7 December 2020

Matthew Smith
Kaipara District Council
Private Bag 1001
Dargaville, 0340

Mangawhai CWWTP - Request for information

1-14129.15

Dear Matthew,

This letter follows KDC request to provide a concise and short summary of the report Mangawhai Community Wastewater Treatment Plant: Future Options Development, (WSP, 2019-11-28). The report outlines the key changes required in the Mangawhai Wastewater network and Community Wastewater Treatment Plant (CWWTP) and disposal to accommodate changes in population.

Included in this information is the basis for population growth used in the WSP forecasts in 2019 that were used as a basis for timelines and future plant sizing.

A route map is given below that outlines many of the key stages required to get a full understanding of the needs of the system and several key areas are being undertaken now to enable informed discussion with the community.

Growth

Spatial Plan population forecast (2019 from KDC) projection to reach 6000 connections by 2043, three times the existing population. Some of this growth will be commercial and light industrial units, with the majority being domestic housing.

WSP estimates in 2019 were based on 2000 connections in 2019, increasing by 70 -100 connections per year. This was deemed appropriate at the time of writing the options study as this matched growth rates from 2017 to 2019 provided by KDC to WSP. Growth in 2019 was 77 new connections.

WSP estimated that based on a growth rate forecast of 70 connections per year an upgrade of the CWWTP will be required by 2029. However, should 100 connections per year occur, this will require acceleration of the upgrade to 2026.

WSP estimated that the irrigation field will reach capacity in 2032 at 70 connections per year, and 2028 at 100 connections per year.

The limitations in the current system are described below.

Treatment Capacity.

The current CWWTP was commissioned in 2009 and consists of an inlet screen to remove inorganic debris, 2 activated sludge reactors for organic and nutrient removal, a flow balance tank, sand filtration and tertiary disinfection before transfer 12 km to Browns Road irrigation

site for disposal to land. Sludge is dewatered on site and currently disposed to landfill in Whangarei.

In 2019 the aeration systems were upgraded to increase treatment capacity (load) up to 2800 connections.

A plant upgrade to provide more biological treatment capacity is expected to be required before summer of 2028 (at additional 70 connections per year)

Hydraulic Capacity

There are currently 65.5 ha of land under irrigation. This is considered to be sufficient land available to dispose of all effluent up to 2032 (at 70 connections) or 2028 (at 100 connections per year). WPS estimated that at an additional 90-100 ha of irrigation land may be required at average flows for 7000 connections . Owing to limitations on land application, this could require purchase of 150 ha of additional land.

Finally,additional rising mains from the CWWTP will be required and storage on site to buffer wet weather when land application is not possible.

The CASS reactors, effluent balancing, sand filters and transfer main have a hydraulic limitation of 70 l/s maximum flow and need upgrade before higher flow can be passed through the treatment plant.

Due to the nature of the catchment being associated with roof tanks, this flow rate is rarely reached for sustained periods with a typical flow in dry weather being only 600m^3/d or 7 l/s (with 1200 m^3/d peak holiday season). However, as has been seen on several occasions in recent years, heavy storms and cyclone events can result in additional flow into the network with at least 70 l/s arriving at Outfall Pump Station for prolonged periods and being passed to the CWWTP. As the catchment grows and more wastewater and storm water enter the system, there may be an increase in storm related high flows. To mitigate the risk of discharge of untreated sewage in a storm event the Balance Tank (planned for build in 2021 and located at the WWTP) will enable storage of additional 900 m^3 of sewage, that can then be treated after the storm event. The tank is sized and designed so that at the 2028 upgrade it can be repurposed to a treatment reactor as part of a flow and load upgrade.

Future Road Map

A roadmap was prepared in 2020 in collaboration between WSP, KDC and Ventia (maintenance operator) as per Figure 1 below. This was publicly presented to the community by the Mayor on the 2 July 2020 at the Mangawhai WWTP (as per Figure 2 below)

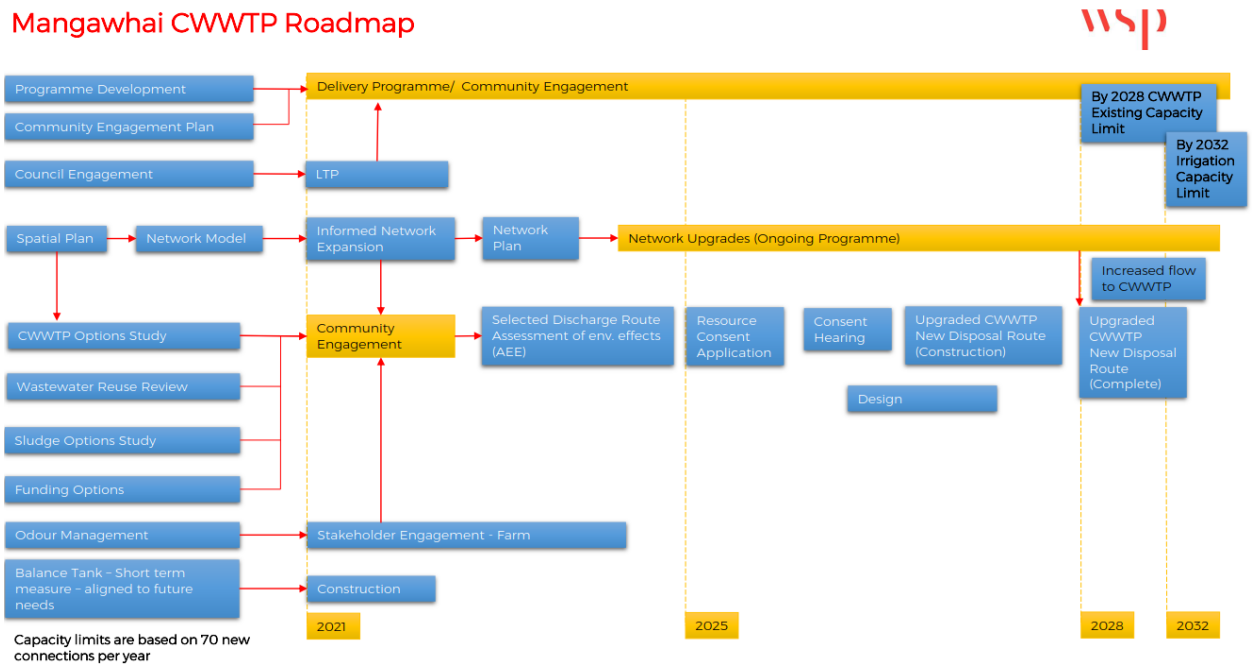

Figure 1 - Mangawhai CWWTP Roadmap

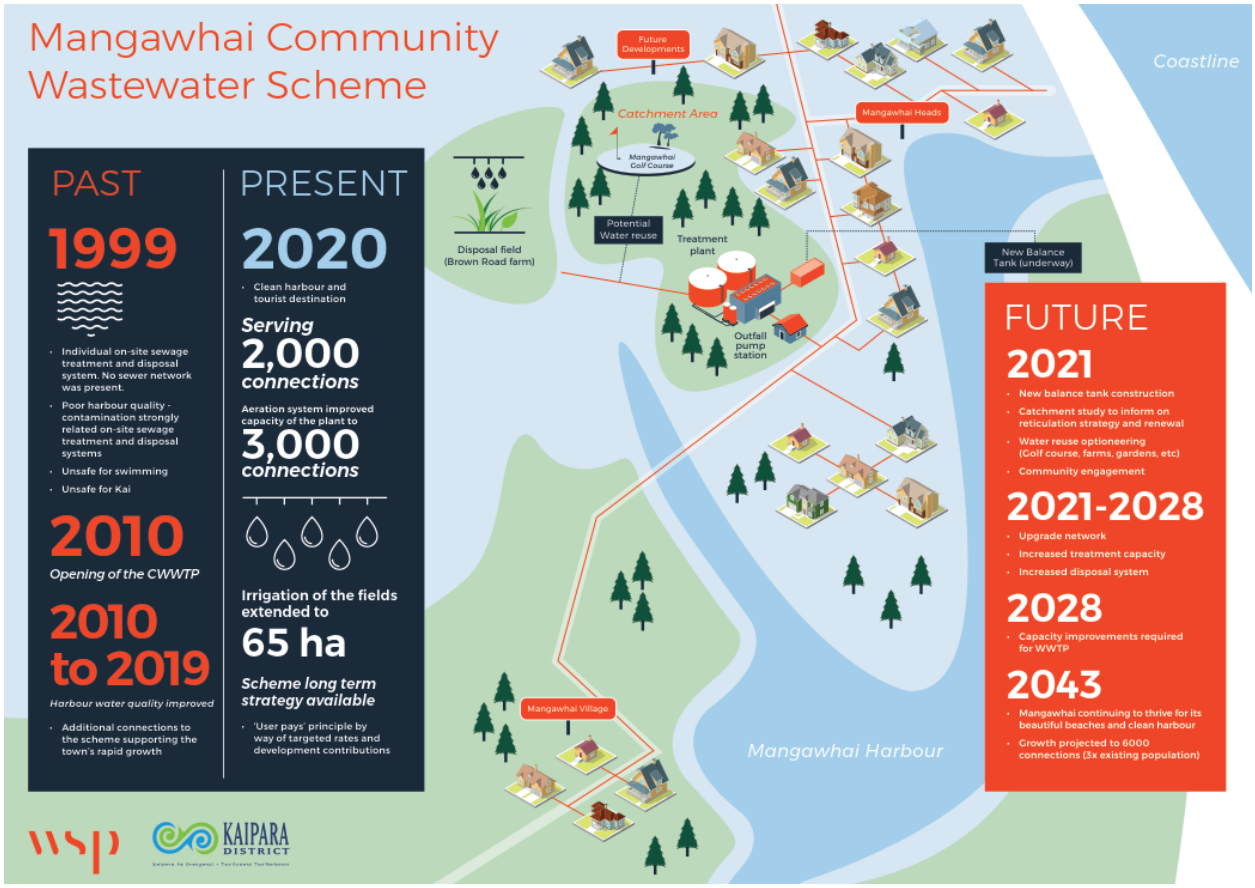

Figure 2 - Poster presentation (also on KDC website)

The scheme will require phased upgrades of wastewater network pump stations, mains and gravity sewers as new properties are developed and infill housing occurs. This will influence

the flow to be treated, which then influences the disposal route for treated high quality effluent.

The choice of disposal route will influence the standard of treatment required and the scope of the CWWTP upgrades. Community engagement with township and Iwi is seen as essential on this journey as the views will be considered and discussions on affordability and funding must be held.

Additional considerations are being given to the long term water supply requirements of the catchment. Currently the town is on roof tank supply, so consumption per capita is very low, but should potable water be available as a municipal supply, there will be an impact on the future flow received at the WWTP.

Progress

The Mangawhai Scheme Roadmap has been developed and shared with Council members.

Building of the wastewater network model is currently underway by WSP, with data collection for calibration to start in January 2021. A costed network strategy will then be developed.

Wastewater reuse options investigation, including reuse of water by the Mangawhai Golf Course ,are currently under considerations including opportunities for treated effluent reuse to irrigation, gardens, recreational areas, or a domestic "purple pipe" system for households. A successful reuse scheme will substantially reduce the infrastructure needed and the impact on the environment from effluent disposal.

The additional balance tank is currently being designed with a 2021 build planned.

If you require any additional information, please contact me at andrew.springer@Wsp.com

Regards

Andrew Springer
Technical Principal Wastewater Treatment Engineer