

Table C.—Total Connected Load in Kilowatts, Horahora.

—	Light.	Heat.	Power.	Total.
Waihi Gold-mining Company	164	100	4,461	4,725
Grand Junction Company	38	38	884	960
Rising Sun Company	80	80
Miscellaneous	10	20	20	50
	212	158	5,445	5,815

Diversity factor $\left\{ \begin{array}{l} \text{Connected load} = 5,815 \\ \text{Max. P. H. load} = 3,600 \end{array} \right\} = 1.615.$

LAKE COLERIDGE HYDRO-ELECTRIC SUPPLY.

The year ending 31st March, 1921 (the sixth year of operation), has again closed with a credit balance after paying all charges.

The year was abnormally dry, and no serious snow troubles were experienced through the winter; nevertheless, considerable transmission-line trouble was experienced as a result of insulator-failures, the failures being approximately 50 per cent. more than in the previous year.

The plant, though operating under conditions of heavy overload for the major portion of the year, has stood up well to its work, and has been maintained in an efficient condition.

The revenue for the year was £51,373; working-expenses, £21,341; capital charges, £18,639; and allowing £7,946 for depreciation, this yielded a credit balance of £3,447 in excess of all charges.

Capital Outlay.

The capital outlay to the end of the year was £499,957, as against £422,076 for the previous year. Details of this expenditure are shown in Table E.

Financial Results of Operation.

Table D gives the financial results of operation and load records. It will be noted that the power-house maximum shows an increase of $6\frac{1}{2}$ per cent., and units output of 10 per cent. over that of the previous year owing to the load factor being improved from 59.9 to 61.4 per cent.

The total generating-costs per unit generated and per unit sold show an increase respectively of 0.07d. and 0.05d. These increases are accounted for in the main by—(1) Increased interest payable; (2) increases in salaries and wages; (3) additional demand made on standby plant owing to line-failure; (4) transmission-line maintenance being 50 per cent. in excess of previous year.

Table F shows the operating-costs for the year under consideration as compared with those of the previous year, and Table G gives the gross financial results of distribution of energy.

Extensions.

No. 5 generator of 3,000 kw. capacity arrived and was placed in position and coupled up to its turbine.

All the material for the third pipe-line is to hand, and the contractors commenced erection in September, 1920, and completed it in August, 1921.

A start has been made on the erection of a switching-station at Windwhistle. This is the distribution station from which the South Canterbury line feeding Timaru and Oamaru (ultimately linking up Waipori), and the North Canterbury line to Kaiapoi via Sheffield and Oxford, will be fed. A small breakdown station is also being erected at this point for local reticulation.

The erection of the third main transmission-line between the power-house and Christchurch has also been started, and provisional surveys made on the North and South Canterbury routes.

Whilst the supply of power available has been limited, nevertheless 11,000-volt reticulation has increased from $72\frac{1}{2}$ miles to $77\frac{1}{2}$ miles, and the City Council has increased its 11,000-volt underground feeders from $18\frac{1}{2}$ miles to 19 miles. No additions have been made by the Department to the 3,000-volt lines, but local bodies supplied by the Department have increased their 3,000-volt lines from 65 miles to $70\frac{1}{2}$ miles.

Connected Load (Table H).

The total connected load increased to 34,277 kw., or $12\frac{1}{2}$ per cent. increase on that of the previous year. This load made a maximum demand on the substation of 6,712, which gives a diversity factor of 5.10, a very high figure, due to the encouragement of off-peak loads.

Operation.

The operation of the plant at Coleridge has, owing to the continuous heavy demands on it, entailed incessant care, and the greatest credit is due to the Superintendent and his staff for the excellent results obtained.

A considerable measure of anxiety was occasioned early in the year under review by the undue wear on turbine liner-rings of Nos. 3 and 4 units. This was brought about through the excessive fall in the lake, necessitating continuous work on the lip of the rock at the mouth of the intake. As a result, considerable quantities of sand and shingle were carried down through the machines. New liner-rings were made locally and installed with satisfactory results.

A test taken on the machines in March, 1921, gave an over-all efficiency, surge-chamber to tail-race, of 71 per cent., which under the circumstances can be regarded as satisfactory.

The maximum load recorded at the power-house was 7,420 kw., representing an overload of 24 per cent. on each of the four generators.