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TERRITORY OF ALASKA

DEPARTMENT OF MINES

JUNEAU, ALASKA

SUMMARY AND ITINERARY REPORT OF MINING INVESTIGATIONS IN LIMESTONE INLET AND SEYMOUR CANAL
October 24 to November 1, 1942

October 24. Juneau to Limestone Inlet.

October 25. Inland from Limestone Inlet to Sunrise Canyon group.

October 26. The Sunrise Canyon group of five claims; namely, Sunrise Canyon No. 1 to No. 5, inclusive, is situated on the divide between the head of the creek flowing into Slocum Inlet and the North Fork drainage of Limestone Inlet. They extend in a northwesterly-southeasterly direction and occupy a defined structural valley which follows the strike of the formations. Slocum and Limestone inlets are situated on the east side of Stephens Passage, 20 to 25 miles, respectively, southeasterly from Juneau. The exact location of the claim group airline is 3 miles northeasterly from the lead of Limestone Inlet, 3 miles easterly from the head of Taku Harbor, and 5 miles southeasterly from Slocum Inlet (Note location sketch). The trail to the property starts at the head of Limestone Inlet, following the north bank of the major stream at the head for 4 miles, thence turns north, following a small north tributary branch to an elevation of 2000 feet, thence turns westerly to a lake, thence northwesterly one-half mile to the Slocum divide. This trail distance is between 8 to 8½ miles. A much shorter and more direct route would be up the valley from the head of Slocum Inlet. This distance would be slightly less than 5 miles to the north end of the claim group. The shorter and more direct routes from Taku Harbor and north of Limestone Inlet are impractical, due to steep bluffs and canyons. The logical route for transportation of this ore would be via road approximately 4 miles in length southeasterly from the head of Slocum Inlet on easy grade, thence a mile of steep aerial tramway.

The discovery of manganese bearing veins was made by Henry Olson in 1935, and the claim group was staked by him in 1940. Since discovery, there has been but very little development, which has consisted of a few small cuts and trenches.

The showings consist of several outcroppings of small manganese bearing veins confined to a zone of highly silliceous schists across a width of 200 feet, and considerable manganese bearing float. The latter is traceable for a distance of two miles. The general strike of this schist zone is N. 30 to 40°W., the same as that of the general structure found along the west contact of the Coast Batholith in southeastern Alaska.

Detail geological contitions with regard to this zone and the contained manganese bearing veins could not be adequately observed on date of visit due to a covering of snow and the presence of considerable talus from the steep slope on both sides of the depression occupied by the manganese bearing schists. This zone represents a contact between quartzite on the west or footwall and amygdaloidal basaltic lavas and tuffs on the hangwall. Both the quartzite stratum and the hangwall tuffs have a schistose structure, while the manganese bearing schist zone shows a much higher degree of developed schistosity. The dip of the quartzite stratum and schistosity is steep to the northeast or the general dip in the region. The formations traversed in the area consisted of greenstone schists (tuffs or lavas), green phyllite schists, sericitic phyllite and quartzite schists with narrow altered limestone strats which contain a schistose structure. The lava and tuff zone which forms the hangwall of the manganese bearing schist zone has a width of several hundred feet. This represents a lava flow with accompanying tuffs intercalated between the existing sediments. Underlying these formations, as noted near sea level and along the Limestone Creek trail, is the diorite and granodiorite of the coastal batholith.

The manganese veins are best exposed along the west edge of the saddle divide between the head of Slocum Inlet drainage and that of Limestone Inlet at an elevation of 3000 feet. Here the veins are exposed for nearly 1000 feet and are thence covered with talus with only float showing. Another exposure is located a mile northwest along the strike on the east bank of a small stream that forms in the valley. Here several veins are exposed for a distance of 400 to 500 feet. It is believed, due to the presence of float, that the veins continue under the talus for the mile distance between the two exposures and for one-half mile down the Limestone Inlet divide. Of the several veins of manganese, which occur within the schist zone width of 200 feet, only three had widths greater than one foot. The largest has a uniform width of two feet and is located in the footwall portion of the zone. This is followed by a few narrow veins parallel in dip and strike to the former vein, thence a vein 18 inches in width outcrops, containing the same kind and type of manganese ore. Crossing the schist zone a few narrow veins containing a manganese and jasper mixture outcrop. Thence No. 3 or a 12-inch manganese vein outcrops near the hangwall of the zone. These veins are continuous with parallel strikes and dips, which conform to the strike and dip of the siliceous schists in which they are contained. While none of these veins contain minable widths in themselves, they do maintain persistent definite structure, which is favorable for mining. The veins in the northwest exposures are fewer and contain narrower widths, with only two veins over one foot in width. The vertical range of this ore, as observed between the two outcroppings, is nearly 1000 feet. The two outcrops appear to have identical ore and the two prevailing types of veins, with the exception of more noticeable rhodonite in the lower or northwest outcrop.

The minerals contained in the two types of veins are similar, however, the red type contains more iron oxides and jasper, in addition to the various manganese minerals, with which the larger veins are almost entirely made up. The three larger veins are identical in mineralogical content. The outcropping ore of these veins has a dull black color and a submetallic luster. It is compact and massive and breaks down into blocks representing the width of the vein. By breaking these blocks the color changes from dull black or color of the oxides to dark gray, light gray, pinkish, creamy and milky white. This variety of color represents various manganese minerals ranging from black oxides to the light colored carbonates and silicates. The predominating manganese minerals are silicates, which make up the greater portion of the ore. Rhodonite was identified as one of the silicate minerals, but the other silicates have not been identified. The black oxides, which rank next in proportion of abundance, and make up 20 to 30 per cent of the ore (surface samples), occurs as fine amorphous material and penetrates along the fractures throughout the ore and are most abundant on the outside or weathered portions. The various oxide manganese minerals have not been identified. A glassy vitreous quartz is associated in spots along these manganese veins and occasionally is mixed with the ore. It occurs mainly as small bunches and blebs, and has manganese oxides disseminated in it. Other than the small amounts of quartz, these larger veins are entirely made up of manganese minerals. Assays from five samples obtained from these veins by the owner consisted of pieces broken from both types of veins and ranged from 10.76% to 38.45% Mn. with gold and silver values ranging from $1.08 to $4.37 per ton. The red type of manganese veins appear to be blended into the schists. These occur in the schists as banded or schistose veins only a few inches wide. They are brownish red in color and contain red jasper, with small amounts of black manganese oxides contained in rounded holes. These veins have a low manganese content, but contain iron oxides, which are not so abundant in the larger black type of vein.

The mineralogical content of the two types of veins consist of:

Black veins - Rhodonite, black oxides, rhodochrosite, white and gray silicates with a little quartz.

Red jasper and schist veins - Limonite, hematite, manganese oxided, silicates and carbonates in lesser amounts, and red jasper.

A peculiar feature of the mineralogical content of these veins is the lack of sulphide mineralization and metallic elements other than manganese and iron oxides. Another peculiar feature is the presence of small amounts of gold and silver.

Sample JCR. 997 consists of a representative sample made up of several pieces collected from the black veins. Since the veins are identical in mineral content and the content is mainly all manganese mineral, these results should be representative. Assay returns are:

Ounces per ton		Percentage
Au.	Ag.	Mn.
Nil	Trace	Nil

Sample JCR. 998 consists of a representative sample made up from the red veins containing jasper. Assay returns are:

Ounces per ton		Percentage
Au.	Ag.	Mn.
Nil	Trace	11.51

The occurrence of these low temperature manganese veins in close proximity to the contact of the coast batholith, which is regarded as of high temperature, is rather unusual. Many details, which might reveal the origin of these veins, are lacking. However, they are believed to be associated in origin to the amygdaloidal basalt which occurs on the hanging wall. The amygdules in the basalt are filled with vitreous quartz and zeolites, which show the existence of hot aqueous solutions, which have found their way into these cavities during the cooling of the basalt. The manganese vein is held to have originated with the solutions accompanying the basalt and to have originally had its origin in the basaltic magma. How the deposition of the manganese mineral in the vein occurred and what accounts for the two typed of veins is not known. The black veins may be the direct precipitation into the open fissures developed in the shear zone by ascending hot solutions. The red veins may be of later origin developed in a state of free oxygen by descending solutions into the small fissures developed in the shear zone, which did not penetrate the zone of hot solutions below. The thin sections listed below may reveal more as to the origin of these veins:

T. D. M. 489 - A specimen of basaltic lava showing amygdules filled with zeolites.

T. D. M. 490 & 491 - White and pink manganese minerals from black veins, unidentified.

T. D. M. 492 & 493 - Red manganese ore from red veins, unidentified.

T. D. M. 494 - Specimen of quartz containing manganese oxide.

Lack of development on these veins leaves an uncertainty as to their probable contents in depth. The vertical range between the two outcroppings which are located one mile apart is nearly 1000 feet. The character of the ore and veins are nearly identical. However, more pink rhodonite was noted in the ore of the lower croppings. The abundant traceable float from one cropping to the other, a distance of a mile, which occupies the valley floor and is covered with slide material, leads one to believe the existence of the veins over this distance. Should this condition be found to exist, the estimated tonnage, from the lower showings to the upper, a vertical distance of 1000 feet, and with surface widths of the three black veins, is placed at several thousand tons

The problems noted, with regard to the mining and utilizing this ore, are:

(1) Five miles of transportation to salt water from 2000 to 3000 feet in elevation.

(2) Concentration problem of separating oxides, carbonates and silicates.

(3) Reduction of carbonates and silicates to usable ores.

(4) Mining veins without minable widths.

No. 1 problem can be solved by a road and aerial tramway. No. 2 by tabling and floating methods of concentration. No. 3 problem, as to usage of carbonate and silicate ores, has been worked out by the U. S. Bureau of Mines in their matte-smelting process of manganese ores. Problem No. 4 with regard to mining veins with less than a stoping width is one of cost as against the average tenor of the ore. Costs with regard to transportation to points of utilization should be figured closely against the tenor of this ore. The average tenor of the ore as shown by sample JCR. 997 gives a manganese content of   per cent.

Specific gravity tests of this ore gave the following data:
Black oxide ore - 3.218
White carbonate and silicate - 3.2268
Pink Silicate - 3.3023
Mixture of pink, white and black oxide - 3.363

October 27. Return to Limestone Inlet.

October 28. An attempt was made to examine zinc and lead deposits in the vicinity of Sweetheart Lake at Snettisham. Slides of rock has taken out the trail along the steep bluffs between the beach and Sweetheart Lake. Thus it was considered too dangerous to attempt at this time of year without rebuilding the trail or using ropes. For this reason the prospects were not visited. To reach the lake otherwise would require a long laborious trip over the mountain ridge which was snow covered on date of visit.

October 29. Snettisham to Pleasant Cove, Seymour Canal.

October 30. Pleasant Cove to Windfall Harbor, Seymour Canal.

October 31. Examined Copper Chief prospect on Seymour Canal. The Copper Chief prospect is located three miles north of Windfall Harbor on the west shore of Seymour Canal, opposite Swan Island. Two claims; namely, Copper Chief and Copper Chief No. 1, are held by Geo. Comstock of Juneau. They are located along the shore and the prospect is situated along high tide line.

This prospect was discovered by Dick Willoughby in 1899. P. Pond and Dick Johnson of Juneau became interested with Mr. Willoughby following discovery and development to the extent of a 25-foot drift, a large cut and a 60-foot shaft was completed. A short description of this prospect is given in U.S.G.S. Bulletin 287, "Juneau Gold Belt" by A. C. Spencer, pp. 150-151. Resultant low values in copper and gold apparently caused the suspension of development. The property has been idle since that time, however, in 1930 the prospect was staked by Bert Maycock.

The position of this prospect along the shore line of Seymour Canal is geologically the position of contact between Jurassic or Cretaceous tuffs and sediments to the east and Carboniferous lavas and sediment to the west. The deposit, however, is situated in volcanics or greenstones of felsitic composition. These lavas in the vicinity of the prospect strike N. 10-30° W. and have flat dips to the west. They are thinly bedded and have been folded, which gives them their schistose and highly fractured structure. The folding and dip of the schistosity at the sulphide deposit is slightly off vertical to the east. Metallic iron sulphides with small amounts of chalcopyrite have been injected with a grayish to bluish quartz into the foliation of the schist forming the deposit. This zone of sulphide mineralization is roughly lenticular in outline with a length of 250 feet and reaches a width of over 20 feet near the central portion in which the drift and shaft have been driven and sunk. This deposit is the result of hot hydrothermal waters penetrating the schists along openings formed by folding from below and depositing quartz and iron sulphides. This action has altered the schistose lava from green to light yellow in the vicinity of the deposit. At the north end of the deposit the hot water apparently at one stage was exposed to free oxygen and oxides of iron were deposited forming red hematite and jasper schists. The sulphides occur as massive bands between schist layers and disseminations both in the quartz and altered schist.

The matallic minerals noted were pyrite, arsenopyrite, a little chalcopyrite and very light colored sulphide, possibly marcasite. The gangue minerals are bluish white quartz, yellow powder, limonite, hematite, chlorite and altered schist pieces.

Sample 1101 was taken at the face of the drift, 25 feet from the portal and represents a 6-foot channel sample from the footwall toward the hangwall. Assay results are: Au. nil, and Ag. nil oz per ton, and 1.75 per cent copper.

Sample 1102 represents the additional portion of the face of the drift and a length of 6 feet. This gave results of: Au nil and Ag. nil oz. per ton, and 1.1 per cent copper.

Sample 1103 represents a 10-pound sample taken from pieces off the dump which is material from the shaft. This gave results of: Au. nil and Ag. nil oz. per ton, and 1.25 per cent copper.

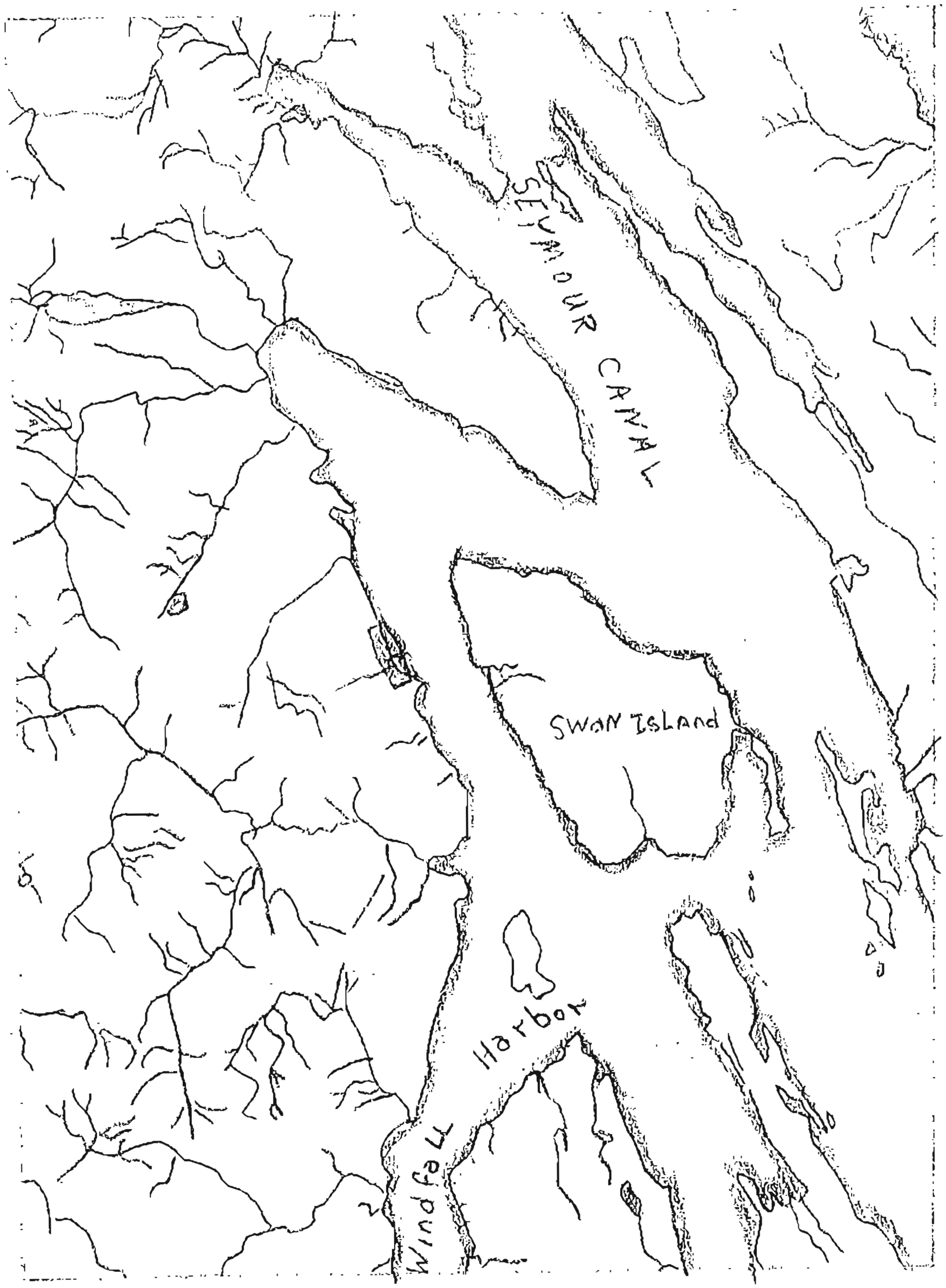
The results from these samples have not been received on the date of writing, and recommendations depend entirely upon them. Judging from the appearance of the copper content, this deposit appears to be not of commercial grade.

November 1. Return to Juneau headquarters.

November 7. At 1:30 p.m. a trip was made by car and on foot to the Antimony Mineral Claim on Douglas Island. The writer was accompanied by R. L. Stewart and John Swe. The latter is the owner. The claim is reached via trail up Eagle Creek from the Douglas Island road, a distance of 4000 feet. The showings on the claim are situated in and along the bank of Eagle Creek at an elevation of 400 feet, between two small waterfalls. This discovery was reported to have been made by Ralph Thompson in 1932.

The showing consists of a compound vein of quartz and the antimony mineral stibnite, ranging in width from six to sixteen inches, and is exposed in the bed of the creek and for a few feet on the south bank, for a distance of 70 feet. This vein starts at the contact of metamorphic sedimentary schists and greenstone lava at the bottom of the falls and extends along the bed of the creek westerly wholly within the lava. It represents a fracture filling by hot ascending solutions. Its strike is N. 85° W. and the dip is slightly off vertical to the north. The vein begins at the contact to the east and extends into the lava nearly at right angles to the general trend of the contact and sedimentary formations. The contact between the sedimentary schist and greenstone lava is represented by a wide shear zone consisting of schistose sediments which range from gray phyllite to limy schists with intercalated lava dikes. The contact strikes N. 30° W. and dips 66° E. The schists near the contact are highly altered and mineralized with disseminated iron pyrite. The lava is a compact dense green rock and contains a short green mineral believed to be augite. Along the contact and along the fractures, which contain the vein, the rock has been altered by solution to a light brownish to buff color.

The compound vein consists of a regular 6-7 inch impure quartz vein on the hanging wall. This quartz is hard and drusy and deposited around angular brecciated rock pieces. This portion of the vein contains a small amount of disseminated stibnite. Along the footwall of the quartz two to nearly six inches of nearly massive stibnite occurs in banded texture with long bladed crystals. Portions of the footwall of altered lava contain disseminated stibnite and quartz up to widths of sixteen inches. In the small cut opposite the creek bed on the south



Location of

COPPER CHIEF PROPERTY

Sulphide Deposit

Seymour Canal   Juneau Precinct

Owner: George Comstock