MEMORANDUM

TO:	Otago Regional Council	Date:	18 August 2023
COPY TO:	Josie Burrows (Beca)	Job No:	64189#BEE24
FROM:	Treffery Barnett		

ECOLOGY AUDIT OF INFORMATION PROVIDED AND RESPONSE TO PLANNERS QUESTIONS DATED 2 AUGUST 2023 WITH REGARD TO CONSENT APPLICATION RM22.434 – LAND USE, WATER TAKE AND DISCHARGE OF SEDIMENT LADEN WATER FOR OPERATION OF SUCTION DREDGE.

Cold Gold Clutha Ltd (the applicant) has applied to Otago Regional Council (ORC) to for a new permit to operate suction dredge on the Clutha River. As part of the application, they also propose to construct two slipways, one permanent (for the life of the consent) and one temporary, on the banks of the Clutha River. The applicant already holds a number of consents permitting suction dredge gold mining in the mid reaches of the Clutha River. The scope of this audit pertains to mining in the Clutha River between the Luggate bridge extending downstream to where the river flows into Lake Dunstan.

Babbage Consultants Limited (Babbage) has been engaged by ORC to provide an audit of the S92 responses by the applicant, which included confirming the conditions of consent, prepared by Terramark, dated 18 July 2023 and e3 Scientific, dated 19 July 2023. Our audit focused on the questions provided by ORC which are answered below.

1. **Is the technical information as it relates to ecology provided in the first s92 response dated 19 April 2023, e3 response to Cultural Impact Assessment dated 19 April 2023, second s92 response dated 18 July 2023 including e3 Scientific memo dated 19 July 2023 robust, including being clear about uncertainties and any assumptions? If not, please explain.**

The e3 Scientific 19 April 2023 response is most clear and robust; the exception is Response 2 (b). The responses to Matters 1 – 8 to the Cultural Impact Assessment (CIA) matters are specific, robust and referenced. With regard to CIA Matter 2, the conclusion is appropriate, but not necessarily for the reasons stated. Stream and river benthic macroinvertebrates are dominated by the larval stage of terrestrial insects (stoneflies, dobsonflies, damselflies, dragonflies, mayflies, caddisflies, diptera etc) which deposit eggs on the edges and shallows of rivers (wadable depth) and provide a clear indication of what macroinvertebrates are in the wider river environment. The exceptions, being kōura and kōkahi, which were discussed in later responses.

Babbage Consultants Limited
Level 4, 68 Beach Road, Auckland 1010
PO Box 2027, Shortland Street,
Auckland 1140, New Zealand
T 09 379 9980 F 09 377 1170
E admin@babbage.co.nz www.babbage.co.nz

Response 2(b) recommends the use of a secchi disk, which has been carried through to the proposed conditions of consent. A secchi disc is not appropriate for use in a river with strong flows as the methodology relies on observing the disc as it descends vertically through the water column. Secchi discs are used in coastal waters and in lakes where there is no or little horizontal movement, and the National Environmental Monitoring Standards (NEMS) (2019) methods and standards for secchi discs (as referred to in the proposed revised consent conditions) are only in Part 3, for Lake Water and Part 4 for Coastal Water.

The second s92 response from Terramark dated 18 July 2023, provides a detailed response with regard to Te Mana o te Wai, largely based on previous consent applications in ostensibly more sensitive environments that have been assessed against Te Mana o te Wai and have been accepted. This response appears robust from a science approach, but assessment of a cultural response is outside of the scope of our ecologists review and should be sought from mana whenua.

Response s92(1) 1. The clarity comment on proposed 250 m setback from any bird nesting colonies during the nesting season raises uncertainties and is discussed below.

Response s92(1) 6. Provides an incomplete response to the request. The request asks for the *methodology as to how Lagarosiphon will be identified*. The methodology is "*observing the watercourse from the riverbank and … tender … during scouting trips*". Not all macrophyte beds are *Lagarosiphon* and this also assumes that the bottom of the river will be clearly visible on the scouting trips. The applicant should refer to their ecologist for a suitable methodology.

The e3Scientific response dated 19 July 2023 has a number of uncertainties.

- Response 1. With regard to indigenous birds is discussed below.
- Response 2. recommends the use of secchi disc assessments to determine water clarity. The use of secchi discs is not appropriate for use in rivers with strong flows (refer above). An alternative practical methodology should be provided. Response 3 and 4 are covered by the questions below.

2. Are there any other matters that appear relevant to you that have not been included in those documents, or is additional information needed? If so, please explain.

No. The areas of additional information have been included in the audit responses above and below.

3. **Do you agree with the Applicant's assessment (specifically in the e3 Scientific memo dated 19 July 2023) that, with the proposed mitigation measures / consent conditions in Appendix 1, the residual ecological effects will be 'low'? If not, please explain why.**

The e3 Scientfic memo dated 19 July 2023 has four responses, plus the consent conditions. Response 1, regarding avoidance of sensitive stream mouths, in our assessment, will mitigate potential adverse effects on trout spawning, when included with Consent Condition 11. The reference to Condition 13 to avoid bird nesting colonies is unlikely to avoid adverse effects on native birds and is discussed below. Response 3 is robust, and considering the ANZECC default trigger values upper limit for turbidity is much higher than the maximum turbidity levels of the plume, we agree with the assessment; the combination of the map and table clearly identify the locations of stream confluences to be avoided. These have been uploaded onto aerial mapping and checked by our ecologists, including assessment of historical aerials and we find the map and table are accurate to mitigate the potential adverse effects (as above).

4. **The Applicant has (in the e3 Scientific memo dated 19 July 2023) has stated that, with respect to avoiding effects on ecology, permanently flowing water is more important than stream width. Do you agree with this statement? The Applicant has identified tributaries (see Figure 1) where suction dredging should be avoided. Do you consider any additional tributaries should be added to this map, and the reasons why?**

With respect to avoiding effects on freshwater ecology, we agree with the e3 Scientific assessment that flowing water is more important than stream width (within the context of this application). The identified tributaries were uploaded on a series of aerial maps and checked, including assessment of historical aerials, and we find the map and table of the identified tributaries are accurate to mitigate the potential adverse effects. No additional tributaries were identified from the detailed aerial photography with sufficient water or habitat to be added to the map.

5. **There has been ongoing discussion about the proposed 200m zone of reasonable mixing vs a 100m zone of reasonable mixing. Fish and Game in their submission (see linked above) recommended there be 'no visually conspicuous sediment plume beyond 100m downstream of the discharge).The Applicant (in the e3 Scientific memo dated 19 July 2023) has presented an assessment that there will be a low residual impact for a zone of reasonable mixing of 200m. Do you agree with this assessment? If not, please explain why. Do you consider there will be any significant adverse effects on aquatic life at 200m?**

We provided an assessment of the mixing zone in our 10 October 2022 review, including recommended conditions for the discharge permit. We stand by our initial response i.e. *we agree with the e3 recommendation for a 100m mixing zone.; we do not support the relaxation of conditions, just to reduce the chances of a non-compliance;*

We recommend the conditions of the discharge permit be amended to the following:

i. *There must be no conspicuous change in colour or visual clarity of the Clutha River/Mata-Au beyond a distance of 200m downstream from the point of discharge at any time.*
ii. *If there is a conspicuous change in colour or visual clarity of the Clutha River/Mata-Au beyond a distance of 100m downstream from the point, the activity must cease until there is no conspicuous change in colour or visual clarity beyond 100m.*
iii. *In the event that a noticeable sediment plume beyond a distance of 200 metres downstream from the point of discharge, all dredging activity must cease, and the Consent Holder must immediately notify the Consent Authority.*

We agree with the e3 Scientific conclusion of a low residual impact between 100m and 200m downstream. The ANZECC (2000) default guideline for New Zealand for protection of aquatic ecosystems is 4.1 NTU for upland rivers and 5.6 NTU for lowland rivers, and the more recent Australian and New Zealand Guidelines for Fresh and Marine Water Quality, has 2.3 NTU for cool wet low elevation sites. The maximum turbidity levels of the plume of 1.62 NTU is low and well below all of these guidelines, and therefore we agree with the e3 Scientific assessment.

Assuming the data presented by e3 Scientific is accurate, we do not consider that there will be any adverse effects on aquatic life at 200m.

6. The applicant has proposed that no mining occur within 250m of any bird nesting colonies between 1 September and 31 January. Do you consider this provides sufficient protection to bird species such that any effects will be 'low'?

No. Potential adverse effects on native birds will not be restricted to the "*bird nesting colonies between 1 September and 31 January*". The 'at risk' birds itemised in the original consent conditions 7 and 8 related to black fronted tern, black billed gull and banded dotterel, all have vulnerable young prior to fledging and some prior to independence. The breeding season rather than nesting season is the minimum standard for protection of avifauna. The breeding season for these three species are quite variable i.e. black fronted terns October to January; black-billed gulls August to March; and banded dotterel July to January (https://nzbirdsonline.org.nz/). The consent condition does not take this into account. In addition, 250m is an arbitrary distance, and if the applicant wishes to reduce potential adverse effects on these species, then a more detailed assessment needs to be provided, for example, is there actually habitat for these

birds present, is 100m sufficient? In addition, the consent now reads for "bird nesting colonies". This is poorly written, as it covers all birds, not just indigenous birds, and does not cover birds that do not nest in colonies.

7. If granted, are there any additional specific conditions, or amendments to the conditions proposed in Appendix 1 of the e3 Scientific memo dated 19 July 2023, that you recommend should be included in the consent?.

1. No. 8 This list under Promoted Conditions of Consent No. 8 does not include Dead Horse Creek (Table 2, of e3Scientific response).
2. No. 13 (replacing conditions 8 and 9) regarding birds need to be re-written (refer above)
3. Original Consent Condition 5 regarding remediation of the river bed has been removed. The condition either needs to be reinstated or an explanation of why it has been removed should be provided.
4. Discharge Permit No. 1 regarding the use of the secchi disc needs to be re-evaluated.
5. The recommended conditions regarding the photographing of entrained fish has not been included. It should either be included or an explanation of why not provided.

Yours sincerely,

Treffery Barnett M.Sc. (Hons), MEIANZ
Senior Coastal & Freshwater Ecologist
T +64 9 379 9417 | **M** +64 21 285 4330 |

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