

Mangawhai Wastewater Treatment Plant Update

Meeting: Council Briefing
Date of meeting: 06 November 2024
Reporting officer: Anin Nama, Principal Advisor Infrastructure

Purpose | Ngā whāinga

To update Elected Members on the Mangawhai Wastewater Treatment Plant performance, recent Water New Zealand conference best paper award, capacity and next stage upgrades.

Context | Horopaki

As per the briefing provided to Council last month, the Mangawhai WWTP was optimised in late 2023 and an inDENSE system was successfully installed and commissioned in March of 2024. These steps resulted in a substantial improvement to the plant's performance, and an increase in capacity from 3,000 connections to 3,550 connections. KDC, SCO Consulting and BecaHunterh2o consulting presented a paper on this project at the October Water NZ Conference and received an award for best conference paper.

Mangawhai is also undergoing a number of plan changes and future population growth, with a current rate of development at approximately 50 new connections per year. Although the plant has capacity for an additional 550 connections or so, there are also ongoing performance issues and capacity limits at the Brown Farm effluent disposal irrigation system. Because of this, KDC are completing concept designs and a resource consent strategy plan for a new effluent irrigation system at the Mangawhai golf course. In parallel, KDC are looking to commission the design of the next stage upgrades for the Mangawhai WWTP, including enhancement of the treated effluent to meet Class A recycled water quality standards for non-potable reuse – which includes spray irrigation on the golf course.

Discussion | Ngā kōrerorero

The Mangawhai WWTP was optimised in late 2023, which included a specialist team from SCO Consulting and BecaHunterh2o mobilising on site for several weeks to run detailed test and work with KDC operations to adjust how the plant is run. The adjustments made to optimise the performance of the plant resulted in substantial improvements to the treated effluent quality and reduced the operational cost (e.g. lower power usage). Following this, the team designed and implemented an inDENSE system to increase the capacity of the plant. The system was installed and commissioned in March 2024, and since then the monitoring data shows it is performing very well and has resulted in an increase of the plant capacity from 3,000 to 3,550 connections. KDC and the consulting team submitted a paper on this work to the 2024 NZ Water Conference and presented at the conference in October of 2024. Attachments A and B provide a copy of the paper and presentation. The paper was chosen for the Best Paper award by NZ Water, with the following statement regarding the basis of this award:

“This paper exemplifies innovation and out of the box thinking while efficiently achieving the best outcomes for the community. This paper showcases a visionary approach to addressing the challenges faced by Mangawhai wastewater treatment system in a high-tourist area. The authors demonstrated that through a series of innovative yet minimally disruptive upgrades, existing infrastructure can be optimised to unlock capacity and enhance performance, reducing both capital and operating costs by over 30%. This paper demonstrates optimizing the existing asset provides best value for money for the community.”

Treatment Plant Capacity and Brown Farm odour issues

The current capacity of the treatment plant is 3,550 connections and it is estimated the plant now has just under 3,000 connections, with a current growth rate of around 50 connections per year. However, the overall Mangawhai wastewater system capacity is also a function of the treated effluent disposal system at Brown Farm, which is now estimated to be reached by the end of 2026. Due to

ongoing performance issues at Brown Farm, KDC has had to impose constraints on when the effluent spray irrigation system can operate and have also decommissioned three of the zones which were closest to effected properties. Decommissioning of three zones reduced the overall irrigation area by 30%. KDC recently commissioned Lowe Environmental, who are a leading specialist consultant in New Zealand for effluent irrigation systems and farms, to assess the farm and related issues and confirm an action plan to mitigate the performance and odour problems. KDC have received a draft report and recommended action plan from Lowe Environmental, and the report will be provided to Council for the December briefing. Table 1 below provides a summary of the action plan provided by Lowe. KDC have commenced a number of the short-term actions already.

The next stage capacity upgrades for the treatment plant will result in a capacity increase to 5,500 connections, and the ability to enhance effluent quality to meet Class A, recycled water standards or a standard that meets the Regional Council requirement/s. KDC are looking at engaging a consultant to developed detailed designs for the next stage plant upgrades in early 2025.

Brown Farm Action Plan			
Action Type	Action #	Action Description	Timing
Irrigation System (Infrastructure & Operations)	1.01	Confirming sprinkler uniformity and operation.	Short Term
	1.02	Maintenance of 6 mm maximum daily application depth.	Short Term
	1.03	Confirmation on SCADA accuracy.	Short Term
	1.04	Ceasing of irrigation on standing water or within water drainage paths.	Short Term
	1.05	Investigation into irrigation pulsing.	Medium Term
	1.06	Irrigation zone prioritisation and balancing.	Medium Term
	1.07	Sprinkler pressure investigation and adjustments.	Medium Term
	1.08	Reestablishment of previously decommissioned zones to expand land area.	Medium Term
Stock Management	2.01	Removal of livestock in excess of 1 year old heifers.	Short Term
	2.02	Avoidance of stock overgrazing of paddocks. No irrigation to occur within 2 days prior to grazing and 1 day after.	Short Term
	2.03	No stock permitted to enter any waterways.	Short Term
Vegetation Management	2.04	Establishment of a pasture renewal programme.	Medium Term
	2.05	Control + removal of wet vegetation (reeds/rushes)	Medium Term
Soil Testing and Fertilisers	2.06	Undertaking of soil testing and development of a fertiliser programme.	Short Term
Farm Management Coordination	2.07	Establishment of a farm manager and farm advisor.	Medium Term
Fencing	2.08	Spraying and removal of Kikuyu grasses on all fences.	Medium Term
	2.09	Reconsidering fencing needs and look to refence farm – Less fences.	Long Term
Accessibility	2.10	Improvement of internal road conditions.	Medium Term
Waterways	3.01	Development of a drainage and riparian management plan.	Short Term
	3.02	Improved management of swampy waterway areas – fencing, planting, install structures.	Short Term
	3.03	Swampy land and odour gas generation investigation	Short Term
	3.04	Remediation of overland flow system and planting.	Short Term
Complaints Log	4.01	Establishment of a complaints log.	Short Term
	4.02	Odour diary	Short Term

Table 1 - Brown Farm Enhancements Action Plan

Concept Design and Resource Consent Plans for Golf Course Treated Effluent Irrigation System

KDC have embarked on the development of concept options for a treated effluent irrigation system at the Mangawhai Golf Course. Figure 1 on the following page provides a general overview of one of the concept options which includes treated effluent transferred from the plant to the practice fairway, with a drip irrigation and drainage recovery system to provide water for surface spray irrigation. KDC have received a draft report for the golf course irrigation system concepts and are having this report independently peer reviewed. A copy of the peer reviewed report will be provided to Council at the December briefing. The concept options being assessed include:

- 1) Treated effluent sent to the practice fairway for subsurface drip irrigation only.
- 2) Treated effluent sent to practice fairway and the 12th and 14th fairways for subsurface drip only.
- 3) Treated effluent sent for subsurface drip and surface spray irrigation on the practice fairway.
- 4) Treated effluent sent to the practice fairway for subsurface drip and surface spray irrigation across the entire golf course.

Options which only involved subsurface drip irrigation can be done with the current Class B effluent quality, and any options involving surface spray will require enhancement of the effluent quality.

The golf club have plans to re-contour and re-shape the practice fairway in early 2025. As such, KDC are looking at options to design and install the subsurface drip irrigation system as part of the practice

fairway modifications to minimise future disruptions. The system would not be livened for treated effluent until a resource consent is granted. Approval of this, will be sought from Elected Members in February 2025.

KDC have also engaged a consultant to assess what is required to apply for a resource consent for the golf course treated effluent irrigation system. Some ground water monitoring bores have been installed, and work has commenced to monitor groundwater levels and water quality over this next year. Additional investigations, effects assessments and community consultation will be conducted over the next year as part of developing a resource consent application. Further details and a copy of the resource consenting plan will be provided to Council at the December 2024 briefing.

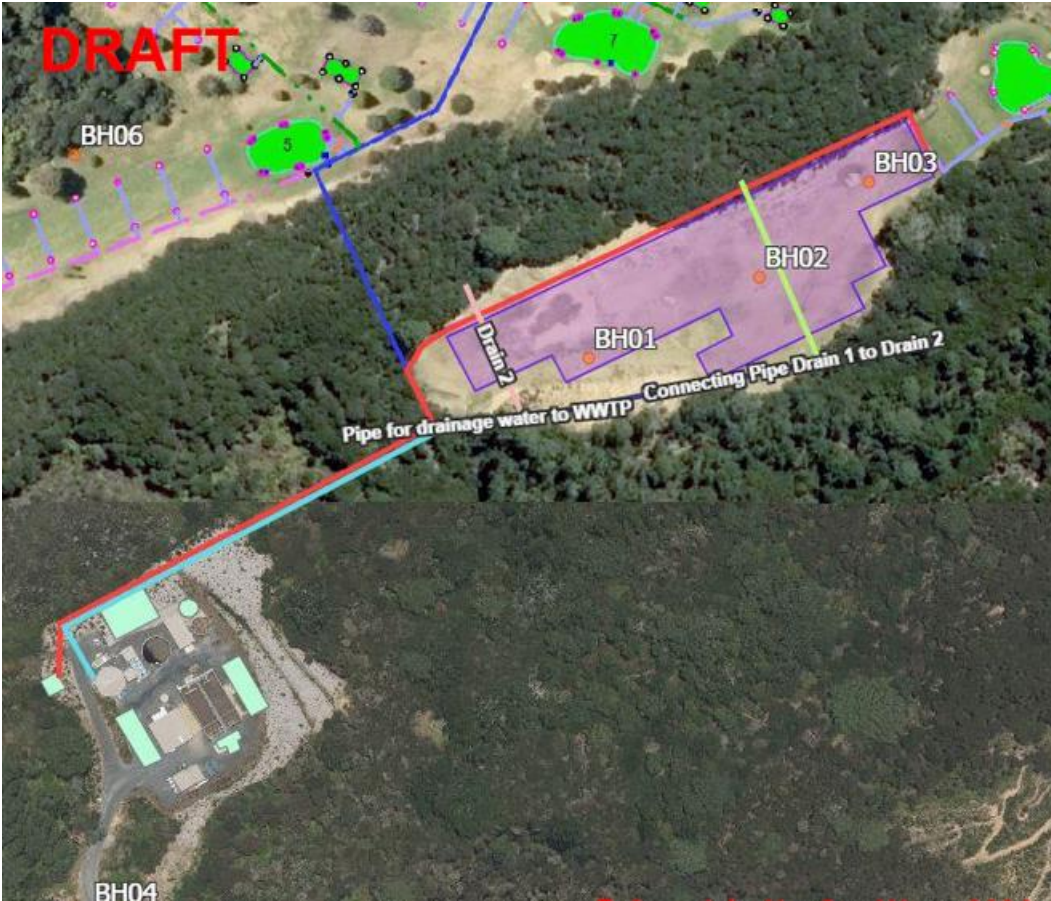


Figure 1 - Concept for Golf Course Irrigation System

Next stages design approvals

A procurement plan is being developed that will set out the design approval as we progress to the next stages of the programme. This will be submitted for approval at the December 2024 Council meeting.

Attachments | Ngā tapiritanga

	Title
A	Water New Zealand Conference Paper on Mangawhai WWTP