

APPENDIX D.

ANNUAL REPORT ON ELECTRICAL WORK AND POWER-SUPPLY
UNDERTAKINGS BY THE CHIEF ELECTRICAL ENGINEER.

The CHIEF ELECTRICAL ENGINEER to the MINISTER OF PUBLIC WORKS.

SIR,—

Public Works Department, Wellington, 1st April, 1918.

I have the honour to submit the following report respecting the development of water-power by the State, the issue of licenses for the utilization of water-power by other parties, and for the distribution of electricity.

NORTH ISLAND POWER SCHEMES.

A considerable amount of office-work has been done in design of power-stations for sites already surveyed at Mangahao and on the Waikato. Various proposals for a general scheme of distribution have been considered, and the transmission routes roughly located.

As far as the limited staff available would permit, the surveys necessary to prepare for this general supply have been carried on. Transmission-line routes have been surveyed from the Waikato above Cambridge into Auckland, from Shannon to Wanganui, and from a junction on this line at Bunnythorpe to Dannevirke and south through the Wairarapa as far as Carterton. These surveys will be continued as opportunity offers to enable all the main sources of power to be linked up into one system.

A personal investigation of the Aratiatia Rapids and of the Kaituna River as alternative sources of power to Arapuni was made from existing surveys. The conclusion reached was that the Kaituna River was somewhat limited in its ultimate economic capacity, and was too expensive for partial developments to warrant further work on it. It is, moreover, not nearly so well situated to fit into the general scheme of distribution, as it is too far east to serve the western and Taranaki districts, and as a supply for the East Coast districts it is not comparable with Lake Waikaremoana. The Aratiatia Rapids gave a very good alternative up to 66,000 horse-power, but for an ultimate larger development than this the scheme would have to be laid out on altered lines from the commencement, and it was decided to have further surveys made to determine the relative merits of Arapuni and this scheme when developed on lines which will permit of the maximum ultimate capacity.

Surveys have been completed at Lake Waikaremoana to enable the works to be laid out in detail, and this work will be taken in hand shortly. This scheme, while an excellent one from the hydraulic point of view, is not so conveniently situated for transmission of its power to payable markets as are the Mangahao and Waikato schemes. It has also been found that the estimates of the amount of power to be economically developed have had to be considerably reduced.

Some further work has been done on the investigation of power requirements in the Wellington District, and the whole of the results between Wellington and the Rangitikei have been tabulated.

LAKE COLERIDGE.

I attach hereto a report of the working of the Lake Coleridge undertaking for the year ending 31st March, 1918, together with a comparison with previous years, by the Electrical Engineer, Mr. Lawrence Birks.

The capital expenditure now amounts to £389,754, including £14,320 interest on capital during construction; the gross revenue during the year amounted to £32,092, and the working-expenses to £14,449; leaving a balance to net revenue account of £17,643. Deducting interest charges, amounting to £14,871, there remains a balance of £2,772 towards depreciation. Having regard to the fact that this is only the third year of working, and also that the growth of the business has been checked for the last two years because of the difficulty experienced in getting machinery, the result is to be regarded as a most satisfactory one.

The plant at the power-station consists of four units, aggregating 6,000 kilowatts, and all four units are run daily without any spare. The demand for more power is so insistent that the delivery of the fifth generator and the necessary pipe-line is a matter of urgent necessity. The turbine for the fifth unit has been received, but there is very little prospect of obtaining the generator, and still less of obtaining delivery of the material for the pipe-line. During the year efforts have been made to obtain steel plates from Canada, the United States, and Australia, but the prices are excessive and the delivery uncertain, and under the circumstances it was deemed better to take further steps to press for the completion of the contract for the third pipe-line, and further steps have been taken in the endeavour to secure a priority certificate for the plates.

With reference to the transmission-lines, the maintenance has proved somewhat troublesome during the year owing to inherent defects in the insulators, and it is desirable in the interest of economy of working and continuity of supply that the insulators should be replaced by others of a newer type as opportunity offers.

During the year application was received from a London firm for 2,500 horse-power in the neighbourhood of Christchurch for electric smelting purposes, but the application had to be refused because of the insufficiency of the plant. This is most regrettable, as I feel sure that this would have been the beginning of a large electric smelting industry which would treat various classes of complex ores. An application was also received for 1,000 horse-power for steel-smelting, and in this case also the application had to be refused.

Steady progress was made during the year with an extension of the lines into the country districts. Many insistent demands have been received from various districts in Canterbury, and in view of the requirements steps should be taken very shortly to enlarge the headworks and to duplicate the tunnel, and to provide the necessary transmission and distribution lines.