

Work has proceeded in the closer investigation of this scheme for about 10 months and while there still remains a good deal of detail to be further examined it is felt that sufficient has been done to make clear the main outline of the scheme and to define within certain limits its possibilities and its probable cost.

The original scheme was designed for 200 Tasmanian Head a head is equal to a discharge of 24 cubic feet per minute) and for a maximum power of 8400 h.p. The position with regard to a scheme of these dimensions remains the same. It would require very moderate storage and a race $1\frac{1}{2}$ miles in length with pipe line of under 2000 feet. There is however, especially in view of the rapid progress that is being made in the electrometallurgical work, quite a fair prospect that there would be a demand not too many years hence for all the power that could be supplied from this source. Under these circumstances any scheme now inaugurated should be capable, if possible, of expansion until the limit of from 10000 to 12000 horsepower has been attained. The difficulty here which has entailed a very large amount of exploratory work has been to formulate a reasonable scheme which will utilise all the available water with the maximum available fall. The original scheme would not readily lend itself to expansion beyond the 8400 horse power.

To use the water from these high-lying plateaux to its full extent it is essential to have adequate storage and the maximum fall at steep inclination. It will be remembered that in the first report it was stated that it was possible through a narrow pass known as Newton Gap, either to turn the head waters of the Anthony into the Henty River or the head waters of the Henty into the Anthony. Nature in her caprice has so ordained it that on the Anthony fall we have an ideal Dam Site for ample storage below the level of Newton Gap while on the Henty fall we have ideal conditions for pipe line with over 1000 feet of fall. On the Henty fall we can however discover no site for adequate storage while on the Anthony fall the location of a good pipe line for 1000 feet fall has proved most difficult. A great deal of work has been done to decide which fall should be utilised but our own conclusion in view of the heavy floods of the winter season and the comparative droughts of February and March is that storage is the dominant feature and that the Anthony fall should be utilised.

Working then on the basis of the Anthony fall being preferable the dimensions of the scheme are primarily dependent on the amount of the rainfall and the extent of the catchment. The rainfall

figures are taken partly from the Mt. Read figures and partly from the Mt. Lyell records at Lake Margaret where similar conditions obtain to those at Lake Rolleston. A fall of over 120 inches per annum is looked for in these mountain regions while since the country is largely solid rock with scanty covering, a run off of 110 inches may be well expected.

The catchment area divides into three classes (a) natural catchment above storage, (b) catchment which can be made available, (c) catchment delivering into race. This last may be regarded as a safety factor in the estimates; it is not otherwise included.

The natural catchment above storage (a) as taken from the Government charts amounts approximately to 13.64 square miles. One square mile with run off of 110 inches per annum gives a continuous flow of 20.26 Tasmanian sluice heads per annum so that from the 13.64 square miles a flow of 277 sluice heads can be secured. The artificial catchment (b) gives an area of about 7.13 square miles yielding a continuous flow of 144 sluice heads.

This gives a total flow of 421 heads. While evaporation and leakage and other losses may reduce this we have as safeguard the water from the creeks which drain the country above the water race itself. I consider that with proper conservation a continuous flow of 400 heads may be looked for and the other calculations have been based on this quantity.

The next step in the scheme is to provide adequate storage to conserve the flood waters and equalise the flow. The rainfall for February and March is often very low and the streams at once dry up. I consider storage capacity is required sufficient to supply 200 head continuous flow for three months. To provide storage of this extent an excellent dam site exists on the Anthony River. Contours here at 50 feet and 100 feet have been laid out showing that the required storage will involve a dam between 80 and 90 feet high. This is a considerable undertaking but is must be realised that storage is absolutely essential in the case of these mountain scheme. The character of the dam and its probable cost are questions to be referred to the inspecting engineer. Contours of the dam site have been prepared.

From the dam the water will proceed by a water race to the top of the pipe column which will lead to the power station. In this instance no question arises as to the course of this race for a distance of 111 chains; 23 chains of difficult rock work intervening but no other route or alternative is possible up to this point which I call A and which was the spot selected for the top of the pipe line of the original scheme. Beyond this point the Red Hills creek comes in from the East

involving a syphon 700 feet long to cross it. If the race is extended beyond this so as to deliver the water into the Murchison River we have an available fall of about 1000 feet in place of 630 but the water race is so far back from the river that the pipe line would be too long to enable this fall to be used in one length. The only alternative is to utilise the water in two steps with two power stations delivering the water by a race from the tail race of the first station to the intake of the second station. The complications and extra cost entailed by this are compensated to a considerable extent by the fact that two distinct plants are a safeguard against accident and that it is easier in every way to use water with 500 or 600 feet head than with 1000.

The different alternatives are thus summarised:-

1. To put one plant below point A and to be satisfied with 630 feet of fall or about 8400 horse power. It would be difficult to increase the capacity of this scheme beyond these limits.
2. To place the first power station $\frac{1}{2}$ mile beyond point A in Red Hills Creek and then carry a race about 3 miles further and deliver the water into the Murchison River. Total available fall about 950 feet. This has the disadvantages of leaving the two power stations a considerable distance apart. It would enable 4000 h.p. to be obtained at a comparatively moderate cost while the extension to 12000 h.p. would be simple. It saves the cost of syphon over Red Hills Creek.
3. To place the first power station about 6 miles beyond point A, near the Kitson property 6 miles from Tullah on the Murchison River. Total available fall about 1020 feet. A race of about $\frac{1}{2}$ mile would deliver the water to the top of the second pipe column.

This is the most convenient site but it entails .

a long race which must be put in at full capacity from the start and would be costly. The country is however, fairly good for race cutting for most of the distance.

Until a decision is arrived at with regard to these main principles it is not possible to present any definite estimates as to cost. Moreover the outlay will be dependent largely on the amount of power that is to be developed. For supplying 1000 h.p. no artificial increase to catchment will be required, the dam need only be of moderate height, through it must be made thick to allow for subsequent rising, the pipe column and machinery will be of moderate dimensions. The only part of the work that must be made of full capacity from the start is the water race: this must be made equal from the first to a carrying capacity of 400 head since subsequent alterations would entail a break in the supply of power.

The question of tram connection, the length and course of the transmission line, the means by which the catchment are can be increased have been very carefully considered and levels and measurements taken where this was necessary. Should the report of the Inspecting Engineer be favourable and the Government decide to proceed with the supply of power, we should be in the position within a few months to start on the permanent construction.

DEPARTMENT OF MINES

HOBART

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