



Waipukurau Second Water Supply – Overview of River Crossings by Directional Drilling

(V1 24 June 2021)

Introduction

As part of the Waipukurau Second Water Supply Project, Central Hawkes Bay District Council (CHBDC) proposes to drill a water pipe under the Waipawa River and Tukituki River in the general locations shown below.

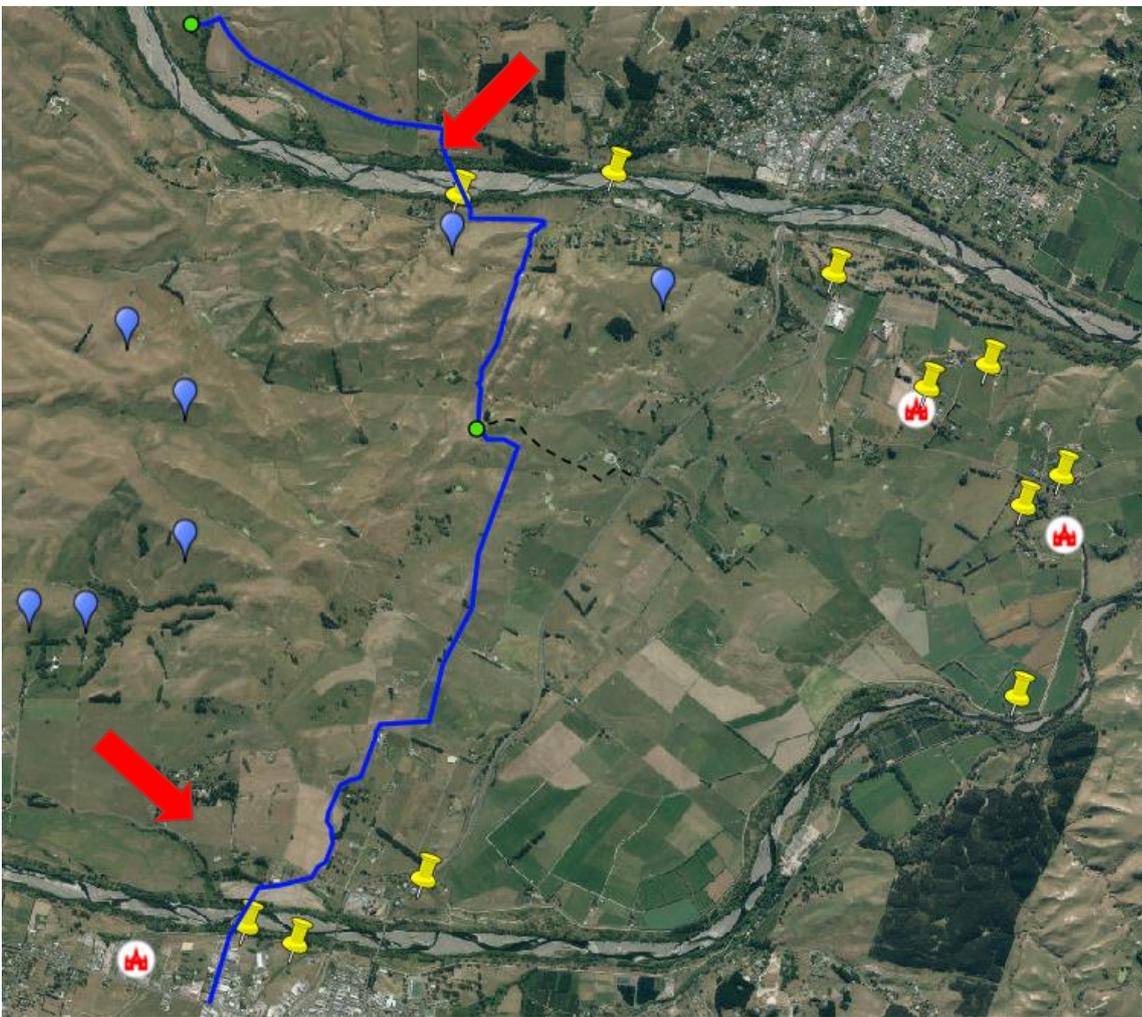


Fig 1- River Crossing Locations

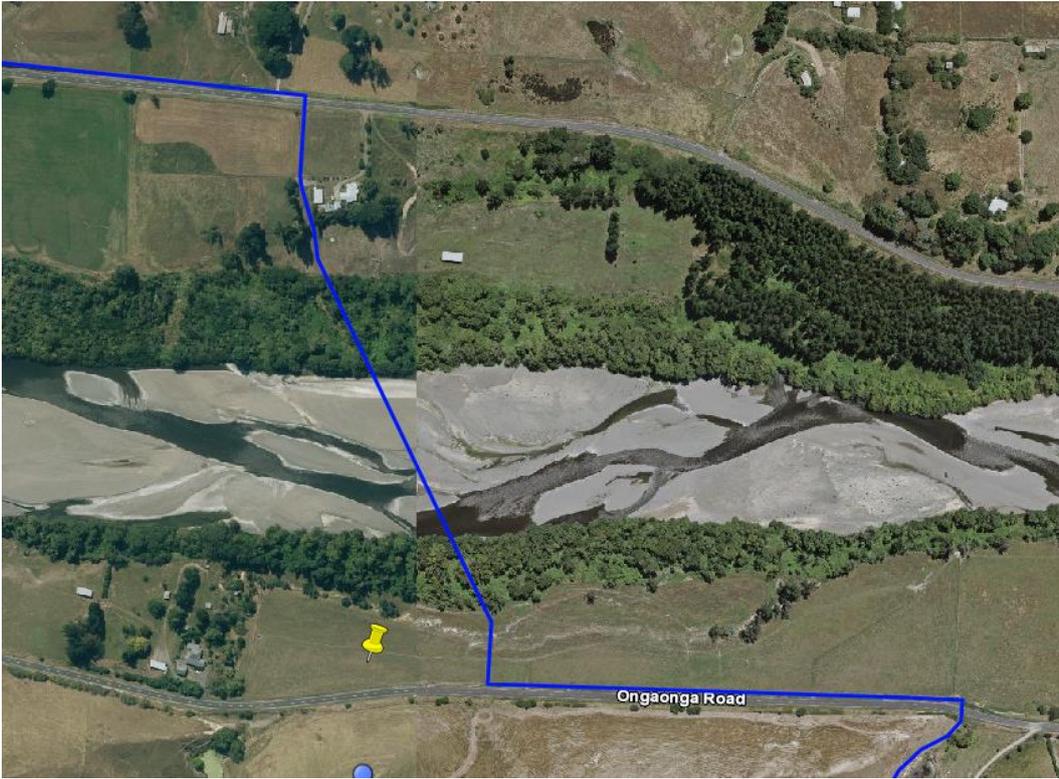


Fig 2 - Waipawa River Crossing

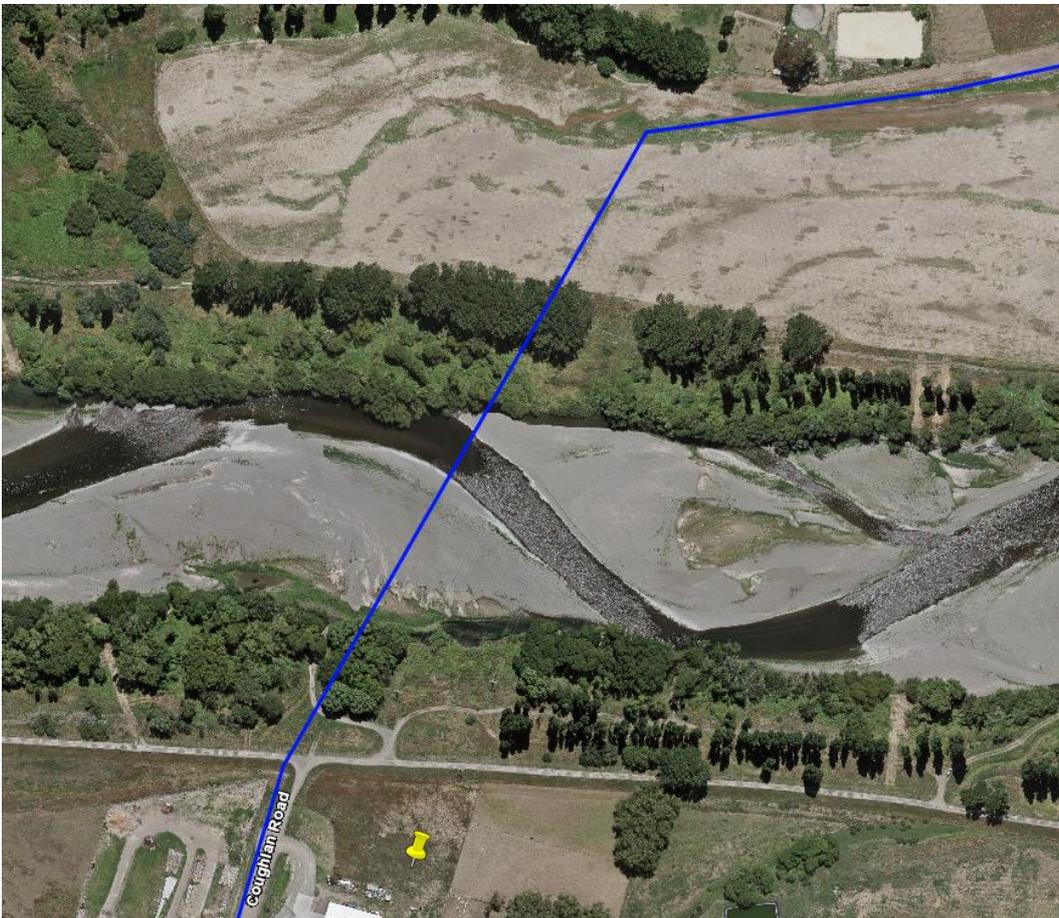


Fig 3 - Tukituki River crossing



This document introduces the drilling process. In-depth information, specific to the locations, will be developed once investigations are completed to support consultation and resource consents.

Why drilling is proposed

A number of options for crossing the rivers were considered:

- Build a new pipe bridge – not preferred due to cultural, environmental and aesthetic impacts
- Attach the pipes to the existing SH2 or railway bridges – not preferred due to sustainability impacts (significantly longer route so more expensive to build and operate, and greater climate impact), earthquake damage risks (pipe would cross known faults) and because the highway bridges will eventually need replacement which impacts the water supply
- Open trench – not preferred due to cultural and environmental reasons.

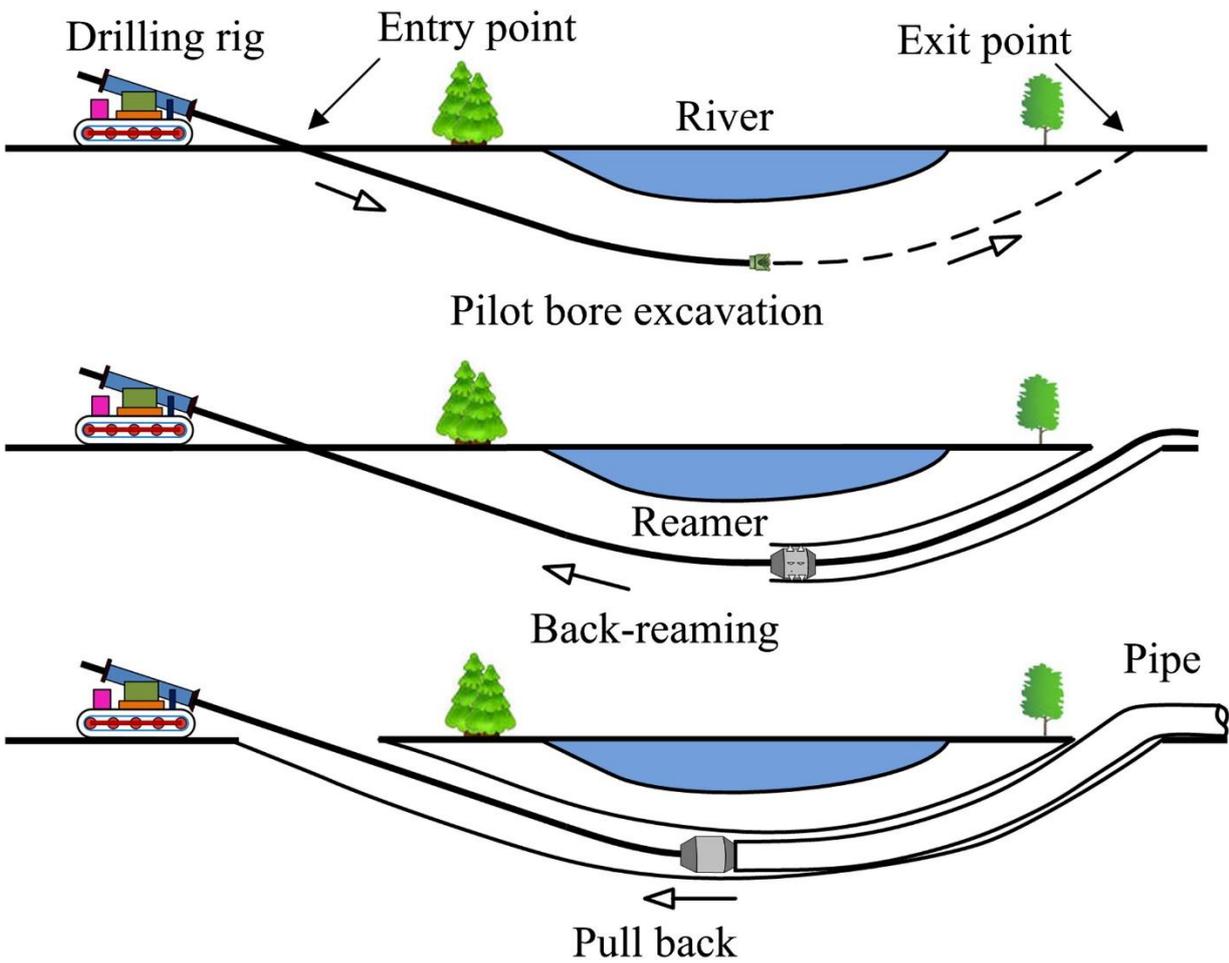
Directional drilling was therefore chosen and the preferred option.

Directional drilling is an established construction technique used by a number of specialist drilling companies around New Zealand. These crossings are relatively simple compared to others that have been successfully completed.

The drilling process

The main steps for drilling the pipes are:

- 1) Drill four 100 mm diameter investigation boreholes at each crossing – one on each bank and two on the river bed. This is to understand the ground conditions and decide how deep to drill the pipes (which need to be deep down in hard soil, not the surface gravel. A resource consent is required for the boreholes.
- 2) Engage a specialist pipe drilling contractor. CHBDC would engage a specialist driller based on their experience and track record for successfully completing projects like this. The contractor would work with CHBDC and stakeholders to develop the specific methodology and environmental management measures.
- 3) Obtain a resource consent to install the pipe by drilling. Obtain approval from LINZ who are the crown agency for the rivers.
- 4) Establish the environmental risk management controls and monitoring.
- 5) Install the water pipes under the river – refer to the diagram overleaf which shows the drilling process. The key details for these crossings are:
 - Waipawa River – approximately 450 m long crossing, 400 mm diameter plastic (polyethylene) pipe
 - Tukituki River – 350 m long crossing, 400 mm diameter plastic (polyethylene) pipe
 - In both cases we anticipate the pipes will be approximately 10-15 m deep below the river bed (in rock). The depth is confirmed following Step 1.
 - Polyethylene pipe has been chosen because it forms a continuous pipe with welded joints that don't come apart, and because it is flexible and resilient. The pipe is pressure tested to confirm there are no leaks, before it is put in service.



There is also a useful YouTube video of the drilling process here:

<https://www.youtube.com/watch?v=bMSQTzJxro4>