

Far North District Council
PO Box 752
Kaikohe 0440
New Zealand

30 October 2020

Attention: Mandy Wilson

Dear Mandy

Kaikohe WWTP Cost Estimate

As per our peer review proposal dated 27 August 2020, a cost estimate has been prepared for a high-level economic analysis of the expected land discharge costs for the Kaikohe Wastewater Treatment Plant (WWTP).

The cost estimate has been prepared based on the assumed key elements in the schematic in Figure 1, and include allowances for preliminary and general contractor costs, and fees and investigations, to give a whole-project cost estimate. This cost estimate is indicative only based off a series of high-level assumptions. No specific land sites have been identified and further concept design and costing work will be required to generate a cost estimate for specific sites and associated site-specific constraints.

The costs for options for the WWTP upgrade have been provided by others, and have not been included in this estimate.

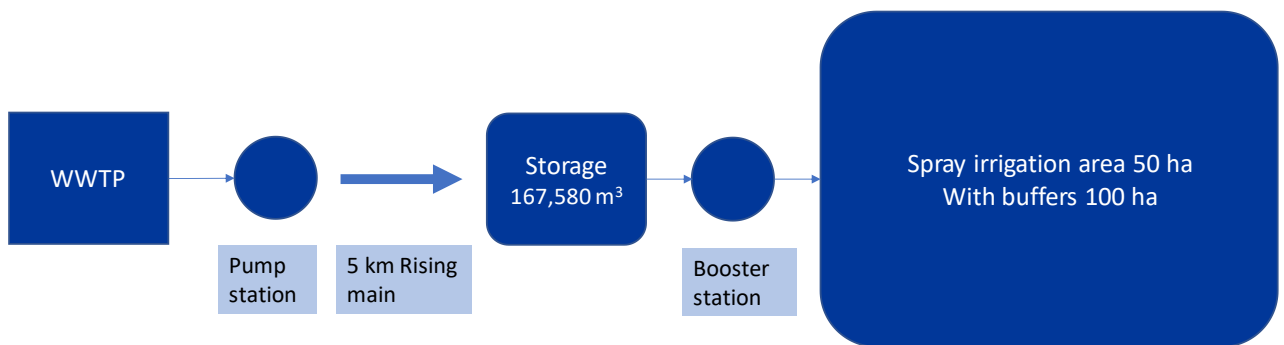


Figure 1 Schematic of high-level land discharge design used for cost estimation

Table 1 Cost estimate for land discharge scheme

Item	Cost (NZD)
Conveyance to irrigation site	\$3.9M
Irrigation scheme and storage	\$4.7M
Fees and investigations	\$2.3M
General	\$4.1M

Item	Cost (NZD)
Land Purchase	\$2.0M
Total Estimated Cost (-35% to +50%) excluding GST	\$17.1M

Estimation Notes and Assumptions

- This estimate is an order of magnitude cost with an expected accuracy range of between -35% to +50%
- 50 ha land area for irrigation is assumed to be required (based on indicative work undertaken by FNDC) plus 100% for storage, buffers and non-irrigable areas or the site and harvest stand down periods. This buffer area may be reduced following the identification of a specific site.
- Spray irrigation proposed – nozzle size allows for larger particulates, for example algae from ponds
- Three months storage of 167,580 m³ is assumed (supplied by FNDC, appears to be based on 2020 average flow)
- Geotechnical investigations included for rising main and irrigation site
- Irrigation site is assumed to require 5 km of pipeline from the WWTP to the irrigation site
- Pump and rising main sizing has been based on schemes for WWTPs of a similar size

Exclusions

- Legal fees
- Consents
- Ground improvement works
- Goods and Services Tax
- Contingency

Limitations

It should be noted that the cost estimates provided as part of the Services are not a statement of absolute cost, rather they will have an accuracy range commensurate with various factors such as the extent of relevant information provided, the certainty of data and the level of detail available at the time of preparation.

The high level cost estimates presented in this letter are typically developed based on extrapolation of recent similar project pricing, historical quotes for some equipment items, industry unit rates and Beca's general experience. The estimates are based on incomplete design and other information and are not warranted or guaranteed by Beca. The accuracy of these estimates is not expected to be better than approximately -35% to +50% for the scope of work described in this report. Further design should be undertaken if a more reliable estimate is required.

Total Scheme Cost

A review of the short-listed options provided by Harrison Grierson in their Options Report (draft, October 2020) found that options 3, 4A and 4B are the most likely to meet consent conditions for discharge to stream when the storage pond for the irrigation is fully utilised, and irrigation is not possible. The times when a discharge to stream is potentially required is when pond-based systems are at their lowest performance levels, generally being in the wet and cold months when treatment processes produce the lowest quality treated effluent of the year, and ammonia (currently the failing determinand) is most at risk. This is based on experience with pond treatment systems in other regions using the technologies in options 1 and 2 which are not meeting compliance with their resource consents.

Potential total costs for a WWTP upgrade and land discharge scheme are presented in Table 2 below.

Table 2 Total scheme capital cost using Harrison Grierson WWTP option costs[#]

Option	HG WWTP Option cost	Total scheme cost [*]
3. IDAL	\$6.5M-\$8.9M	\$17.6M-\$34.6M
4A. side stream BNR	\$15.0M-\$20.6M	\$26.1M-\$46.3M
4B. BNR	\$17.5M-\$24.0M	\$28.6M-\$49.7M

[#]Note: Beca accepts no responsibility for the costs provided by others

^{*}Total scheme costs have been calculated to include the high/low range for the land discharge costs

References

Kaikohe WWTP Options Assessment, Harrison Grierson, Draft October 2020

FNDC Kaikohe WW Peer Review 01.10.20.pdf

Yours sincerely



Nicola Marvin

Senior Environmental Scientist

on behalf of

Beca Limited

Phone Number:

Email: nicola.marvin@beca.com