FINGAL COAL MINE

REPORT ON THE LOCATION OF PROPOSED LINES OF TRANSPORT

INTRODUCTION

The purpose of the recent investigation was to determine the most economical method of transporting the product of the mine to the Fingal railway, and also to determine the most advantageous route to follow. In an enterprise of this kind the initial cost of the undertaking is, as a rule, the factor that governs all subsequent operations. Bearing this in mind all available routes were examined and, where necessary, preliminary surveys were made. The information obtained in these preliminary investigations was sufficient to enable the writer to adopt a scheme which not only allows of cheap construction but provides for also a low running cost and an efficient service.

The location of the connecting link is clearly indicated on the accompanying map which was prepared by H.G.W. Keid of the Geological Survey.

LOCATION

The coal mine is situate two and a half miles due east of Fingal which lies on the left bank of South Esk River. Through the centre of the broad flood-plain of the South Esk the Conara-Fingal railway passes to St. Marys. From the western edge of the flood-plain, and half a mile from the railway, an unmetalled road leads up the hillside rising 750 feet in 1½ mile to the main workings of the mine. Outcrops of other seams occur at higher and lower altitudes, and all are easily accessible.

PHYSICAL FEATURES

Between the railway and the foothills the valley floor is occupied by alluvial materials to a depth of 3 to 30 feet. This plain is almost denuded of vegetation, and is free from irregularities. The lowest member of the coal measures is exposed in the foothills, and the productive or coal-bearing member is met 500 feet above the plain reaching an ultimate altitude of 1050 feet, or nearly 2000 feet above sea-level. These measures have been intruded by diabase which crops out in bold bluffs of very considerable extent on the north and south sides of the coal area, and in small protrusions here and there on the west side of the workings. The extreme irregularity of outline of the diabase is the cause of the rugged nature of the country as this rock is hard and tough while the sandstones are comparatively easily removed by erosion. Only one small valley leads from the mine workings, and this is the route chosen as the outlet.

TRANSPORT SYSTEMS

1. - The construction of a branch line from the Fingal Railway to the mine.

This system naturally suggests itself if the conditions are suitable. In this case engineering considerations and cost of construction preclude its adoption. From the South

Esk flood-plain at the railway line there is a rise of 750 feet to the mine, consequently on a continuous ascending grade of 1 in 33 the branch railway would be 4¾ miles long. Not only is this gradient over such a long distance excessive, but the line would be very costly to construct over those sections occupied by diabase rock.

II. - The construction of a branch railway of standard gauge to the edge of the floodplain and from the selected point connect with the mine by means of a self-acting haulage line.

The terminals or extremities of the proposed railway being known, the first problem was to determine the general route which the line connecting them should take. A careful study of the map indicated two possible routes, the comparative merits of which were determined by investigation in the field. So far as the railway location was concerned no engineering difficulties were presented at all. It was found that the present railway siding was suitable, and trial surveys were run from that terminal to the site of storage bins at the end of the proposed self-acting haulage, a distance of 1½ mile. The railway route passes over grassed plains on grades not exceeding 1 in 50 with the load, the rise being gradual all the way from the siding.

As there was only one outlet from the mine the decision respecting the route of the haulage was a simple matter to arrive at. The next consideration was the system of haulage to be adopted.

Either (a) a self-acting, endless-rope, ground tramway, or (b) a self-acting aerial ropeway could be employed; but the former would prove cheaper to construct and more efficient for the purpose in view if the contour of the ground were found suitable. After two trial lines had been run a route fulfilling the required conditions was found, and the system of self-acting ground tramway was adopted. This line will be over 60 chains long. If desired, the haulage line could be extended to serve other coal seams outcropping at higher altitudes.

So far as the railway is concerned, the construction consists of surface-forming all the way. Only two very small streams cross the line, and the ground is clear of scrub and trees with the exception of a few stunted wattles.

The haulage requires much more attention. The point of send-off is on the north side of the creek about 150 feet away from the mouth of the new tunnel, and the line from that point to the proposed site of bins is almost due west.

One of the few difficulties to be overcome is the first crossing of the creek, but material for this purpose is available nearby. From that point the line follows sidling country in diabase, but very little solid rock will be met as the surface slopes are not highly inclined. The steepest grade on this line is 1 in 4 which is not excessive for a haulage-way. Rapid changes of grade on a haulage of this kind do not necessarily indicate a bad location.

One skilled in such engineering work should be employed to design and supervise the construction of the railway and tramway. It is most important to so design the haulage line that abrupt changes of grade are obviated thereby preventing undue strain on the trucks in passing from an easy to a steep grade.

PRELIMINARY ESTIMATES

As the survey has not been made it is quite impossible to give in detail the approximate quantities of all material to be handled in the work of construction and of all probable cost attending such work. The estimate given here may be regarded as a rough approximation only, but the cost of supplies, such as rails, sleepers, etc., are correct. It is considered that the total cost will be less instead of more than that stated here as a liberal allowance has been made for contingencies.

The estimate is arrived at as follows:-

Surveys	£ 100
Excavation - railway line	£ 500
Culverts - 2 large, 4 small	£ 120
Sidings - 2	£ 100
Ballasting and Packing	£ 100
Plate-Laying	£ 100
Ballast	£ 400
Rails (46 lb. weight per yard) 1½ mile - 108.4 tons at £8 per ton	£ 867
Sleepers (2'3" centres) 3520 at 2/-	£ 352
	£2639

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Excavation, Tramway	£ 400
Ballasting and Packing	£ 100
Sleepers - 3400 small size at 1/- each	£ 170
120 ten-feet lengths at 3/- each	£ 18
Rails (if 46 lb. weight rails are to be used) 108.4 tons at £8 per ton	£ 867
Ballast - tramway	£ 85
Culverts	£ 50
Plate-laying	£ 75
Trucks for haulage line & mine - 40 at £15	£ 600
Rope - 125 chains, 1 inch diameter, steel wire; Brake-gear, Tension gear, tumblers, etc. (second hand)	£ 800
Bins capable of holding 500 tons lump coal	£ 500
Cost of Construction of Haulage Tramway, and of whole Surface Equipment in connection therewith	£3665
TOTAL COST OF SURFACE WORKS	£6304

GOVERNMENT GEOLOGIST.
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LAUNCESTON
16th October, 1922