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## MEMORANDUM

**TO:** Dwayne Fletcher – Activity Planning Manager  
**FROM:** Glenn Stevens - Resource Scientist  
**DATE:** 9 September 2020  
**FILE NO:**  
**RE: Marahau Groundwater Resources**

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The Marahau catchment is underlain by Separation Point Granite (SPG). In the lower reaches of the catchment, the valley floor has been infilled with eroded SPG material, predominantly comprising of coarse granitic sand. Granite gravels, cobbles and potentially boulders are present in places, but the sediments are expected to be dominated by granite sands closer to the coast. The intertidal area of Sandy Bay comprises of large sand flats extending out 0.5 km or so from Mean High Water Springs.

The accumulated sandy sediments in the lower valley and coastal plain support a shallow unconfined aquifer. Groundwater levels are typically high (1 to 2 m below ground level). There are broadly two parts to the unconfined aquifer:

1. The valley floor adjacent to the Marahau River. These broaden down the valley and extend to the coast. Recharge is from leakage from the river and infiltration of incident rainfall. Close to the river recharge will be dominated by river leakage.

It is anticipated that sufficient groundwater could be obtained from within this aquifer close to the river. Either from a bore filed or a horizontal infiltration gallery or similar.

2. The coastal plain to the south of the river mouth where the residential development is concentrated. Recharge here is predominantly infiltration of incident rainfall but will include some recharge from the small creeks flowing from the bounding hill slopes to the south.

Overall recharge to this aquifer is limited and unlikely to be suitable for a community supply. Several exploratory bores have been drilled as part of a recent subdivision proposal (a SHA) but suitable groundwater was not encountered.

The unconfined aquifers extend out into the foreshore and are hydraulically connected to the sea. A tidal influence is present in groundwater levels close to the coast. Bores/wells close to the coast are vulnerable to sea water intrusion from over pumping.

In the early 1990s a 150 mm diameter test bore was drilled and installed (this was the bore subsequently sold to Wakatu). It was screened with a 1 mm wedge-wire screen set at 11.4 to 13.4 m below ground level (approximate location E1600234 N5461716). A pumped aquifer test

was undertaken (pumped at 5 L/S for 5.5 hours with a 3.2 m drawdown) resulting in an estimated transmissivities in the order of 300 to 500 m<sup>2</sup>/day.

Apart from manganese and iron water quality is generally good. However, the shallow unconfined nature of the aquifer is such that it is vulnerable to contamination from surface activities (in particular onsite wastewater disposal and livestock farming). There is no wastewater reticulation in Marahau and all properties rely on onsite wastewater disposal systems. Whilst elevated iron and manganese concentrations are known to be present in parts of the aquifer, little is known about their distribution across the aquifer.

#### Points to address

- Unsecure aquifer, vulnerable to contamination
- Previous sampling data revealed faecal matter
- If we went with a CWS a well field by river will likely not be subject
- If we built a CWS manage land around it