

REPORT ON THE PROPOSAL TO ESTABLISH CEMENT WORKS

ON THE SILKSTONE PROPERTIES

SCOPE OF REPORT

In view of the fact that these properties are at present under offer as a cement proposition, this report will deal with the various factors governing their suitability for the purpose of cement making. The necessary materials for the manufacture of cement are coal, clay and limestone. A permanent water supply must also be assured, and easy access to Railway must, if possible, be obtained.

ACCESS

Dealing firstly with the last named, the Silkstone properties are placed with their South-western corner situate at about $2\frac{1}{2}$ miles from the point where the Fingal Railway crosses the Break o' Day River. The property forms the Western extremity of the Mount Nicholas Range and has a minimum altitude of about 600 feet above the Railway at the point where it crosses the River. The altitude above Sea Level is about 1,400 feet. The maximum altitude of this property is about 2,400 feet above sea level, or about 1,600 feet above the Railway. Access to the property is gained in either of two ways. A fairly easy grade is obtained from the present Silkstone Siding to the boundary which is situate about 70 chains from the Siding. An easy grade is also obtainable from the Railway in the vicinity of the Break o' Day Crossing to the boundary of the leases. From the boundary of the leases to the present Mine workings the grade becomes steeper.

The area covered by this property is in all 959 acres made up of three leases - two containing 320 acres and one containing 319 acres - at present held by Messrs. Meredith and Whittle.

COAL

As in the case of the other coal properties of the Mount Nicholas Range, eight seams of varying thickness are known on these properties. These seams vary in thickness from 2' to 8'. Of the eight seams three only are worthy of consideration at the present time. Two seams, each of which reach a maximum thickness of 4', and one seam reaching a thickness of 8' 4" may be regarded as the coal reserve of the property.

In the 8' seam and in one of the 4' seams which will be called "4'A" there is a peculiarity appearing in that on the Eastern portion of the area the seams have thinned out. In the case of the 8' seams only 2' 6" has so far been located. The seam 4'A has so far not been definitely proven on the Southern side of the Range, but taking into consideration the altitude and dip of this seam on the Northern side of the Range I feel certain that when more prospecting has been done on the South-western portion of the area this seam will be found to correspond with what is now known as the 15" seam. In one of the tunnels put into the 8' seam this peculiarity has been demonstrated. The tunnel is driven to the North-west, and at a point 130 feet from the entrance a series of step faults with a Northerly strike have been encountered. The throw of

these faults varies from about 15" to 2' 6" and the down-throw side is to the West. About 30 chains to the West of this tunnel a second tunnel has been driven on the 8' seam in which the total thickness of the seam has been proven and maintained. To my mind this faulting has in some unaccountable way been responsible for the disappearance of the upper portions of the seam in the Eastern tunnel. The same may also be said of the 4'A seam so that to the West of this belt of faulting the full thickness of the seam may be expected.

The second seam which has a thickness of 4' and which may be called "4'B" has been proven along the whole of the Southern boundary and has in all places shown the full thickness of 4'. This is certainly peculiar as the 4'B is situated at an altitude between the 8' and the 4'A seams.

Between the 8' and the 4'B seams another seam occurs, the quality of which is very poor. Bands are frequent and what coal is clean is of poor quality. This seam is 5' in thickness and has been proved for a considerable distance along the Southern and Western boundaries of the property, and has also been proven in one or two places on the Northern side of the Range.

That these seams are continuous round the Range is to my mind certain. The next point as regards the coal is as to whether or not the seams pass right under the Range. The Mount Nicholas Range is capped with diabase. This diabase was considered to be in the form of a dyke but it has now, I thin, been definitely proven to be an intrusive sheet or sill. At three points along the Range faulting takes place with the formation of saddles in the mountain. In each saddle sand-stone and not diabase is to be found. Were this diabase in the nature of a dyke sandstone could not possibly be expected in these saddles. In the Mount Nicholas Coal Mine sufficient work has been done and the tunnel has been driven so far that if the diabase were a dyke its baking effect should ere this have been noticed. Again, it was noticed that all those creeks which flow towards the South from the Range have a greater degree of permanency than those which flow towards the North. This can only be accounted for by assuming that the whole of the sandstones of the Range are forming intake beds to keep the Southern creeks fed with water, the slight Southerly dip of the strata being just sufficient to cause direction of flow. Were the diabase a dyke this marked difference in the nature of the creeks would not be noticed for the diabase would form an effective barrier to the water percolating from the North and the slight dip of the strata would not be sufficient to alone account for the poor flow of the Northern creeks. I feel sure, therefore, that the diabase is only a sill and that the seams of coal and other strata alike pass right under the Range. Support is given to this by the fact that the outcrops of coal as found enable a fairly true section to be drawn.

Taking all the known facts and data into consideration the available coal in each seam may be stated as follows:

Seam	Acreage	Available Thickness	Tonnage
8'	358	4' 6"	1,933,200
4' B	808	4'	3,878,400
4' A	358	3'	1,288,800

The analyses of these coals are attached.

CLAY

There is only one important occurrence of clay on these properties. The difference in altitude between the 5' and the 8' seams is only 10 feet. The whole of the intervening rock is clay of a slaty colour. Samples of this clay have not yet been taken systematically either by the Geological Survey or by private individuals. The presence of this clay has been proved in every case where either the 8' or the 5' seam has been located. Its thickness at the outcrop has so far remained fairly constant. Further to the East of this property a variation in the thickness of this clay has been proved. In parts of the Mount Nicholas leases the clay seems to have thickened considerably, but in the Cornwall leases it has again reached its normal thickness. This band of clay is well exposed in both tunnels which have been driven on the 8' seam. In the Eastern tunnel the clay can be seen along the whole length of the tunnel and the uniformity of colour and texture seems to indicate that the composition of the clay is also fairly uniform. I have been informed that samples taken at different places and at different times have given analyses agreeing remarkably well so that the composition of the clay may be assumed to be regular.

Possible Irregularities

Faulting on a small scale has already been met on these properties and it is almost certain that faulting is still to be met with as mining proceeds. It is common in all coal mining districts to meet with a more or less great number of faults of varying size. These faults, though they do not seriously effect the output raise to a slight degree the cost of production. There is only one fault of large dimensions in the vicinity of these properties. This fault is situated on the Eastern boundary of the area and has a throw of 200' with the down throw side to the east.

As only a comparatively small amount of clay is needed for the manufacture of cement it may be taken that an unlimited supply of clay is available on these properties. The quantity available is by calculation found to be 21,600,000 tons.

LIMESTONE

There is no outcrop of limestone on the Silkstone properties. The limestone of these properties is only to be found at a depth and would, if this were the only available supply, have to be mined in a similar manner to the coal and clay. The limestone is to be found outcropping to the South and West of these properties on private property, but to the North the limestone is again found outcropping on Crown Land. Confusion has at times arisen over the occurrence of a band of Permo-Carboniferous shales or mudstones. These mudstones, like the limestones, abound with

Marine fossils, chief of which are Fenestella, Spirifer and Productus. The occurrence of these fossils in the mudstones has led to the belief that the limestone in this area has a thickness of approximately 200 feet. This belief is entirely wrong. The greatest thickness of limestone as measured in the Mount Nicholas area is 80'. This thickness of limestone is to be found in the Horseshoe Cliffs to the North of the Silkstone area, and is maintained over a very great portion of the area. Whether or not this full thickness of 70 to 80 feet is maintained in the limestone to the South of the area is still to be definitely established. From the point where the junction of the limestone series and the sandstone series is found to the Railway line on the South, the dip of the strata corresponds fairly well with the slope of the surface, so that it is a reasonable assumption to say that the limestone has the full thickness throughout the area. Certain factors have to be taken into consideration, however, for the actual surface of the earth over a great portion of the area is composed of Recent deposits. Denudation may have taken place to a greater or less extent with of course loss of limestone. Old creeks and rivers, which at one time may have had their courses over this area, are likely to be met. No definite evidence that old creek beds do exist is to be found, but their presence or otherwise can only be proved by systematically boring the area. The country in this area is fairly flat so that as limestone does actually outcrop in many parts this denudation cannot have effected the average thickness to any great extent.

Taking the average thickness of limestone remaining as at 45' over the Southern portion of the area, the available limestone in the area between the creek to the West of the map and the junction of the limestone and the sandstone series and extending in a North and South direction from the Break o' Day River on the South to the Silkstone leases on the North may be stated at 39,204,000 tons.

On the North of Silkstone leases a more or less unlimited supply of limestone is available, but this is at a distance of about four miles from the junction of the River and Railway. There is a second area of limestone to the South of the leases and adjoining the present Silkstone Siding which could yield a reserve supply of stone approximating 50,000,000 tons.

The accompanying map and six sections will serve to indicate more clearly the occurrence and distribution of the various materials available.

WATER

The supply of water for the manufacture of cement in this area would necessarily have to be drawn from the Break o' Day River, or from the creek to the West of the Map. The Break o' Day River, though only a small stream, is permanent in character and is capable of yielding a sufficient quantity of water to suit the requirements of almost any cement works. This supply is augmented by the small creek to the West of the Map which receives its supply from springs issuing from the sandstones and limestones of the Western portion of Mount Nicholas Range.

CONCLUSION

In conclusion, I would recommend that, if sufficient

time is at the disposal of those concerned, the limestone be sampled for analysis either by a series of bores placed systematically over the area, or else by means of a deep cut or quarry, the face of which could be sampled. By these means the present thickness and quality of the limestone could be proved, but as far as can be gauged from surface observations my opinion is that the quantities of clay, coal and limestone available are as stated above. As neither the clay nor the limestone has been systematically sampled by the Department no analyses of these can be furnished. The samples of coal, the analyses of which are furnished have been taken according to the method of the Geological Survey of Tasmania and may be taken as being representative of the various seams as they were being worked at the time of sampling.

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LAUNCESTON,

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ANALYSES OF COALS FROM THE SIKLSTONE PROPERTIES.

Seam	8'	4' B	4' A
Moisture at 100°C	4.90	4.10	3.30
Volatile Combustible Matter	23.38	20.18	23.48
Fixed Carbon	51.44	46.72	48.52
Ash	20.28	29.00	24.70
Sulphur	0.33	0.38	0.48
Heating Properties (B.T.U.)	11690	10442	11230