

Enclosure 2 in Appendix C.

FURTHER REPORT ON EXPLORATION for a RAILWAY LINE from HELENSVILLE to WHANGAREI.

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Public Works Office, Wellington, 31st March, 1881.

THE tunnel, $6\frac{1}{2}$ chains long, mentioned in last year's report, is the summit between the Waitepoko and a branch of the Kikowhiti, which flows into the Mangonui. From this tunnel the line follows the valley of this stream and then of the Kikowhiti in a rather circuitous course, with moderate grades and work; then passes through the first Mareretu Gum Field, across the Taipo Stream, near the road-bridge; through the second Mareretu Gum Field, across the Mangonui River, a short distance below the road-bridge; along the right bank of that river, through the Waikiki Gum Field, through three short deep cuttings to the watershed between the Mangonui and Tauraroa, where there will be heavy earthwork and a viaduct of considerable size near it. From this watershed easy grades with light work can be obtained by following the left bank of the Homaiwhare, a tributary of the Tauraroa, up to the road from Mangapai to Tangahua, crossing this stream, and then along the foot of the spurs, crossing and recrossing the Tauraroa, and running along the latter and a small tributary to it past Mr. James's homestead, through the watershed between the Tauraroa and the Otaika. The line would then follow the valley of the Puera, a tributary of the Otaika, to its junction with the latter; then the right bank of the Otaika to a little below the road-bridge, cross that stream, cut through a low ridge between it and Limeburners Creek, run along the right bank of Limeburners Creek, cross this creek, and join the Whangarei-Kamo Railway about half a mile north of Limeburners Creek.

From the tunnel to the junction with the Kamo Railway grades of 1 in 50 can be obtained, with the exception of the grade into the valley of the Tuera, where a landslip of considerable extent will probably force the line to be taken below that slip, necessitating a grade of 1 in 40.

Except in two places the earthwork and bridging will be below the average of North Island railways.

The country all round the northern side of the Wairau basin has been examined, but no point lower than 450 feet above sea-level and suitable for a tunnel could be found. About 2 miles is the greatest length that can be obtained from sea-level to any of these places. It is therefore impossible with ordinary grades to get through the ranges on the north-east side towards Waipu and the East Coast.

At the request of Port Albert settlers a cursory inspection has been made of a route starting from above the junction of the Mainene and Tepuna Creeks. It is proposed to cross the Mainene a little above Mr. Nicholson's saw-mill, and run along the east bank of the Tepuna to join the line to the north. The Mainene is here about 400 feet wide at high water: the Kaipara Steam Navigation Company's steamers run up to the mill, and smaller craft go above it. The nature and size of the bridge will depend on the question whether the navigation above it can be stopped for all but small boats. To the south the proposed line would skirt along the western slope of a tidal creek till it reached the swamp at the foot of Mount Brane. This swamp is about 80 feet above high water, and there is ample length for an easy grade. There will probably be some short high banks and sharp curves on this piece. From the swamp it would run up a valley to Hexam's Saddle, to Moore's Saddle, along the right bank of the Te Kakaho Creek, cross this creek near Markroft's road-bridge, and then run down to Mr. Newcome's store. To this point grades of 1 in 50 could be obtained, and, except near the Te Kakaho, the work would not be heavy. From the store the line could be brought along the coast to the Te Pane River. From this river inland, *via* Mr. Newcome's homestead to the Oteo River, the heights are too great and the distances too short to allow workable grades; and keeping along the coast does not promise better here. A short tunnel near the left bank of the Oteo would lead into country where a good line with moderate grades and work could be obtained to a short distance south of the Areparera River. Thence the country to the Makarau River becomes very broken, and workable grades cannot be obtained unless the line be taken along the coast, which, from the configuration of the country, does not appear advisable.

At the request of Waiwera settlers the following route has also been explored: This route would start from the junction of the Helensville-Riverhead and Newmarket Railways at the Kumeu, and run along the right bank of the Waitemata Stream, past Mr. Lamb's dam, to a saddle which is about 200 feet above the Kumeu Valley. There is, I believe, sufficient length between the junction and the saddle to allow of a grade of 1 in 50, but there will be some sharp curves on this piece and a deep gully to cross near the saddle. From the saddle the line would run down a branch of the Ararimu Stream, which it would cross above the road-bridge at a level of about 250 feet below the saddle; a grade of about 1 in 50 could probably also be obtained here, and no very heavy earthworks would have to be constructed. From the Ararimu crossing the line would again rise with a grade of about 1 in 50, skirting the south-eastern side of a steep spur, locally called the "Peak," to a second saddle, which is about 260 feet above the Ararimu road-bridge; near this saddle also a deep gully would have to be crossed. The rest of the earthwork need not be very heavy. A great many small streams will have to be crossed both going down into and rising from the Ararimu Valley. From the second saddle the line would run down in the valley of a branch of the Waipuakakaho to near its junction with the Waipapakauri, descending a height of about 230 feet, with probably a grade of 1 in 50, and moderate earthwork. After crossing the Waipapakauri the line would run for some distance in easy ground along the left bank of the Kaukapakapa Stream, and then cross the Waitoki and run along its right bank to a saddle east of the Flat Top Mountain. This saddle my aneroid readings make 345 feet above high water. There appears to be length enough to allow a grade of about 1 in 50, but for about 3 miles south of this saddle the ground is very much broken up by gullies, and only further instrumental investigation can lead to the adoption of the best ground available. This last saddle forms the watershed between the Waitoki, which joins the Kaukapakapa, and one of the smaller branches of the Makarau. To the north-west of it lies the locally-termed "First Ti-tree Flat," through which my cut line from Kaukapakapa goes; and the line under report, shown in *red* on the accompanying sketch, would join my cut line, shown in *blue*, about 1 mile further north between the "First" and "Second Ti-tree Flats." The length