

Before the Fast-track Panel

Under: The Fast-track Approvals Act 2024
In the matter of: FTAA-2605-1238 Barrytown Minerals Project

Statement of advice Roland Payne
Wetland ecology
Independent consultant
21 September 2026



Department of
Conservation
Te Papa Atawhai

**Te Kāwanatanga
o Aotearoa**
New Zealand Government

Introduction

1. My full name is Roland Kahurangi Payne.

Instruction

2. I have been instructed by the Department of Conservation (DOC) to provide expert advice on the fast-track application by Tāiko Critical Minerals Limited (the Applicant) for the Barrytown Minerals Project.

Qualification and Experience

3. I am an Ecological Consultant employed by Wildland Consultants Limited. I have a Bachelor of Science in Geography from the University of Canterbury (2004), and a Master of Science Communication with Distinction in Science and Natural History from the University of Otago (2013). I have more than 12 years professional experience working as a senior ecologist, ecologist and field botanist. This includes five years working as an ecologist at Wildland Consultants (four as a senior ecologist), four years working as a terrestrial ecologist for Kingett Mitchell and Golder Associates NZ and three years working as field botanist and team leader for New Zealand forest surveys. My role in this project to date has included a review of wetland aspects of the Ecological Effects Assessment (Appendix L4 of the substantive application documents) and associated documents.
4. I have a good understanding of the wetland ecology in various parts of New Zealand, based on the following experience and roles:
 - a. I have undertaken numerous Ecological Impact Assessments on wetlands for development projects and provided management recommendations that have been adopted as consent conditions to avoid, minimise and remedy those effects.
 - b. I have prepared numerous ecological restoration plans for wetlands that have been implemented to restore and enhance degraded wetland habitats.
 - c. I have provided various councils with ecological peer reviews on wetland impact assessments, wetland effect management and wetland restoration and constructed wetland projects.
 - d. I have undertaken large-scale wetland mapping and classification projects including the mapping of thousands of wetlands throughout Otago and the delineation and mapping of wetlands on Rekohu/Chatham Island.

Code of conduct

5. Although this is not an Environment Court Proceeding, I confirm that I have read the Code of Conduct for expert witnesses contained in the Environment Court Practice Note 2023. I have complied with the Code of Conduct in the preparation of this advice. This advice is within my area of expertise, although in respect to cryptic wetland fauna I have relied on the expertise of Dr Richard Storey (freshwater) and Dr Elizabeth Parlato (avifauna). I have not omitted to consider material facts known to me that might alter or detract from the opinions I express.

Scope of advice and expert opinion

6. My expert advice will address the following matters:
 - a. Adequacy of the Applicant's assessment of wetlands, including identification of any values that have not been assessed or have been insufficiently characterised.
 - b. Adequacy of the Applicant's assessment of effects on wetland habitats with specific reference to any effects that are incomplete, understated, or not addressed.
 - c. Adequacy of the Applicant's proposed effects management measures regarding wetlands.
 - d. Comments on conditions that relate to management of wetlands.

Sources

7. In preparing this advice I have reviewed:
 - a. Appendix L4 - Barrytown South Mineral Sand Project Ecological Effects Assessment. Prepared by Ecological Solutions (March 2026).
 - b. Appendix M9 - Barrytown South Mineral Sand Project: Southern Block, Landscape Mitigation Package. Prepared by Glasson Huxtable Landscape Architects, REV H, May 2026.
 - c. Appendix M6 - Barrytown South Mineral Sand Project, Southern Block, Rehabilitation Management Plan. Prepared by Tai Poutini Resources (May 2026).
 - d. Appendix K - Barrytown Minerals Project – Southern Block, Relevant Maps and Plans. Prepared by Tāiko Critical Minerals (April 2026).
 - e. Appendix L4A: Statement of Evidence Dr Bramley Terrestrial Ecology.
 - f. Appendix P1 - Barrytown South Mineral Sand Project, Southern Block, Proposed Resource Consent Conditions – District and Regional Council.
8. I also undertook a site visit to investigate wetlands on 11 August 2026.

Discussion

Project summary

9. The project is to extend mining operations on the Barrytown Flats into an area known as the 'Southern Block' (SB), which is located between Canoe Creek and Fagan Creek and extends over an area of approximately 408 hectares (ha). Mining will occur over 69 percent of this area (280 ha) with additional earthworks to assist with recontouring and rehabilitation potentially covering a further 72 ha. This would bring the total disturbance footprint to 352 hectares, or 86.3% of the site.

Wetland and habitat summary

10. The site has a long history of disturbance from timber and flax harvesting, agriculture, and mining. Currently it is still intersected with several long thin waterbodies created by mining related dredging (dredge channel wetlands). Nearly all the original vegetation has been removed, and the site is currently used for dairy farming. The land has been partially drained and the ground 'humped and hollowed' to enable cultivation of exotic pasture grass on the humps. However, the intersecting 'hollows' are nearly all wetlands along with other low-lying areas of the site. These wetlands are largely vegetated with moisture-tolerant pasture species and indigenous wetland plants including *Juncus* spp., *Carex* spp., and *Isolepis prolifera*, which is often dominant.
11. The dredge channel wetlands are deeper with areas of open water and are often fenced to exclude livestock. These areas have a mixture of swamp and shallow water wetland habitat and more developed and diverse wetland plants, including stands of indigenous raupō (*Typha orientalis*), flax/harakeke (*Phormium tenax*), and pukio (*Carex secta*). Other wetland habitats on the site are associated with creek floodplains and coastal lagoons. All these wetlands provide habitat for indigenous fauna including birds, invertebrates and (where connected to waterways) fish, including potential habitat for Threatened and At Risk fauna.

Concerns with wetland classification

Incorrect classification of some wetlands

12. The Ecological Effects Assessment (EEA) states that "wetlands were identified in accordance with the National Policy Statement for Freshwater Management (2020) (NPS-FM) and wetland delineations carried out in accordance with MfE Wetland Delineation Protocols (2022)". The wetland delineation methods mention the use of historic imagery and desktop data in assessing the historic hydrological conditions, but it appears to have only been used to identify areas for investigation during the field survey and not in the assessment itself.
13. The site has a documented history of wetlands. In 1846, Charles Heaphy described the area as "apparently swampy, covered with rata bush and flax" (Taylor 1959, pg. 204). New Zealand Geological Survey maps of the area in 1912-14 (Henderson 1917) clearly show that most of the site was swamp (wetland). This is corroborated by the soil mapping from the 1960s, which shows most of the site is situated on peaty silt loam topsoil with gley subsoil horizons that are poorly drained with severe internal water impedance (New Zealand Soil Bureau 1964).
14. This poorly drained peaty soil would have historically supported wetland habitat prior to modifications such as dredging and drainage. Wetlands resulting from poor drainage from hump and hollow landforms, and from historic mine dredge pits, have been incorrectly classified as 'artificial wetlands' (and therefore not subject to the policies of the National Policy Statement for Freshwater Management 2020

(NPS-FM) or the Resource Management (National Environmental Standards for Freshwater) Regulations 2020 (NES-F)). However, according to NPS-FM and supporting documents, for the wetlands to be classified as artificial, they would need to have been created intentionally as wetlands and maintained as such.

15. Similarly, the historic dredge pits are not deliberately constructed water bodies and wetland habitat existed in this area before dredging. Therefore, these wetlands should be classified as highly modified natural wetlands or induced natural wetlands, which are subject to the policies and regulations in the NPS-FM and NES-F, respectively. Correctly reclassifying these wetlands brings the total area of natural inland wetlands to 42.1 hectares within the SB and 35.8 hectares within the mining footprint.

Concerns with assessment of wetland ecological values

16. The Ecological Effects Assessment (EEA) follows Environment Institute of Australia and New Zealand's (EIANZ) Ecological Impact Assessment Guidelines (EclAG) (Roper-Lindsay et al. 2018) and assigns wetland values ranging from Negligible to Moderate. It does not assess wetlands ecological significance against the West Coast Regional Policy Statement (WCRPS Appendix 2 criteria for identifying significant wetlands). The EEA correctly identifies that nationally wetlands have declined to less than 10% of the estimated pre-human extent and are still in decline, with the West Coast continuing to experience some of the highest losses of wetlands. The EEA also correctly identifies that all freshwater wetlands with indigenous vegetation have at least a 'High' value for rarity. However, it fails to identify that some wetlands on the site are dominated by indigenous vegetation and assesses that all wetlands on the site are not 'representative' due to a dominance of exotic and common widespread indigenous species. This implies that common indigenous species are not representative.
17. During the site visit, I observed several wetlands that were dominated by indigenous vegetation including species such as raupō, harakeke, and pukio, which are representative of lowland swamps and coastal marsh wetlands in this region. The EEA appears to lump all wetlands habitats together and, in doing so, does not identify the areas that have a greater dominance of indigenous vegetation. Therefore, the assessment assigns Low ecological values to wetlands, which should score at least Moderate for Representativeness.
18. The EEA wetland values assessment is also based entirely on vegetation and does not consider wetland fauna. Despite undertaking eDNA sampling in waterways connected to wetlands there is no mention of the potential value of wetlands to fish, birds, or other wetland fauna. It is noted there are eBird records of Australasian bittern (*Botaurus poiciloptilus*; Threatened – Nationally Critical) and marsh crake (*Zapornia pusilla*; At Risk – Declining) within 10 kilometres of the site, and there is habitat for these species within the Southern Block. Neither species

was recorded during the EEA field surveys; however, both are cryptic and difficult to detect without targeted surveys, and none were undertaken¹.

19. The results of the eDNA survey suggest that At Risk fish species including giant kōkopu (*Galaxias argenteus*; At Risk – Declining) and longfin eel (*Anguilla dieffenbachii*, At Risk – Declining) are widespread on the site and could be present within the pools associated with wetlands. Brown mudfish (*Neochanna apoda*, At Risk – Declining) are known from the nearby Nīkau Scenic Reserve, and habitat for mudfish is present at the site. Mudfish are a cryptic, rarely encountered, primarily nocturnal species that tend to live in wetland habitats (Ling et al. 2013). They are also considered difficult to capture and survey for (Eldon 1992). Electrofishing for mudfish is documented to have variable success and potentially yield poor results, as mudfish appear to be able to protect themselves from the electrical current by hiding within mud and vegetation, while stunned fish may not be observed in turbid water (Ling et al. 2013). Additionally, eDNA sampling is likely to have variable success in a still-water environments such as those found in most of the wetlands on the site. Furthermore, the EEA freshwater fish survey did not target wetlands or habitat of brown mudfish using appropriate survey techniques (e.g. Gee minnow traps), therefore their absence from the site cannot be confirmed.
20. Including wetland fauna in the wetland assessment will likely increase the ecological value of the wetlands; if Threatened or At Risk fauna are present the ecological value could increase significantly. Therefore, a precautionary approach should be applied to the wetland values assessment, meaning that where habitat for Threatened and At Risk fauna is present the ecological value of the wetland for Rarity and Distinctiveness should be considered **High** or **Very High** and these wetlands should be considered ecologically significant under the WCRPS Appendix 2 criteria.

Summary of potential effects on wetlands

21. Impacts on wetlands associated with the proposed activities include:
 - a. Complete removal of habitat beneath mining path (i.e. loss of at least 35.8 hectares of wetland extent within the mining footprint) and potentially more if wetland habitats are impacted by additional earthworks to assist with recontouring and rehabilitation.
 - b. Complete loss of habitat for wetland flora and fauna, including potentially Threatened or At Risk fauna.
 - c. Loss of potentially ecologically significant wetland habitats.

¹ Pers comm Dr Elizabeth Parlato

Concerns with assessment of values

22. The ecological value of the wetlands is considered to have been underestimated in the EEA. Given the potential habitat for Threatened and At Risk species present in the wetlands, the value for 'Rarity and Distinctiveness' of the wetland should be rated as Very High.
23. The magnitude of effect has been correctly classified as Very High but the overall level of effect before mitigation should account for the potential fauna habitat values. The EEA also potentially overstates the benefits of the proposed mitigation, having assessed the level of effect after mitigation to be "**Very Low or Net Gain**". However, as the ecological values of the wetlands that will be lost have not been adequately assessed the effectiveness of the mitigation cannot be verified.

Concerns with proposed effects management

24. Section 9.5 of the EEA sets out how the authors have applied the effects management hierarchy to the project. Features that will be avoided include Granite Creek and dead rātā snags (that are already outside of the mining area). In addition, no mining activities will be undertaken at night to avoid affecting tāiko (*Procellaria parkinsoni*). The EEA does not assess whether any wetlands have ecological values that should be managed through avoidance or minimisation. Instead, the authors of the EEA propose to manage the loss of the wetlands by constructing and planting a new wetland covering c.53.1 hectares and have classified this effects management as 'remediation'. However, the existing wetland habitats will be permanently destroyed, which means they cannot be remediated. Instead, the proposal is to replace the lost ecological values by creating a new wetland de novo. Therefore, this wetland will act as a substitute or compensation for the ecological damage that will occur. Even though the wetland will be constructed on the site it is not remediation — it is compensation that occurs on the site and should be described as such.
25. The constructed compensation wetland, as proposed in the Consent Conditions (16.1 – 16.15) will include the construction of a wetland of at least 50 hectares undertaken in accordance with the Landscape Mitigation Package and Rehabilitation Management Plan. These documents list the following habitats that will be included:
 - a. At least 5.3 ha of shallow marsh with an average depth of 0.4 m
 - b. At least 2.8 ha of mid-depth water with an average depth of 1 m
 - c. At least 4.8 ha of deep open water with an average depth of 2 m
 - d. At least 16.8 ha of flaxland and dry edge vegetation
 - e. At least 5.9 ha of Carex Rushlands
 - f. At least 14.3 ha of Raupō
 - g. At least 3.2 ha of raised islands

26. However, based on this breakdown, only 28.3 hectares of the habitats listed here are wetland habitat, with the balance consisting of flaxland and dry edge vegetation (16.8 ha), raised islands (3.2 ha) and deep open water (4.8 ha). The extent of the “flaxland” component of the flaxland and dry edge vegetation is not specified, nor is the planting for the raised islands. Therefore, it is possible that this compensation wetland will be less than the total area of wetland lost (which is at least 35.8 ha) and is not, as claimed by the authors of the EEA “substantially more than currently exists within the SB2”.
27. The EEA also asserts that the ecological value of the constructed wetland will be higher than the current wetlands due to higher value flora and greater hydrological connectivity. Therefore, the net result after wetland construction is presented as a net gain. However, without an assessment of the wetland fauna values and the preparation of a robust offset model, this cannot be demonstrated. For transparency, and to demonstrate that the proposed wetland construction is sufficient to offset the loss of the existing wetlands, surveys for cryptic wetland fauna should be undertaken and a Biodiversity Offset Accounting Model (BOAM) should be used and the results presented.
28. The proposed wetland will be constructed in stages, as mining progresses. The first stage is in the north of the SB; mining in this area occurs between Years 1 and 7, and wetland construction begins in Years 1 and 2. The second stage is in the centre of the SB; mining in this area occurs between Years 8 and 11, and wetland construction begins in Years 10 and 11. The wetland will be constructed progressively within the mined area as a series of individual ponds that are gradually linked together to form the larger wetland complex. The EEA predicts that vegetation and ecological functions in the wetland will take about five years to develop.
29. However, it is not clear from the design how quickly the individual ponds will be linked and how much of the wetland can be planted in each stage, nor how much disturbance to wetland habitat will occur as the ponds are linked to create the final wetland. Therefore, there will be a significant time lag between loss of the current wetlands and construction of a new functional (established) wetland. As such, it would be appropriate for the Applicant to lodge a bond to the value of \$40,000-50,000 per hectare of natural inland wetland that will be destroyed during each stage. This amount is roughly based on the per hectare cost of restoring new wetland habitat, including site preparation, plant supply, planting labour, and post-planting maintenance for a minimum of three years.
30. This issue has been partly addressed in the Proposed Resource Consent Conditions (14 September 2026) as follows:

² Appendix L4 - Barrytown South Mineral Sand Project Ecological Effects Assessment. Prepared by Ecological Solutions (March 2026). Section 9, Page 82.

- a. Section 4 of the proposed conditions requires a bond of \$300,000. However, this is still much less than \$40,000-50,000 per hectare, given that at least 35.8 hectares of wetland is within the mining footprint.
 - b. Condition 7.6 requires that wetlands outside of the mining path (as per Schedule X) will be protected, as far as practicable, until the proposed wetland has been constructed. This will help address the time lag related issues, but the wording of this condition lacks any guarantees.
31. The EEA claims to be consistent with the policies of the National Policy Statement for Indigenous Biodiversity 2023 (NPS-IB) and the NPS-FM, citing NPS-IB policies 3, 4, 6–8 and 13–15 and NPS-FM policies 3–9 and 11–14. However, regarding NPS-IB policies, a precautionary approach has not been adopted when considering adverse effects on indigenous biodiversity (Policy 3), and the wetlands have not been assessed against the WCRPS criteria for ecological significance, thereby demonstrating avoidance of significant habitat (Policies 6 and 7). Regarding NPS-FM policies, the proposed compensation wetland does not clearly demonstrate (i) ecological equivalence, (ii) that no further loss of natural wetland extent is occurring, and (iii) that the existing wetland values are protected (Policy 6). Therefore, the proposed mitigation is inconsistent with requirement 3.22(1) of the NPS-FM3, that is the effects do not appear to be managed by applying the effects management hierarchy. Due to a lack of targeted mudfish surveys in the wetlands the EEA also fails to demonstrate that the habitats of indigenous freshwater species are protected (Policy 9).
32. The EEA does not include details of where the additional “72 ha of earthworks to assist with recontouring and rehabilitation⁴” is going to occur and whether any wetland habitats will be impacted.

Conclusion

Wetland classification

33. The Ecological Effects Assessment (EEA) has misclassified the majority (33.95 hectares) of wetlands on the site as artificial, with only 8.17 hectares classified as natural inland wetlands. Correctly reclassifying these wetlands in accordance with the NPS-FM definition brings the total area of natural inland wetlands to 42.12 hectares within the SB and 35.8 hectares within the mining footprint.

Recommended additional measures

34. Update the EEA with correct wetland classification and assessments against the current NPS-FM and NES-F.

³ Subpart - 3 Specific requirements. 3.22 Natural inland wetlands

⁴ Appendix L4 - Barrytown South Mineral Sand Project Ecological Effects Assessment. Prepared by Ecological Solutions (March 2026). Section 1, Page 1.

Wetland ecological values

35. The assessment of wetland ecological values focusses on vegetation and assesses their general value without identifying areas with higher indigenous vegetation dominance (and potentially higher value). The assessment of wetland values also makes no mention of potential fauna habitat value of the wetlands. There is potential habitat in these wetlands for several Nationally Threatened or At Risk species that are known from the area. These are cryptic and hard to detect species, including Threatened – Nationally Critical Australasian bittern, and At Risk – Declining marsh crane and brown mudfish. The authors of the EEA did not undertake surveys to target these cryptic species and their habitats, and therefore a precautionary approach should be adopted and the wetlands considered ecologically significant and assigned an ecological value of High and/or Very High (depending on the habitats present).

Effects on wetlands

36. The potential adverse effects on wetlands have been understated as a result of misclassifying wetlands and not including wetland fauna. This includes wetlands that provide potential habitat for Threatened or At Risk fauna. Therefore, the value assigned to the wetlands for Rarity and Distinctiveness should be High or Very High and overall ecological impact needs to be reassessed. Some wetland areas within the site are likely to have higher values than others, but this has not been clearly delineated in the assessment.

Recommended additional measures

37. Undertake targeted surveys for cryptic wetland fauna or update the EEA effects assessment to reflect the precautionary approach outlined in Policy 3 of the NPS-IB.

Wetland effects management

38. To manage the effects on the wetlands, the construction of a new 53.1-hectare wetland has been proposed. As the proposal is to replace lost wetlands by creating a new wetland de novo, it should be classified as compensation for the ecological damage that will occur, not 'remediation' as stated in the EEA.
39. The authors of the EEA claim this compensation wetland will be larger than the area of wetland lost, but according to the Rehabilitation Management Plan only 28.3 hectares are to be planted with wetland species. Planting areas designated as either 'flaxland and dry edge vegetation' or 'raised islands' may some wetland habitat, but this is not substantiated in the documents.
40. The EEA assesses that the ecological value of the constructed wetland will be higher than the current wetlands due to higher value flora and greater hydrological connectivity. Therefore, the net result after wetland construction is presented as a net gain. However, for transparency, and to demonstrate that the proposed wetland construction is sufficient to offset the loss of the existing wetlands, surveys for

cryptic wetland fauna are required, and the actual calculations to show a net gain need to be presented (i.e. through the preparation of a BOAM).

41. The potential for a significant time lag between existing wetland habitat removal and the construction and establishment of the new wetland has been partially addressed through the proposed Resource Consent Conditions (Section 4 and Section 7, 14 September 2026). However, the bond in Section 4 (\$300,000) is still significantly less than what it will cost to construct and establish a new wetland and the wording in Section 7 (for retention of the existing wetlands) lacks adequate guarantees.

Recommended additional measures

42. Update the EEA, Landscape Mitigation Package and Rehabilitation Management Plan, and Consent Conditions to reflect that the constructed wetland is compensation for the wetlands that will be lost, unless a robust accounting model demonstrates that it meets the requirements for a biodiversity offset.
43. Confirm the total amount of wetland planting/habitat in the constructed wetland will be equal in wetland area and sufficient, as shown by a BOAM or equivalent model (that incorporates cryptic wetland fauna), to achieve no net loss/net gain.
44. Increase the bond amount in the proposed Consent Conditions to reflect the cost per hectare of restoring at least 35.8 hectares of wetland.
45. Reword proposed Consent Condition in section 7 (7.6) to require that all wetlands outside of the mining path (as show in Schedule X) will be maintained until the start of mining where the wetland occurs (i.e. year 1-14 as shown in Plan D⁵), as well as protected.

References

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⁵ Appendix K - Barrytown Minerals Project – Southern Block, Relevant Maps and Plans. Prepared by Tāiko Critical Minerals (April 2026). Plan D: Indicative Mine Path Including Mine Starter Pits. Page 5.

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