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MCWSG FEASIBILITY STUDY - GROUNDWATER AND DRINKING WATER SUPPLY REVIEWS

Dear Kate

The MCWSG has provided Golder with comments on the recently submitted groundwater and drinking water supply reviews. There has been an exchange of views on the adequacy of the review documents. This letter¹ summarises the discussions to date and provides possible direction for further studies.

Scope

The scope is reasonably well documented and includes the following:

- Assess the groundwater resources of the catchment and undertake an assessment of whether *Managed Aquifer Recharge* could be successfully integrated into the project. This was examined and it was determined that applicability is probably not high (due to the limited extent of suitable gravel based groundwater resources).
- A brief catchment-wide assessment of domestic water supplies. Please respect that this was a small brief (the budget was approximately one week's effort) and it did not anticipate any significant consideration of CODC issues regarding the Clyde, Dunstan Flats and Alexandra public water supplies. The review does paint a (hopefully useful) picture of the known state of public and private drinking water supplies in the catchment.
- Perhaps the groundwater review should have included the work that is being done by AgResearch on farm Overseer simulations within the catchment. Overseer is a powerful predictive tool and it has the ability to compare current irrigation seepage with future scenarios; using this, we have a guide as to the change in groundwater recharge that would result from the various water management options. Nutrient losses are also included in the Overseer results, so changes in nitrate leaching or phosphorus runoff will be available. While it was not in the scope of these reviews, the information will be available to the Group in the final feasibility report.

Specific Issue: Groundwater Bores at Dunstan Flats

Gary Kelliher raised a point regarding the future of groundwater bores in the Dunstan Flats. This area is not serviced by an external drinking water supply that would provide alternatives to the population residing on the Dunstan Flats. The dependence of the Dunstan Flats, Letts Gully and Galloway Flats on irrigation recharge has only been recognised in recent years.

¹ This document is provided subject to the limitations attached.



Probably the most comprehensive public airing on the subject was before an Otago Regional Council committee hearing in July 2011 ("Irrigation water going to ground." <http://www.odt.co.nz/regions/central-otago/170857/irrigation-water-going-ground>). This discussion made it clear that the aquifers beneath these areas were, to a degree, dependent on artificial recharge from race losses, by-wash soakage and, from irrigation return through the soil. To this extent, the issue is on the public and governmental 'radar'. At a technical / scientific level, the relationship between irrigation inputs and the health of the underlying aquifers is known institutionally within ORC, and to a lesser extent CODC. The current feasibility study will further address this issue through the Overseer assessments. We have given the subject some thought and included possible investigations (summarised at the end of this letter) that could be undertaken to respond to the needs of the community.

Specific Issue: Groundwater contributions to streamflows (with a focus on game habitat)

Otago Fish & Game raise a point on the question of groundwater contributions to stream flow and therefore game habitat. While the emphasis of the groundwater and drinking water supply reviews were with water resources, acknowledgement was made in relation to basement rock aquifers and Thompsons Creek that base flow from groundwater requires consideration. It is difficult in a set of reviews that are necessarily limited in focus to give fair treatment to all aspects of this wider subject area. In acknowledgement of the need to 'join the dots' of a hydrological nature, we have suggested some hydrological investigation responses that would be undertaken to naturalise the catchment hydrographs and reveal the base flow contribution from groundwater in a number of current and future scenarios. Such scenarios for further examination would include reduced irrigation recharge and / or increased groundwater extraction.

Recommendations for possible future work in addition to the proposed Overseer assessments

Future work to assist the MCWSG in the context of groundwater and drinking water could include:

1. Modelling of the three groundwater aquifer systems (Dunstan, Manuherikia Claybound and Manuherikia Alluvium) within the Manuherikia Catchment. Such modelling should consider both groundwater quantity and quality, and should examine the likely localised impact of changes resulting from upgrading the irrigation systems within the Manuherikia River Catchment. Such localised modelling is beyond the scope of the current feasibility study.
2. An examination of the saturated thickness available to private water supplies or individual domestic bores, and the correlation between reduced groundwater recharge and bore failure.
3. A base flow hydrograph separation investigation using available Manuherikia catchment hydrographs to identify the role of groundwater storage in sustaining catchment baseflow, perhaps combined with further hydrological examination of flow naturalisation of the Camping Ground hydrograph.
4. An inventory of the drinking water infrastructure within the catchment for public, community, private and individual water supplies.
5. An infrastructural strengthening assessment of the catchment's domestic water supply requirements and regulatory compliance challenges.

Yours sincerely

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Attachments: Attachment A: Report Limitations

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