

Upon examination of the before-mentioned Madam's Creek I formed the opinion that from its elevated position, commanding the whole town, and the volume of water (although limited), it would have been the best adapted for the purpose, but a race to the Corley battery nearly monopolizes the creek-water, and I found that three or four rights exist, although one mine only has been opened in the hills at the creek source, which would probably not contaminate the catchment area. There is a good site for a storage-reservoir 300 ft. above sea-level, and the creek running about half a Government sluice-head in the driest season would be sufficient.

The Whakanekeneke, or Courthouse, Creek could also be used with advantage for the purpose, and at an elevation of 250 ft. an excellent site for a reservoir is available, but, unfortunately, it is too close to the cemetery, and there are two or three gold-workings on the watershed, and, moreover, there are four prior rights in the stream. The other branch of the Courthouse Creek is a mere stream, well known to be strongly impregnated with mineral acids, and therefore out of the question.

Karaka, or "Cadman's," Creek is the only other water source suitable for the purpose, and, after a close examination, that has been selected in preference to going all the way up the Waiau River to obtain almost the same result, at about one-third of the cost. It is by far the most expedient on account of the comparative purity of the water and freedom from contamination by workings on the catchment area. There are four existing rights in the creek, however, but, as far as I could ascertain, have never been made use of by the holders, and therefore may be resumed. With a view of setting the question at rest regarding the purity of the water, Mr. J. Malcom Maclaren, Director of the School of Mines at Coromandel has kindly given me an analysis of a sample of the water, which I quote: "This a clear, colourless, tasteless water, depositing only a very minute quantity of sediment on standing. After boiling for some time it has a feebly alkaline reaction. The fixed salts, or solids, are very low, amounting to 7.28 gr. per gallon, made up of alkaline chlorides (principally sodic chloride, or common salt) 4.6 gr. per gallon, and carbonate of lime, 2.4 grains per gallon. It must be termed a very soft water, and is therefore eminently suitable for steam or manufacturing purposes. With regard to its suitability for domestic purposes, I find it requires 0.149 gr. of oxygen to oxidize the organic matter in a gallon of water. This is a somewhat high factor, and the water is therefore of only ordinary purity. It must, however, be remembered that the sample was taken towards the close of a long period of drought, and that water then is not so pure as at any other time of the year. This percentage of organic matter, though large, will not invalidate it as a potable water, the more so as I failed to find any traces of albuminoid ammonia or other nitrogenous compounds, the presence of which would have infallibly indicated contamination." This, although not entirely satisfactory as a drinking-water, shows that there is no presence of contamination, and I think it may be taken as a fair sample of bush-water in similar localities after being filtered over several miles of a creek-bed of shingle and sand.

The catchment area, except on the left bank of the creek and at the source, is limited, but there is abundance of water, except at the driest season of the year, to supply five times the present population, which is estimated at not more than two thousand. The normal capacity of the stream (eliminating floods) may be taken at about 300,000 gallons per day of twenty-four hours at the point of intake, which is above three small tributaries, and gives the very liberal allowance of 150 gallons per head. At 30 gallons per head (the generally accepted rate) only 60,000 gallons per day would be required. There is, therefore, an ample margin for fire-extinguishing purposes, and, if required, driving power. The site for the intake chosen is at an elevation of about 150 ft. above sea-level and half a mile from the old mill, and will give a head of 140 ft. in the most thickly built part of the lower town around and about the bank corner; 100 ft. at the Presbyterian Church, Ring's Road; 90 ft. at the old Courthouse (present hospital); and at the Tramway Hotel and surrounding houses at Belleville a head of 60 ft., rather a low pressure at this point, but sufficient for purposes of fire-extinguishment. More elevation for the intake would have been better, but beyond the site chosen the creek-bed rises rapidly, and is very confined, full of heavy boulders and rocks, and the expense of the head-works would be at least double to get 50 ft. more elevation. The proposed head-works consist of a concrete weir 8 ft. in the mean in height, built in the solid rock, with a rough filter-bed at the back, silt-pit in front, and on the side a flood-overflow, or by-wash, of 14 ft. This will impound, when the creek-bed is cleared of stranded timber and large boulders, about 340,000 gallons. An iron grid, as shown on the sketch-plan, will prevent floating snags and *débris* from entering the reservoir. A settling-tank of some description is necessary when the creek is in flood, and it may be as well perhaps to provide a reserve for future contingencies. The delivery-main from the silt-pit to the centre of the lower town would be 8 in. cast-iron pipes; the reticulation for the main street (Ring's Road) north as far as the post-office and south to the bridge at Woollams's triangle, 6 in. pipes; the remainder of the pipe-track, as shown on plan No. 1 in red lines, 4 in. pipes: the whole laid with tee branches at all places where water is likely to be needed eventually. Scour valves provided at the low levels and creek-crossings, stop-valves at suitable intervals, and fire-plugs at every two or three chains where most likely to be required. In roads or streets where there are at present only a few scattered houses 1½ in. and 1 in. wrought-iron pipes. Laying the water to the houses is not considered in the scheme, as I conclude that would be better left to the local authorities to come to some equitable arrangement with the residents requiring the water, unless it be made compulsory to take it.

A more direct route for the pipes would be to cross from Cadman's Mill, turning northward over the low saddle, and following the low ground to the junction of Ring's Road and Albert Street, but private land would have to be crossed. It is therefore better to avoid purchase or compensation by taking the pipes down Wangapoua Road to the junction with the Tiki Road, and thence into the lower town. An extension along the Tiki Road can be easily made if necessity arises. The cost of maintenance will be nominal, only requiring the cleaning of the shingle occasionally at the back of the weir, removal of any snags and *débris* from the grid, and the scouring of the bottom of the silt-pit and mains frequently.