

NOTES ON ZEEHAN MINING FIELD.Summary of Geology:

The Zeehan field is occupied by rocks of two sedimentary systems (pre-Silurian and Silurian) and numerous types of igneous rocks. The pre-Silurian system consists of slates, quartzites, breccias with spilite lavas and tuffs and keratophyre tuffs, referable to the Dundas series. The Silurian system comprises conglomerates, quartzites, slates, sandstones and limestones with Silurian fossils, and includes the West Coast Range Conglomerate series and the Queen River (or Zeehan) slates and sandstone series.

The igneous rocks include dykes of granite porphyry, aplite and mica gabbro, while to the west serpentine, gabbro-amphibolite and granite occur. These rocks all belong to the Devonian intrusion. The two sedimentary systems occupy their present positions by virtue of faulting. In the northern part of the field there appears to be one main fault with a trend from N.N.W. to S.S.E. which separates the Dundas series on the west from the Silurian to the east, the latter being the down-thrown side.

The greatest number of the reefs have strikes parallel to the main fault and the earth-movements apparently caused the formation of the fractures or fissures along which the lodes formed. There is an earlier set of fractures and fault zones which cross the lode fissures.

The vein types are numerous and include pyrite-cassiterite, magnetite, magnetite-pyrite-chalcopyrite-sphalerite-galena, the pyrite-blende-galena, pyrite-galena, siderite-galena, pyrite-stannite-chalcopyrite and pyrite-stannite-galena. The siderite-galena has been the most important type from the economic aspect. The siderite is manganiferous and the galena argentiferous, while tetrahedrite and bournonite also contribute to the silver value of the ore. The proportion of silver was usually one ounce per unit or less.

Historical:

Frank Long and John Healy in 1882 made their way through to Mt. Zeehan from Long Plains and Long discovered on December the 8th of that year a galena lode which he pegged for the Arthur & Long Plains Prospecting Association.

Owing to the then low price of lead, no great attention was paid to the field until the Broken Hill discoveries and improved metal prices some few years later.

In 1887 a lode was found on the Silver Queen property and after some years prospecting, sinking was commenced by that Company in 1890. The Silver Queen Co. may be said to be the first to engage in operations on a large scale and I believe the first to declare dividends. In a few years numerous companies were at work. Among these were Balstrup's Manganese Hill & Central, Despatch, Grubb's Junction, Mt. Zeehan (Tas), Mt. Zeehan, Silver Bell, Silver King, Western etc. In 1891 mining was extremely active and the mining market excited over repeated fresh discoveries, but in August of that year the suspension of the Bank of V.D.L. caused a sudden financial collapse from which the field took some time to recover. In 1892 the Government Railway from the port of Strahan to Zeehan was completed and serious mining commenced. After two unsuccessful attempts to establish smelting (at Argenton and Zeehan) a third smelter was erected by the Tas. Smelting Co. Ltd. on the railway line 2 miles from Zeehan in 1898.

The output of ore from the mines has been continuous, although the quantities have mainly depended on one mine and then another. The most prosperous period was that of a few years prior to 1909, when undiminished production coincided with high market prices of metals. But from about 1908 the output began to fall as the shoots of ore being worked in the mines operated by the large companies became less productive and no adequate discoveries of fresh metal were made to take their place. Among the mines which in the last decade have been the most prominent ore-producers are the Mt. Zeehan, Zeehan-Montana-Western, Oonah, Silver Queen etc., and after working steadily on their lodes down to about 300 ft. from the surface, where upon the shoots on which they were operating tailed out or became unremunerative below that level. Some of them continuing work a little further down, and finding the lodes still unpayable, suspended operations; e.g. Western, Queen, Oonah Lead, Spray, King &c. The Zeehan - Montana alone kept on producing ore under difficulties, but also continuously exploring without substantial results; this mine is, next to the Zeehan Western, the deepest mine in Zeehan, the main shaft being down to 800 ft. The total amount of galena produced to 1910 was 220,589 tons.

In 1914 it was reported that unfortunately the exploratory work carried out during the past five years has proved with very few exceptions, unproductive; consequently no new ore-bodies have been discovered and finally reserves were depleted and No. 1 shaft was closed; the pumps were stopped on 16.5.1914 and the water allowed to rise in the mine. Operations since then have been carried on above water level and in surface prospecting.

In 1915 all mines with the exception of the Argent Flat State Mine were let on tribute. When the Argent Flat State Mine closed in 1917 the ore raised was principally won by small parties.

Prior to 1921 the Argent Mill had been re-treating the tailings but in that year, owing to the slumps in metal prices, work was discontinued. Work has been carried on continuously since by tributaries etc. In 1924 interest was revived by a reported discovery of several new lodes by Messrs. Clarke & Others, about 2½ miles north westerly from the Zeehan township, but activities displayed were not attended with any developments of importance.

With reference to the stannite deposits, the chief producers were the Oonah and Silver Queen mines. The Oonah lode is the most important and besides stannite contains cassiterite, pyrite, chalcopyrite and other sulphide minerals.

The total amount of stannite mined is probably between 20,000 and 25,000 tons. A fairly large tonnage has been mined from the Oonah Mine and it would appear that all ore above the No. 6 level has been removed. The future of the mine, therefore, depends upon the extension of the lode in depth and its development by further sinking the shaft, cross-cutting and driving.

The value of mineral production from the Zeehan field would be approximately £5,000,000.

NICKEL.

Five-Mile District:

Purple and grey slates and breccias of the Dundas series occupy the greater part of the field. They are intruded

by two narrow basic dykes of dolerite or fine gabbro, the augite of which is largely altered to chlorite, and trending north and south with an easterly dip.

The ore-bodies are associated mainly with eastern dyke and occur in it or at its footwall and conform to it in strike and dip. This dyke is $1\frac{1}{2}$ miles in length and the ore-bodies extend over $1\frac{3}{4}$ miles apparently continuing south beyond the dyke. The ore-bodies are not continuous but occur as lenses along the dyke the number being eight.

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March, 1935.