment

Additional modelling was undertaken by James Weidmann to address concerns raised in Submission 358 and others regarding impacts to the Perry River hydrology. I have reviewed these results and incorporated relevant information in my response to submissions in Section 3.3.

3.3 Response to Submissions

I reviewed submissions with comments relevant to my field of expertise. The submissions I reviewed with substantial content relating to my area of expertise are shown in Table 3-1. These along with some other submissions included comments on various themes relating to my report. Many submissions make general comment on erosion and stability. These submissions are listed in Appendix C. As such, I have prepared my responses to these submissions under those themes (Section 3.3.1 to Section 3.3.6).

TABLE 3-1 SUBMISSIONS WITH SUBSTANTIAL CONTENT RELATING TO MY FIELD OF EXPERTISE

#	Entity	Title
716	East Gippsland Shire Council	Environmental Effects Statement, Draft East Gippsland Planning Scheme Amendment C156 and EPA Works Approval Application – Fingerboards Mineral Sands Project, Fingerboards and Glenaladale
552	East Gippsland Catchment Management Authority	Environment Effects Statement - Fingerboards Mineral Sands Project
358	West Gippsland Catchment Management Authority	Fingerboards Mineral Sands Project Inquiry and Advisory Committee

3.3.1 Implications of Topographic Changes to the Headwaters of Honeysuckle Creek Upstream of the Mine Site

Submission 358 expresses concerns regarding the intersected portion of the unnamed tributary of Honeysuckle Creek with the mining area to the north of the pine plantation (Figure 3-1). This is a valid concern as topographic changes to the area may result in a substantial increase in stream slope leading to bed deepening upstream and considerable impacts up and downstream of the site. The submission also expresses concern as to the lack of a specified waterway course (within the proposed final landscape topography) along and throughout the downstream section of this tributary on the mine site.

My report assesses the final landform as a conceptual design and not an exact representation of what will be left at mine closure. Again, I agree that measures such as appropriate channel design, revegetation and stock exclusion will be vital to ensure stability of the water courses, particularly those that are unconfined such as the tributary of Honeysuckle Creek. This design process should begin as soon as the exact final landscape is established.

In relation to the first concern (regarding the intersected portion of the unnamed tributary of Honeysuckle Creek), several possibilities exist to mitigate impacts at this location. Grading the area to an appropriate slope combined with an appropriate planform layout of the channel, may be enough to mitigate these impacts. This issue should be used to inform the morphology of the final landscape. Ideally this would result in a grade and planform of a watercourse that is stable once vegetated. It may be necessary to augment such a design with other engineered features, however, these would require maintenance. Such options include:

- The water course could be combined with grade control structures to ensure stability, although such structures would require ongoing maintenance (likely associated with storm events).
- A dam is proposed at this location (dam 20) to control flows entering the mine sites (Figure 3-1) during operations. The dam could be incorporated into the final landform as a permanent lake feature, which would potentially also require some level of maintenance. If appropriately designed, such a feature would act as a stilling basin for flows entering the area. The design of such a feature would have to account for flows entering the lake when the water level is down.

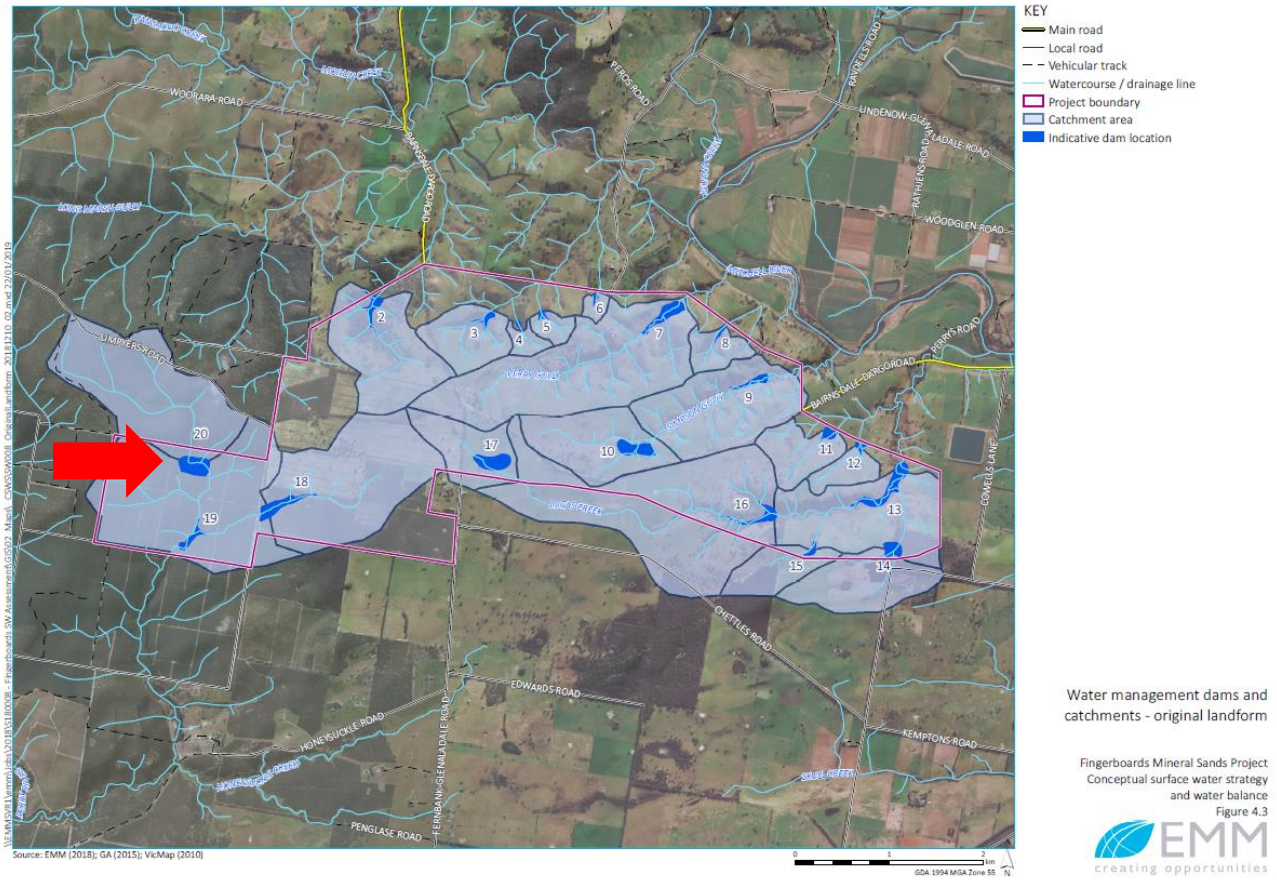

FIGURE 3-1 DAM LOCATIONS FOR OPERATIONAL STAGES WITH DAM AT INTERSECT OF UPSTREAM TRIBUTARY AND MINING LEASE IDENTIFIED WITH A RED ARROW.

3.3.2 Current Condition

The existing waterways within the operation mine boundary (those to be removed) are highly disturbed (cleared and grazed) and are considered degraded from a geomorphic perspective. Impacts to the area from cattle and clearing have left a degraded landscape. Many of the gullies and creeks, including Honeysuckle Creek, are currently experiencing bed deepening through head cut migration, albeit slowly. A lack of vegetation and unrestricted cattle access are key contributors to this degraded condition. Several submissions refer to the

land as prime agricultural land, however, I would suggest that the many decades of grazing have left the landscape in relatively poor condition, particularly the gullies and waterways. With appropriate rehabilitation, monitoring and maintenance efforts, the recommended revegetation and stock exclusion along these waterways should result in an improvement in condition.

3.3.3 Eastern Gullies Stability and Sediment Delivery to the Mitchell River

The ephemeral gullies of the eastern side of the mining lease that discharge to the Mitchell River are all in degraded condition, with unrestricted stock access and low density, patchy riparian vegetation. However, even in their current state, it is unlikely that they are delivering substantial volumes of sediment to the Mitchell River. The ephemeral nature of flows down the gullies and relatively coarse texture of the sediments within the gullies result in sediment pulses that are transported downstream during high rainfall events and deposited on the lower lying, lower grade areas. These appear to colonise with ground cover reasonably quickly even under drought conditions. As such, subsequent flows are less likely to move the sand further downstream. As stated in section 7.1.1 of my Report, I recommend that revegetation efforts within gullies in the areas between the operational mine area and the edge of the mining lease, be initiated in advance of mine operations. This will provide the following benefits:

- Mitigate the effects of moderate increases in flow velocity resulting from mine operations and the final landform.
- Control and mitigate the effects of tunnel erosion downstream of the pit boundary where soil treatment is not planned, through increased landscape stability.
- Mitigate the effects of uncontrolled flow releases from the dams by slowing flows, reducing sediment transport, and encouraging deposition.
- Mitigate the effects of sediment starvation by slowing sediment transport and encouraging deposition.
- Providing an established vegetated buffer at the site prior to mine closure. If revegetation efforts begin prior to mine operations some of the buffer will be 15-20 years old in parts when mine closure efforts begin.

As stated in my Report, with an appropriate rehabilitation plan and a commitment to maintaining vegetation to a point where it is self-sufficient, an increase in stream health and environmental value is a realistic target of the final landform. With established dense continuous vegetation, these gullies are likely to see increased stability.

3.3.4 Perry River Impacts

Chain of ponds features are common within the greater Perry River catchment. In some areas, such as in the west, these can be considered intact, and I agree that these intact features are worth preserving. Hydraulic modelling has now been extended to include the confluence of Honeysuckle Creek and the Perry River (Figure 3-2). This modelling shows that despite some increases in water surface elevation and flow velocities, the impacts dissipate downstream and are negligible once they reach the Perry River. The small catchment of Honeysuckle Creek when compared to that of the Perry River upstream of their confluence, means that any residual impacts in flows during storm events and as such, the impacts from the mining operations and rehabilitated landscape, are insignificant by comparison. In terms of impacts to the chain of ponds features within the Perry River catchment, cumulative and unmitigated impacts associated with agricultural practices, such as farm dams and clearing of vegetation, are a far greater influence.

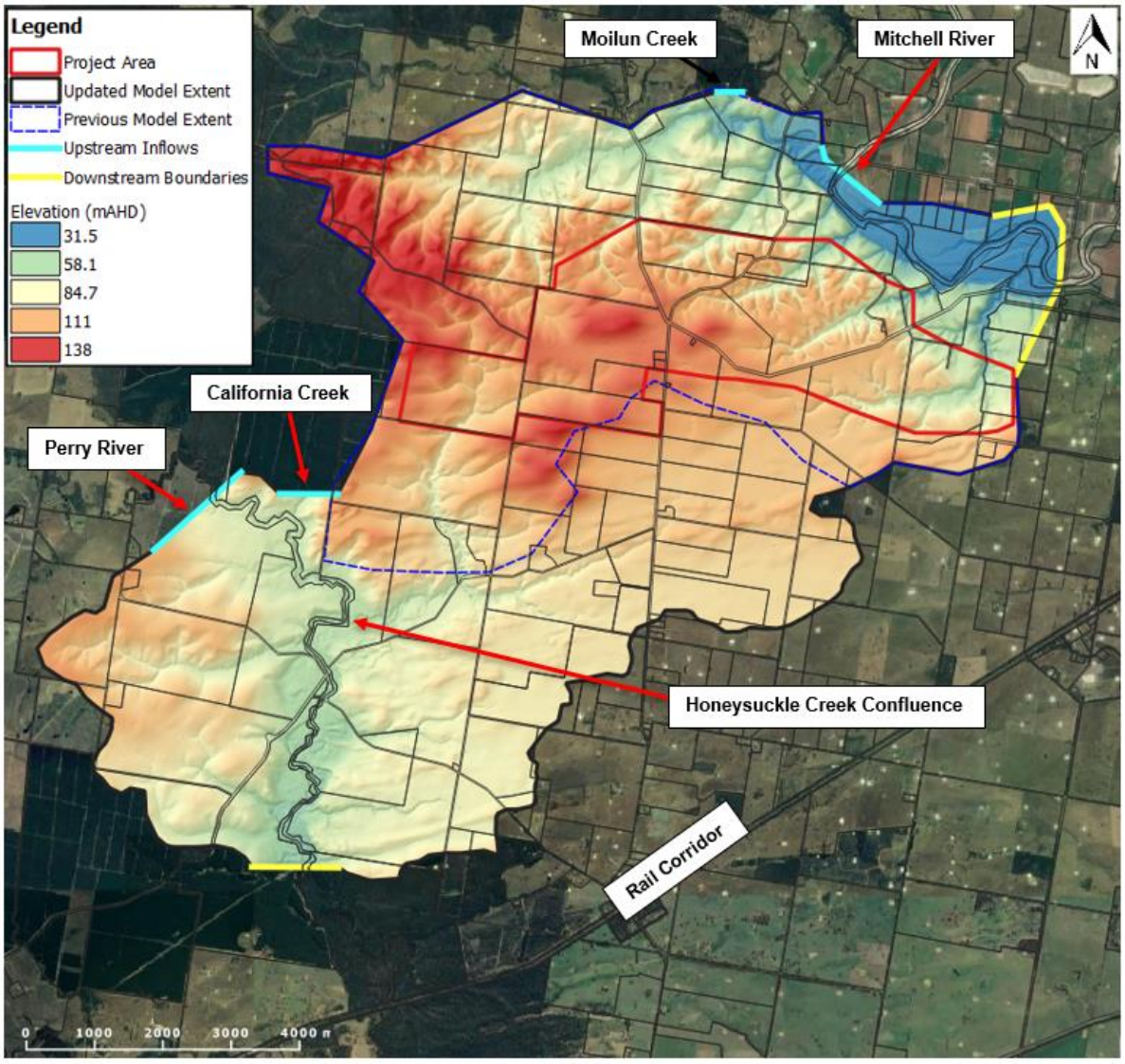

FIGURE 3-2 UPDATED TUFLOW MODEL EXTENT.

Sediment delivery from the mine site to the Perry River is proposed to be mitigated through the installation of onstream retention dams designed to capture runoff (and any eroded sediments). These are shown as dams 18, 19 and 20 on Figure 3-1.

Submission 358 cites concerns regarding storm events, overtopping of the dam wall and sediment delivery to the Perry River. Whereas such a scenario would release some fine sediment into the system, the likelihood of this is low during the mine life (overtopping is associated with low recurrence frequency events) and any increase in sediment delivery would be substantially advected by flows from the upper Perry River Catchment. Regardless, the ponds downstream of the confluence of the Perry River and Honeysuckle Creek are degrading through erosion and the gradual linkage of ponds into a continuous channel through scour and head-cut migration. Minor increases in fine sediment load during very large, low-recurrence frequency events will not contribute to this process of degradation.

3.3.5 Honeysuckle Creek and Chains of Ponds

Whereas I agree that some remnant chain of ponds exist along the unnamed tributary of Honeysuckle Creek, this is far from an intact system and not one that would usually be the focus of preservation, much less geo-conservation, when compared to the chains of ponds that exist in the western part of the catchment. I also question the validity of the mapped ponds in Submission 358, reported as extracted from the State-wide Victorian Index of Wetland Condition Data Management System (DELWP) supported by data obtained from Frood *et al.* (2018).

I have inspected the reach in question both in June 2018 and December 2020. The ponds mapped in the figure provided in Submission 358 are in many cases inaccurate or questionable. Some are clearly farm dams (Figure 3-3) and others are simply a result of water ponded behind elevated road crossings (Figure 3-4). Whereas some of these features may have been ponds in the past, the system is now highly modified as a result of agricultural practices and in my opinion are not "intact". Furthermore, almost none of these ponds are identifiable on the 1951 aerial imagery (Figure 3-5) indicating that they are recent features either formed through road construction, scour due to unrestricted livestock, or constructed as farm dams.

Frood *et al.* (2018) state in their report that:

> *"a number of small sites mapped as ponds on the HVP [pine plantations] mapping require on-ground confirmation, as a small proportion of these represent features such as blackberry patches, small grassy clearings or area of shadow, which can be difficult to distinguish accurately from ponds on the aerial imagery, especially when they are immersed with pine plantations."*

Given that the data obtained from Frood *et al.* (2018) requires ground truthing and that my observations show that the mapped ponds are in many cases inaccurate or questionable, the ponds mapped on the Victorian Index of Wetland Condition Data Management System (DELWP) are not, in my opinion, definitive.

Finally, Submission 358 proposes that the "chain of ponds" system along Honeysuckle Creek is reinstated in the final rehabilitated landform. Again, and with reference to the above, the system is now highly modified as a result of agricultural practices and cannot in my view be considered "intact". Chains of Ponds are rare features for a reason, and this is entirely due to a specific set of environmental controls required for their formation in the natural environment. Whereas there are a lot of unknowns about the formation processes of Chains of Ponds, it is hypothesised that their formation is related to palaeo-rivers up to 100,000 years old and that they are a "contemporary expression of a persistent geomorphic landform" (Williams and Fryirs, 2020). Hydrogeomorphic processes work to maintain them; however, once degraded, these features cannot be replaced or restored.

To reinstate them in any meaningful or sustainable manner would require establishing the area as a nature reserve or national park (if it were possible at all). I can think of no reason why this particular reach requires reinstatement now. To my knowledge, no such requests have been made of the landholders prior to this date and no such request have been made of the landholders in any other part of the Perry River catchment. In my opinion, the intact features to the west would be a far better focus for preservation than the degraded system within the mining lease.

FIGURE 3-3 FARM DAM MAPPED AS POND IN FIGURE PROVIDED IN SIBMISSION 358.

NOTE, OBVIOUS SPOIL PILE OF EXCVATED SEDIMENT ON THE FAR SIDE OF THE DAM.

FIGURE 3-4 PONDED WATER UPSTREAM OF ROAD CROSSING, MAPPED AS POND.

FIGURE 3-5 1951 HISTORICAL AERIAL IMAGERY OF THE UNNAMED TRIBUTARY OF HONEY SUCKLE CREEK WITH PROJECT AREA SHOWN IN RED LINE.

3.3.6 Tunnel Erosion

Tunnel erosion is brought up in several submissions. As stated in my report, tunnel erosion was observed in some locations, however, observations included acute locations and did not indicate that tunnel erosion was prevalent. Regardless, tunnel erosion is driven by sodic soils, soil permeability and exacerbated by land clearing. This can be exacerbated by wombat borrowing or in some cases wombat burrows can be mistaken for tunnel erosion. The recommendations in my report for revegetation combined with the soil treatment proposed in the mine closure report, are sufficient to mitigate the risks of tunnel erosion. With this treatment and the revegetation effort, a reduction in tunnel erosion across the site is a realistic target for the final landscape.

Submission 552 cites concerns as to the future stability of the eastern escarpment area of the site. Reference to a report on Tunnel Erosion in East Gippsland is made citing that tunnel erosion is common in this area (DPI, 2010). I accept that tunnel erosion may be common in this region; however, I did not observe it in any high concentration on the mining lease on either of my site visits. Furthermore, the same report (DPI, 2010) makes the following recommendations for mitigating tunnel erosion, which are in line with mitigation measures recommended by me and others within the EES.

"The recommended method for paddock tunnel erosion rehabilitation in East Gippsland is as follows:

- *Application of 4 t/ha of gypsum.*

- *Single pass deep ripping by a dozer no less than 38 tonnes and 300 horsepower on contour with the rip lines 1 metre apart at 1.5 metres deep over the whole local paddock catchment area from top to bottom.*
- *Establishment of perennial pasture (or revegetation with tree species that are indigenous) and in some cases, in combination with a crop in the first year depending on the degree of slope of the site."*

The above mitigation measures are reported to be effective in this document (DPI, 2010). Given the similarity between these mitigation measures and the proposed rehabilitated landform, I do not agree with the submission's suggestion that these methods are untrialled.

4 DECLARATION

I have made all the inquiries that I believe are desirable and appropriate and no matters of significance which I regard as relevant have to my knowledge been withheld from the Inquiry and Advisory Committee.

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29 January 2021

APPENDIX A: CV

DR MICHAEL CHEETHAM

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Phone: 07 3105 1460 | 0410 640 206

Principal Scientist - Geomorphologist

PhD (SCU), BSc (Hons)(UOW), GCRM (SCU), CEnvP

Adjunct Fellow – Southern Cross University

QUALIFICATIONS

- PhD, Fluvial Geomorphology, SCU, Lismore, Australia
- Grad. Cert. Research Management, SCU, Lismore, Australia
- BSc (Hons) Geology, UOW, Wollongong, Australia
- Certified Environmental Practitioner (CEnvP) (Cert No. 0667) 2014-Present: Waterway Assessment & Management, Geomorphology, and Sedimentology

AFFILIATIONS

- Chair – Specialist Environmental Advisory Committee (CEnvP – Specialist Category for Geomorphology)
- Accreditation Officer – Australian New Zealand Geomorphology Group
- Member – Environmental Institute of Australia and New Zealand

SUMMARY

Michael is a geomorphologist with 16 years' experience coordinating research and consultancy projects for clients such as the QLD Department of Natural Resources, Mines and Energy (DNRME), the Murray Darling Basin Authority (MDBA) and Victorian Department of Economic Development, Jobs, Transport and Resources (DEDJTR). Michael has seven years' experience in fluvial landscape process research, working on a variety of research projects funded by industry and the Australian Research Council.

Michael is a certified environmental practitioner (CEnvP) and specialises in waterway assessment and management (with specialist expertise in geomorphology and sedimentology). He has produced numerous international publications and has managed large-scale research and consultancy projects reporting to lead investigators, industry partners and clients. Michael has a wealth of experience in a wide range of field assessment techniques; geomorphologic and sedimentologic data analysis and interpretation; waterway management techniques; and floodplain sedimentology and hydrology.

Michael has been engaged as part of multiple expert review teams assessing the environmental performance mine sites, mine closure plans, government grant applications for river rehabilitation and technical advice for major infrastructure projects. He has also acted as Principal Editor, leading a team of experts from across Australia in the development of the Queensland Stream Management Guidelines.

AWARDS

- 2005: Australian Postgraduate Award (Industry), PhD research in Fluvial Geomorphology.

CERTIFICATES

- Remote First Aid 2009, (Refresher 2012, 2014, 2016, 2017,2019)
- River Styles® Course, 2013
- Acid Sulfate Soil Professional Short Course, 2012

PROFESSIONAL HISTORY

2016 – Present	Principal Scientist (Geomorphologist) – Water Technology, QLD
2012 – Present	Adjunct Fellow, Southern Cross University, Lismore, NSW
2012 – 2016	Senior Scientist (Geomorphologist) – Water Technology, QLD
2010 – 2012	Research Associate, Southern Cross Geoscience, Lismore, NSW
2009 – 2010	Lab Technician, Field Hand, Southern Cross Geoscience, Lismore, NSW
2005 – 2010	APAI Scholar PhD, Southern Cross Geoscience, Lismore, NSW
2004 – 2005	Geologist, Moultrie Group, Moranbah

SPECIALIST AREA OF EXPERTISE

- Waterway management for inland and coastal catchments
- Geomorphic assessment of river channels and floodplains
- Fluvial sedimentology and stratigraphy in river morphology and soil development
- Landscape processes and landscape evolution
- Stability assessments for riverine and coastal systems
- Coastal geomorphology and Holocene landscape evolution
- Erosion-control structure assessment
- River diversion assessment

RECENT MAJOR PROJECTS

PARADISE DAM WATER QUALITY AND GEOMORPHIC ASSESSMENT (Sunwater). Project manager and fluvial geomorphologist assessing the water quality and sedimentation implications for lowering the paradise dam full supply level. (2019-2021).

HILL AND SAVAGES CROSSING (Seqwater). Project manager and fluvial geomorphologist developing options and undertaking community and stakeholder engagement for the rehabilitation and recreation management of highly disturbed sites on the Brisbane River. (2019-2021).

MARROON DAM, SLATER PARK BANK STABILISATION (Seqwater) Project manager and fluvial geomorphologist assessing the stability of the park foreshore and developing detailed design for stabilisation. (2019-2020)

GLADSTONE MONTO ROAD ASSESSMENT (Stantec, Department of Transport and Main Roads). Fluvial geomorphologist assessing 11 road crossing designs in context with fluvial geomorphic processes and hydraulics. (2019).

LOCKYER CREEK EROSION CONTROL (Seqwater). Project manager and fluvial geomorphologist developing options and undertaking detailed design for erosion control on Lockyer Creek. (2019-2020).

FLAT ROCK CREEK NATURALISATION PROJECT (City of Gold Coast). Project manager and fluvial geomorphologist developing options and undertaking community and stakeholder engagement for the naturalisation of a highly disturbed and urbanized coastal catchment in the Gold Coast. (2019).

BARMAH CHOKE INVESTIGATION (Murray Darling Basin Authority). Project manager and fluvial geomorphologist undertaking an in-depth study into channel capacity reduction and unseasonable flooding related to fluvial processes in the Barmah Choke (2019).

FINGERBOARDS MINERAL SANDS LANDSCAPE STABILITY AND SEDIMENT REGIME ASSESSMENT (Kalbar Resources). Fluvial Geomorphologist engaged to assess the landscape stability on a mine lease adjacent to the Mitchel River, VIC and to provide expert advice on landscape character, likely behavior, and broad rehabilitation advice (2018-2019).

EDDIE KORNHAUSER RECREATIONAL RESERVE BED AND BANK INSTABILITIES (City of Gold Coast). Project manager and fluvial geomorphologist developing options and undertaking detailed design for a tributary of Tallebudgera Creek (2018).

QUEENSLAND STREAM MANAGEMENT GUIDELINES (Department of Natural Resources, Mines and Energy). Principal Editor for the Queensland Stream bank rehabilitation guidelines (2018).

LOGAN RIVER NUTREINT OFFSET PROJECT – DETAILED DESIGN (Healthy Land and Water). Detailed design of bank stabilsation works on the Logan River as part of an STP nutrient offset program (2018).

LOGAN AND ALBERT RIVER - NDRRA DETAILED DESIGN (Healthy Land and Water). Detailed design of bank stabilisation works on the Logan River and Canungra Creek as part of the Federal Natural Disaster Relief and Recovery Arrangements (2018).

STANLEY RIVER BANK STABILISATION ASSESSMENT (Seqwater). Condition and options assessment for bank stabilsation works on the Stanley River to reduce impacts of erosion on Lake Somerset, including concept design (2017).

MARY RIVER BANK STABILISATION ASSESSMENT (Seqwater). Condition and options assessment for bank stabilisation works on the Mary River to reduce impacts of erosion and sediment supply on a Water Treatment Plant well, including detailed design (2017).

CABOOLTURE RIVER NUTREINT OFFSET PROJECT – DETAILED DESIGN (Healthy Land and Water). Detailed design of bank stabilisation works on the Caboolture river as part of an STP nutrient offset program (2017).

AGRICULTURAL LANDSCAPE REHABILITATION SCHEME – FLOOD ASSESSMNETS (NRM North). Individual, on-ground assessment of 130 sites and reporting across Tasmania for application for ALRS funding. Rapid turn-around for this project; all work completed in 5 weeks. (2017).

DEEBING CREEK CORRIDOR PLAN (Ipswich City Council). Fluvial Geomorphologist engaged for expert advice on river character and likely behavior, and options for management and waterway health improvement. (2016-2017).

NATURAL DISASTER RELIEF AND RECOVERY ARRANGEMENTS – FLOOD ASSESSMNETS (North East CMA). Individual, on-ground assessment of 65 sites and desktop assessment of 233 sites in north east Victoria for application for NDDRA funding. Rapid turn-around for this project; all work completed in 4 weeks. (2016).

LOCKYER VALLEY CATCHMENT OPTIONS ASSESSMNET, CATCHMENT MANAGEMENT (Lockyer Valley Regional Council). Individual assessment of 9 sub-catchments within the Lockyer Catchment to determine waterway conditions and identify options for management and waterway health improvement. (2016-2017).

HOLCIM – EXTRACTIVE RESOURCE (Groundworks Plus). Fluvial geomorphologist engaged to assess extractive resource pit stability and recommend options for erosion protection (2016).

WOORONG PARK ARCHAEOLOGICAL SALVAGE (AECOM). Geomorphological investigation into landscape formation and conditions during Aboriginal occupation. (2016-2017).

CABOOLTURE RIVER NUTRIENT OFFSET PROJECT (SEQ Catchments). Establishing historic and future erosion rates at three sites along the Caboolture river for testing feasibility of use for nutrient offset (2016).

SECOND RANGE CROSSING – WATERWAY CROSSING, EXPERT ADVICE (Nexus, Aurecon, PB). Fluvial Geomorphologist providing technical advice for the second range crossing, project. Assessment of 5 major waterway crossing locations. Provide advice on erosion protection. (2015-2017).

MCARTHUR RIVER MINE – INDEPENDENT MONITOR (NT Department of Mines & Energy). Fluvial Geomorphologist engaged as part of an independent expert review team to assess the environmental performance of the McArthur River Mine and the Department of Mines and Energy. (2016-2017).

TAMAR ESTUARY AND ESK RIVER RIVERBANK EROSION GRANTS (NRM North). Fluvial Geomorphologist responsible for assessing river works applications and providing technical advice on design and implementation. (2015).

DRY CREEK CATCHMENT MANAGEMENT PLAN (Toowoomba Regional Council). Fluvial Geomorphologist responsible for assessing river condition and recommending a waterway management and infrastructure protection strategies. (2015).

O'MARA ROAD, BRIDGE PROTECTION DESIGN (Toowoomba Regional Council). Fluvial Geomorphologist responsible for assessing river condition and recommending infrastructure protection designs. (2015).

MAROOCHYDORE SANDS – EXTRACTIVE RESOURCE (Groundworks Plus). Fluvial geomorphologist engaged to assess extractive resource pit stability and recommend options for erosion protection (2015).

MCARTHUR RIVER MINE – INDEPENDENT MONITOR (NT Department of Mines & Energy). Fluvial Geomorphologist engaged as part of an independent expert review team to assess the environmental performance of the McArthur River Mine and the Department of Mines and Energy. (2015).

MURRAY RIVER BANK STABILITY PRIORITISATION TOOL (NSW Office of Water, MDBA). Fluvial geomorphologist engaged develop a specialised prioritisation tool for bank stability works on the Hume to Yarrawonga reach of the Murray River (2015).

BRISBANE WEST AIRPORT GEOMORPHIC ASSESSMENT (Toowoomba Regional Council). Fluvial geomorphologist engaged to assess the impact of floodplain development on Westbrook creek (2015).

GYMPIE WEIR GEOMORPHIC ASSESSMENT (SMEC for SEQ Water). Fluvial geomorphologist engaged to provide specialist investigation into connectivity of the Mary River under low flow conditions. (2015).

GUANABA & WONGAWALLAN CREEKS EROSION MANAGEMENT PLAN (Gold Coast City Council) Fluvial geomorphologist engaged to provide specialist investigation into erosion processes. Preparation of the erosion management plan. (2014).

RUM JUNGLE GEOMORPHIC ASSESSMENT (Department of Mines and Energy). Fluvial geomorphologist engaged to assess the current stability of select waterways wit in the rum jungle mine site and the potential impacts of rehabilitation programs. (2014).

MCARTHUR RIVER MINE – INDEPENDENT MONITOR (NT Department of Mines & Energy). Fluvial Geomorphologist engaged as part of an independent expert review team to assess the environmental performance of the McArthur River Mine and the Department of Mines and Energy. (2014).

MIARA CARAVAN PARK ROCK-WALL REVIEW (Bundaberg Regional Council) Coastal Geomorphologist employed to assess coastal processes affecting beach erosion and the potential effects of installing a rock wall as erosion control. (2014).

BAXTER'S CONCRETE FLOOD PROTECTION (North East CMA) Fluvial geomorphologist engaged to provide specialist input and advice for floodplain erosion control and avulsion mitigation. (2014).

BANK EROSION CONTROL CONCEPT DESIGN, OXLEY RIVER (Tweed Shire Council). Fluvial geomorphologist engaged to provide specialist input and concept design for bank erosion control and avulsion mitigation. (2013).

CHARLTON WELLCAMP ENTERPRISE AREA – DRY CREEK ASSESSMENT (Toowoomba Regional Council) Discharge assessment, detention basin design and geomorphic assessment of Dry Creek. (2013)

EROSION CONTROL OPTIONS ASSESSMENT, Brays Creek. (Tweed Shire Council) Geomorphologist providing geomorphic erosion control options for bank instabilities. (2013).

GEOMORPHIC ASSESSMENT OF EIGHT MILE CREEK (Albury City Council). Geomorphologist providing geomorphic assessment of Eight Mile Creek for the mitigation of erosion issues. (2012-2013).

RIVER STRUCTURE AND REVIEW Logan River (RPS for Logan City Council). Project Manager and geomorphologist providing geomorphic stability assessment for proposed park location. (2012-2013).

MARINE CROSSING ASSESSMENT: Port Curtis, Gladstone (Atteris Pty Ltd & Santos GLNG). Project Manager and geomorphologist providing geomorphic stability assessment for The Narrows gas transmission pipeline crossing (2012-2013).

FITZROY TERMINAL PROJECT ENVIRONMENTAL IMPACT STATEMENT (CQ Consulting Group). Fluvial geomorphologist and sedimentologist engaged to provide input on the effects of boat wash on Raglan Creek potentially impacted by the construction of the Fitzroy Terminal (2012).

FLOOD IMPACT ASSESSMENT REPORT - Hookswood and Pelham Roads, Miles (Nautilus Blue Pty Ltd). Fluvial geomorphologist engaged to provide specialist input on flood impacts and riparian corridor (2012).

IMPACT OF GRAVEL BARS ON THE OVENS RIVER - Whorouly, Victoria (North East CMA) - Provided specialist fluvial geomorphic input and review for the investigation of in-channel gravel bars. (2012).

MULGRAVE RESOURCE ACCESS – Creek Diversion Options (BHP Mitsui Coal Pty Ltd). Provided specialist fluvial geomorphic and sedimentologic input on and review of design options for the diversion of Walker Creek and Carborough Creek (2012).

LOWER LAKES PHASE 1 SULFATE REDUCTION MONITORING PROJECT (SA Department of Environment, Water and Natural Resources). Geomorphologist and Project Manager for assessing sulfate reduction and acid sulfate soil remediation of the Lower Lakes, MDB, SA. (2011-2012). (Previous employment).

DISTRIBUTION AND HAZARD OF SULFIDIC SEDIMENTS IN A RIVER AND CREEK CHANNEL SYSTEM OF THE MURRAY-DARLING BASIN (Murray Darling Basin Authority). Geomorphologist for assessing Acid Sulfate Soil distribution in the Murray Darling Basin. (2010). (Previous employment).

LOWER LAKES LABORATORY STUDY OF CONTAMINANT MOBILISATION UNDER SEAWATER AND FRESHWATER INUNDATION (South Australian Environmental Protection Authority). Geomorphologist involved in the assessment of acid sulfate soil distribution and remediation of the lower lakes, MDB, SA. (2010). (Previous employment).

MAJOR REPORTS

Cheetham, M., Markham, A., Brooks, A., Martin, J., Pearson, B., Pietsch, T., Tait, J., Vietz, G. 2018. Queensland Stream Management Guidelines. Department of Natural Resources, Mines and Energy.

ERIAS Group. (2017) Independent Monitor Environmental Performance Report 2015-2016, McArthur River Mine. Report No. 01164D_1_v2. Prepared for the NT Department of Mines and Energy, Darwin.

ERIAS Group. (2016) Independent Monitor Environmental Performance Report 2014-2015, McArthur River Mine. Report No. 01164C_1_v2. Prepared for the NT Department of Mines and Energy, Darwin.

ERIAS Group. (2015) Independent Monitor Environmental Performance Report 2013-2014, McArthur River Mine. Report No. 01164B_3_v2. Prepared for the NT Department of Mines and Energy, Darwin.

ERIAS Group. (2014) Independent Monitor Environmental Performance Report 2012-2013, McArthur River Mine. Report No. 01164A_1_v03. Prepared for the NT Department of Mines and Energy, Darwin.

Ladson, T., Tilleard, J., Erskine, W., Cheetham, M. (2014) Geomorphology of the Yea and Acheron Rivers. Prepared for the Goulburn Broken Catchment Management Authority.

Sullivan, L.A., Ward, N.J., Bush, R.T., Cheetham, M.D., Cheeseman, P.J., Fyfe, D.M., McIntyre, T., Bush, M. and Hagan, R. (2012) Lower Lakes Phase 1 Sulfate Reduction Monitoring Project. Southern Cross GeoScience Technical Report No. 112. Prepared for the SA Department of Environment, Water and Natural Resources, Adelaide.

Sullivan, L.A., Burton, E.D., Ward, N.J., Bush, R.T., Coughran, J., Cheetham, M.D., Fyfe, D.M., Cheeseman, P.J. and McIntyre, T. (2011) Lower Lakes sulfate reduction study. Southern Cross GeoScience Technical Report No. 711. Prepared for the SA Department of Environment and Natural Resources, Adelaide.

Bush R.T., Keene A.F., Erskine W.D., Sullivan L.A., White I., Bowman G., Cheetham M.D., Somerville P. (2010) ARC L-P0455080 Final Report to Industry Partners. Restoring hydrological connectivity of surface and ground waters: Biogeochemical processes and environmental benefits for river landscapes. April 2010. Southern Cross GeoScience, Southern Cross University. pp. 102.

Bush R.T., Tulau M., Coughran J., Ward N.J., Wong V.N.L., Cheetham M., Morand D. (2010) Distribution and hazard of sulfidic sediments in a river and creek channel system of the Murray-Darling Basin: Edward-Wakool channel system case study. Southern Cross GeoScience Technical Report No. 1010, Southern Cross University, Lismore, NSW.

Bush R.T., Ward N.J., Wong V.N.L., Cheetham M., Coughran J. (2010) Distribution and hazard of sulfidic sediments in a river and creek channel system of the Murray-Darling Basin: Edward-Wakool channel system case study (Preliminary Activity Statement). Southern Cross GeoScience Technical Report No. 710, Southern Cross University, Lismore, NSW. 48 pp.

Sullivan L.A., Bush R.T., Ward N.J., Fyfe D.M., Johnston M., Burton E.D., Cheeseman P., Bush M., Maher C., Cheetham M., Watling K.M., Wong V.N.L., Maher R., Weber E. (2009) Lower Lakes laboratory study of contaminant mobilisation under seawater and freshwater inundation (long-term study). Prepared for South Australian Environmental Protection Authority. Southern Cross GeoScience Technical Report 1109, Southern Cross University, Lismore, NSW. 377 pp.

PUBLICATIONS

REFEREED JOURNAL ARTICLES

Wong, V.N.L., Cheetham, M.D., Bush, T.R., Sullivan, L.A., Ward, N.J., Zawadski, A. (2015). Accumulation of Sulfidic Sediments in a Channelised Inland River System, Southern Australia. Marine & Freshwater Research. DOI: 10.1071/MF15080

Peter Kraal, P., Burton, E.D., Rose, A.L., Cheetham, M.D., Bush, R.T., Sullivan, L.A. (2013). Decoupling between water column oxygenation and benthic phosphate dynamics in a shallow eutrophic estuary. Environmental Science & Technology. 47(7), 3114-3121. DOI: 10.1021/es304868t

Cheetham, M.D., Wong, VN.L., Bush, T.R., Sullivan, L.A., Ward, N.J., Zawadski, A. (2012). Mobilisation, Alteration, and Redistribution of Monosulfidic Sediments in Inland River Systems. Journal of Environmental Management. 112. 330-339. DOI: 10.1016/j.jenvman.2012.08.015

Erskine, W., Keene, A., Bush, R., Cheetham, M., and Chalmers, A. (2012). Influence of riparian vegetation on channel widening and subsequent contraction on a sand-bed stream since European settlement: Widden Brook, Australia. Geomorphology. 147-148, 102-114. DOI: 10.1016/j.geomorph.2011.07.030

Cheetham, M.D., Bush, T.R., Keene, A.F., Erskine, W.D. (2010). Non-synchronous, episodic incision: Evidence of threshold exceedance and complex response as controls of terrace formation. Geomorphology, 123, 320-329. DOI: 10.1016/j.geomorph.2010.07.024

Cheetham, M.D., Keene, A.F., Erskine, W.D. Bush, R.T., Fitzsimmons, K., Jacobsen, G.E. and Fallon, S.J. (2010). Resolving the Holocene alluvial record in southeastern Australia using luminescence and radiocarbon techniques. Journal of Quaternary Science, 25(7), 1160-1168. DOI: 10.1002/jqs.1396

Cheetham, M., Keene, A., Bush, R., Erskine, W. and Fitzsimmons, K. (2010). Longitudinal Correlation of Late Quaternary Terrace Sequences of Widden Brook, South-Eastern Australia. Australian Journal of Earth Sciences, 57: 97-109. DOI: 10.1080/08120090903416229

Erskine W., Chalmers A., Keene A., Cheetham M. and Bush R. (2009) Role of rheophyte in bench development on a sand bed river in southeast Australia. Earth Surface Processes and Landforms. 24, 941-953. DOI: 10.1002/esp.1778

Cheetham, M., Keene, A., Bush, R., Sullivan, L. and Erskine, W. (2008). A comparison of grain-size analysis methods for sand-dominated sediments. Sedimentology, 55, 1905–1913. DOI: 10.1111/j.1365-3091.2008.00972.x

REFEREED CONFERENCE PAPERS

Erskine W., Ladson A., Tilleard J. & Cheetham M. (2014). River management on a reach basis highlights lagged channel responses to multiple catchment disturbances: Yea and Murrindindi rivers, Victoria, in Editors Names, Proceedings of the 7th Australian Stream Management Conference. Townsville, Queensland, 8pp.

Cheetham M. & Walton R. (2014). Waterways and Gully Stabilisation in Vertosol Soils: Dry Creek, Condamine Catchment, QLD, in Vietz, G; Rutherfurd, I.D, and Hughes, R. (editors), Proceedings of the 7th Australian Stream Management Conference. Townsville, Queensland, Pages 171-177.

Cheetham M.D., Wong V.N.L., Bush, R.T., Sullivan, L.A., Ward, N.J. (2012). Monosulfidic sediments in the Wakool River, Southern Australia: A preliminary investigation. In: “Proceedings of the 6th Australian Stream Management Conference”. 6-8 February 2012 Canberra, Australian Capital Territory. pp. 214-222.

Keene A.F., Erskine W.D., Chalmers A., Bush R.T., Cheetham M.D. (2009) Riparian revegetation and creation of a pool-riffle sequence by river restoration works on the sand-bedded Widden Brook, Australia. In: “The 7th International Symposium on Ecohydraulics and the 8th International Conference on Hydroinformatics: Science and information technologies for sustainable management of aquatic ecosystems”. 12–16 January 2009, Concepción Chile. (IAHR-IWA-IAHS-IAMG).

Cheetham M.D., Keene A.K., Erskine W.D., Bush R.T., Jacobsen G.E. (2008). Connecting the disconnected: longitudinal correlation of river terrace remnants. In: “Sediment Dynamics in Changing Environments”. (Eds. J. Schmidt, T. Cochrane, C. Phillips, S. Elliot, T. Davies & L. Basher). 1–5 December 2008 Christchurch New Zealand. (IAHS Publication, 325). pp. 123-129.

Keene A., Bush RT., Cheetham M., Chalmers A., Erskine WD. (2008). Pool-riffle reformation and bed armouring induced by structures and riparian revegetation that sequester sand. In: “Sediment Dynamics in Changing Environments”. (Eds. J. Schmidt, T. Cochrane, C. Phillips, S. Elliot, T. Davies & L. Basher). 1–5 December 2008 Christchurch New Zealand. (IAHS Publication, 325). pp. 576-583.

THESES

Cheetham, M. (2010) Correlation of River Terrace Sequences: Widden Brook, Australia. Doctor of Philosophy, Southern Cross University.

Cheetham, M. (2004) Stratigraphy and Holocene Infill of Lake Wollumboola: A Saline Coastal Lake on the South Coast of NSW. Honours, University of Wollongong.

APPENDIX B: INSTRUCTIONS

WHITE & CASE

30 September 2020

White & Case
Level 32, 525 Collins Street
Melbourne VIC 3000
Australia

GPO Box 2756
Melbourne VIC 3001
Australia

T +61 3 8486 8000

ABN 17 847 592 731

whitecase.com

Michael Cheetham
Water Technology Pty Ltd
Level 5, 43 Peel Street
South Brisbane, QLD 4101

By email: michael.cheetham@watertech.com.au

Confidential and subject to legal professional privilege

Dear Mr Cheetham

Fingerboards mineral sands project

We act as legal advisors to Kalbar Operations Pty Ltd (**Kalbar**), the proponent of the Fingerboards mineral sands project (**Project**).

This letter confirms and sets out the scope of your retainer to prepare an expert witness statement and potentially also present evidence at the inquiry hearing to be held in relation to the environment effects statement (**EES**) prepared for the Project pursuant to the *Environment Effects Act 1978* (Vic).

1. The Project

Kalbar proposes to develop the Project on an area of approximately 1,675 hectares within the eastern part of the Glenaladale mineral sands deposit in East Gippsland, Victoria. The Project site is located near the Mitchell River, approximately 2 km south of Glenaladale, 4 km south-west of Mitchell River National Park and 20 km north-west of Bairnsdale.

The Project includes the development of an open cut mineral sands mine and associated infrastructure. It is expected to have a mine life of 15–20 years and involve extraction of approximately 170 Mt of ore to produce approximately 6 Mt of mineral concentrate for export overseas.

2. Panel and EES inquiry

The EES and the studies and assessments that underpin it (together with a draft planning scheme amendment and application for an EPA works approval) are presently on public exhibition until the end of October 2020.

The inquiry is scheduled to convene its directions hearing on 13 November 2020, and the inquiry hearing is scheduled to commence on 7 December 2020. We will keep you informed of any relevant directions, including the timetable for filing evidence and, if required, any expert conferences.

3. Scope

This letter is confirmation of your engagement as an independent expert to:

(a) prepare an expert witness statement in which you:

(i) set out your background and relevant expertise;

30 September 2020

(ii) briefly describe and summarise the Landscape Stability and Sediment Transport Regime Assessment prepared in support of the EES and your role in preparing it. In particular, we ask that you detail whether there is anything in the report that you disagree with or wish to elaborate on and set out any additional information that you consider necessary to include, including any additional assumptions;

(iii) consider the submissions that are relevant to your area of expertise and respond to any issues raised; and

(b) if required, prepare and present expert evidence at the inquiry hearing.

We will provide further instructions on the scope of your engagement and any new instructions as necessary.

4. Form of your expert witness statement

The form and content of your expert witness statement should be prepared in accordance with Planning Panel Victoria's *Guide to Expert Evidence* (**Guide**). We enclose a copy of the Guide for your reference. Please review the Guide and ensure your witness statement addresses the matters set out in it, in particular those matters listed under the heading 'The expert witness statement'. Please contact us if there is anything in the Guide that you do not understand, or if you have questions in relation to it.

Until your expert witness statement is in final form it should not be signed. You should, however, be aware that unsigned documents may need to be disclosed to other parties.

5. Your duties and responsibilities as an expert witness

Even though you are engaged by Kalbar, you are retained as an expert to assist the inquiry, and you have an overriding duty to it. The inquiry will expect you to be objective, professional and form an independent view as to the matters in respect to which your opinion is sought.

6. Timing

The timing for completion of your expert witness statement is to be advised. We will let you know as soon as we can.

7. Conflict of interest

It is important that you are free from any possible conflict of interest in providing your advice. You should ensure that you have no connection with any potential party to this matter that could preclude you from providing your opinion in an objective and independent manner.

30 September 2020

8. Costs and invoicing

Water Technology Pty Ltd will continue to be contractually engaged by Kalbar and Kalbar will continue to be responsible for the payment of your fees. Your accounts should be sent directly to the appropriate person nominated by Kalbar.

9. Confidentiality

Your engagement and any documents you prepare under it should be marked "Confidential and subject to legal professional privilege".

If anyone other than ourselves, Kalbar or its technical advisers contact you about this engagement or the work you are undertaking under this engagement, please contact us immediately.

If you have any questions about this letter or require any additional information, please contact us.

Yours sincerely,

Tim Power

Tim Power
Partner

T +61 3 8486 8037
E tim.power@whitecase.com

Kirsty Campbell

Kirsty Campbell
Senior Associate

T +61 3 8486 8008
E kirsty.campbell@whitecase.com

Enc: Planning Panel Victoria's *Guide to Expert Evidence* - April 2019

Expert Witnesses

April 2019

Introduction

An expert witness has specialised knowledge from training, study or experience. A Panel may rely on that specialised knowledge to form an opinion about an issue that is relevant to the Hearing. Generally more weight will be given to expert evidence that is independent.

This Guide applies to:

- instructing an expert witness preparing expert evidence
- the preparation of the expert's evidence
- the presentation of the evidence at the Hearing
- questioning ('cross examination') of an expert witness.

The Guide explains what happens when an expert witness is to be called at a Hearing. A Panel may make specific Directions that vary this Guide.

Parties calling an expert witness must make sure that the expert is made aware of this guide when they are retained.

Expert witness' duty to the Panel

An expert witness:

- has a paramount duty to the Panel
- has an overriding duty to assist the Panel on matters relevant to the expert's expertise
- is not an advocate for a party
- must not withhold material matters known to the witness even if it may be unfavourable to a particular party.

The expert witness statement

An expert witness preparing a written statement for a Hearing must do so in accordance with this Guide. The statement must include:

- the expert's name and address
- the expert's qualifications, experience and area of expertise
- details of any other significant contributors to the statement (if there are any), and their expertise
- all instructions that define the scope of the statement (original and supplementary and whether in writing or verbal)
- details and qualifications of any person who carried out any tests or experiments upon which the expert has relied in preparing the statement.

All experts must declare in their statements:

> *'I have made all the inquiries that I believe are desirable and appropriate and no matters of significance which I regard as relevant have to my knowledge been withheld from the Panel.'*

Sometimes, an expert witness may have prepared an earlier report or advice that informed the Planning Scheme Amendment or proposal under consideration by the Panel. In these circumstances, the expert should not provide a revised version of that report. Instead, the expert's witness statement should include:

- a clear reference to the earlier report(s)
- details of the expert's role in preparing or overseeing the earlier report(s)
- confirmation that the expert adopts the earlier report(s) and identifying:
  - any key assumptions made in preparing the earlier report(s)
  - any departure from findings or opinion expressed in the earlier report(s), and why
  - any questions falling outside the expert's expertise
  - whether the earlier report is incomplete or inaccurate in any respect
- details of any changed circumstances or assumptions since the earlier report(s) were prepared, and whether these affect the opinions expressed in the earlier report(s).

Where the expert was not involved in the preparation of earlier reports or advice that informed the Planning Scheme Amendment or proposal, the expert's statement should include:

- the facts, matters and assumptions on which the expert relies in preparing the statement
- reference to documents and materials the expert has used in preparing the statement
- a summary of the expert's opinion(s), including provisional opinions.

Where the expert materially changes their opinion

An expert witness who changes their opinion on a material matter after the circulation of evidence must communicate that change in writing to the Panel and all parties to the Hearing and explain why their opinion has changed.

Privacy

Expert witness reports are usually published on a website. They are also available to all parties to a proceeding. An expert witness statement should not refer to submitters by name. Where necessary, submitters should be referenced by submission number.

Expert witnesses should inform themselves of their obligations under the *Privacy and Data Protection Act 2014.* Personal information contained in submissions should be used in accordance with the principles in the Act.

For more information on Privacy refer to the separate **Guide to Privacy at Planning Panels Victoria.**

Form of statement

Expert witness statements must be provided in the following form.

All copies

Witness statements and any supporting information must:

- be prepared at A4 page size, unless otherwise directed
- use a black, 12 point font (Arial or Calibri preferred)
- have numbered paragraphs and pages.

Maps, images or plans must be at a high-definition resolution of at least 600 pixels per inch.

Electronic copies

An electronic version of a document must be less than 10MB in size and provided to:

- parties on the distribution list in accordance with the Panel's Direction
- the Panel in unlocked 'pdf' or Microsoft Word format
- the Planning Authority in a format suitable for uploading to its website.

Paper copies

Paper copies of evidence are generally not required. Where the Panel directs a paper copy, each document must be:

- two-hole punched
- stapled, not bound
- printed on both sides of each page.

Maps, images or plans may be printed at A3 and be folded within the report so they can be read without being removed.

Circulation of expert reports

Parties must confirm at the Directions Hearing any evidence they will be calling at the Public Hearing.

Expert reports must be circulated five working days before the Hearing starts or as directed by the Panel.

People not on the evidence circulation list can obtain electronic copies by contacting the Panel Co-ordinator on 8392 5115.

Directions relating to expert witnesses

The Panel may direct that expert witnesses address certain matters in their evidence, to enable all parties to gain a clear understanding of the basis of evidence to be presented. Examples include a response to specific questions asked by the Panel, or to explain the methodology, assumptions and inputs that contributed to the expert's assessment.

Expert meeting prior to the Hearing

The Panel may direct that expert witnesses in the same technical area meet before the Hearing and prepare a statement of agreed opinions and facts.

The expert meeting is for technical experts to discuss the issues without instructors, to identify (and if possible reduce) areas of disagreement in the Hearing. This ensures a more efficient and effective process. The Panel will provide specific directions for an expert meeting where required.

Evidence at the Hearing

Experts should identify any errors in their statement at the Hearing at the start of giving evidence. Witnesses should summarise key opinions in their evidence in no more than 30 minutes.

Experts can prepare a summary statement or presentation for the Hearing, but this must be drawn from the circulated evidence. Responses to other expert reports that constitute new material must be clearly identified.

Cross examination

An expert witness may be questioned by parties, advocates and the Panel. Questions put to expert witnesses must be relevant, directed to matters of fact or professional opinion, and must genuinely assist the Panel in understanding the issues. To ask questions of a witness, a party must be present for the whole of the evidence summary and questioning of the witness.

The Panel may regulate cross-examination to ensure an efficient hearing and that the cross examination remains relevant to the issues. The Panel may limit cross-examination that is not of benefit to the Panel.

Consequences of not complying with a Direction

The Panel has a broad range of powers to control Hearings under Division 2, Part 8 of the *Planning and Environment Act 1987.*

It is important to comply with Directions. The consequences of a failure to comply may be significant. For example, a Panel may refuse to allow an expert to present evidence at the Hearing.

Other witnesses

A range of other people with specialist expertise appear at Panels including:

- technical staff from agencies or Councils, who might make submissions in place of giving evidence
- lay witnesses who may have specialist knowledge. Past examples have included business owners, farmers and boat skippers.

These witnesses are generally not subject to cross examination but may be asked questions by the Panel or by other parties through the Chair.

Further information

Further information about Planning Panels Victoria can be found at:

https://www.planning.vic.gov.au/panels-and-committees/panels-and-committees

WATER TECHNOLOGY
WATER, COASTAL & ENVIRONMENTAL CONSULTANTS

APPENDIX C
LIST OF SUBMISSIONS

SUBMISSIONS CONSIDERED (FLUVIAL GEOMORPHIC, LANDSCAPE STABILITY AND SEDIMENT ASSESSMENT)

Topic	Submissions considered
Fluvial geomorphic, landscape stability and sediment assessment	108 123 202 268 291 358 369 514 552 568 691 693 716 743 812 813

Melbourne

15 Business Park Drive
Notting Hill VIC 3168
Telephone (03) 8526 0800
Fax (03) 9558 9365

Brisbane

Level 3, 43 Peel Street
South Brisbane QLD 4101
Telephone (07) 3105 1460
Fax (07) 3846 5144

Wangaratta

First Floor, 40 Rowan Street
Wangaratta VIC 3677
Telephone (03) 5721 2650

Perth

PO Box 362
Subiaco WA 6904
Telephone 0407 946 051

Geelong

PO Box 436
Geelong VIC 3220
Telephone 0458 015 664

Gippsland

154 Macleod Street
Bairnsdale VIC 3875
Telephone (03) 5152 5833

Wimmera

PO Box 584
Stawell VIC 3380
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