

MR-191-01A

57-Petersburg

The Vermont Marble Co.
Tokeen and Calder.
Prince of Wales Island.
Ketchikan Precinct.
March 1925.

MR-191-1 A

1925-26

KTN Dist. Properties

Examined by J.G. Shepard.
U.S. Bureau of Mines.

Location:

The Vermont Marble Co. operates two plants on Prince of Wales Island, Tokeen and Calder. The first is situated on Davidson Inlet and Calder on Shakan straits. Both have excellent deep water harbors which offer no obstacles to ocean going vessels.



Tokeen Plant:

Tokeen Harbor

The Tokeen plant is working at full capacity. As operations have only been recently resumed for the season, a large amount of dead work is being necessarily carried on, in order to place the pits in full producing condition. Four pits are being worked at the main quarry. A derrick is used at each pit. Nine channelers and five burleys are in operation. The lowest point reached at any of the pits is approximately one hundred feet below the surface. At this depth surface joints still persist and cause a large percentage of waste. Another cause of annoyance and waste is a series of intersecting andesite dikes.

One quarter mile north of the main workings a prospect is being floored off. One derrick is being operated and a shore derrick is being erected. Two channelers and one burley are in operation. More equipment will be added as soon as space is cleared.

At the beach two derricks handle the blocks of marble, which are freighted by barge, to Tacoma and San Francisco, for manufacture.

All machinery is run by steam, an aggregate of 450 H.P. being generated by coal fed boilers.

Ninty men are employed at present at the plant and production should reach 800 tons per month, with the completion of dead work.

A complete machine shop, equipped to care for the simple repairs needed for the quarrying machinery is located half way between the beach and the pits. Lights are generated by a small gas engine, direct connected to the dynamo.

Calder Plant:

At the Calder plant a small crew of men are engaged in moving machinery and equipment from the quarry operated last year to the pits of old Calder. The prospect operated last season turned out marble, apparently of a good quality, but on attempting to manufacture, it was found to be of insufficient hardness, making it necessary to abandon the prospect. It is hoped that the material from the old pits will be found to meet manufacturing requirements.



Marble blocks at dock.

Conclusion:

It is the intention of the Vermont Marble co. to continue operations on a large scale and to increase production as much as possible. Business conditions on the Pacific Slope are said to be excellent and Alaska marble is much in demand. The entire situation depends on the grade of marble which can be produced without exceeding the maximum amount of waste allowable. The waste percentage has been found to be very great, reaching at times, over 70%. Some material of a seemingly good grade is found to be too soft and unsuitable for manufacture in the factories.

However, in spite of these handicaps, officials of the Company look forward to a prosperous year in the marble business.

PE
119 Craig
KX119-1

Alaska Palladium Minigg Co.
Salt Chuck Mine.
Ketchikan Precinct.
Feb. 1925.

Examined by J.G. Shepard.
U.S. Bureau of Mines.

Location:

The Salt Chuck Mine is located at Salt chuck, the head of Kasaan Bay., Prince of Wales Island.

Economic Geography:

The mill is located on the beach at tide water. It is connected to the mine, which is one quarter mile north east, by fifteen hundred feet of narrow gauge track over which the ore is delivered. There is plenty of available timber for mine use on the property. Water is drawn from a fifteen acre lake one quarter mile east of the mine. This lake furnishes one hundred H.P. for ten months of the year.



The Salt Chuck.

Brief History:

This property was discovered some thirty years ago, and worked intermittently and unsuccessfully, as a copper mine. Work was never pursued on a large scale and no modern equipment was installed until recent years. The present owner discovered palladium to be present in the ore in paying quantities and a small mill was installed. Results from this mill changed the aspect of the property entirely and resulted in the present installation.

Economic Geology:

The ore bodies are of the contact-metamorphic type and ^{are} entirely within a granitic intrusive. They occur as large irregular lenses varying in length and width. These lenses have a general north - south strike and rake 60-65° south easterly. Two types of ore body occur, one in gabbro and one in pyroxenite. The ore occurs as disseminated bornite, with small amounts of chalcocite and in some instances chalcopyrite. The copper values are nearly the same in both type of ore bodies, but the bornite is more massive and the palladium content much higher in the pyroxenite. There are no walls, the values being most intense at the center of the lenses and becoming gradually less toward the edges, until disappearing entirely in the country rock.

Mine Workings:

At present the mine workings are confined to a relatively small area, as the orebodies are so large and a limited tonnage required, that it is not necessary at present to work more than eight machine shifts per day. The workings are reached by a 300 foot adit cross cut, an extension of the trackage from the mill, at an elevation of ninety feet above sea level. This tunnel cuts the ore at an elevation 300 feet below the surface. Two raises connect the surface with the adit level. These raises are known as No. 1 and No. 2 raises and hole respectively in the bottom of No. 1 and No. 2 glory holes and are used as oreways. Considerable ore has been gouged in the past from small stopes on the 300 or adit level, but at the present time, no work has been out lined or is being done on this level.



No. 1 Glory Hole.



No. 2 Glory Hole.

On the 200 level, 12 inch grizzlies are placed in the oreways, and the ore from the glory holes passes over them before falling to the adit level. 30 feet south of No. 2 raise, on the 200 level, a shrinkage stope has been broken into at the present writing. This stope is some 50 feet in length and 40 feet in width. The entire area is a very good grade of ore and no limit has been reached in either length or width. This stope is the only one being worked underground at the present time, and will eventually work through to the surface and form another glory hole. It is known as No. 5 stope. Immediate development plans are for the extension of drifts and x-cuts south of No. 5 stope and the opening up of two more shrinkage stopes on the 200 level: These stopes will also work through to the surface and form glory holes. There is nothing to indicate that still farther development to the south will not bring in equally good ore reserves, as fine surface showings extend for 1500 feet beyond present workings.

Operation:

At present the mine is practically a one shift operation. A production of about 4000 tons per month is maintained, this tonnage being limited by mill capacity. There is sufficient ore opened up to keep the mill in constant operation for a year. It will not be necessary to sink below the adit level for years to come.

The Milling Plant:

The mill is a dry crushing, wet grinding, straight oil flotation type. Ore from the mine, passed through 12 inch grizzlies is delivered to a 300 ton head bin. Here it is dumped on finer grizzlies and the large chunks of waste are sorted out by two ore sorters.

Initial crushing is done by a 14 inch traylor gyratory crusher. The product from this machine is step crushed in turn, to 3-4 inch ring, by a Blake jaw crusher and a simonds disc. This product is delivered to a 170 ton fine ore Bin. 15 per cent of the mine run rock is sorted out by hand and run to waste.

The grinding plant consists of a 7'x36" hardinge conical ball mill, supplimented by dorr duplex drag classifier. This mill tkes the feed from the fine ore bin and in closed circuit with the classifier, reduces it to - 60 mesh. The flotation oil, consisting, of seven parts coal tar, three parts light creosote oil, and one part pine oil, by volume, are feed directl y into the mill. Consumption is approximately one pound of oil per ton of ore treated and ball load is about 22,000 pounds.



The Mill.



Blacksmith Shop
and tunnel portal.

The product of th grinding plant is put through two K. & K. flotation machines in parallel and the tails sent to waste. The concentrates are cleaned in another K. & K. machine and the resulting concentrates settled and filtered.

Power is generated in the mill building by by three semi-deisal Fairbanks Morse gas engines and a pelton water wheel. This water wheel, capable of producing about 100 H.P. drives an inger-sol rand air compressor of 600 cubic feet of free air per minute capacity. This air is piped to the mine. One 100 H.P. engine drives a 150 K.W. generator which supplies power for the crushing plant. The second Second 100 H.P. engine drives, by belt, the ball mill. The third engine drives, by belt, all the flotation equipment.

Operation:

The crushing plant works one shift, the mill and power plant works three shifts.

Summary:

The mine is in good shape. Sufficient ore is in sight to enable increased production with very little additional expenditure and cost. The grade is also better than has been experienced in the past. Mining costs are approximately \$ 1.00 per ton This will probably be reduced to \$.75 per ton with increased production.

At present the mill is making around an 80% recovery of values. Machinery consisting of a 200 H.P full deisal engine and an 8' x 48" hardinge ball mill are being installed. This added equipment will increase the mill capacity to 250 tons per day and permit of finer grinding which will raise the palladium recovery from 65% to 86%. It is in the palladium that the greatest recoverable loss occurs. Per ton costs are as follows.

Mill Feed:

	heads -	tails -	% recovery	-	Actual value
palladium-	.12oz.	.042oz.	65%	-	\$7.20
gold	.03	.0025	91		.60
silver	.18	.05	72		.15
copper	1.07%	.13%	87		2.60

					\$10.55 Total.

Concentrates:

		value recovered from refinery.
palladium-	3.15 oz.	\$ 179.50
gold	1.20	21.90
silver	6.50	3.50
copper	45.00%	94.10

		\$299.00 Total.

Concentrate cost:

Mining-	\$ 42.00	
Milling	67.00	
Frt. & Treat.	25.00	
Overhead	50.00	

		\$ 184.00 Total.
		\$ 184.00

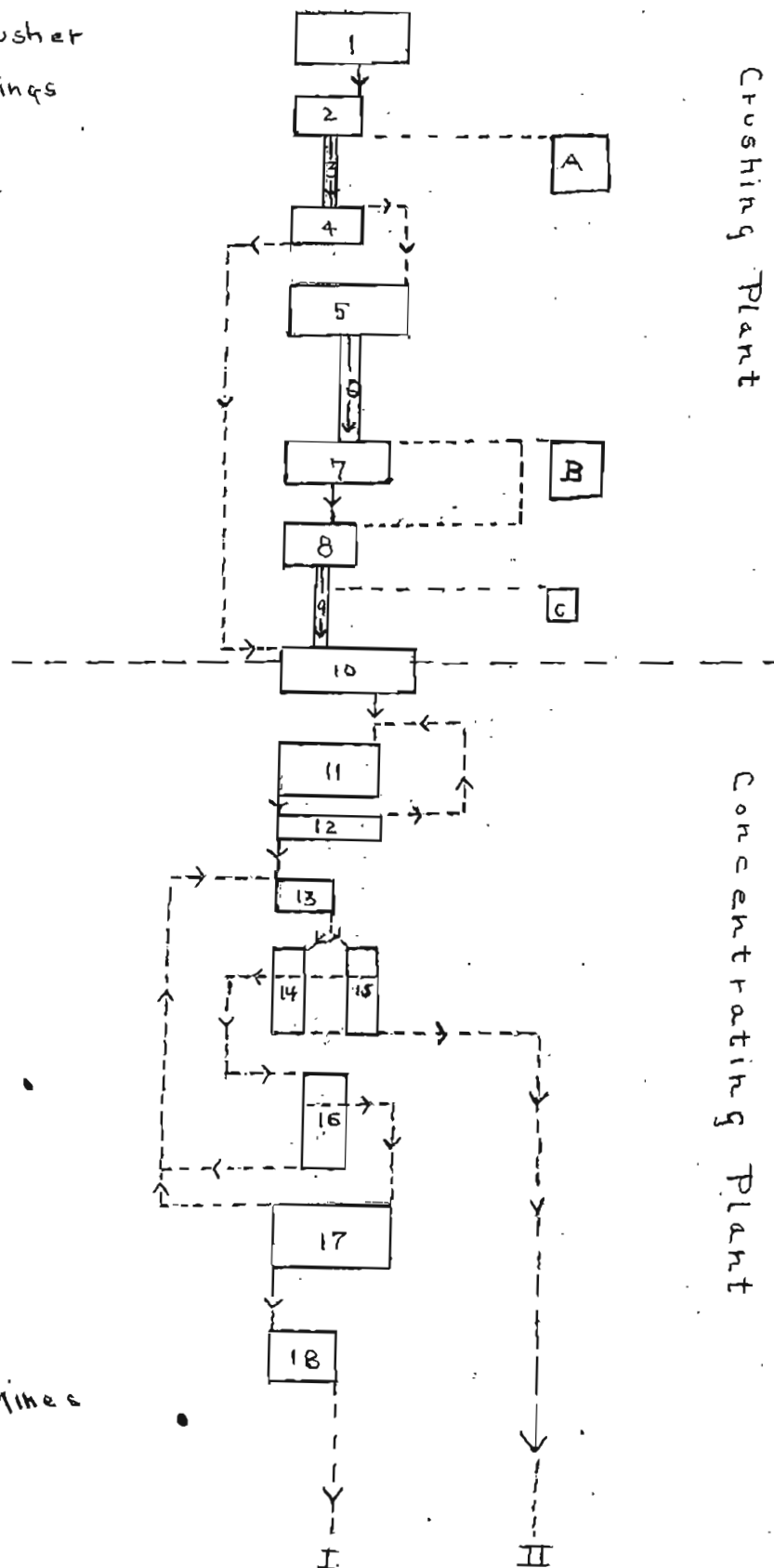
Per ton profit on concentrates.

\$ 115.00

Ratio of concentration 42 to 1
Present rate of production of concentrates. 85 tons per month.

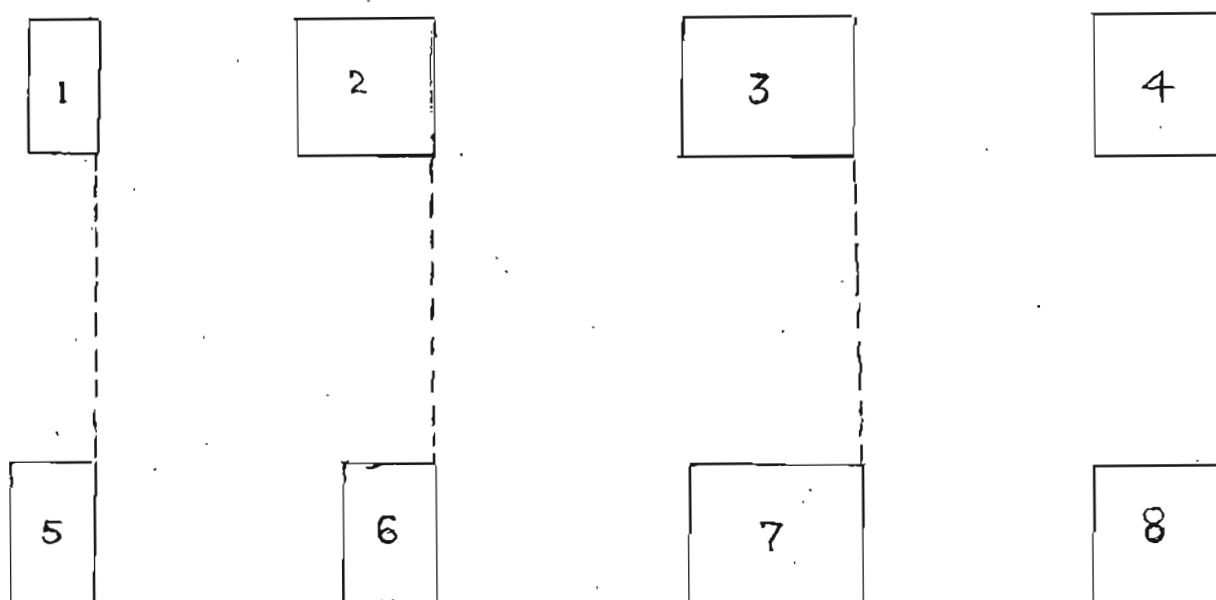
Alaska Palladium Co. Mill Flow Sheet.

- 1- 300 Ton head Bin
- 2- 14" Traylor Gyratory crusher
- 3- 24" Belt conveyor
- 4- Shaking screen - 3" openings
- 5- coarse ore Bin.
- 6- Pan conveyor
- 7- 9"x15" Blake Jaw crusher
- 8- 24" Simonds Disc-crusher
- 9- 18" Belt conveyor
- 10- 170 ton ore Bin-fine
- 11- 7'x36" Hardinge Ball Mill.
- 12- Dorr Duplex Classifier
- 13- 2" Wilfley Pump
- 14- K.K. Floatation Machines
- 15- K.K. Floatation Machine
- 16- 14'x7' Dorr Thickener
- 17- 3'x4' Oliver Filter
- 18- Conc. for shipment
- I- Conc. for shipment
- II- Tails to waste
- A- 60 H.P. Motor
- B- 50 H.P. Motor
- C- 5 H.P. Motor



By J.G. Shepard.
U.S. Bureau of Mines

Alaska Palladium Co. Power Distribution.



- 1- 100 H.P. Pelton Water wheel
- 2- 100 H.P. Fairbanks-Morse - Semi-Diesel Gas Engine
- 3- " " " " " " " " " "
- 4- 75 " " " " " " " " " "
- 5- 12"x14" Ingersoll-Rand - air compressor
- 6- 150 K.W. Generator - Power for crushing Plant
- 7- 7'x36" Harding Ball Mill
- 8- concentrating Machinery
- 9- 6- K.W. Generator for Lighting Plant.

By J.G. Shepard.
U.S. Bureau of Mines.

THE ALASKA PALLADIUM MINING COMPANY
Ketchikan Precinct

4 119-1

Examined by J. G. Shepard,
September, 1926.

A detailed report of the Alaska Palladium Mine was made in 1925.

During 1926 additions were made to the milling plant which raised the grinding capacity from 125 to 300 tons per day. A 200 H. P. Deisel engine and an 8' by 48" Hardinge ball mill were installed. The mine was unable to produce the extra tonnage needed and some of the old tailings were retreated to bolster up the tonnage.

At the mine very little development work was done. Ore exposed in the workings was mined by widening the glory holes in all directions. Proposed development of the ground southeast of the present working was delayed until too late. Mining in the glory holes beyond the limits of mineral enrichment caused mill heads to drop 50 per cent (see report 1925). During the summer the price of palladium declined materially. This fact in conjunction with low mill heads, no ore reserves and a weak financial condition caused the property to be closed early in October.

During the summer a limited amount of surface work was done southeast of the mine and some very good surface showings exposed. Undoubtedly other orebodies of a similar character to those mined in the original workings exist in this territory. 1,000 feet of drift and crosscutting would demonstrate either the presence or absence of commercial orebodies in this vicinity.

MR - in Dew

THE KETCHIKAN MINING DISTRICT

-1926-

By J. G. Shepard,
U. S. G. S.

Mining in the Ketchikan district during 1926 was confined to two major and five minor operations.

The Vermont Marble Company operated its quarries throughout the major portion of the year at usual capacity. Kx 119-128

The Alaska Palladium Company operated its Salt Chuck mine and mill during the year until October when operations ceased due to financial difficulties. Substantial additions were made to the mill. A crew of 60 men was maintained during operations. Kx 119-1

The Kasaan Gold Company continued development of the Harris Creek mine with a crew of 10 men but no production was made. Kx 119-8

The Gold Standard mine at Helm Bay was operated under lease by three men. Approximately \$1,000 per month in gold was produced. Kx 120-88

The Peerless Mining company at Sea Level on Thorne Arm maintained a crew of four men, stripping and open-cutting several gold quartz veins. A large amount of this work was accomplished. Kx 120-86

Late in the year operations were resumed in a small way on the Sulzer property at Sulzer.

A lease was given to C. E. Satterquist of Seattle on the Valparaiso mine at Dolomi by Mrs. Yeardley, the owner. The workings were unwatered and 75 tons of ore was hoisted from the mine. The mill was reconditioned but was not run. Due to an unusually dry summer a water shortage handicapped operations. The lessees became discouraged and surrendered the lease in October without making any production. Kx 119-32

These operations comprise the mining activity in the Ketchikan district during 1926.

The only interest evinced in the copper properties was the sale of the Rush and Brown mine to San Francisco interests for a nominal sum.

There is no prospect of any great increasing activity for mining operations at present.

The Kasaan Gold Mining Company,
Harris Creek-Ketchikan Precinct.

119-B

Examined by J.G. Shepard,
Sept. 1926.

The property of the Kasaan Gold Mining Company which operates the old Julia or Harris Creek mine, is situated on Harris Creek about three-quarters of a mile from the mouth and about 100 feet above sea level. Supplies are floated in boats up the creek at high tide to within 1500 feet of the camp and are then transferred to a small surface tram.

The surface plant consists of camp buildings capable of accommodating 25 persons, a milling and power plant, blacksmith shop and hoisting plant. Previous operators utilized water from Harris Creek conducted through 1,000 ft. of flume to run three small water turbines, the power from these being transmitted to the mill, a distance of 700 feet, by cables. This practice has been abandoned.

The milling plant consists of a jaw crusher, battery of five stamps, amalgam plates, 5x4 ball mill, 3 wilfley tables, and cyanide tanks and zinc boxes. Power is furnished by a 75 H.P. Fairbanks Morse semi-diesel engine installed so that it may drive interchangeably either the mill or an Ingersoll Rand 3 drill air compressor.

The orebody occupies a shear zone in graphitic slate dipping at an angle of 30°. Where it has been cut in the south drift on the 300 ft. level, the zone is 30 ft. wide and carries a value of \$ 2.00 per ton. Quartz stringers constitute the ore that has been mined and are irregular as to size and value. Two types of quartz are present; one, a barren, white, massive quartz and the other a banded quartz mineralized with pyrite and gold, probably of a later age. Nearly all the known ore has been mined from the surface to a distance 300 ft. along the dip of the deposit. This ore was all embodied in one shoot zone about 300 ft. in length. To date no second shoot has been disclosed by drifting north and south although it is hoped that one will be found at a distance 600 ft. north of the shaft, there being surface indications at this point.

Present plans are to sink the main winze a distance of 150 ft. and further develop the ore shoot from which production has been made in the past. Eight men have been employed on development work during the year. Possibly 500 tons of ore of a commercial grade could be obtained from the present workings.

-THE GOLD STANDARD MINE-

KX 100-88

Helm Bay - Ketchikan Precinct

**Examined by J. G. Shepard,
September, 1926.**

The property of the Gold Standard Mining Company is situated on the west shore of Helm Bay about $2\frac{1}{2}$ miles below the head of the bay.

The property is controlled by Richard Kneekles and Dr. Dickenson, both of Ketchikan.

Muckall



Beach Buildings.

There are two orebodies on the property from which a production has been made. In 1899 a five stamp mill was erected near the upper vein which is about $3/4$ mile from the beach at an altitude of 300 feet above sea level. This showing is a quartz vein in schist and argillite, measuring from a few inches to 3 feet in width. A pocket which produced 20,000 dollars was mined from this vein. An upper tunnel

50 feet long, an intermediate tunnel 150 feet long, and a shaft 150 deep with drifting constitutes the major work done on this showing. The intermediate drift and shaft workings are inaccessible and it is reported that all the ore developed by these workings was mined out. Possibly 500 tons of commercial ore could be secured around the upper tunnel.

Subsequent to these operations, the mill was dismantled and re-installed on the beach near the lower orebody which is a zone in the schist containing auriferous stringers of calcite and quartz. The principal mineralization is pyrite, some of which impregnates the schist country rock as well as the veinlets, thereby making selective mining difficult.

About 1,000 feet of tunneling was done on this property by the Strong interests of Ketchikan. Results were not satisfactory and the project was abandoned. The greatest depth below the surface obtained by this exploration was fifty feet.



No. 1 Glory Hole

During 1926 the deposit was being worked under lease by C. Johnson and two partners. Ore was mined in small glory holes between the adit level and the surface and trammed from chutes to the mill. Apparently the best ore was close to the surface and in oxidized ground. One 12-hour shift was worked. Eight to nine tons of ore per day was milled. The average value of the ore was estimated at \$5.00 per ton. Probably the value of the ore was slightly higher and the mill recovery lower than was figured by the lessees. Production of about 1,000 dollars per month was made during operations.



No. 2 Glory Hole

Surface equipment on the property consists of camp buildings, trackage from the mine to the mill (1,000 feet), a

small jaw crusher, battery of five stamps, amalgam plates, two vanner tables, one Wilfley table, and a two drill Ingersoll Rand air compressor. Power is furnished by water under a fifty foot head led through 500 feet of 16 inch steel pipe to a Pelton wheel. The concentrates from the mill are shipped to the Tacoma smelter. Probably 2,000 tons of ore can be mined in this manner without any additional development work.



Milling Plant

Also known as
"Moonshine Property"

THE CHOMLEY MINING COMPANY
Cholmondeley Sound - Ketchikan Precinct.

By J. G. Shepard,
September, 1926.

K2119-33

The property of the Chomley Mining Company is situated on the west shore of the south arm of Cholmondeley Sound. The surface showings are located on the crest of the mountain at an elevation of 2500 feet. The property was located in 1906 and sold to the Alaska Galena Company who did desultory development work. The property was later acquired by the Chomley Mining Company, a corporation owned largely by Ketchikan men. This company undertook to develop the property on an extensive scale. About \$60,000 was expended with unsatisfactory results and the property was closed down in 1924.



Adit Dump from camp

The Chomley Mining Company installed a single wire aerial tram about $1\frac{1}{2}$ miles in length which reaches from the beach to the mine camp. A gasoline engine was used to pull the load. A two-drill air compressor also gas driven is installed at the mine camp. Two frame camp buildings were erected.

The original workings consisted of a 90-foot shaft with short drifts from the bottom and a 200-foot tunnel which was intended to tap the bottom of the shaft. The Chomley Company drove a 1600-foot tunnel which was designed to reach the fissure zone about 325 feet below the surface. In raising to reach the bottom of the old shaft a mistake in surveying was made and the connection was missed. The raise encountered a lime vug and the ground caved. In pulling this cave a glory hole was formed with a length of 135 and a width of 50 feet, one end exposing the old shaft.

No orebody of any size was seen. It was impossible to enter the old shaft. The showing is a well defined fissure cutting limestone and schist. The only ore seen was in the 200-foot tunnel where some galena has replaced limestone. It would cost approximately \$10,000 to complete the work of cleaning out the cave and putting the raise in such shape that a definite continuation of exploration could be continued in the ground adjacent to the foot of the shaft.



Showing cave