BEFORE THE COMMISSIONERS ON BEHALF OF THE OTAGO REGIONAL COUNCIL

Consent No. RM19.440

BETWEEN	**OceanaGold Limited**
	Applicant
AND	**OTAGO REGIONAL COUNCIL**
	Consent Authority

EVIDENCE OF RICHARD MARK ALLIBONE

Introduction

1. My full name is Richard Mark Allibone.
2. I am the Director and Principal Ecologist of Water Ways Consulting Limited. I hold the following tertiary qualifications; a BSc (Zoology and Geology), an MSc (Zoology) and PhD (Zoology), all from the University of Otago. I am also a certified resource consent hearing commissioner. My research has centred on New Zealand's native fish with a focus on the New Zealand galaxiids, their taxonomy, life history and threats to these species.

3. I specialise in freshwater ecological research and management of native freshwater fish. I have been a freshwater fisheries specialist for the Department of Conservation, a Post-Doctoral Fellow and fisheries scientist at NIWA, and a Species Protection Officer in the Department of Conservation's Biodiversity Recovery Unit. Since 2004 I have worked as a consultant; firstly at Kingett Mitchell Limited, then Golder Associates (NZ) Ltd. In November 2014 I formed the company Water Ways Consulting Limited where I am a director and the principal ecologist.

4. My PhD conducted the first research into the ecology, distribution and conservation threats of four of non-migratory galaxiids in the Taieri River catchment, Taieri flathead (*G. depressiceps*), Central Otago roundhead galaxias (*G. anomalus*), Eldon's galaxias (*G. eldoni*) and Clutha flathead (*G. spD*) found in the Taieri River (Allibone 1997). Since completing my PhD I have conducted further research on the effects of water abstraction and salmonid impacts on non-migratory galaxiids in Otago (e.g. Allibone 2000a, b).

5. I am a recognised expert with regard to the conservation management of New Zealand's freshwater fish. I have been a member of the expert panel that conducts the conservation status assessments (threat rankings) for freshwater fish since 2001, including being the chair of this panel in 2009. While working for the Department of Conservation I was the lead author on three freshwater fish recovery plans (DOC 2003, 2004, 2005) and while these plans have now lapsed they are still the only recovery plans written and only guidance the Department of Conservation has produced for threatened fish management in New Zealand.

6. During the last 15 years I have undertaken freshwater ecological assessments for a range of irrigation schemes, either working for the applicant or reviewing applications for Environment Canterbury. I have worked on mining consents for coal mines, such as the Solid Energy Stockton mine and Takitimu Coal's mine at Nightcaps, Southland. I have conducted the assessment of aquatic effects and reviewed assessments for alluvial gold mining operations in

Otago and the West Coast. I am currently contracted to the Otago Regional Council to provide scientific advice for the Water Plan changes processes the Council is undertaking and to review the aquatic ecological aspects of resource consent applications.

7. I confirm that I have read and agree to comply with the Environment Court Code of Conduct for Expert Witnesses (Consolidated Practice Note 2014). This evidence is within my area of expertise, except where I state that I am relying on the evidence or information provided by another parties. I have not omitted to consider material facts known to me that might alter or detract from the opinions I express.

Scope of Evidence

8. My evidence addresses:

    a. Ecological values in the Deepdell Mine extension area;

    b. Cumulative effects of the mine development;

    c. Submissions from the Department of Conservation, Aukaha and the Macraes Community Incorporated; and

    d. Possible consent conditions

9. I have read the application and S92 information provided by the applicant and also the submissions of the Department of Conservation, Aukaha and Macraes Community Incorporated.

Ecological values

10. Ryder (2019) provides the aquatic ecological assessment for the application and provides a general description of the ecological values and notes the threatened species that are present. Taieri flathead galaxias is the most significant noted threatened fish with a threat classification of *Nationally vulnerable*, (Dunn et al 2019), koura, the freshwater crayfish is present and classified as *At Risk declining* (Grainger et al 2018).

11. There are no further threatened species noted. However, the assessment does not attempt to determine if there are any threatened invertebrate species (aside from koura) present in any of the wetland or stream habitats that will be impact or lost by the mine development. The assessment regards these areas as impacted by agricultural landuse activities such as

grazing and stock trampling. The site photographs provided support the assessment of these areas as being degraded but the actually present day ecological value has not been established.

12. Therefore, the conclusion that the recognised threatened fish, the Taieri flathead galaxias will not be directly impacted is accepted. A lack of direct impacts on the *At Risk* longfin eel is also accepted as correct.

13. There is a possible loss of koura habitat, but this is not well quantified. The assessment indicate 380 m of cut-off drain may support koura but health of this population has not been established. The applicant does offer to provide new koura habitat in a clean water drain that will flow to Camp Creek. It is possible that koura can be established in the cut off drain and the habitat enhancement activities such as riparian planting and placement of instream cover will aid in maintaining any koura population established. Given the length of drain is not long and the description classifies this area as a drain rather than a natural water course the loss of koura habitat and the associated creation of new habitat is considered reasonable

14. The uncertainty with regard to the presence of koura in the areas of stream or drain to be lost creates some difficulty assessing the effect and providing consent condition. Therefore, I would recommend a consent condition that requires no nett loss of koura. This will require koura to be collected from the existing drain and then transferred to the new cut off drain. Monitoring of the new cut off drain population will have to show that the koura population is equivalent or better to than the existing population that will be lost. In this way if koura are not found in the present drain no loss will occur but if there is a substantial population present then this will have to be replicated in the new cut off drain.

15. A monitoring condition should be set to ensure any koura population established is surviving and meeting the no nett loss condition. Given development of habitat for koura will be time dependent an assessment of the sate of the new population should be undertaken five years after establishment and again at five yearly intervals.

Cumulative effects

16. . The submitters, Auhaka and the department of Conservation, and myself note there is a process of cumulative loss of small headwater streams and ephemeral and intermittent wetland/stream areas as the mine is developed. Ryder (2019) demonstrate an on going issue in that the small areas of ephemeral streams, wetlands and drain that will be lost are present in the assessment of effects and the impact of this loss is considered less than minor.

However, the cumulative impact of multiple stream and wetland losses at some stage ceases to be less than minor and there are significant cumulative losses occurring. As part of the Section 92 request for further information we requested that the applicant attempt to quantify the total loss of stream courses around the mine site since the mine was started.

17. The Section 92 response reports (page 13) that 14,449 m of water course has been disturbed /lost during the mine development from the Deepdell Stream catchment. This response also notes that 7090 m has been protected in Island Block and Highlay Hill Covenant, 2150 m in the Crankys Jim wetland covenant and 3380 m in the Crankys Jim Shrubland, Deepdell tussock and Highlay Creek covenants. This leads to a cumulative protection total of 12.620 m. These totals show that the accumulative loss, assessed with no consideration of the stream type or condition, is 1829 m more than has been protected.

18. A further consideration with the cumulative loss is that streams that have been completely lost along with any ecological values they supported. The streams within the various covenants are protected but no additional streams have been created to offset the loss of stream habitat. Therefore, the cumulative loss of stream and wetland has not been replaced. It is also unknown whether the habitat types lost are represented in the covenant areas so it is possible rare habitats have been lost and no protected in the covenant areas.

19. To address the issue of cumulative habitat loss some Regional Council now require no nett loss of ecological values and habitat loss have to be offset by not simply habitat protection but habitat improvements and/or creation to achieve the no nett loss outcome.

20. I have been engaged as an independent expert on the Transmission Gully motorway construction project for fish passage and environmental compensation reviews. For this project the Stream Ecosystem Valuation process (SEV) was used to assess aquatic ecosystem values. The Court of Enquiry that consented the project set Environmental Compensation Ratios (ECRs) following the agreement of experts on the ratios to be used. Of relevance to this hearing is the stream loss compensation ratio, for every 1 m of stream lost there was a requirement for improvements to 6 m of stream habitat to be conducted.

21. I would conclude that to date the cumulative impacts of mine development have not be well assessed nor has the mitigation via covenants provided a level of mitigation that is appropriate. While it is not possible to revisit previous consents, I would recommend that for this consent and any future consent the cumulative lost is addressed and mitigation or offsetting is undertaken that seeks to achieve a no nett loss outcome.

22. The mitigation for stream loss can take various forms, such as enhancement works to improve habitat (riparian planting and fencing), removal of fish passage barriers, or possibly support for Department of Conservation, iwi project or community projects. A key aspect of such work is that long term benefits occur and these benefits are maintained into the future so that the permanent stream loss is mitigated for the long term.

Summary

23. Both the possible impacts on koura and the proposed mitigation have aspects of uncertainty with regard to what might be lost and what can be created to maintain the koura populations. I recommend consent conditions that require no nett loos of koura and monitoring to demonstrate this is occurring.

24. The issue of cumulative loss of habitat, especially the smaller ephemeral stream courses and wetland type features, is a real concern. The S92 information provided indicates significant losses and the protection work (i.e. covenants) does not replace the lost habitat. For this consent I would recommend that no nett loss of ecological value is required and the applicant with submitters and the ORC develop a mitigation plan for this consent and any future consent.

Richard Allibone

21 July 2020

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