GISBORNE DISTRICT COUNCIL

17–252

Title:	**Managed Aquifer Recharge Update and Next Steps**
Section:	Environmental & Regulatory Services
Prepared by:	Lois Easton (Acting Director Environmental Services & Protection)
Meeting Date:	20 July 2017

☐ Legal ☑ Financial ☑ Significance = HIGH

Report to FUTURE TAIRAWHITI Committee for decision

SUMMARY

The purpose of this report is to provide an update on progress with the Managed Aquifer Recharge trial and outline the proposed next steps.

Recharge of the Makauri Aquifer is of significant strategic economic importance to the region. The Council also has an obligation and duty of care around the aquifer and its stewardship. Sustainable management is a key requirement under the Resource Management Act and National Policy Statement for Freshwater Management.

A trial recharge is currently underway at Kaiaponi Farms. The results from this trial is expected to answer some, but not all, of the questions around the environmental response to injection of water into the aquifer.

In order to gather sufficient information to inform the scoping of a full recharge scheme, to the level sufficient to develop a business case, gain funding and ultimately resource consents, we recommend a second stage trial be undertaken in 2018.

Alongside the trial, economic analysis of the farm level impacts indicate that a full MAR scheme would have substantial positive impacts on growers. A whole region economic impact study will be completed by end June 2017. This will be key information to inform any business case for funding a full Managed Aquifer Recharge Scheme.

The decisions or matters in this report are considered to be of **HIGH** significance in accordance with the Council's Significance and Engagement Policy.

RECOMMENDATIONS

That the Future Tairawhiti Committee:

1. **Notes the contents of this report – and in particular:**
   a) **That the Managed Aquifer Recharge Trial is still ongoing.**
   b) **That a full economic impact study will be completed at the end of June 2017.**
2. **Agrees in principle, subject to further work, that a Stage 2 trial of Managed Aquifer Recharge of the Makauri Aquifer be undertaken over the 2018 calendar year.**

3. **Instructs staff to continue discussions with the Horticulture sector, Eastland Community Trust and Ministry for Primary Industries around the funding and governance options for a full Managed Aquifer Recharge of the Makauri Aquifer.**

Authorised by:

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Keywords: Managed Aquifer Recharge, Makauri Aquifer, Irrigation,

BACKGROUND

Strategic Rationale for Involvement in a MAR Scheme

1. Council first became involved in scoping a Managed Aquifer Recharge (MAR) through its Freshwater Planning process in 2014. It is now recognised that the economic significance of the Makauri Aquifer, and its continued decline, is a major economic and environmental concern for the region. Without finding a way to augment the water supply in the aquifer, cuts in irrigation takes required to stabilise the aquifer would have a substantial adverse economic impact.
2. Alongside the need to stabilise and restore the aquifer levels, Council also has a duty of care to protect the environmental and cultural qualities of our regional natural assets. The decline of the aquifer has been a direct result of decisions made by the Council over a 30 year period. While these decisions were made with the best information available at the time, the result has been a decline in water levels and calls for immediate action to remedy in a sustainable manner.
3. Alongside these important primary drivers, since the notification and implementation of the Freshwater Plan, other key strategic drivers are:
    - that a recharge of the aquifer will offer significant resilience benefits in the face of droughts and low river flows such as were experience in the 2016/2017 summer;
    - that a recharge of the aquifer provides the potential for environmental benefits and improvements to the wider hydrological system in the aquifer including the potential to augment minimum flows in the Taruheru River and thereby improve its water quality;
    - that a recharged Makauri Aquifer would represent a more certain – and sustainable source of emergency water supply for Gisborne City, than the current emergency supply from the also declining Matokitkoki Aquifer;
    - that with the full allocation of water resources on the Poverty Bay Flats and the Resource Management Act (RMA) directive that renewals of existing resource consents have priority over new applicants, an aquifer recharge represents one of the few options available to provide for new applications for water takes. It also enable areas which are currently not irrigated to be able to increase their agricultural potential.
4. Securing and protecting the Makauri aquifer as a sustainable water source is a central project in the Tairāwhiti Economic Action Plan. Ultimately, the long-term viability of irrigating the Poverty Bay flats is critical to the community, our regional economy and employment.

DISCUSSION

Progress with the trial to date

5. Since 2014, the Council and a range of stakeholders have been working together to develop a trial of MAR of the Makauri Aquifer. Funding from Eastland Community Trust (ECT) and the Ministry of Primary Industries (MPI) has been sought and approved, and resource consents gained for the development of a trial. The drilling of the injection well at Kaiaponi Farms was completed in May and the first stages of the trial are underway.
6. At this stage, monitoring data indicates that MAR of the Makauri Aquifer is likely to be feasible. However, there are still many unanswered questions about the aquifer and the best environmental management options for a full aquifer recharge. Staff consider that these need to be worked through in subsequent trial(s) before a full recharge could be undertaken. The current stage of the trial, including post trial monitoring is expected to be complete by December 2017.
7. Accordingly this report recommends that a Stage 2 trial be undertaken over the 2018 calendar year, and potentially a Stage 3 trial in 2019. This is to ensure that sufficient information to about all aspects of a MAR scheme can be adequately gathered.

8. Key questions which further testing/trials will need to answer are outlined in the table below:

Question	What issues we need to address	Level of confidence 2017 trial data is likely to give	Trial data 2018 required?	Trial data 2019 required?
What time of year is recharge of the aquifer best achieved through a MAR?	Sizing of an ultimate MAR Scheme – how many injection wells required to be operating to recharge the aquifer.	Low – medium. The trial injection commenced at the end of May. Because of the very wet April this is two months after the expected optimum time for recharge.	Start trial as early as possible at the end of the irrigation season – ideally April before significant rain has started to fall.	Depending on outcome of Stage 2 trial.
What rate of injection will provide optimal recharge outcomes of the aquifer?	Sizing of an ultimate MAR Scheme. Consenting of a MAR Scheme – at what point does over-pressurisation of the aquifer occur	Low We are being conservative and trialling a rate which we are confident will not over-pressurise the aquifer.	Change rates of recharge in a controlled manner to see what the maximum rate of recharge is possible.	
What volume of water needs to be injected to address decline and start to improve water levels in the aquifer?	Sizing of an ultimate MAR Scheme. Consenting of a MAR Scheme – at what point can further water be abstracted from the aquifer.	Low –medium. The trial will give us information at the current site and surrounding area. This will be used to upgrade the hydrological model.	Medium Repeating the trial and changing the timing and rate of injection, as well as expanding the monitoring network will enable better accuracy of the hydrological model.	Medium – high This will enable us to better understand the impact of the trial on the wider aquifer – eg Patutahi, Makaraka, Hexton.
How wide across the aquifer is the effect of recharge?	Sizing of an ultimate MAR Scheme. Best locations of injection bores. Whether a MAR will assist with water supply in key areas (eg Patutahi) with existing scarce water availability.	Low Because of the rate of movement of water through the aquifer the answer to this question is a multi-year approach.	Low-Medium With each trial we get a better understanding of this.	Medium With each trial we get a better understanding of this. This will enable us to better understand the impact of the trial on the wider aquifer – eg Patutahi, Makaraka, Hexton.

Question	What issues we need to address	Level of confidence 2017 trial data is likely to give	Trial data 2018 required?	Trial data 2019 required?
	Consenting of a MAR Scheme – at what point can further water be abstracted from the aquifer.			
What effects could be felt on base flow of the Waipaoa River and levels in other aquifers?	How linked the Makauri aquifer is to the river and other aquifers? Sizing of an ultimate MAR Scheme. Consenting of a MAR Scheme - will a recharge have wider environmental benefits?	Low Because of the rate of movement of water through the aquifer the answer to this question is a multi-year approach.	Low-Medium With each trial we get a better understanding of this.	Medium With each trial we get a better understanding of this. This will enable us to better understand the impact of the trial on the wider hydrological system of the Poverty Bay Flats.
What effects will a recharge have on springs – including those in locations such as Makaraka where springs have dried up and land subsequently built on?	How linked is the Makauri aquifer to springs on the Poverty Bay Flats? Location of injection wells. Consent issues – is there a rate of recharge where springs re-occur (positive and negative benefits).	Low Because of the rate of movement of water through the aquifer the answer to this question is a multi-year approach.	Low-Medium With each trial we get a better understanding of this.	Medium With each trial we get a better understanding of this. This will enable us to better understand the impact of the trial on the wider hydrological system of the Poverty Bay Flats.
What effects will a recharge have on rural infrastructure such as septic tanks, the Makaraka cemetery?				
What effect, if any, will a recharge have on any organisms living in the aquifer?	Understanding the environmental and cultural impact of a MAR – what are environmental bottom lines and consenting requirements.	Low As part of this year's trial we are sampling the aquifer to understand what organisms (if any) are within it.	Low-Medium Will enabling development and implementation of a biota monitoring programme.	Medium With each trial we get a better understanding of this.

9. Alongside the trial, work is also near completion to further understand the farm scale and whole region economy impacts of a MAR. This work looks at a range of scenarios from status quo (declining aquifer, cuts in use required) to a full recharge where additional water for irrigation is available. The results of this work will be valuable in informing a business case. However, further work will be needed to develop the Business Case to a standard necessary to attract any external funding.

Consideration of Iwi Concerns

10. Iwi have raised concerns about a number of cultural matters. Some of these are being addressed through the current trial, but not all will be answered. Of particular concern to iwi is how the mixing of surface water with the aquifer water impacts the mauri of both water sources.

11. Turanga iwi have also expressed concern around the potential ownership and governance of any full MAR scheme. Particular concerns include:
    - Avoidance of a situation where existing consent holders – or private shareholders of a MAR scheme are the only people who can take water from the aquifer;
    - Ensuring that iwi can gain access to water for their economic and cultural uses;
    - Stewardship of a community asset – and that with the likely long timeframe of any consent for a MAR Scheme this could be seen as passing over a portion of that responsibility to the scheme developers.

Funding Issues

12. Funding of any full MAR Scheme is a key issue which still needs to be properly explored. To date it has been assumed that the Ministry of Primary Industries (MPI) funding will be available to provide a substantial contribution towards the costs of development. However discussions with MPI, make it clear that grant funding is only available at the investigation stage. The Community Irrigation Fund does not fund capital projects. Crown Irrigation Investments is a commercial funder that supports irrigation schemes through loans repaid on a commercial basis.

13. Other funders such as Eastland Community Trust may be interested in funding a MAR Scheme, but they and any other potential funders will require a full Business Case to be developed.

Council uses of a MAR Scheme

NEXT STEPS

14. Completing the current trial and analysing the results is the current focus of MAR trial project team.

15. From early indications it has become clear that this trial will not provide all the answers we need to adequately determine a long-term sustainable and financially viable scheme.

16. We propose a Stage 2 trial in 2018. This trial would inject a further 100,000 m^3 into the aquifer and expand the network of monitoring bores. Staff recommend this option in order to acquire both sufficient information to inform the development of a full MAR Scheme, and sufficient information to ensure that any such scheme's environmental effects will be well understood at a consenting stage.

17. The costs of a Stage 2 trial would be relatively low, (estimated at $80,000) as all the infrastructure is now in place. As the MAR Pilot is a non-regulatory project included in the Freshwater Plan, the stage 2 trial could be funded from that existing budgets within the 2017/2018 Annual Plan.

18. In order to undertake a Stage 2 trial a Variation to the current resource consent will be required. We will discuss and consult with Rongowhakaata and Te Aitanga a Mahaki as mana whenua and in the case of Rongowhakaata also as submitters against the Stage 1 trial.

19. Alongside the Stage 2 trial, we propose to develop a Business Case to support an application to any funders. At this stage we are recommending that staff discuss this with the horticulture group and seek external funding for the Business Case development. While the economic work underway will fulfil part of the content required for the Business Case it is likely that additional consultancy and legal advice will be required to develop the business case to the level required.

20. Alongside the MAR trial, ongoing investigations of other water sources to supply the Gisborne Plains are planned as part of the 2017-2018 financial year work programme. This includes investigating infiltration MAR methods to recharge the Waipaoa Gravels and Shallow Fluvial Aquifers, and surface water storage options to support horticulture outside of areas accessible to the Makauri Aquifer.

ASSESSMENT OF SIGNIFICANCE

Criteria	This Report	The Process Overall
The effects on all or a large part of the Gisborne district	**Low**	**High**
The effects on individuals or specific communities	**Medium**	**High**
The level or history of public interest in the matter or issue	**High**	**High**
Inconsistency with Council's current strategy and policy	**Low**	**Low**
Impacts on Council's delivery of its Financial Strategy and Long Term Plan.	**Low**	**High**

21. The decisions or matters in this report are considered to be of **high** significance in accordance with Council's Significance and Engagement Policy.

22. There has been a high level of public interest and comment around the trial, which is considered to be of critical importance to irrigators on the Gisborne plains.

23. The MAR Pilot is a non-regulatory project in the Waipaoa Catchment Plan, and is provided for in policy within the Freshwater Plan.

24. The MAR Pilot is identified as a key part of the Tairawhiti Economic Action Plan. 87% of the jobs in the Plan are directly linked to the success of a MAR. The successful recharge of the Makauri aquifer will unlock further horticulture potential on the Poverty Bay flats and help to stimulate economic growth in the sector.

COMMUNITY ENGAGEMENT

25. Information about the MAR project is available on the Council website. Stakeholder meetings are held regularly. One on one discussions with Rongowhakaata and Te Aitanga a Mahaki representatives (as mana whenua) have been ongoing through the project to date.

CONSIDERATIONS

Financial/Budget

26. The MAR trial is currently $150,000 over budget due to the costs of infrastructure construction and further funding from MPI is being sought. They have indicated they will accept a further funding application. We have also discussed with them the possibility of funding for a Stage 2 trial.

27. Should external funding be unavailable, a Stage 2 trial, at an estimated $80,000 cost could be funded from the non-regulatory freshwater projects budget in the Environmental and Science Services section.

Legal

28. Understanding the state of the Makauri Aquifer is a key part of our monitoring requirements under the RMA. The MAR Trial is assisting in us meeting this obligation.

POLICY and PLANNING IMPLICATIONS

29. The MAR Pilot and progressing to a full MAR scheme is a defining project of *He Huarahi Hei Whai Oranga,* the Tairawhiti Economic Action Plan. The Aquifer recharge is a pivotal sector action to intensify horticulture production on the Poverty Bay flats. This project alone is set to create 1,100 jobs out of the 1,260 jobs outlined in the plan, and would double the horticulture contribution to regional GDP from $160m annually to $320m by 2022.

30. The decline in the Makauri Aquifer is required to be addressed under the RMA and National Policy Statement for Freshwater (NPSFM). Unless a way to augment the aquifer is found, significant reductions in water takes will be required.

31. The Waipaoa Catchment Plan includes measures to address water takes and over-allocation problem on the Poverty Bay flats.

RISKS

32. Rongowhakaata Iwi Trust may oppose a Stage 2 Trial and Council will then need to consider whether it wants to proceed to a notified consent.

NEXT STEPS

Date	Action/Milestone	Comments
30 June	Economic analysis complete.	Will be reported to Council at August Meeting.
1 September 2017	MAR Injection complete	Water quality monitoring is required to be undertaken for 3 months past the finishing of the injection,
June – September 2017	Consultation and discussion with iwi and stakeholders around a Stage 2 trial. Development of funding application for Better Business Case.	
1 December 2017	Stage 1 Trial Completed	Once the trial is complete the results will be analysed and reported back to Council.
December 2017	Application for Resource Consent Variation to undertake Stage 2 Trial.	