Comments on a Substantive Application under section 53 of the Fast-track Approvals Act 2024: Stream Ecology

Fast-track project name	**Mt Welcome, Pukerua Bay, Porirua**
Fast-track application number	FTAA-2603-1181
GW file number	FTA260348

Technical area	**Stream Ecology**
Date	01 July 2026
Author	Dr Gareth Taylor Principal Ecologist, Director Collaborations
Statement of expertise	I am an ecologist with over 15 years of experience starting in tertiary teaching then local government and the majority in private consulting. I am self-employed as a Director and Ecologist for Collaborations, a small consultancy that works across a range of environmental, land and water science fields. I have a particular experience in freshwater ecology and management having worked on projects throughout New Zealand undertaking ecological assessments, design and site based management. I have a PhD in Environmental Science, PgDipSci in Environmental Science and a Bachelor of Science in biological science and psychology all from University of Canterbury. I hold a current Certified Environmental Practitioner certification and Making Good Decisions accreditation.
Code of conduct	I confirm that I have read and agree to comply with the Code of Conduct for Expert Witnesses contained in the Environment Court Practice Note 2023. This technical memorandum has been prepared in accordance with that Code. Unless I state otherwise, the opinions I express are within my area of expertise, and I have not omitted to consider material facts that might alter or detract from the opinions that I express.
Documents considered	• Fast Track Substantive Application; Mt Welcome, Pukerua Bay, Porirua; dated 16 March 2026 prepared by Incite. 'AEE' • Appendix 15: BlueGreen Ecology (2025). Mt Welcome station Ecology: Ecological values, effects and effects management. Report prepared by Bluegreen Ecology Ltd for Pukerua Property Group LP. (dated 20 November 2025 revision 9) "the ecological assessment"

	• Appendix 23: Blac Limited. (2025). Landscape and Ecology Plans – Part A and B. Prepared for the Mt Welcome development resource consent application, Wellington, March 2026 "the landscape plans" • Appendix 11: Envelope Limited (2025). Part A - Stormwater Management Plan. Prepared for Pukerua Property Group LP "the stormwater plan" • Appendix 30: Plans. Scheme Plans prepared by Envelope R2 dated 05-02-2026. • Ecological Information contained within Appendix E: Ecological Advice of response to Minute 3. • Ecological Information provided entitled Kakaho West Main Stem by Dr Vaughn Keesing, dated 2 June 2026. • M Dixon (6/7/2026) Mt Welcome, Pukerua Bay, Porirua – Wetland Ecology Comments on Section 53 Substantive Application. GW File FTA260348. • J Blyth (6/7/2026). Mt Welcome, Pukerua Bay, Porirua – Hydrology Comments on Section 53 Substantive Application. GW File FTA260348

Comments

Summary

In my view, the application (in relation to Stream Ecology and Fish Management) in its current form:

1. Does not adequately assess water quality, habitat quality, and downstream effects associated with the proposed wetland retention ponds, including potential urban runoff, altered hydrology, temperature, dissolved oxygen, microbiological inputs, and uncertainty around wetland function and maintenance.

2. Assesses effects of culverting on Taupō Stream using a Stream Ecological Valuation (SEV) that is not in full accordance with the Guidelines and is then utilised to determine an offset package. This approach creates uncertainty as to whether ecological impacts and the proposed offsets are adequate.

3. Identifies the effects on streams on the property will be positive due to improvements in fish passage and retention wetlands providing increased habitat; though evaluation of quality of both this habitat and downstream effects is not provided.

4. Has insufficient fish sampling effort and detail to confirm that fish passage is provided across all culverts and wetlands, allowing fish to migrate into and out of the project site (including

Taupo Stream). In addition sampling effort is required to satisfy appropriate management is in place through construction. Further detail should be required by conditions to ensure this is achieved.

5. The Ecological Assessment for on property streams is on a full development basis but should consider staging given the AEE indicates there will be 24 stages over 10-15 years. As a result, effects of stages are not assigned, nor is required management, monitoring and mitigation sufficient to ensure outcomes are met. These require assessment within the SEV framework to assign effects, quantify enhancement and residual compensation that is to be triggered when a stage is to commence. Without this there is risk of outcomes not being achieved (or with significant time lags) due to the potential for staging of the project and components that may not be undertaken (either later or at all).

Due to the above, if the Panel chooses to grant the application, a number of conditional matters are recommended to ensure the project achieves a net gain (as assessed in the Ecological Assessment) of ecological value through appropriate survey effort and assessment methods to determine fish passage, salvage, and offsetting for effects that cannot be avoided, mitigated, or remedied. An adaptive approach to stream management and offsetting linked to project staging is also appropriate to help ensure ecological values are managed to achieve this outcome. This should be integrated into an overarching plan (i.e. eco-hydrological monitoring and response plan) to ensure the environmental outcomes are achieved.

Agreement with the applicant

1. The matters of agreement are as follows:

   (a) All stream culverts should seek to provide fish passage.

   (b) SEV is an appropriate method of stream assessment and use of the Environmental Compensation Ratio is an appropriate method for offset calculations.

   (c) It is possible that the project can achieve positive effects for stream ecology; however, the project does not currently achieve this because further effort is required to establish effects, mitigation, offsets, and linkages to development staging.

Matters in contention and suggested response

Water Quality – Land use change and Wetland Retention Ponds

2. The Ecological Assessment does not consider changes in water quality resulting from the catchment being modified from its present form but is within Appendix 19 of the Application but not specifically for within the wetland retention ponds. The assessment notes that

sedimentation is expected to be reduced through the creation of wetlands and stabilisation associated with the change in land use, which I agree with.

3. Dr Keesing notes that retention wetlands will replace approximately 450 lineal metres of stream. These 'wetlands' (totalling permanent water of >4500 m^2) are intended to receive and detain stormwater, so they are of a constructed nature. Though the applicant considers they will not need to maintain the ponds, as there will be vegetation present and an artificial outlet, it is unlikely no maintenance will be ever required as sediment binding could raise the invert as well as dislodged vegetation causing blockages may require mechanical removal in future.

4. The retention wetland on the Kakaho Stream (Retention Wetland E) is particularly concerning. A large portion of the catchment draining to this retention wetland comes from an off-site catchment currently in pine trees, at various stages of harvest. Sediment impacts on this wetland could therefore be particularly high and outside of the application's control, limiting its suitability to mitigate effects.

5. Whilst I agree that the retention wetlands will provide a larger quantum of permanent habitat covered by freshwater than is lost for the on-property streams, the *quality* of this habitat has not been considered (e.g. possible water quality effects such as temperature fluctuations, reduced dissolved oxygen, etc.). Such risks are discussed in reports by Ms Dixon and Mr Blyth.

6. There are also potential downstream effects on receiving ecosystems due to changes in hydrological regime and water quality. Creation of wetland retention ponds can change hydrological regimes within streams by causing shifts in temperature and dissolved oxygen, as well as changes to microbiological and nutrient concentrations (e.g. where permanent wet ponds exist, this can attract avifaunal inputs, raising *E. coli*). In the context of this development, it is noted these retention wetlands will receive inputs from urban environments, so they also have the potential to pass introduced metals into the stream systems. I note the applicant has considered these to be fully vegetated, though the designs show some significant depths which may prevent vegetation establishment, a matter that has been discussed by Ms. Dixon (wetland ecology) and Mr Blyth (hydrology) in their reviews.

7. In terms of downstream impacts, Wetland D[1] is of potentially higher concern as it sits high in the catchment and has a relatively deep pond area (approx. 1.4 m) and steep-sided margins, which may create uncertainty around vegetation establishment. I also note the pond discharges to a gully that has not been assessed, so values are not known, but it is noted as a

[1] It is unclear the purpose of maintaining a permanent water level in 'Wetland D', rather than designing this as a dry attenuation basin. Noting the design arrangement does not appear to provide for holding water as indicated by the invert level of the culvert.

Significant Natural Area (SNA010 – Muri Road Wetland) in Porirua City Council's planning maps.

8. Should the Panel choose to grant the application, conditions should require that the wetlands perform within expected parameters, given they are intended to remediate stream loss and should not have downstream effects. In particular, conditions would need to ensure that water quality and habitat are of suitable quality and quantum to provide for fish and aquatic biota within the retention wetlands.

Stream Ecological Valuation Method

9. Within Wellington Region the Stream Ecological Valuation (SEV) method (Auckland Council Technical Report 2011/009) is the accepted methodology to undertake stream ecology assessments and have a prescribed set of guidelines and methods for scoring the streams value. This is then utilised to determine level of effects and any further mitigation and/or compensation/offsetting required for a proposal.

10. The Ecological Assessment, as lodged in the application, provides values relating to the Stream Ecological Valuation (SEV) methodology; however, no actual SEV assessment has been completed in the Ecological Assessment to validate the numbers. I do not consider this appropriate as it implies the methodology has been undertaken to quantify values and compensation requirements, when it has not. Dr Keesing subsequently has provided further information to help establish validity of the assessment made.

11. The survey methods for streams are vague and no detail has been provided on dates of site visits and antecedent conditions. These details are important because they indicate whether observations and information were collected at the appropriate time of year and accurately represented.

12. The author has assigned stream values and assessed effects using relevant terminology, but has not stated the assessment methodology used (presumably the EIANZ Ecological Impact Assessment Guidelines 2018). The author should reference these guidelines in the report if that is what has been used.

13. The stream methods state that fish data was utilised from existing studies. It would be useful for the author to provide details of such study methods; the subsequent reporting does not appear to have utilised any studies or information other than two NZFFDB records and a 2021 Boffa Miskell survey.

Stream Assessment and Mitigation - Taupō Stream

14. GWRC subsequently engaged with the Applicant who submitted further information in response to Minute 3 of the Panel Convener after undertaking further SEV assessment for Taupō Stream. My review below is based on that information.

15. The updated SEV assigns a value to Taupō Stream (Mt Welcome in the table) of 0.51 (the Ecological Assessment had assumed it to be 0.6), indicating it is of slightly lower value. The SEV preparer is suitably qualified and experienced to provide assessments across the parameters, so I accept these as being generally consistent; however, I note the following that is not in accordance with the SEV data and may impact on the reliability of this value:

    (a) No fishing effort has been undertaken to confirm no fish are present. If fish are present this would increase the value for Vfish.

    (b) No macroinvertebrate samples have been collected from the reach; therefore the author has used judgement to assign values for Vmci, Vept, Vinvert. Without sampling I cannot confirm what value change this may create.

    (c) Vriparian connectivity appears to be undervalued as the photos appear to show there is connectivity which would result in a higher score.

    (d) A calculated SEVi-P (potential of the impacted stream) has not been provided so I have had to revert to 0.65 in the application as there is an error in calculations in the Minute 3 information that affects the offsetting calculation.

16. The updated SEV also has provided an assessment of the impact on Taupō Stream from the culverting and given a value of 0.203. Whilst some values can vary in judgement it is typical that culverts return such values.

17. The Taupō Stream compensation in the Ecological Assessment had been calculated utilising the SEV methodology for compensation termed ECR (see Section 6.5.1); however, these have been based on values that have been generalised through the Author's judgement, citing their experience. These are unqualified values as no SEV data sheet was provided within the Ecological Assessment to establish how the weighting of values has been considered nor other SEV compensation parameters to qualify the compensation this has been addressed in Minute 3 response and the further ecological information provided.

18. Using the SEV values for offsetting the Taupō Stream culverting (110m being lost) within Section 6.5.1[2], the multiplier has been calculated incorrectly and should be 2.625, so 289m (i.e. 96m more than identified in the report) of stream requires enhancement. These matters

[2] *(ECR = (0.65-0.3) / (0.6-0.4) X 1.5 = 1.75.)*

were raised in conferencing, and the Applicant provided a response as part of Minute 3 (see the appended ecological information).

19. The applicant has since provided a revised calculation in response to Minute 3 utilising their SEV values to determine an ECR of 1:1.55 (i.e. 1.55 times more stream area must be improved). This is then asserted to require 170.5 lineal metres of stream to be enhanced (23 m less than previously identified due to the change in values). I have noted however that the SEVi-P score is incorrect in this calculation and what is used is the current value of the stream (SEVi-C), but should be the potential value which was advised as 0.65 in the Ecological Assessment. To assist the Panel I provide a revised calculation below (See paragraph 26) which if not using a multiplier results in an ECR of 1:2.16 (i.e. 2.16 times more stream required).

20. In establishing whether the lineal metres are appropriate, the following should be considered:

(a) The potential value of Taupo Stream has not been calculated and is based on Dr Keesing's prior judgement of 0.65.

(b) The biodiversity values are estimated so the SEV undertaken cannot be considered conforming to the Guidelines. This may over or underrepresent values and need survey during the correct season to confirm.

(c) Determining the stream area for Taupō Stream and the offset stream to be enhanced is required. This has not been disclosed, but it could affect the lineal metre outcome in that, if the compensation stream area is smaller, more lineal metres would be required, whereas if it is larger, fewer lineal metres would be required.

21. Determining the level of ECR is discussed within the SEV Guidelines[3]; ' *Where a stream reach set to be degraded is similar in most respects to a reach that will be restored then, assuming full restoration is possible over a short time frame, a theoretical ECR of close to 1:1 may be warranted. However, where the stream reach to be restored is lower in overall ecological value than the stream reach being degraded, then the ECR needs to be set at a higher level to compensate for this.*'.

22. Determining the ECR is undertaken within the guidelines through the following calculation:

$$ECR = [(SEVi\text{-}P - SEVi\text{-}I)/(SEVm\text{-}P - SEVm\text{-}C)] \times 1.5$$

Where:

[3] Storey, R.G., Neale, M.W., Rowe, D.K., Collier, K.J., Hatton, C., Joy, M.K., Maxted, J. R., Moore, S., Parkyn, S.M., Phillips, N. and Quinn, J.M. (2011) Stream Ecological Valuation (SEV): a method for assessing the ecological function of Auckland streams. Auckland Council Technical Report 2011/009.

- SEVi-C & SEVi-P are the current and potential SEV values respectively for the site to be impacted.
- SEVm-C & SEVm-P are the current and potential SEV values respectively for the site where environmental compensation is to be applied.
- SEVi-I is the predicted SEV value of the stream to be impacted, after impact.
- 1.5 is a multiplier suggested to account for lag and uncertainty.

23. The Minute 3 Memo notes that there was an error in the Ecological Assessment ECR calculation shown in that the proposed ECR did not use the 1.5 multiplier (though it was referred to in the Ecological Assessment). It has subsequently been clarified by the applicant that the use of a multiplier of 1 (i.e. no multiplier) is deliberate and has been adopted on the basis that there is sufficient certainty regarding successful restoration outcomes and no implementation difficulties that would justify applying a higher multiplier to account for uncertainty.

24. I am understanding of this viewpoint, but I note the potential that, whilst compliant, there will be an upstream retention wetland and the introduction of urban contaminants and runoff, which adds some uncertainty to the outcome due to the change in hydrological regime as detailed by Mr Blyth (Hydrology). In addition, the staging of the offsetting against the stages of development is not detailed.

25. Dr Keesing then addresses the lag component and notes that vegetation may take 5–10 years to provide the relevant functions, whilst other factors will be immediate. The application in its current form does not provide project staging at a level that allows lag to be fully determined. It is noted that overall staging plans are provided, but these do not show sequencing in relation to the Taupō Stream offsetting. This may result in the offset being undertaken in a manner that creates a lag (for example, prior to later stages of development that have downstream effects).

26. Should the panel accept a multiplier of 1.0, then it is recommended the offsetting is undertaken prior to the roundabout and staged such that upstream activities from the development (e.g. Culvert P38 and Wetland E) do not risk or impact on the offset stream reach.

27. A subsequent calculation with the revised values has not been provided, so to assist the Panel I have calculated this based on the numbers provided as below:

SEVi-P = 0.65 – from the Ecological Assessment (estimated)

SEVi-I= 0.2 – from the Minute 3 Response

SEVm-P = 0.552 – from the additional Ecological Information

SEVm-C=0.344 – from the additional Ecological Information.

If conforming to guideline multipliers:

ECR = [(0.65 – 0.2)/(0.552 – 0.344)] x 1.5 = 3.245

Or if adopting Dr Keesing's multiplier

ECR = [(0.65 – 0.2)/(0.552 – 0.344)] x 1.0 = 2.163

Based on 110m of Taupo Stream to be culverted, and in adopting the values above, between 238.0m and 357.0m of stream length is required to be offset (requires 45.0m to 164.0m more offset stream length than proposed) depending on the multiplier selected.

28. It should also be noted that the lineal meters of offset stream can be reduced if the mitigation stream is wider or if the SEVi-P was found to be less with a calculated value. The calculations in Paragraph 26 assume stream width is identical and the SEVi-P remains at 0.65.

29. To address project staging, certainty and lag (and support the reduced multiplier adopted by the applicant), I consider it appropriate to impose conditions requiring a management plan for stream offsetting and monitoring linked to SEV targets to be achieved. That plan should be certified by GWRC prior to physical works occurring.

30. As mentioned previously, it is recommended that restoration works on the compensation reach are required to be undertaken prior to the piping of the Taupō Stream if a multiplier of 1 is accepted.

Stream Assessment and Mitigation - Watercourses within the site

31. The site contains four watercourses and associated tributaries and catchments totalling 3288.65 m of stream. The Scheme Plans indicate the development is to be undertaken in 24 stages over 15 years.

32. The Ecological Assessment identifies that 450 m of intermittent and perennial streams (300m in the Taupō catchments and 150m in the Kakaho West Catchment, as per Table 6) will be replaced by retention wetlands. Drawing 1753-02-SK9250-R1 (overall Ecological Areas Plan) shows an additional 295 m of stream that is proposed to be reclaimed under the bunds for the retention wetlands or as culverted as part of road crossings. Therefore there is over 745m of intermittent and perennial stream affected on property by culverting, associated structures and the creation of the retention wetlands.

33. The Ecological assessment also notes that road crossings will require modifications of existing culverts and/or new culverts. These will provide passage; however, the stream loss

has not been quantified using SEV to determine level of remedy or offsetting required. Culvert P-38 (as labelled in the Minute 3 Civil Infrastructure Report) does not appear to be assessed and is noted to require a 44m long culvert.

34. In reviewing the Ecological Assessment against the staging detailed in the AEE and Scheme Plans, I note the following:

(a) The Ecological Assessment of streams within the site has not been undertaken using the SEV methodology, which is accepted practice. Use of the SEV is considered appropriate and would provide a consistent method for establishing stream value and the mitigation, remedy, or offsetting required for the effects (as has been applied to the proposed modification of Taupō Stream). This is required to establish the effects and inform a mitigation and/or offsetting package linked to the development. I consider it is pertinent that the SEV is undertaken prior to a decision being made on the application to provide a clear understanding of values, impacts and required mitigation and offsetting for the development. This should also be linked to staging.

(b) The Ecological Assessment has considered the effects and mitigation on the streams at full development. It does not address whether the staging and sequencing are appropriate to the anticipated effects, and I consider that a final staging plan linked to mitigation and offsets is required to obtain sufficient certainty. The development is proposed in the AEE to occur in 24 stages over 15 years. My review of the staging plans suggests there is potential for adverse effects where stages containing mitigation and enhancement for earlier effects are proposed in later stages; assessment is required for this reason.

(c) There is no direct offsetting proposed for the stream loss to structures and stream reclamation, and the proposal relies on constructed retention wetlands as a remedy for stream loss. Therefore, if the wetland retention ponds are not considered suitable as offset for stream habitat, this will result in a loss of ecological value in the site. To confirm, the SEV method should be undertaken for each stream impact to determine if remedies are appropriate or if additional offsetting is required, which may require additional reaches of stream such as the Kakaho East Tributary.

35. Due to the staging proposed in the AEE, I consider there is a need to identify effects, set outcome targets, and assign mitigation packages against stages prior to a decision being made on the application. Using the SEV and ECR (if needed) would be appropriate for this purpose and should be undertaken prior to a decision being made on the application.

36. Due to staging and design updates anticipated as the development progresses, a condition set should include a management and monitoring Plan (see the Eco-Hydrological Management, Offsetting and Monitoring Plan section), linking mitigation and offsetting to

staging and SEV targets. That plan should be certified by GWRC prior to physical works occurring.

Fish Survey Data

37. Fish data presented in the application is considered to be relatively light as some records presented are very old and others are unable to be validated. The fish survey effort is insufficient, with only spotlighting and eDNA samples (both potentially undertaken out of season) carried out for each of the south-west and north-west draining catchments to Taupō Stream (see Figure 8 of the Ecological Assessment).

38. The western branch of the Kakaho Stream has been a key omission; no surveys have occurred in this catchment despite a large online wetland retention structure being proposed on the main stem of the stream. See Figure 5 of the Ecological Assessment showing this stream.

39. Table 3 of the Applicant's ecological assessment notes fish species recorded or likely to be present, however:

    (a) records from the New Zealand Freshwater Fish Database are very old; and

    (b) no location or collection data is provided for 2021 Boffa Miskell surveys.

40. Fish may be more widespread, and additional fish species may be present. Reliable data is important to inform:

    (a) fish passage design (requires confirmation of species present).

    (b) effects management (e.g. fish salvage protocols) and offsetting (requires information on how widespread fish are).

41. Due to this, I recommend a set of conditions are imposed which:

    (a) Require fish passage on all culverts that is informed by a fish survey.

    (b) Require submission of designs for certification by GWRC prior to installation.

    (c) Require a final Fish Salvage Plan which has been informed by sufficient survey to confirm fish absence; or takes a conservative approach to fish salvage in that salvage will be undertaken for any flowing waterway on site.

Threat status of longfin eel

42. The Ecological Assessment appears to downplay the significance of longfin eel presence on the site by suggesting that its threat status is under debate. At present the published status is At Risk – Declining (Dunn et al. 2025[4]) and should be treated as current.

Taupō Stream culvert permitted baseline requirements for fish passage

43. The ecological assessment states that Taupō Stream is not required to have a culvert compliant to NES-F due to the existing downstream barrier.

44. This is not correct as regulation 70 (2)(1)(a) requires that *'the culvert must provide for the same passage of fish upstream and downstream as would exist without the culvert,...'* this does not account for downstream structures.

45. In this instance, designing the Taupō Stream culvert will require consideration of species that could feasibly migrate through this reach in the absence of the downstream barrier as part of its design. This may need to be informed by a downstream fish survey if data does not already exist.

46. I recommend a condition is imposed that fish passage is required for all stream culverts, including those connected between streams and the wetland retention ponds. Design should be in accordance with relevant fish passage guidelines, presently the New Zealand Fish Passage Guidelines (2024).

Fish Passage – Retention Wetlands

47. The design of the retention wetlands, if operating and compliant to proffered consent conditions, will provide fish passage. As discussed in Ms Dixon's and Mr Blyth's reports, there are some risks of this performance due to hydrological regimes, steep culverts and potential of a lack of vegetation establishment. Should these risks materialise there is the potential for fish passage to be disrupted (e.g. where low flows infiltrate and do not provide passable flows down the culverts) and/or create adverse conditions for fish (e.g. pools with not outflows stranding fish in stagnant water). This risk has not been assessed.

48. To ensure these risks are managed, performance and hydrological monitoring would be required with triggered actions being identified should such risks materialise. Such responses

[4] Dunn, N.R.; Closs, G.P.; Crow, S.K.; David, B.O.; Goodman, J.M.; Griffiths, M.; Hicks, A.S.; Hickford, M.J.H.; Jack, D.C.; Kitson, J.C.; Ling, N.; Waters, J.M.; Wylie, M.J.; Hitchmough, R.A.; Makan, T. 2025: Conservation status of New Zealand freshwater fishes, 2023. New Zealand Threat Classification Series 46. Department of Conservation, Wellington. 66 p.

may require monitoring or relocation of resident fish from the wetland retention ponds if flows ceased, temperatures rise and dissolved oxygen was to reduce; as an example.

Fish Salvage Plan

49. The draft Fish Management Plan (Appendix 3 of the ecology assessment) is inadequate as it is missing the following:

    (a) Response to chance finds of fish.

    (b) Acknowledgement that other fish species may be present and fish may be more widespread than identified in the ecological assessment, given the limited survey work and that it cannot be assumed that no other fish species are present.

    (c) Hand capture of stranded fish during dewatering. This should be done prior to a 'muck out'; from my experience, a relatively high proportion of captures can come from stranded fish (especially eel species that can bury to avoid capture by electric fishing).

    (d) Quantitative measurements for fish size and fish numbers salvaged and relocated.

    (e) The permits required and held by personnel implementing the plan (e.g. whether at a project level or under a global permit).

    (f) Reference to DOC approval under Freshwater Fisheries Regulations given the proposed use of exclusion methods.

    (g) A section on maintenance and re-fishing requirements should there be a high flow event, given the proposed use of exclusion screening.

    (h) Detail on timings – including seasonal requirements and development phasing.

    (i) Addressing for potential salvage once the development is operational.

50. Therefore, should the application be granted, an updated fish management and salvage plan should be submitted as a condition prior to works, for certification that the above matters have been addressed.

Eco Hydrological Management, Offsetting and Monitoring Plan

51. Due to matters raised in this memo as well as those by Ms Dixon (Wetlands) and Mr Blyth (Hydrology) it is considered an integrated management and monitoring plan is required as a matter of condition that requires ecological, water quality and hydrological management,

monitoring and reporting, and includes hydrological trigger levels in streams, existing retained wetlands and any offset wetlands.

52. This plan will establish 'environmental bottom lines' and outline hydrological targets (i.e. for the existing retained wetlands, offset wetlands and streams. The plan would also detail actions and responsibilities should a trigger be breached during or post development, or offsetting targets are unable to be achieved. An integrated eco-hydrological plan that also establishes ecological condition requirements will streamline monitoring and reporting.