P R E L I M I N A R Y
R E P O R T
O N
GEOLOGY AND MINING
AT THE
PANCAKE BAY MINING SYNDICATE'S
LOCATION
IN
RYAN TOWNSHIP

BY

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AREA AND TITLE:

4609 acres held under the Mining Act of Ontario, 3089 acres of which can be patented immediately. On the remaining 1520 acres four days assessment work per acre or 170 days per claim have to be performed and registered to bring them up to patenting. The 3089 acres are already survey claims and the government patenting fee per acre is $5.00.

All these claims are held in the name of W. S. Meguire as trustee for the Pancake Bay Mining Syndicate.

Search of Title was made at the Mining Recorder's Office, Sault Ste. Marie, Ontario, and claims are in good standing.

The N - S Length of property is 3½ miles on West side, 4 miles on East side; breadth is 2½ miles or a little more than 7 square miles.

LOCATION:

The Pancake Bay Mining Syndicate's property is situated on and around Pancake Bay, in the Township of Ryan, in the Sault Ste. Marie Mining Division.

Distances to Sault Ste. Marie, City are:

36 miles by airplaine route,

48 miles by steamer route,

53 miles over newly constructed 66 feet wide trunk road which bisects the property in an east to west direction along the shores of Pancake Bay. The distance from the mine to nearest siding on the Algoma Central and Hudson Bay Railway is 35 miles over the new highway.

TRANSPORTATION:

Freight rates, in 300-ton cargoes, to Laurel Hill and Carteret Smelters and Refineries are $3.00 per ton of ore by Lake boat from Pancake Bay or Sand Bay; at the latter a dock for lakeshipping has been built by the Pancake Bay Mining Syndicate.

Rail rates for ore to above mentioned smelting plants are $9.00 per ton and to Copper Cliff Refinery less than $2.00 per ton.

Truck hauling costs to Sault Ste. Marie from mine are $2.00 per ton on contract basis and $1.50 per ton to A. C. R. siding.

A spur line to Bucyrus or Ogidaki on the A. C. & H. B. Ry. a distance of about 22 miles from Pancake River, could be very cheaply constructed. Over the first 11 miles it could be run along the government highway, the remaining 11 miles would have to be run along Harmoney River, where one 660 feet long rockcut only would be necessary to reach the valley bottom above the waterfalls without rise of grade. This projected spur line crosses the transmission lines and the electric power as the motive power for this proposed Mineral Belt Railway could be obtained cheaper than at the mine rate.

Additional income from this Spur Road could be secured from the Fishing Industries at Batchewana Bay, Mamainse and points farther North as well as from the Timber and Lumber Industries which would quickly respond to such transportation facilities.

POWER:

In the immediate neighborhood of the property, i.e.

within a distance of ⅛ and 2 miles, there occur two natural waterfalls on the Pancake River of 8 and 15 feet height respectively. To utilize these for the generating of electric power proper dams could be built to greatly rise their height without flooding adjacent areas under development. 1000 or 2000 H.P. may be made available at the 15 foot Falls site.

The Batchewana River has many waterfalls along its course an and at the mouth of the Harmony River at a distance of 11 miles from the property and immense hydro-power project is indicated by, at least, a 300 foot fall.

Additional hydro-electric power, if this should be necessary, is offered by the Great Lakes Power Company at $20.00 to $25.00 per horse power per year. Their transmission line is within a hundred feet from the Highway to Pancake Bay and a pole line could be strung alongside without heavy expenditure for cutting a Right of Way. Cedar posts of the proper length are available at the Syndicate's property for the cost of felling the trees plus a few cents per pole for ahulage along the line, the total distance of which is 15 miles along trunk road,; a crosscountry Right of Way would shorten the distance by 3 miles but construction cost would be much higher, at least 500.00 per mile for the pole line. The Power Company reimburses the cost of such construction at the rate of 10% per year.

TOPOGRAPHY:

The surface of most of the area is very rugged, the hills having an elevation of 1000 to 12000 feet above sea level, or 398 to 598 feet above Lake Superior which has an elevation of 602 feet.

There is not much swamy land except for a very wide crustal break in the formation having an NW to SE direction and not over 2000 feet wide; the hills adjacent to this fault present almost vertical faces toward the southwest and form the from 300 to 500 feet high Pancake escarpment.

The southwestern part and the southern part of the property are slightly undulating; lowland ranging from 75 to 50 feet above the Lake level to within a distance of 1200 feet from the shoreline of Pancake Bay.

The attached Geological Sketch Plan shows Contour Intervals of 50 feet.

GENERAL GEOLOGY:

A cross-section of the oldest of the basic and acid extrusives of the middle Keweenawan Series with the alternating Conglomerates and some intrusives of younger age, as observed in the area of the Pancake Bay Mining Syndicate's Location is hereby given.
The strike-faults, the valleys and the streambeds, where observations were difficult or not obtainable, will account for the discrepancy in thickness.

CROSS-SECTION IN DESCENDING ORDER:

MELAPHYRE. Amygdaloid, porphyrite and Trap. Aparently the Augite Porphyry is altered to epidote and carries disseminated in epidosite native copper, silver and gold. Strike 355° highly tilted 600'

CONGLOMERATE is faulted here being thrown up, and 2000 feet to the southeast, Creek in valley bottom, No. 910 vein traced through this valley. 175'

INTRUSIVE FELSITE AND QUARTZ PORPHYRY. Splitting and tilting the

overlying lava flows. Felsite glassy and fluoritic, porphyry sheared. Purple and green Fluorite, copper stained 30'

AMYDALOID, TRAP AND FELDSPATHIC MELAPHYRE - much disturbed, vertically tilted, containing chalcocite, Silver and gold values in small cleavage and fracture veins. Abundant Copper stain, dense heavy trap black and highly amygdaloidal basalt containing large amygdules of chlorite. 280'

BASIC SANDSTONE. With small Huronion or Keewatin pebbles, and large and small agates. Geodes filled with a large variety of beautiful crystals. Purple Fluroite, etc. 40'

AMYGALOID. Heavy bed of melaphyre and trap showing copper stain, coarsely amygdaloidal. 340'

CONGLOMERATE. Highly titled, rapidly widening in its northern direction displaced. 215'

AMYGALOID. Containing epidote and Calcite, fissure veins, highly tilted. Copper stained 350'

CONGLOMERATE. Highly titled, disturbed and displaced. 115'

AMYGALOID. Amygdules filled with Chlorite and Calcite. Seams of epidote and Chalcocite. 325'

CONGLOMERATE. Strike 330°, displaced 20'

FELSITE, QUARTZ PORPHYRY. Splitting and displacing conglomerate Carries Cu, Ag and Au 20'

CONGLOMERATE. Strike 310°. This is a displacement 95'

AMYGDALOID. Amygdules of Chloride and stringers of epidote, quartz, cupriferous. 215'

CONGLOMERATE. Highly tilted and disturbed, faulted 23'

2843'

AMYDALOID. Basalt with inclusions of epidote, copper stained 208'

AMYDALOID. Coarsegrained, dark green, soft, friable, highly amygdalcidal in parts, cupriferous (Tradienne Lode, 110 feet above sea level). 710'

AMYDALOID.AND TRAP. Augite porphyry remnants, all well fissured, highly mineralized, seams cemented with epidote, quartz, (Adrienne Lode 1100 feet above sea level). Cut by quartz diabase dikes 2" wide, also well mineralized. Also cut by quartz porphyry. Faulted every 500 feet. Immediately to south huge bosses of Feldspar-Porphyries and Felsites occur, very much tilted and disturbed, well mineralized and auriferous. 600'

CONGLOMERATE. With calcitic matrix, appears baked red (intrusive contact and is greatly displaced. 100'

FELSITE BOSS. Eliposoidal, intrusive, glassy. 20'

FELSPAR PORPHYRY. Numerous cleavage seams. Well mineralized with Cu, Ag and Au, sericitized, stained green, red and black (The PODRIENNE Lode) 60'

CONGLOMERATE. Cement epidotic. Very much disturbed, highly titled, 1200 feet above sea level, fractured and fissured, cross-faulted on an average once in every 500 feet, re-brecciated, faulted and disturbed. Fractures and fissure-seams show amethystine-quartz, epidote, also Chalcopyrite with silver and gold values. Identical mineralization in the Matrix (CODRIENNE Lode). 400'

AMYGDALOIDAL MELAPHYRES. Basalts coarse to fine grained and intrusive diabases. Amygdules filled with Epidote, quartz,

and patolite. Bosses of bornite-bearing epidote, calcite vein (3 feet wide). The above flows are cut again by intrusive Felsites and well mineralized quartz porphyryies 2500'

Thickness Investigated 7441 ft.

Pancake River Valley, no exposures 3960 ft.

Total Approximate thickness 1,1401 ft.

ECONOMIC GEOLOGY:

In the high grade area of approximately 7920 feet of length, by 2640 to 330 feet width (tapering down to 1,320 feet at the north end) field investigations would permit one to state that all extrusive rocks have been highly tilted, folded and are cross-fissured on an average of one fissure vein for every 25 inches of length in a direction of 55° to 60°; these true fissures contain high grade Chalcocite averaging from 45 to 78% Cu with varying precious metal values, the latter always highest in that portion of the veins which carry the more acidic gangue, often running to several hundreds of ounces in Silver and up to 2.4 oz. in Gold.

The Acid intrusives in this area are more intensely sheared and altered but always carry Pyrites, Chalcopyrite or Bornite with low Gold and Silver values in disseminated form.

From a great number of assays made by independent and government assayers of bulk sampling taken from the ADRIENNE Lode I have arrived arrived at 10% Cu content and 0.05 oz. of gold and 7.5 oz. of silv as the lowest admissable average for rock and ore, in this calculation the secondary cross-fractures and stockworklike seams carrying also the highest grade of Copper and Silver content were not given consideration (about 2% more).

In some instances I have had cross channel samples taken over 6 feet width which run 45% copper with unusually high gold and silver values.

COPPER MINERALIZATION:

Chalcocite occurs only in the crystaline form in aggregates and solid crystaline fillings of the entire width of the ture fissures, usually from 2" to 12", such high grade mineralization occurs also frequently in some of the developed breccia zones which are up to 6 feet wide and then contain from 6 to 9 true fissure veins of various widths, all of which will assay not less than 60% copper, containing the silver values mostly as argentite or other sulphides, etc.

In some of these fissure veins Chalcocite occurs intimately associated in crystal form with crystaline quartz, (either agatiform or amethystine) epidote, fluorite, calcite and barite and then the precious metal contents are rising visibly but the copper content falls below 60% and as low as 15% with a steady increase of gold and silver values. Copper ores assaying between 15 to 45% Cu always carry much higher than average silver and gold values.

Oxydation and carbonization products of Copper occur sparingly and mostly only for the first few feet where meteoric waters have had accress. Very few veins contain crystalized cuprite, and in the majority of the veins the Malachite and the Cuprite are less than 1% in a 100% chalcocite vein.

SILVER, GOLD MINERALIZATION, ETC.

Where through zonal arrangement in some fissures the Copper disappear for a few inches at time, the values in Gold and Silver (all in the virgin metallic form) appear plainly visible to the naked eye and the silver

frequently has the pale yellow tinge of gueltisch silver. Silver often is found in isometric crystals, plates or flattened scales up to an inch in length and imbedded in crystalline and amethystine-quartz, etc. Gold occurs frequently as Electrum.

When Silver is accompanied by epidote as the principal gangue mineral it is more coarsely filiform and granular, often in nugget size.

Silver leaves are also frequently seen cutting across individual quartz crystals in repeated fractures and entirely or half enveloping these same crystals.

When occuring disseminated, silver is found in flattened scales and plates imbedded between quartz crystals and chalcocite. Native silver is abundant always when lined by copper-carbonate incrustations (voglite, niccolite, etc.) and often occupies the same superficial areas as do the Malachite. The virgin silver always carries approximately 10% of the silver values in gold.

Bismuth and zinc have not been observed.

Lead was observed in minute quantities, less than 0.05% Antimony. Arsenic and quicksilver occur apparently only when associated with the argentiferous tetrahedride which is occasionally seen, quicksilver occurs only in the form of its alteration products.

Sperrylite has been observed as well as native platinum.

SOURCE OF THE ORE SOLUTIONS:

They are of hydrothermal origin and primary sulphide solutions.

During early middle Keweenawan time long continued series of dynami disturbances have taken place to produce such high tilting and folding of the beds, their immense fracturing, fissuring and faulting, as evidenced in the Pancake Bay section, repeatedly causing theopening of thousands of

closely spaced crossfissures for the ready reception of ascending hot sulfate and sulphide solutions; re-opening and refilling of the fissures has undoubtedly occurred at different periods as evidenced by the alternation crystallization of a variety of acid and basic gangue minerals, the secondary quartz crystallization in the same veins and as shown by the slight shearing of the veins.

Replacement of wallrock in breccia zones has also taken place on a grand scale and in such zones great masses of Chalcocite have accumulated weighing many tons. These breccia zones occur frequently between two and three parallel fissures filling the entire intervening space with a variety of ores of the true fissure vein type varying from 20 to 30 inches of solid Chalcocite with the cementing chalcocite and the disseminated ores. At other periods smaller fractures were subsequently rapidly filled with almost pure Chalcocite. The ~~aqueous~~ fissures and gaseous solutions have contined to circulate along established ore channels until a much latter period. The presence of fluorine and boron in some of the veins would indicate that magmatic ore bearing sclutions and depostion must have taken place in mineral cycles showing rapidly changing conditions.

It is too early yet to come to positive conclusions based on the so far observed radio-(or thorio?) active content of this deposit to account for such vast-scale igneous manifestations above or beneath the surface.

ORE BODIES:

In the centre of the highly tilted area in sections 30, 29, 20 and 19, called by the Indians Manitou Mountain, one eminently rich high grade orebody occurs and five distinctly commercial ore bodies are indicated. The lodes "ADRIENNE, PODRIENNE, CODRIENNE and TRADIENNE occur and are

indicated here. The "EPIDRIENNE" and "FETRADRIENNE" are indicated in section 19. The more or less oval shaped centre series of reffs embracing the adrienne lode at an elevation of from 1,000 to 1,200 feet, has a length of 7,920 feet and a width varying from 2,640 to 3,300 feet horizontally.

The ADRIENNE Lode is almost in the middle of this highly tilted range and appears to me as one of the worl's riches copper, silver and gold deposits, its so far definitely proven length is 1500 feet by a varying width of from 600 feet in the southermost part to about 200 feet further north; an additonal length in the northern part of 1,320 has been drilled and blasted into showing similar mineralization as in the test pits further south. The possibilities of this high grade orebody extending to 3000 feet length by 200 to 400 feet average width, or 2400,000 cubic feet per foot of depth are evidently indicated.

The presently actually proven area indicates a quantity of 20'000.00 tons down to an assumed depth of 500 feet to which depth the fissures have been ascertained by diamond drilling. Average not lower than 10% Cu, 7.5 oz. ag and 0.05 au.

The strike of the proven ground is 330 degrees and the dip of lode appears almost vertical or slightly to the west.

The Adrienne deposit looks where test pitted, like a mineralogical museum in which every variety of sulphide ore of copper and silver and virgin silver and gold are plentiful in evidence. (Radium see further on).

Chalcocite occurs as the principal sulphide in all veins which persistently run up to 78% cu with commercial silver and gold values. In those veins in which the principal gangue minerals, as agatiform and amethystine quartz, epidote, fluorite and barite, become more abundant than the

sulphides the silver values often rise to several hudred ources, even thousands of cunces in especially chosen specimen, and gold is present herein from 0.125 oz. to 2.4 oz. per ton.

On the surface the 720 odd true fissure veins, on an average one in every 25 inch s, are visible only as cracks, or fractures cemented with epidote, or less often with quartz, they strike 55-60°. Their width varies from 1" to 12" and are beginning to be mineralized at a depth of from 2 to 4 feet from the barren surface.

None of the ore solutions did actually reach the once hermetically sealed surface. The loss of temperature near the surface is the most potent factor of such precipitation.

Some of these fissures were found at 8 feet depth to widen out to 12 inches solid chalcocite while the others have at a depth of 32 feet reached a widht of 60 inches over which average assays of 50% cu with average silver and gold values were had. This inclueds breccia matter, gangue and ore which latter here occurs in seven almost pure chalcocite fissure veins while the rest of this width appears as a disseminated breccia and copper sulphide cementing, running not lower than 25% Cu plus Ag and Au values usually higher with this lower copper tenor. In some of the veins where epidote or amethystine quartz become very abundant as the gangue minerals, the copper content diminishes in varying degrees but then the native silver and gold appears therein up to nugget size and often in crystalform, varying from 1/8" to 1" and longer in size.

Oxidized or carbonated Copper ores occur only in the very upper parts of the deposit and afford less than 1% of the total percentage of copper. Some veins carry a considerable amount of Cuprite in solid crystalform and others carry the ore in changing deposition cycles often

varying in compositbn from a copper - silver - gold ore to one of silver-gold - copper and vise versa. This would give room for thoughts of an immediately underlying and much wider contact vein as the main ore solution channel-way.

The following minerals and metals are most prominent in all these fissures: Chalcocite, argentiferous and mercurial tetrahedride and subordinately, occasionally only, cuprite, black-copper oxides, small quantities of Malachite incrustations and Uranothallite Liebigite, and voglite.

Silver and gold occur both mainly native, but also in the form of gueldishes silver with au, pt, cu, hg, and se. Argentite, Pyrargyrite, also a little Stibnite, Selenides, Cinnabar and Metacinnaberite, etc. Accessory gangue minerals are: Prehnite, Laumontite and a variety of zeolites.

In addition to this outstandingly rich copper, silver and gold deposit on the ADRIENNE Lode there were traced from a relocated occurrence of an Uranium mineral, named Coracite by its first investigator Dr. J. L. LeConte in 1847 and subsequently quantitatively analysed by Dr. Ghent and Dr. J. D. Whitney (see "Geology of Canada 1856, Page 504 and Dana's "Mineralogy under Gumnite"; also notes on Radium-Bearing minerals by Watt Malcolm, Ottawa 1914 Page 20 and Dr. F. Kockmann's Mineralogy, Stuttgart, 1922, Page 492, see also attached copies of "A new ore of Uranium) to this ADRIENNE Lode several alteration products of Pitchblende which were found to be Gumnite $Pb\dot{-}(PB)Si\ U_3\ O_{12}.5\ H_2O$, (in gelform) Uranium - Calcium Phosphate (autunite) $Ca\ O,\ 2(UO_2)\ O, P_2\ O_5,\ 8H_2$) and Uranium - Copper Phosphate (Chalcocite) $Cu\ O,\ 2(UO_2)\ O, P_2\ O_5, 8\ H_2\ O$, where they occur in two 4" wide amethyst quartz veins and supposed to

occur also in another such vein 16 - 26" wide.

This discovery is very recent and further determinations and researches are necessary to arrive at its real importance. Presumably an unaltered mineral of a different nature will be found at a little greater depth in these and other promising amethyst veins. The corelation of age is under investigation.

These radio-active (or thorium?) minerals so far have only been found in three of the to date opened and tested fissures bu they appear of such importance as to demand careful attention and further study which is presently being undertaken.

The center of the volcanic action (source of the solfataric and the thermal solutions of the Adrienne and the other lodes) is not far to be sought and maybe located near or below the blassy and well baked intrusive Felsite, now exposed some 600 feet to the East of the Adrienne Lode of true cross-fissures and amygdaloidal breccia veins.

2. The PODRIENNE Lode is in a Feldspar-porphyry dike traced for 3,000 feet in length, much shattered, greatly sheared and well mineralized and is from 40 to 60 feet wide and strikes almost parallel to theAdrienne Lode, perhaps a few degrees more to the west as it appears to cross the Adrienne as well as it does the Codrienne lodes.

This Podrienne Lode seems a slower cooled marginal phase of the adjoining glassy intrsive Felsite boss, which at its contact caused quite a lot of baking to both its contacts, the conglomerate as well as the Feldspar porphyry.

This porphyry carried pyrites (most likdy Marcasite) and copper sulphides, as well as gold and silver values. The original copper sulphides cannot yet be identified as the one pit of several feet depth has not

reached the actual unaltered mineralization zone. Here the alteration to copper-carbonates is somewhat deeper than at the Adrienne Lode.

Sampling of this Lode has not been done systematically as it has the appearance of millroch only, the average values may be well over $10.00 per ton over the whole width.

3. The CODRIENNE Lode also will have to be considered as a milling proposition as the mineralization is confined to small cross-fractures and amethystine quartz fissures and to the matrix of ferruginous cement which all carry the mineralization as auriferous and argentiferous Chalcopyrite. It appears a low grade copper ore but the values in Gold and Silver may eventually prove more important. If the cross-fractures extend through it from the Adrienne Lode this reef of conglomerate would make an additional and wide Copper, Gold and Silver orebody. No tests of any consequence have been made upon this Lode. This conglomerate is well baked owing to the intrusive Felsite contact which apparently erupted underneath it and greatly fractured, faulted and highly tilted it.

4. The TRADRIENNE Lode is a steeply tilted reef of redish trap, amygdaloild and melaphyre, well shattered, in which, almost if not quite as frequent, identical epidotic inclusions as originally exposed on the Adrienne Lode are seen and which appears well mineralized. It would be wide enough for steam-shovel quarrying. The amygdaloid appears hopeful though no mineralization can be seen on the surface on account of the amygdules haveing been leached out and work has not gone deep enogh to reach unaltered rock.

5. The EPIDRIENNE Lode occurs in the northwestern part of section 19 with a red-trap contact. This trap carried native copper and likely silver and gold, less than 1% of disseminated copper flakes and grains.

The Epidrienne Lode is an amygdaloidal, metasomatic epidote carries consistently and in disseminated form native copper averaging 1%, silver averaging 6 ounces and gold averaging sixty cents per ton. As no further work than the necessary assessment quota was done here the continuity is not very much evident although trenched for almost 1200 feet in length. The metallics from this lode when mille, concentrated and smelted would run into six hundred ounces of Silver plus $60.00 in gold. This lode would be further investigated by diamond drilling when and if milling will be contemplated. The strike is 35°, the dip was not determined.

This would be a steam-shovel proposition as the lower grade Red-Trap ore could be mined together with this 1% Epidrienne lode. A promising Silver - Copper - Gold lode.

6. The FETRADRIENNE Lode is in dark blue and black Trap and Melanhyre on a highly tilted and displaced reef to the ast of the Epidrienne Lode. It carries Chalcocite, silver and gold values in cross-fractures, seams and fissure veins of not great width. Some disseminated specks of native copper were occasionally seen but an orebody is only indicated here but work in this vicinity may uncover the continuity which on accoun of the greatly disturbed position could not be accurately determined. The intrusive Felsite and Quartz porphyry which apparently are the cause of splitting and uplifting this lode also show signs of mineralization and the fluorite gangue is especially noticeable. The porphyry is greatly sheared.

Abundant copper carbonate stains are visible over a wide area and if fissure veins could be located as wide as on the adrienne lode this couldmake probably a 1200 feet long lode.

A BONANZA DEPOSIT:

On the Adrienne Lode all the ture fissures carry ore in the highest

state of concentration. Only secondary seams and veinlets of cryptocrystal line quartz so far have been observed as barren of copper. Most of the veins not really true fissures, especially coalescent continuities of amygdaloidal per shaped chalcocite-filled cavities, carry practically no gangue minerals and while their occurrence may be frequent their average content is never under 65% copper, plus silver and gold.

The true fissure veins and the segration veins are so closely spaced to each other that a very high recovery of Copper, Silver and Gold may be made by quarrying with steam-shovels.

Onthe surface the true fissure veins appear often only as cracks and seams and are cemented forming barren epidote and quartz veins down to from 2 to 4 feet from the uneroded crust; from 4 feet down on they usually show a minimum of 2" widening out to 12 inches. They occur always so close to each other, 25 inches apart, that they can easily be and must be mined by the open cut method in order to get as near as possible to a 100% recovery of the High Grade Ores of the Adrienne lode.

The general strike of this lode is more or less N 30° W and the course of the true fissures almost at right angles to it or N 60° E.

The slight overburden remaining unremoved can be handled by hydraulicking at a trifling cost.

RADIUM, ETC., ORE POSSIBILITIES:

Radium (or Thorium?) and other rare earth-metal ores have so far been found to occur only on the Adrienne Lode, where they were had in the amethystine-quartz and epidote veins and their geodes. To date only three of such veins have been investigated and the radiophotographic results were 100% positive. As the unaltered mineral or minerals have not been reached as yet no definite statements can be made. The investigator though has found, some distance from the Adrienne Lode a 2 inch vein of

what is known as Coracite but which apparently is an alteration product of Uraninite (Gummite). The three veins showing radio-activity are amethystine-quartz - silver and Epidote - chalcocite veins.

As soon as the presently undertaken investigations are concluded and have been checked by more competent authority a definite statement will be forthcoming. Two Radiophotographs are attached.

Copies of the findings of previous investigators into the Pitchblende discovery in this area follow herewith:

"A NEW ORE OF URANIUM"

Art.XIX. -- On Coracite, a new ore of Uranium; by John L. LeConte, M.D. (1847 A. D.)

This mineral forms part of a collection made by Mr. B. A. Stanard on the north shore of Lake Superior; the speciman in my possession, is from the surface of the vein, and one portion of it appears to be much weathered; the remainder is quite compact and apparently unaffected by any exposure; it is, however, traversed in all directions by minute fissures filled with carbonate of lime, sulphuret of iron and silica. Many of these are almost microscopic, and indeed, quite invisible, until they have been bleached by exposure to a high temperature. For this reason I have been induced to defer any quantitative analysis, until purer specimens shall be obtained. As will be seen, however, by the experiments detailed below, the composition of this mineral is such that it cannot be placed with any known species. On visiting the locality next summer, I hope to obtain specimens that will admit of a satisfactory quantitative analysis. The following as the character on which this species is founded.

Massive and compact; cleavage, none.

H = 4.5, G = 4.378. lustre resinous; fracture conchoidal, uneven; streak

gray.

Before the blowpipe unalterable; after exposure to an intense heat, the mass assumes a grayish color; but on examination with a lense, it is found that this appearance is owing to a great number of threads of foreign substances by which the mass is penetrated. With borax it melts slowly into a glass yellow while hot, and pale yellow when cold; in the reducing flame, the bead affords indications of iron.

This mineral as I am informed by Mr. Stanard, occurs on the north shore of Lake Superior, about seventy miles from Sault Ste. Marie, at the junction of trap and sienite (Felsite?), the vein in which it is found is about two inches in width; but on account of its position (on the face of an almost perpendicular cliff) only a few specimens were obtained, and those with great difficulty. For the purpose of ascertaining its composition, the following experiments were made.

A small portion was pulverized; the powder was of a pale gray color.

A. This powder was treated with hydrochloric acid, it dissolved rapidly, with violent effervescence, and slight evolution of hydrosulphuric acid. The solution was of a bright yellowish color; it was evaporated to dryness, and left a dark green mass. Water was added and the solution filtered, a small quantity of silica was left on the filter. The solution was then boiled, when the colour changed to a dark blackish-green almost opake; on the ebullition being continued, a copious black green precipitate was formed, and a colourless solution remained. This precipitate was collected on a filter and washed (a).

B. The remaining solution was very astringent; ammonia was added to it with the formation of a copious precipitate, slightly tinged with

green, becoming yellow on exposure (b). The residual liquid was tested with sulphuric acid, and then with oxalate of ammonia, the latter caused a precipitate of oxalate of lime. The remaining solution, on being evaporated, left a residuum, volatilizable by heat, consisting only of the ammoniacal salts.

a. This precipitate dissolved with ease in dilute sulphuric acid; forming a pale green solution becoming yellow when heated with nitric acid, and on evaporating depositing small yellow crystals, and giving a copious red-brown precipitate with ferrocyanid of potassium. It was therefore protoxyd of uranium.

b. This precipitate was heated with a solution of potassa, a great portion was dissolved leaving a dark green residuum (c). The portion dissolved appeared to be alumnia.

c. The brown substance was dissolved in dilute sulphuric acid, and the solution concentrated by heat; as the ebullition proceeded, a white precipitate was deposited, which was washed with a small quantity of water. When heated before the blowpipe it left a white earth which gave a colorless assay with borax. The precipitate therefore was sulphate of thoria.

C. The solution left after separating the sulphate of thoria was evaporated to dryness, and the crucible ignited, the residuum was gray.

d. This powder was boiled with hydrochloric acid almost to dryness; a fine yellow mass was left, which dissolved in water with the excention of a few flocks. (the last portions of the thoria). The solution gave with ferrocyanuret of potassium a red-brown precipitate, it therefore

contained uranium. An excess of solution of carbonate of soda was added to it; the yellow precipitate at first formed, was almost entirely re-dissolved, a few bron flucculi only remaining, which when dissolved with hydrochloric acid gave a deep blue precipitate with ferrocyanuret of potassium. They were sesquioxyd of iron.

The constituents of the mineral thus found, are:

(a and d) Protoxyd of uranium. (the peroxyd in (d) being formed by the decomposition of the protochlorid in (A).
b. Alumina.
c. Thoria.
d. Iron.
A. Caronic acid, silica and sulphur.
B. Lime.

Now the carbonic acid could have been combined only with the lime, the sulphur with the iron. The silica also was in very small quantity. These were probably the components of the small veins which became apparent on heating the mass. Rejecting these we have left protoxide of uranium alumina and thoria, as the essential ingredients. The pitchblende from Jeachimstahl is Bohemia, was found by Rammelsberg to be a compound denoted $\dot{U}\dot{U}$. So that this mineral may be regarded as a corresponding compound in which the sesquioxyd of uranium is replaced by alumina.

The physical characters of this mineral approach very closely to those of pitchblende: from which however it may be distinguished by its lustre, and its less specific gravity. The presence of the thoria gives this mineral rather an anomalous composition; but as it is contained in a very small proportion, I apprehend that it will be found adventitious, or that the same vein will eventually furnish specimens of thorite, which being very similar in its physical properties, would not be obvious if mingled with the coracite.

DR. GENTH'S CONTRIBUTIONS TO MINERALOGY

(1849)

Coracite (Le Conte) is Pitchblende

Dr. John J. Le Conte kindly presented me with a specimen of the mineral from about ninety miles above Sault Ste. Marie on the north side of Lake Superior, which he had described as Coracite (Am. Journ. Sci. iii, 173).

Its great resemblance to pitchblende favoured the opinion that it was really nothing else. Mr. Whitney (Bost. Soc. Nat. His., 1349, 36), suggested that the uranium might be in the form of U_2O_3 and not of UO, U_2O_3, but stated, that it yields a green solution with chlorhydric acid.

I endeavoured to extract the carbonate of lime, which is mechanically mixed with it, by very dilute acetic acid, but I soon observed that the coracite was also acted upon and that the liquid became green; I therefore washed it completely, dried over sulphuric acid and used the partly extracted substance, which was slightly acted upon by the acetic acid, for analysis.

Before giving the results, I will state that the protoxyd of uranium was determined by dissolving the mineral in a mixture of chlorhydric acid and chloraurate of sodium and by calculation from the quantity of reduced gold. The separations were made as usual with exception of that of uranium from iron. By qualitative experiments I ascertained that this separation could be made more easily and accurately by the precipitation of the sesquioxyds of iron and uranium by ammonia from a boiling solution and re-solution of the sesquioxyd of uranium by digestion with dilute acetic acid.

I obtained the following results:

Sesquioxyd of uranium	46.21	contains 7.76 oxygen.
Protoxyd of uranium	16.47	" 1.95 "
Sesquioxyd of iron	3.51	p. c.
Alumina	0.52	"
Magnesia	0.56	"
Lime	5.33	"
Oxyd of lead	7.39	"
Silicic acid	13.15	"
Carbonic acid and water	6.14	"
	99.28	

The ratio of oxygen in UO to $U_2 O_3$ is very near 1;4. The excess of uranic oxyd may be accounted for by partial oxydation or perhaps by the presence of a combination of it with oxyd of lead, and though it is interesting that ti is so readily soluble in chlorhydric acid, this fact alone is not sufficient to separate it from pitchblende.

SCIENTIFIC INTELLIGENCE
(1849 A.D.)

Chemical examination of some Minerals; by J. H. Whitney.

Coracite of LeConte.--An analysis of this mineral afforded:- silica 4.35, alumina 0.90, oxye of iron 2.24, oxyd of uranium 59.30, oxyd of lead 5.36, lime 14.44, carbonic acid 7.47, water 4.64, magnesia and maganese in traces = 98.70. Mr. Whitney considers the uranium in the mineral as $\dot{U}$ (and not $\dot{U}\ddot{U}$ as in common pitchblende) in consequence of its ready solubility in acids. The mineral occurs amorphous, with an uneven fracture and no trace of cleavage. Hardness = 3. color pitch black. Powder grey. Lustre resinous. Before the blowpipe it does not change its appearance or colour the flame. With the fluxes it gives the characteristic reactions of uranium. In dilute muriatic acid it dissolves readily without heat, effervescing strongly, while pitchblende is insoluble except in nitric acid or aqua regia. The solution has a fine green colour and contained a little flocky silica.

Abstract from Geology of Canada
by Sir William Logan.

URANIUM

An ore of rare metal is said to occur at Mamainse where it forms a vein about 2" in width, at the junction of the trap and syenite? (coracite). It was first described in 1847 by Dr. J. L. LeConte as a new ore of uranium, under the name of coracite It is amorphous, pitch black in colour, with a grey streak, a resinous lustre, and a conchoidal fracture. Its hardness is 3.0, its density 4.38, according to J. D. Whitney, who subsequently analysed it, it is distinguished from pitch-blende by its ready solubility in cold hydrochloric acid, and contains:

oxide of uranium	59.30%	Lime	14.44%
oxide of lead	5.36%	oxyd of iron	2.24%
alumina	0.90%	silica	4.35%
carbonic acid	7.47%	H_2O	4.64%
			98.70%

with traces of magnesia and manganese. Mr. Whitney with much probability suggest that the oxyd of lead, and a portion of lime, are to be regarded as combined with the sesquioxyd of uranium.

ORE CALCULATED:

From past performances in quarrying and by assay checks I have arrived at a very conservative calculation of the average ore content of the Adrienne Lode. The lowest admissable average content of copper must be said to be 10% and assays of the metallics obtained from this are run from 0.5 to 10 ox. of gold and from 75 to hundreds of ounces of silver but I have taken the lowest figures as the average run. By using

the more silicious ore exclusively I judge the average wouldbe at least three times as much, or 1.5 oz. gold and 225 oz. of silver per metallic ton.

Actually 1500 feet of length by an average of 300 feet of width are now exposed and have proven identical mineralization as where test pits were sunk to 34 feet depth. From diamond drilling information I am sure at least of 4,000 feet of depth, but again I provisionally take only 500 feet depth at the above tenor of copper, silver and gold and I arrive at approximately 19,000,000 tons of ore and rock that will contain 10% plus copper with the above mentioned silver and gold values per metallic ton which latter will amount to:

142'500,000 oz. or $ 85,500.000. for silver @.60¢ per ounce.

950.000 oz. or $ 32,625,000. for gold @ $35.00 per ounce.

allowing only a 10% copper content recoverable we have a total of 3'800,000,000 lbs. of fine copper, producable at a cost not exceeding 2½ cents per pound (see attached schedule of estimated cost of production). Smelting and refining in situ should reduce this cost very considerably.

The basis for my calculations are as follows:

Lowest average of vein width.....2½"

Average space between true fissures.....25"

Cubic feet per ton of vein matter..... 6 cubic feet

Cubic feet per ton of country rock.....12" "

Percentage of metalic copper in true fissures.....50% plus

Average amount of silver in 50% concentrates oz. 37½

" " " gold " " " oz. 0.25

In the above calculations I have not taken in account the secondary fractures, stockworks and breccia matter which will amount to

about a 1% copper content or a 90% recovery and which 1% excess I do allot for the losses in the recovery while shipping ore to outside smelters.

(Sgd.) S. Henry Bowman

MARCH 30th, 1935.

Pancake Bay Development - Mining Partnership

Claims (77)

SSM #

6621, 22, 23, 28, 29
6630, 31, 36
6642, 43, 44, 48, 49
6650, 54, 55, 56
6660, 61, 63, 64, 65, 69
6670, 71, 72, 74, 77
6680, 81, 82, 83, 86, 87, 88, 89
6690, 91, 92
6700, 01, 02, 03, 07
6576, 76, 78, 79, 73
6556
6561, 62, 63, 64, 66, 66, 67, 68, 69
6570, 71, 72
6960, 61, 62, 63, 64, 65
7179, 80, 81, 82, 83, 84

900

MANCHESTER HOUSE,
29 MELINDA STREET,
TORONTO, CANADA.

Sept. 23rd, 1937.

Erie Canadian Gold Mines Limited,
Post Office Box 670,
Kirkland Lake, Ont.

Att'n Mr. C. L. Holbrooke

Dear Sirs;

I am forwarding you on instructions from my friend Mr. W. S. Maguire of Sault Ste. Marie, a report on Pancake Bay by Henry Bowman; attached thereto is a coloured map showing the geology of this property together with a blue-print headed "Sketch plan showing geology on property of Pancake Bay Mining Syndicate".

Please acknowledge receipt.

Yours very truly,

H. C. MILLER

HCM/MW
ENC
P

September 27, 1937.

Mr. H. C. Miller,
Manchester House,
23 Melinda Street,
TORONTO, Ontario.

Dear Sir:

This will acknowledge receipt of a report by Henry Bowman on Pancake Bay. Attached to the report is a coloured map of the property together with a blue print headed "Sketch Plan Showing Geology on Property of Pancake Bay Mining Syndicate".

We will return these to you after we have had a chance to examine the property.

Yours very truly,

ERIE CANADIAN MINES LIMITED,
(No Personal Liability)

G.L.H.

GLH:MO

Superintendent.

October 23, 1937.

Mr. H. C. Miller,
89 Melinda Street,
TORONTO, Ontario.

Dear Sir:

Enclosed please find the report on the Pancake Bay property by Henry Bowman, which you so kindly forwarded here some time ago for our inspection. We have such information as we require from this report and hope to be able to make an examination of the property sometime before the snow.

Yours truly,

ERIE CANADIAN MINES LIMITED,
(No Personal Liability)

Superintendent.

GLH:MO
Encl.

ERIE CANADIAN MINES

DRAWING	SKETCH GEOL. PLAN.
LOCATION	PANCAKE BAY MINING SYNDICATE PROPTY. RYAN TWP. ALGOMA DST. ONTARIO.
1"=40 CH	
SCALE	1"-40 CHAINS APPROX.
DATA FROM	H.BOWMAN. EM. PHD.
DRAWN BY	K.O.M.
REF. NO.	465
DATE	OCT. 14-37.

MINERAL POINT
DOCK
HIBBARD BAY
COPPER PT.
NORWAY PINE PT.
CONGLOMERATE PT.
COPPER MINE PT. CAMPS
LIGHTHOUSE
WHISKEY PT.
SAW PT.
CAMPS.
LAKE SUPERIOR
SWAMP
MINE ROAD
FAULT VEIN :910
FETRA.
PO.
TRA. 7183
ADRI.
CO.
DUMP
SWAMP
PROJECTED AERIAL LINE.
W.P. DAM HEAD - 200' 160' WIDE
GOVERNMENT TRUNK ROAD
TELEPHONE LINE.
PROJECTED PLANT SITE
PROJ. DOCK.
PANCAKE BAY
PANCAKE PT.
PANCAKE RIVER
TOWN PLOT
53 MILES TO SOO

N

NOT TO BE REMOVED FROM THE OFFICE OF THE RESIDENT GEOLOGIST, ONT. DEPT. OF MINES SAULT STE. MARIE, ONT.

FISSURE VEINS.
FAULT VEINS.

MAG.VAR. 4° 10'

LODES
EPI. - EPIDRIENNE
FETRA. - FETRADRIENNE
TRA. - TRADRIENNE
ADRI. - ADRIENNE
PO. - PODRIENNE
CO. - CODRIENNE

① - BLACKSMITH SHOP
② - POWDER HOUSE

(100) ELEV. ABOVE L. SUPERIOR.

ERIE CANADIAN MINES

DRAWING	GEOLOGY PLAN BY H. BOWMAN PHD.
LOCATION 1" = 40 CH.	PANCAKE BAY PROPTY. RYAN TWP. ONT.
SCALE	1" - 40 CHAINS.
DRAWN BY	K.O.M.
REF. NO.	465.
DATE	OCT. 13-37.

DOCK

OLD ROAD

FELSITE

CONGLOM-ERATE.

PIT

MELAPHYRE - AMYGDALOID

SWAMP

GABBRO

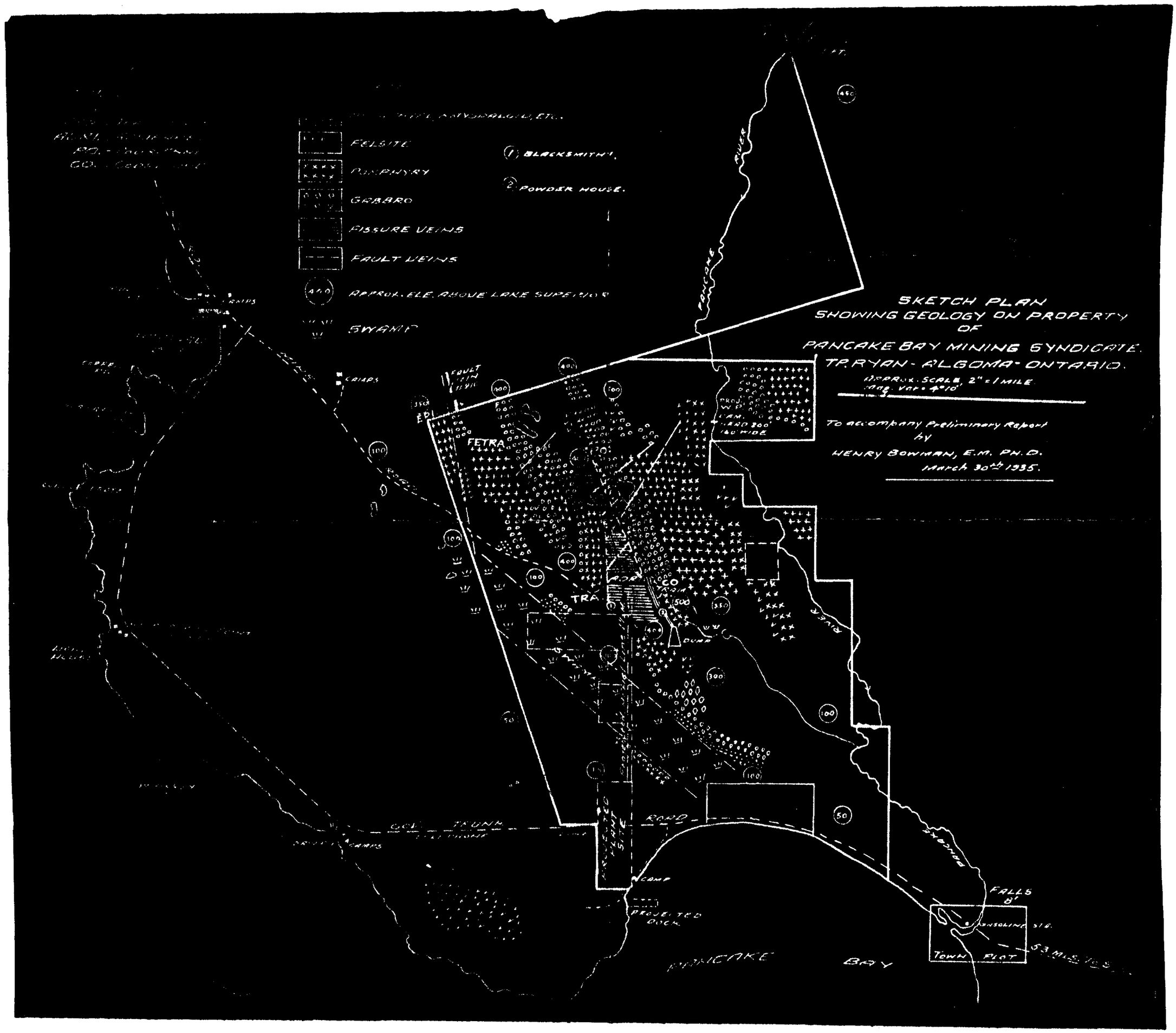
PANCAKE RIVER

GOVT. TRUNK ROAD TO SOO.

LAKE SUPERIOR

LAKE SUPERIOR

N



RYAN-0028 #1