

SER
622(2)
C212MS

Dept. Energy, Mines & Resources
MINES BRANCH ✓
AUG 1 1969
LIBRARY
OTTAWA, CANADA.

This document was produced
by scanning the original publication.
Ce document est le produit d'une
numérisation par balayage
de la publication originale.

MINES BRANCH
DEPARTMENT OF MINES
OTTAWA - CANADA

OCCURRENCES OF PITCHBLEND AND SILVER ORES
AT
GREAT BEAR LAKE, N. W. T.

622(06)
.C212

Memorandum Series
No. 51
October, 1931

MINES BRANCHDEPARTMENT OF MINES, OTTAWA, CANADA

Memorandum Series

October, 1931

Number 51

OCCURRENCES OF PITCHBLENDE AND SILVER ORES
AT GREAT BEAR LAKE, N.W.T.

By

Hugh S. Spence¹
- - - - -

Introductory

Great Bear lake, in the Northwest Territories of Canada, is one of the lesser known great inland lakes of the continent. It is the fourth largest, having an area of approximately 12,200 square miles. It is located between the 118th and the 124th meridians west of Greenwich, and for the most part lies north of latitude 65°N., the northern part being traversed by the arctic circle. From the mouth of Dease river, in the northeast angle of the lake, to the western outlet through Great Bear river the distance is about 180 miles. The shore line is very irregular, being indented by many deep bays, and there are numerous rocky islands, especially along the eastern shore.

Until the advent of the airplane the region was difficult of access. The usual route was by steamer down the Mackenzie river to Fort Norman and thence by boat or canoe up the Great Bear river, the journey from Waterways, the nearest rail terminal, requiring about four weeks under the most favourable conditions. Now practically all the travel to and from the region is by air, the lake being easily reached in good weather in a single day from Waterways.

Prospecting has been in progress for the last three seasons in the vicinity of the lake, principally along the eastern end. Late in 1930, the Mines Branch received from Mr. Gilbert La Bine,²

¹ Mineral Technologist, Mines Branch, Ottawa.

² The original discovery of pitchblende and silver in this region was made in May, 1930, by Mr. La Bine at La Bine Point on the west side of Echo Bay. Silver was first discovered on the Bonanza group of claims, six miles south of La Bine Point, by Mr. E. C. St. Paul, one of the Eldorado Company's employees, in May, 1931.

Managing Director of Eldorado Gold Mines Ltd., a small shipment of mineral from Echo Bay, at the eastern end of the lake. This material proved to consist largely of pitchblende, the most important commercial ore of radium. Tests were made upon it in the Mines Branch laboratories and a report on these tests was published in March, 1931, as No. 48, Memorandum Series. The character of the samples indicated that they came from vein deposits which might be of economic importance, and, accordingly, I received instructions to visit the locality this season and to report on the occurrences.

I spent from August 9th to August 31st at La Bine Point, making several visits, also, to nearby properties. During the above period planes were arriving constantly, bringing in parties of prospectors to stake ground. The two commercial plane services reported themselves able to handle only a part of the traffic offered them, and each had several chartered planes at the disposal of parties on the ground for days at a time. Staking was heavy during August, and the ground south and east of La Bine Point has been staked for miles around the bays and for a considerable distance inland. This staking has been done principally in the hope of finding silver, due to the news reaching the outside of the finding of rich silver on Eldorado ground.

Prominent in the field during August were Eldorado, Consolidated Smelters, Dominion Explorers, N.A.M.E., a few smaller local interests, and a number of parties from the East. I heard nothing of any important finds of either pitchblende or silver, or any other minerals, being made on newly-staked ground up to the time I left. Most of the parties were pulling out at the end of the month, and it is hardly likely that many more will attempt to get in this season owing to the uncertain flying weather. The commercial air services will not fly to Great Bear between around September 10th and the freeze-up.

PITCHBLENDE

As far as I have been able to learn, all of the present known pitchblende-bearing ground lies at and around the site of the original discovery at La Bine Point, and also along the assumed continuation of the veins found there. The distance between extreme points at which pitchblende was been found on these veins has lately been extended to about two miles by a find of high-grade pitchblende at that distance along the strike from the shore of the lake, into which all the veins pass. Indications of pitchblende, in the form of stain, have been found on a small block of adjoining claims, but no actual pitchblende has yet been reported.

Occurrence

The pitchblende is found in persistent veins, within or along the contacts of what appear to be highly sheared and often brecciated greenstone bands (possibly diabase dykes). These bands are usually narrow, 10 to 20 feet, but sometimes reach 50 feet or

more. They have an almost vertical dip, a very persistent strike, and can often be traced for long distances by their eroded outcrops. They occur at frequent intervals, 50 to several hundred feet apart, along the lake shore, striking inland, and converging slightly, suggesting that they possibly run together somewhere to the northeast.

Of the numerous sheared bands on an around La Bine Point, four have been found to carry pitchblende veins. Many of them are probably barren, but prospecting and development to date have been confined principally to two veins and little attempt has yet been made to explore others.

There is, in short, every evidence that there exists at La Bine Point an extensive and fairly closely-spaced pitchblende vein-system, that can readily be exploited by underground development. There is little drift or ground-cover of any sort in the area, and veins outcropping along the lake shore can often readily be traced inland on the surface for considerable distances. Pitchblende, however, is seldom visible on the actual surface, owing to weathering, but when present it can usually be broken out by the pick at a depth of a few inches.

Development

To date, only two pitchblende veins have been developed to any extent. One of these, known as the No.1 vein, is the site of the original discovery. It parallels the shore of a small bay, can be traced for several hundred feet, and much of the exposed outcrop lies under shallow water. From a small surface pit sunk to a depth of 12 feet at the original discovery point, 8 tons of cobbled, high-grade pitchblende were taken in the early part of this year.

No. 2 vein strikes approximately parallel to No. 1 at a distance of about 500 feet. Most of the work done this summer has been conducted upon it. It has been followed for a distance of 1400 feet, where it passes into a small lake, and fourteen surface pits have been opened on it at intervals. Pitchblende was encountered in thirteen of the pits, in the form of a strong lead, and can be picked out from the surface outcrop over a continuous distance of 800 feet. About 12 tons of clean, cobbled ore were recovered during the above operations. This, with the 8 tons from No. 1 vein (20 tons in all) were shipped out to Waterways, via Norman, at the end of July.

A little surface work has recently been done on a third parallel vein (No.3), about 400 feet beyond the No. 2 vein, and pitchblende was found close to the surface at two points.

I personally broke heavy uranium stain and pitchblende from a fourth, as yet unexplored vein, lying about one mile beyond No. 3.

It is quite possible that others of the as yet unprospected, brecciated bands that occur north of the known veins will prove to carry pitchblende veins.

To date, the No. 2 vein has received the greater attention and is at present the most important. It will probably be made the site of initial mining operations, whenever these are started. Its importance is increased by the fact that for part of its length it carries rich silver ore associated with the pitchblende (see below). From the west outcrop at water's edge, the vein strikes up-hill to a maximum elevation of about 100 feet above the level of the lake. Some of the richest pitchblende found, both on the No. 1 and No. 2 veins, was taken out at the shore outcrops, and the width of massive ore was as great at these points as at any other. This suggests the veins may improve both in size and grade of ore with depth. The fact that pitchblende has recently been found two miles inland from La Bine Point, and on the strike of the veins there suggests that the vein-system may have a very considerable persistence.

The veins usually consist of either massive pitchblende from $\frac{1}{2}$ " to 6" wide, or of several thinner, $\frac{1}{4}$ " to 1", stringers, separated by similar widths of quartz or calcite gangue. The pitchblende slabs off readily from the latter, and can easily be separated by hand-cobbing; a shipping product of 50 per cent or better uranium oxide should be obtainable without difficulty by such means. A proportion of mixed ore, impossible to cob, will also be secured in mining, and this, together with the cobbing fines, will have to be milled.

The massive pitchblende is very clean, chalcopyrite in minute veinlets being the principal metallic impurity, with locally lesser amounts of galena and silver.

While at present no estimate of actual available tonnage can be made, the No.1 and No.2 veins may be expected to yield several thousands of tons at least of high-grade pitchblende, as well as a lesser amount of milling ore. Underground exploration upon their extension inland and under the lake, as well as prospecting of other known veins, will probably materially increase these amounts.

Economic Situation

Beyond any question, the pitchblende deposits at La Bine Point constitute a very valuable source of radium. At the present value of radium, ore could easily meet the cost of shipment to rail (\$400) per ton. Improved transportation facilities, however, will have to be provided if serious production is to be attained. At present only a small gas-boat drawing a 10-ton capacity scow is available for shipment across Great Bear Lake to Fort Norman, and ore has to be handled several times. Large tugs and scows will be

required on the lake, and a truck-road or light railway is suggested as the best means of overcoming the rapids difficulty on Great Bear river. Drowning of the rapids by a dam has been suggested, but ice conditions are said to be against this.

As regards actual mining, the lie of the ground could hardly be improved on, and development would be of the simplest character. An adit driven in along the No. 2 vein would produce ore from the commencement of operations, pending the bringing in of machinery and shaft-sinking.

SILVER

All of the reported silver discoveries at Great Bear Lake to date have been made in the Echo Bay section. The principal finds have been made at (1) La Bine Point, where the metal was first reported; (2) on a group of adjoining claims to the northeast; and (3) on the Bonanza claims six miles to the south. All of the ground around these claims has recently been staked, but I have heard nothing of any important new discoveries.

The silver occurs in the native form, as wire or leaf. Probably the most important occurrence to date is that on the easterly 200-foot section of the No. 2 pitchblende vein on La Bine Point. This vein carries a quartz gangue for 1000 feet from the lake, but from this point eastward carbonates and barytes replace quartz, and silver commences to appear in important amounts. It occurs as (1) leaves and films throughout the massive pitchblende; (2) a strong vein, up to 30 inches wide, of carbonates and wire silver, in contact with the pitchblende (silver constituting often about 40 to 50 per cent of the vein matter); (3) leaves and films on joints and cracks in a 10-foot to 15-foot sheared band on the footwall side of the vein.

The silver on the adjoining claims to the northeast is predominantly of dendritic type, and is associated with cobalt minerals in a well-defined vein; some argentite also occurs here, but no pitchblende has been reported.

On several of the Bonanza claims six miles south of La Bine Point, the silver occurs as leaf and wire in the calcite filling of joints in narrow, sheared greenstone bands, as well as in the sheared rock itself. Some of the surface ore found here is very rich. A block of 40 pounds weight, in large part silver, was shipped out in July. On another of the Bonanza claims, the silver occurs as wire, thickly distributed through a 26-foot band of sheared and highly altered rock, containing much magnetite and chlorite and irregular stringers of calcite.

OTHER MINERALS

Associated with the pitchblende mineralization, but later than it, is a system of cobalt-bismuth-copper-quartz veins. These usually cut across the pitchblende veins, but are also found running with them and then appearing to form part of the same vein. They consist principally of white quartz, and the amount of cobalt, bismuth and copper in them is small. The metallic minerals occur in the carbonate filling of small vugs in the quartz. From present indications, these veins probably possess little economic significance.

Many of the hill-tops in the area form conspicuous yellow-weathering gossan outcrops, derived from the weathering of iron pyrites. These gossans apparently represent sulphide-magnetite-rich zones in the country rock. They often enclose large masses of rock rich in magnetite, and entire hills are sometimes in large part magnetite. As a result the compass is of very little use in the area. These magnetite-pyrite gossans have not yet been reported to carry any minerals of major importance.

In one of the pits on the No. 2 pitchblende vein, a heavy 8-foot band of chalcopyrite and galena carrying small amounts of native wire silver, crosses the vein: this appears to be a local impregnation of country rock near a granite contact.

One mile inland from La Bine Point, a wide band of rock heavily mineralized with galena has recently been found.