

9 December 2016



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Ltd  
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Dear Bas,

### **Request for Further Information**

**Record Number(s): CRC173284 – CRC173289**

**Applicant Name: Barrhill Chertsey Irrigation Limited**

We have been processing your consent application to use land to construct, use and maintain a storage pond at 577 Barkers Road, Methven.

Under Section 92 of the Resource Management Act 1991 (RMA) we request the following information from you:

#### **1. Dam break study and Potential Impact Classification**

- a. In regards to Potential Failure Mode 6 Please provide the storage volume for this case, to compare this to the volume at normal operating level. For these worst case flood conditions there would be the PMP rainfall event, wave run up, coinciding with peak inflow into the storage of 3 m<sup>3</sup>/s. It should be confirmed that a failure scenario could not be anticipated (i.e. at the spillway) under this scenario. The dam breach volume would therefore be greater than 1.8 MCM or closer to 2 MCM (i.e. up to 25% greater volume than considered at full supply level). Though failure at the spillway has lower embankment heights than other parts of the storage, so volume is reduced.
- b. Please clarify the discrepancy between the maximum embankment height of 10 m at the southern point of the storage, with a maximum embankment breach depth of 8.5 m at location 1B.
- c. The higher peak dam break hydrograph for the sensitivity analysis is not discernibly different to the base case (641 v 588). Please provide an assessment that considers the sensitivity to a much larger peak hydrograph, e.g. 700-800 m<sup>3</sup>/s (i.e. an upper bound). Obviously this would occur over a shorter duration. At the moment, the difference in hydrograph shapes are too similar, which would flow onto the downstream inundation (i.e. small differences observed in downstream inundation depths).

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Your Customer No: EC257775, EC114453

- d. Please provide depth velocity (DV) maps, particularly for the residences and areas immediately downstream of the storage (Maps E1-3). The DV information is shown in the tables, and used for assessing the Potential Loss of Life at residential locations. It is important for potentially affected parties to see the DV hazard across their property and to allow an assessment of this hazard.
- e. There has been a recent interim Environment Court decision released which provides guidance on the level of detail required for resource consent applications to dam water. This guidance includes detail regarding dam safety and emergency plans. We have received internal legal advice that the following plans are required as part of this application. Please provide the following:
  - i. A Dam Safety management Plan;
  - ii. An Emergency Action Plan; and
  - iii. An Emergency Evacuation Plan.

## **2. Engineering, design and hazards**

- a. Please provide clarification regarding the spillway design and how it will prevent erosion of the embankment or downstream area during operation, and where the anticipated flow path for spillway flow is for when this is operating.
- b. Please provide clarification regarding the operation of the low level discharge capability in an emergency situation. i.e. can the flow be bypassed from the pipeline to a local watercourse downstream from the storage? Otherwise the pipeline is used to supply the BCI Methven line (supply to irrigators).
- c. Please provide an Independent Peer Review of the design of the dam and associated dam break assessment. The NZSOLD DSG (2015) recommend 'a formal peer review of the investigation and design, by an independent engineer, should be completed. It should include an early initial review....' (Section 3.3 – Medium PIC Dams).
- d. In regards to embankment stability, no preliminary numerical analysis is provided to confirm the stability of embankment slopes under usual, unusual and extreme loading conditions. Although it is acknowledged this analysis will be completed as part of detailed design and that the preliminary design is based upon engineering precedence, the feasibility of the preliminary engineering design is required to be provided. This should include consideration of all scenarios documented within Section 6.5.4 of the NZSOLD DSG (2015) unless judged inappropriate. Embankment stability is judged critical to dam safety. On this basis, preliminary stability analysis is required to assess the hazard posed by the proposed pond to people and infrastructure.
- e. Limited information is provided pertaining to likely performance of the proposed geomembrane liner as a result of embankment cracking/deformation. Although it is acknowledged this analysis will be completed as part of detailed design and that the preliminary design is based upon engineering precedence, the feasibility of the preliminary engineering design is required to be demonstrated. The integrity of the geomembrane liner is judged critical to dam safety. On this basis, an

assessment of likely liner performance as a result of embankment cracking/deformation is required to assess the hazard posed by the proposed pond to people and infrastructure.

### **3. Groundwater quantity**

- a. The groundwater level information provided with the application is sourced from water level readings dated in the 1950's and 1960's with a few spot measurements in more recent years. There is therefore a lack of certainty of what the current range of groundwater levels at the proposed site as they will depend on current Rangitata Diversion Race (RDR) losses (Which may be quite different than in the past) and on longer term groundwater level trends.

Please provide further information regarding current groundwater level conditions at the proposed site.

- b. The application states that the effect on groundwater level of seepage from the pond is '*very localised, and is not expected to adversely affect area groundwater levels*'. This cannot be sufficiently assessed without information relating to the following:
  - i. Expected seepage rates – a range from best practice, to perhaps measured rates in some of their existing ponds
  - ii. Some analytical or modelled solution of potential groundwater mounding over the area. This could range from the very simple (such as the mounding solution in Aqtesolve) to a Modflow model. Any solution should use a range of aquifer parameters and seepage rates to provide an indication of the potential scale of effects.

Please provide the information detailed in points i and ii above.

### **3. Groundwater quality**

There is some contamination risk to groundwater quality at this site especially during the excavation stage. It is therefore advisable to monitor groundwater quality in few locations downgradient to local groundwater flow direction. In some situations of dewatering of groundwater, soil profile may develop acidic conditions if soil profile contains peaty or carbonaceous material.

Please provide information on any groundwater monitoring proposed during the excavation of the dam.

Your options under Section 92A(1) of the RMA are to:

- (a) Supply the requested information; or
- (b) Agree in a written notice to supply the information requested; or
- (c) Refuse in a written notice to supply the request information.

Please respond to this request by 24 January 2017. Your application will not be processed further until we receive your response.

The decision to notify or non-notify your application will be made after the further information is received. If we do not receive a response from you by 24 January 2017,

or you refuse to supply the information requested, we are required to publicly notify your application under Section 95C of the RMA, and shall proceed to do so.

The Consent Planner for this application is Simon Woodlock. You can contact Simon via email at [simon.woodlock@ecan.govt.nz](mailto:simon.woodlock@ecan.govt.nz) if you have any queries.

Yours sincerely

A handwritten signature in black ink, appearing to read 'David Just', written in a cursive style.

David Just  
Senior Consents Planner

cc:  
Barrhill Chertsey Irrigation Limited  
C/- Irrigo Centre Limited  
18 Kermode Street  
**Ashburton 7700**