

NOTED

APR 4 1939

H. D. STEVENS
Commissioner of Mines

ON
PRELIMINARY REPORT OF FLAGSTAFF MINING COMPANY,
KARTA BAY, PRINCE OF WALES ISLAND
June 4, 1938.

Location and Accessibility:

The Flagstaff Mine is located 4 miles southwest of Karta Bay and $3\frac{1}{2}$ miles northeast of Hollis on the east slope of Granite Mountain on Prince of Wales Island. A newly constructed caterpillar road leads from the south end of Karta Bay to the south shore of Karta Lake and thence south following a small creek to the mill site, elevation 540 feet. A new road is under construction by the Forest Service beginning at Karta Bay on the north side of Karta River and following the latter to Karta Lake, a distance of 2 miles. Karta Bay is navigable to ocean-going vessels.

Owner:

The company holds under option and recent staking a total of twenty-nine lode claims included in five claim groups. These groups consist of eighteen claims in the Flagstaff group, four in the Keystone group, three each in the Apex and Raven groups, and the Ketchikan claim. A total of four mill sites are held, two located on Karta Bay, one at the outlet of Karta Lake and one at the present camp and mill site on the north slope of Granite Mountain. The present owners are H. J. Mesta, G. W. and W. M. Sheridan, Wm. Goodwin, R. J. Tobin, and C. B. and D. S. Morgareidge. Later reports were to the effect that C. B. and D. S. Morgareidge have sold their interest to the above group.

History:

The early history of this discovery is not known. The first report on record by the U. S. G. S. is contained in bulletin No. 284, "Alaskan Mineral Resources in 1905" by F. E. and C. W. Wright, pp. 41-42. The property was then known as the Treasure group of claims. Two tunnels were reported at this date of 500 and 160 feet in length at 1400 foot elevation. These tunnels were reported on the same vein and the upper tunnel, elevation 1400 feet, has only been extended a few feet since that time. The lower tunnel had not been reopened on date of visit. The description of the two veins contained in this report and the following report in bulletin 347, "Ketchikan and Wrangell Mining Districts" by the same authors, pp. 164-165, is representative of present conditions, with the exception of further underground development on the upper cross vein and a few feet in the upper tunnel of the lower vein. The year in which the three short tunnels on the upper cross vein were driven is not known. In 1934 Tom Stevens and associates restaked this group totaling 17 claims. Assessment work was done for the years following in which the extension of the upper tunnel on the lower vein revealed the downward extension of the small ore shoot above in the bed of a small creek.

Handwritten notes:
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+ upper 1400 ft. tunnel
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*H. H. Wilson
see his report*

During the season of 1937 the property was examined by a representative of the Territorial Department of Mines. As a result, the property was optioned to the above present owners and the Flagstaff Mining Company was formed. Since 1937 to date the company has been engaged in building the four miles of caterpillar road, building a camp, erecting an aerial tramway, and erecting and installing a 25-ton mill. To date no further development has been done.

Geology:

The formation of Granite Mountain, and within the boundaries of the claim groups, consists of a diorite with phases varying from quartz diorite to gabbro. Several small to large diabase dikes cut the diorite in the vicinity of Granite Mountain. These strike northwest and dip northeast. Two systems of veining are in evidence, one striking northeast and the other northwest, the latter paralleling and associated with the diabase dikes. Both sets of veins are later than the diabase dikes and the lower vein of the Flagstaff mine follows a diabase dike and cuts through the dike from wall to wall. A specimen taken from this dike above the upper tunnel showed considerable alteration. The ophitic structure was distinct, and the main mineral constituent consisted of augite and Labradorite with alteration products of chlorite, quartz and iron pyrite. Epidotization and chloritization are common within the dike and the walls of the diorite. Parallel with the strike of the dike there has been considerable movement. This, with the later mineralizing solutions, caused the alteration of the dike minerals, the wall rock minerals, and formed the present orebodies in the structural openings.

which

The Flagstaff vein, ^{which} is known and referred to as the lower vein, strikes N. 57° W., and varies in dip from vertical to 70° NE. This vein has been traced from the lower workings at 1200 feet elevation over the top of Granite Mountain for nearly one mile. This vein varies in width from 1 to 3½ feet.

as "Cross-Vein" as it is otherwise called

The outcrop of The North and South vein is located above the Flagstaff vein near the top of Granite Mountain between elevations of 2600 and 2800 feet. The vein strikes N. 25° E. and dips 20° NW. This vein varies in width from 1 to 3 feet. These two veins are similar in appearance, but the latter is in quartz diorite only and intersects the Flagstaff vein on its southerly end. This intersection has not been uncovered. The latter vein carries less mineralization than the Flagstaff vein, but carries more free gold. Slight movement shows along the walls of this vein.

Workings and Showings:

1060

The lower tunnel of the Flagstaff vein at a 1,000-foot elevation has not been reopened. Whether or not the tunnel was driven on the Flagstaff vein or a parallel vein has not been determined. The present working tunnel to which the recent aerial tram has been constructed is beneath a small waterfall of a small creek at an elevation of 1440 feet. This tunnel has a total length of 515 feet and follows the vein in its entire length. The last ten feet was reported as ore and this ore represents the beginning of the ore lense that shows in the creek bed 220 feet above. This ore outcrop has a length of 54 feet which is heavily mineralized and maintains an average width of $3\frac{1}{2}$ feet. A rough estimate by the mine officials from assays of the surface and the tunnel of \$90,000 was made from this lense of ore between this tunnel and the outcrop. This ore lense is on the footwall of the vein with the dike rock as a hanging wall. Recent reports that in further development in this tunnel another ore lense was encountered.

This must be checked with surface for mineral
2 Flagstaff
map - also
1000 ft

No. 1 tunnel on the north and south vein is located above a small cabin and arrastre near the top of the mountain at an elevation of 2690 feet. The tunnel follows the vein over its entire length of 166 feet. The vein consists mainly of altered and crushed diorite with small quartz lenses inclosed in the gouge varying from 6 to 15 inches in width. Very little mineralization shows in the quartz and gouge.

No. 2 tunnel is on the same vein and located at an elevation of 2730 feet. It also follows the vein and has a length of 108 feet. The vein consists of 8 to 10 inches of gouge material containing crushed and angular pieces of quartz.

No. 3 tunnel, elevation 2770 feet, was caved and not accessible. Quartz pieces were exposed on the dump. Above No. 3 tunnel a lense of quartz occurs on the vein and is exposed for 150 feet. The quartz is banded and has a width that averages from 2 to 3 feet. Mineralization is spotty and sparse. Three further outcrops on the vein to the north show similar widths of quartz, but appear to be only slightly mineralized.

Mineralization:

(operating tunnel)

The ore lense above the upper tunnel on the Flagstaff vein contains the greatest amount of metallic minerals. These are in order of abundance, pyrite, galena, chalcoppyrite, gold and silver. The free gold content was reported as ranging from 2 to 40 per cent. The ratio of the silver to gold is high in comparison to most gold veins in this section. The gangue minerals consist of a white milky quartz, calcite, epidote, chlorite and various altered diorite and dike minerals. The north and south vein has a similar mineralization which is of a weaker nature, with the gold occurring more free.

Assays:

No assays were taken since nearly all outcrops and tunnels have been sampled by the officials. Ore values are to date reported confined to the one ore lense which carries values in gold and silver varying from 25 to \$35 per ton.

Machinery and Mill Flow:

No actual mining had been done by the company up until the date of the writer's visit. The mill was to start operations on July upon the completion of the aerial tramway. Sorted ore at the portal of the tunnel was to be milled. This ore is to be dumped into the upper ore bin and thence trammed over a 2,000-foot aerial tram, consisting of two $1\frac{1}{2}$ " cables and $5/8$ " carrier cable in 1,000-lb. buckets to the lower tram tower. Here the ore is dumped over a grizzly of 1-inch mesh with the fines fed directly to a 50-foot wooden chute that leads to the lower bin at the top of the mill. The coarse material is fed to a 6x8" Blake type Morse Bros. crusher, which is run by an 8 H. P., 2-cylinder Cushman gas engine. A plunger-type feeder at the lower bin feeds the 25-ton Morse Bros. 44x48" ball mill. The flow from the mill passes over a 20-mesh classifier attached to the end of the ball mill. The fines flow passes to a Wilfley table where a high grade concentrate is made. The coarse material is elevated and returned to the ball mill over a belt type elevator. The overflow from the table is returned to a rake type classifier on the ball mill floor by means of a Wilfley sand pump. The fines from the classifier are fed to four Denver flotation cells. The oversize is returned to the ball mill. The oil reagents are fed into the oversize flow from the classifier direct to the ball mill. Thus the flow mixes with the reagents in the ball mill. Power for the mill is furnished by an auto-type 4-cylinder Waukesha gas engine.

The mill building is 35x60 feet, with a built-in settling box for concentrates below the cells. A Kohler light plant, run by a small gasoline engine, is installed in the mill and furnishes light for both camp and mill. The camp buildings consist of cook house, office, bunk house, shower and wash room, caterpillar house and saw mill. The saw mill is a small American make and is run by a 40 H. P. caterpillar. A second-hand Morse Bros. compressor is to be installed at the portal of the tunnel and this is run by a Wisconsin gas engine. A total of 12 men were employed.

Timber and Water Power:

Building timber for the camp and mill was obtained in the immediate vicinity. The supply is abundant along the tractor road. The company has staked and held as a mill site the outlet of Karta Lake. This lake, with the additional basin of Salmon Lake, only a few feet higher, is one of the largest potential water power sites on Prince of Wales Island. Should industrial projects and mining ventures warrant, this could be easily developed.

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File Copy

Territory of Alaska
DEPARTMENT OF MINES

DESCRIPTION OF
THE FLAGSTAFF MINING PROPERTY,
KARTA BAY, PRINCE OF WALES ISLAND,
ALASKA

Compiled and edited

by

B. D. STEWART
Commissioner of Mines.

June 1944

FOREWORD

This description is a compilation of information that is contained in several separate reports on the Flagstaff property that are on file in the office of the Commissioner of Mines at Juneau, Alaska. These reports are based principally on observations made by J. C. Roehm, associate mining engineer of the Territorial Department of Mines, during the course of routine mine inspections that were conducted annually during the period within which operations were being carried on at the property.

It will be noted that no samples for assay were taken by Mr. Roehm during any of his inspections.

Also included, quoted or referred to, are reports, excerpts, and maps prepared by persons who have visited the property, as follows:

1. "Ketchikan District, Kasaan Bay, the Treasure Group of Claims": a description by F. E. and C. W. Wright at pages 41 and 42, U. S. Geological Survey Bulletin 284, - "Investigation of Mineral Resources of Alaska, 1905".
See Appendix "A" attached hereto.
2. "Treasure Group": description by F. E. and C. W. Wright in U. S. Geological Survey Bulletin 347, - "The Ketchikan and Wrangell Mining Districts" - pages 164-165.
See Appendix "B".
3. "The Treasure Group of Claims" (Last Chance 1, 2, and 3): description by Theodore Chapin in U. S. Geological Survey Bulletin 642, - "Mineral Resources of Alaska, Report on Progress and Investigations in 1915", pages 80-81.
See Appendix "C".
4. Flagstaff Group: Extracts from Memorandum on examination of the Flagstaff property in 1937, submitted to the Commissioner of Mines by H. G. Wilcox, temporary field engineer, Territorial Department of Mines.
See Appendix "D"
5. The following items from a report by E. S. McCurdy, mining engineer, Mills Building, San Francisco, who examined the property in 1940 for the Flagstaff Company, and who courteously granted permission for the material to be used:

- (a) "Flagstaff Mine and Mill Production Record
from 7-28-38 to 4-1-40 (from beginning of
mining operations to 3-1-40)
See Appendix "E"
- (b) "Flagstaff Tunnel - Vein Width and Values"
See Appendix "F"
- (c) "Flagstaff Mine - Major Items of Equipment"
See Appendix "G"
- (d) "Mill Production of Flagstaff Mining Company
1938 to March 1, 1940"
See Appendix "H"
- (e) Map - "Plate 2 Flagstaff Mine Location from
U. S. C. & G. S. Map No. 8142, Scale 1/40,000
Date 4-20-40"
See Appendix "J"
- (f) Map - "Plate 4 - Flagstaff Mine - Plan and
Section of Vein. 4-20-40 Scale 1" - 200' "
See Appendix "K"
- (g) Map - "Plate 5 - Flagstaff Mine - Plan of
Camp. Scale 1" - 40'. 4-20-40.
See Appendix "L"

Location and Accessibility:

The Flagstaff mine is situated on the east slope of Granite Mountain, Prince of Wales Island, at a point approximately 4 miles southwest of Karta Bay and $3\frac{1}{2}$ miles northeast of the old mining settlement of Hollis. The elevation at the mine camp and mill is approximately 540 feet above sea level. An auto truck road that was constructed by the U. S. Forest Service with the cooperation of the Flagstaff Mining Company connects the mine with the navigable waters at the head of Karta Bay. This road is in two sections. the first section, 2 miles in length, leading from tide water to the northeast end of Little Salmon Lake, the elevation of which is 104 feet above sea level; and the second section, $1\frac{1}{2}$ miles in length, leading from the southwest end of the lake to the mine camp. Transportation between these two sections is across this lake, a distance of about half a mile, by means of a power driven barge and scows. Karta Bay is navigable by ocean-going vessels.

History of the Property:

According to information obtained by H. G. Wilcox for the Territorial Department of Mines in 1937, probably from the late Tom Stevens, who until his demise was a co-owner, the Flagstaff property was originally located as the "Treasure Mine" by Anton Diminue in 1900. Subsequently one Dr. Agrisick and associates are said to have spent \$40,000 on the property and then to have abandoned it. The development work that was accomplished prior to 1908 is briefly described by Wright brothers in U. S. Geological Survey Bulletin 284, and in Bulletin 347 which was issued in 1908. (Typed copies of these reports appear as Appendixes "A" and "B"). This development work appears to have been confined to the vein that is now known as the "lower" or "main" Flagstaff vein and also to have included what is now a portion of the operating tunnel of the Flagstaff mine.

Subsequent to 1908 a series of three, or possibly four, tunnels were driven on a second vein system that is referred to as the "upper" or "cross-vein" system. Under what ownership this work was done is uncertain. Tom Stevens first staked the property in 1912 under the name "Last Chance Group" (see Appendix "C").

The extent of the work done by Stevens prior to 1934 when he and his associates restaked the ground after it had lain idle for many years is not known.

From 1934 to 1937 development work on the property, which then included seventeen claims, was limited to the performance of annual assessment work, which consisted partly of the extending to

a length of 515 feet the original 485-foot tunnel on the "lower" or "Flagstaff" vein. This additional 30-foot section of this tunnel penetrated an ore body that proved to be the downward extension of a lens of ore that outcrops strongly in a creek bed at an altitude 220 feet higher than the tunnel level.

During the season of 1937 the property was visited and examined on behalf of the Territorial Department of Mines by H. G. Wilcox, mining engineer, who recommended development of this ore body (see Appendix "D"). As a result of this recommendation an option on the property was secured by a group of persons in the States who formed the Flagstaff Mining Company. Following the granting of this option, work immediately commenced on the construction of a road to the property, the erection of camp buildings and the construction of a 25-ton mill. Mining and milling operations were commenced in July, 1938, and work continued intermittently until the fall of 1941. At the end of that year the Flagstaff Mining Company relinquished its rights to the property which then reverted to its owners, Mrs. Bina Annette of Ketchikan, and the heirs of Tom Stevens, deceased. Under date of January 3, 1944, the Flagstaff Mining Company was dissolved as a corporation.

Geology and Outcrops of Ore Deposits:

Within the boundaries of the Flagstaff property the bedrock formation consists of several phases of diorite that vary in type from quartz-diorite to gabbro. Several dikes of diabase that cut the diorite formation and vary in size from small to large occur on the property. These dikes strike northwesterly and dip northeasterly.

Two systems of quartz veins are exposed on the property. The first of these is known as the "Flagstaff" or "lower" vein, the other is variously referred to as the "north and south", the "upper" or the "cross-vein" system.

The Flagstaff vein strikes northwesterly and thus parallels the direction of the diabase dikes above referred to, the wall of one of the larger of which it follows. At one point the vein cuts through this dike from wall to wall.

A specimen taken from the dike at a point above the main Flagstaff tunnel shows considerable alteration. The ophitic structure of the diabase is distinct in this specimen, the principal mineral constituents of which are augite, labradorite, chlorite, quartz and pyrite. Epidotization and chloritization are apparent both within the dike and on the walls where it is in contact with the diorite mass. There are evidences of pronounced movement within the dike and wall rocks along planes that are parallel with the strike of the dike. Apparently this movement, together with the mineral solutions for which it provided channels, was responsible

for the bedrock alteration and the formation of the vein and ore deposits within and along the structural openings and zones of fracture which were caused by it.

The Flagstaff vein strikes about N. 57° W. and varies in dip from 70° NE to vertical. The thickness of the vein varies from 1 foot to 3½ feet. The vein has been traced from the vicinity of the present mine workings at an altitude of approximately 1200 feet southeasterly over the top of Granite Mountain, a distance of nearly one mile.

The ore bodies occur in the Flagstaff vein in what appear to be rather well-defined shoots having an average thickness of from 24 to 42 inches so far as they have been developed.

The principal outcrop of the vein is situated beneath a waterfall in a small creek at an elevation of about 1440 feet, which is about 220 feet above the Flagstaff tunnel level. This ore outcrop, which has a length of 54 feet and maintains an average width of 3½ feet, is heavily mineralized. The ore lens is on the footwall of the vein which has dike rock as its hanging wall.

The outcrops of the north and south, or cross-vein system, as it is also called, are located above that of the Flagstaff vein and near the top of Granite Mountain at altitudes ranging from 2600 to 2800 feet. According to Roehm, the principal vein of this system strikes N. 25° E. and dips 20° NW. It varies in thickness from 1 foot to 3 feet. In appearance it is similar to the Flagstaff vein but carries less sulphide mineralization and is said to carry a higher percentage of free gold. There is evidence of slight movement having taken place along the walls of the vein. This vein also differs from the Flagstaff vein in that it is not closely associated with a diabase dike but occurs in the main diorite mass.

(Note: Descriptions of the north and south, or cross-vein system as given by the several observers who have examined and described it, differ substantially and are very difficult to interpret and reconcile one with another. See Appendixes "A", "B", "C" and "D", and also the map, Appendix "K". The difference in strike as recorded by the several observers may be due to the fact that there are at least two veins in the cross-vein series, or that the various portions of the vein differ from one another in strike, as recorded by Wilcox).

The two vein systems intersect near the southerly end of the developed section of the Flagstaff vein.

Mine and Development Workings and Associated Ore Showings:

Workings on the Flagstaff Vein: The principal mine workings

on the Flagstaff vein as of April 20, 1940 are displayed in plan and longitudinal section on the map entitled "Plate 4, Flagstaff Mine", (Appendix "K"). This print is from a tracing of the mine map that was made by Mr. McCurdy to accompany his report to the Flagstaff Mining Company in the year 1940.

With reference to the underground work performed during the year ending in June, 1940, Mr. Roehm in his report to the Commissioner of Mines, states:

"In the mine the tunnel has been advanced to a total length of 1120 feet. The total length was 485 feet when the Company took its option on the property in July, 1937. During the last year three additional raises have been driven to heights averaging 55 feet. This makes a total of six raises. A 50-foot winze was sunk on the vein last winter at a point 380 feet from the tunnel's portal. Quartz, which is reported to be good ore, shows down its entire length in thickness from 18 inches to 3 feet. At a point 900 feet from the tunnel portal a cross-vein was encountered which contains only small values and beyond which no values were found in the tunnel on the main vein".

In commenting further on this development work, Mr. Roehm states in his 1940 report:

"In the last 50 feet of tunnel work the drift turned 15° to the south and followed a vein which leaves the diabase dike and goes into the footwall. This vein contains no values whereas ore shows in the dike on the surface further up the mountain".

A report to the Commissioner of Mines on progress made in operations during the year 1941, after an inspection that was made by Mr. Roehm in October of that year, includes the following statement:

"The Flagstaff Gold Mining Company was inactive up until August when a crew of four men began the performance of work necessary to fulfill the requirements of the annual labor law and also necessary to comply with the terms of the Company's purchase agreement. These men were engaged in crosscutting into the hanging wall at a point 15 feet east of the winze in the main tunnel. This is 40 feet east of the north-south fault which cuts off the ore on this level. The crosscut was being driven by hand mining and was in a distance of 15 feet. The diabase which forms the hanging wall of the vein was penetrated and the crosscut ended 5 feet into the diorite. On the hanging wall of the dike a few calcite seams containing minor amounts of manganese carbonate were cut. Since there was no further known objective in continuing this crosscut the writer

advised that work on it be discontinued. Instead it was recommended that new work be undertaken commencing at a point 60 feet back from the face of the mine tunnel, which from that point follows a small barren quartz vein into the footwall, and to project a tunnel along the footwall of the dike where the ore shoots of the mine have formerly occurred and in which position they are known to exist on the surface above".

In the same report Mr. Roehm also states:

"Mr. U. S. Rush, engineer from Seattle, who examined the property last year, recommended that the Company proceed with further development operations. His recommendation was that a new tunnel be started 163 feet lower in altitude and about 300 feet slope-distance away from the portal of the present working tunnel. The point selected by him for the new portal is at the foot of a small bluff in the center of the tram right-of-way and 200 feet north of the vein. The steel sharpener and furnace have been moved and set up in a building near this site".

That a lower tunnel similarly placed was contemplated by Mr. McCurdy in his report to the Company is indicated on his map - Appendix "K".

In a letter received by the Commissioner of Mines in February, 1942 from a representative of the Flagstaff Mining Company, the following explanation was given as to why the proposed plans above indicated were not carried out, and as to why the option on the property was relinquished:

"Prior to the relinquishment the Company had contracted with Homer Bradford to drive a lower tunnel. Mr. Bradford went to Denver to pick up equipment which he needed to economically do the work but could get neither the equipment nor any promise of a delivery, and as the Company was required to mine or mill for a period of nine months out of each year, it found the conditions impossible of practical performance and the relinquishment resulted".

Workings on Cross-vein System: Workings on the "upper" or "cross-vein" series that were found by Mr. Roehm during his visit to the property in 1938, were described by him as follows:

"No. 1 tunnel on the north-south vein is located above a small cabin and arrastre near the top of the mountain and at an elevation of 2690 feet. Throughout its entire length of 166 feet the tunnel follows the vein. The vein consists mainly of altered and crushed diorite with small quartz lenses that vary from 6 to 15 inches in width enclosed in the gouge. Very little mineralization shows in the quartz and gouge".

"No. 2 tunnel is on the same vein and located at an elevation of 2730 feet. It also follows the vein and has a length of 108 feet. The vein consists of from 8 to 10 inches of gouge material containing crushed and angular quartz".

"No. 3 tunnel, which is at an elevation of 2770 feet, was caved and not accessible. Pieces of quartz were exposed on the dump. Above No. 3 tunnel a lens of quartz occurs on the vein and is exposed for 150 feet. The quartz is banded and has a width that varies from 2 to 3 feet. Mineralization is spotty and sparse. To the north three additional outcrops on the vein show similar widths of quartz, which appears to be only slightly mineralized".

For somewhat more complete descriptions of workings on the cross-vein system see memorandum by Wilcox - Appendix "D".

Mineralization:

The lens of ore in the Flagstaff vein where it outcrops beneath the waterfall above the mine tunnel, as above referred to, contains the largest amount of metallic minerals of any exposure seen. In the order of their abundance these minerals are: pyrite, galena, chalcopyrite, gold and silver. ~~The free gold content is reported to range from 2% to 40%.~~ The ratio of the silver to gold is high in comparison to most gold veins in this section. The gangue minerals consist of white milky quartz, calcite, epidote, chlorite and various altered diorite and dike minerals.

The north-south vein has mineralization which is similar but weaker in nature and, as previously stated, more of the gold occurs in a free state.

Assays:

No assays were taken by Mr. Roehm on the Flagstaff property for the reason that nearly all outcrops, as well as exposures in the tunnels and other workings, had been sampled by officials of the mining company.

The results of assays of samples taken by Mr. Wilcox on exposures of the cross-vein system appear in his memorandum - Appendix "D".

Equipment:

For a list of the major items of equipment that were on the Flagstaff property in the spring of 1940 see Appendix "G" - "Flagstaff Mine - Major Items of Equipment" by Mr. McCurdy.

From 2% to 40% of the gold content of the ore is reported to occur in the free state.

Former Milling Operations:

The results of former milling operations appear in Appendix "H" of this report - "Mill Production of Flagstaff Mining Company" by E. S. McCurdy.

Timber and Water Power:

Timber for building the mine camp and the mill was obtained in the immediate vicinity. The supply of timber is abundant along the tractor road.

The Company has staked and held as a mill-site the outlet of Karta Lake. This lake, together with the additional basin of Salmon Lake, which is only a few feet higher, provides one of the largest potential water power sites on Prince of Wales Island. Should industrial projects or mining ventures justify it this power could be easily developed.

APPENDIX "A"

"Ketchikan District, Kasaaan Bay, the Treasure Group of Claims" - by F. E. and C. W. Wright, U. S. Geological Survey Bulletin 284, pp. 41-42 - "Investigation of Mineral Resources of Alaska, 1905".

"The Treasure group of claims, located on the east slope of Granite Mountain, is reached by trail from Karta Bay. The ore body is exposed in a gulch which has resulted from erosion along the quartz-filled fissure. At about 1,400 feet elevation a tunnel over 500 feet in length has been driven along the vein, which varies from 1 to 3 feet in thickness, with an average of about 18 inches, and strikes N. 55° W., with a steep northeasterly dip. Its walls are free and often lined with mineralized gouge, and show slipping striæ which pitch at low angles to the northwest. The vein lies largely in the hanging-wall side of a diabase dike which is frequently decomposed and resembles the "paint rock" of iron-ore miners. The dike has invaded the granite and fills one of the several large fracture or joint fissures. Along the same place of weakness the mineral-bearing solutions have also deposited their content of quartz with free gold, pyrite, chalcopyrite, and galena. The term granite has been used as a field name, the actual rock being more basic in composition and varying from a medium- to fine-grained diorite to gabbro in which considerable secondary epidote and hornblende appear. A second tunnel, about 160 feet beneath the upper one, has been driven 50 feet along a narrow quartz vein 6 inches in width which may be the continuation of the main lead. Above these workings a second set of veins has been discovered crossing the first and striking N. 15°-20° W. They are also younger than the diabase dikes and crosscut instead of following them. The character of mineralization of the cross veins is not unlike that of the first set. Values, however, are reported to be lower and irregularly distributed".

APPENDIX "B"

"Treasure Group" - by F. E. and C. W. Wright,
U. S. Geological Survey Bulletin 347, pp.
164-165, - "The Ketchikan and Wrangell Mining
Districts".

"The Treasure Group of twelve or more claims is located on the east side of Granite Mountain about $1\frac{1}{2}$ miles from Karta Lake. The developments consist of two tunnels, the upper, at 1,380 feet elevation, following the vein for 450 feet. The vein varies from 1 to 2 feet in width and follows the hanging wall of an altered diabase dike rock in the granite. Its general strike is N. 55° W. and its dip from 60° to 80° NE. This vein has been traced up the mountain slope along a steep gulch and over the summit for a mile, five claims being located on this vein alone. At the upper tunnel considerable ore has been extracted and placed ready for transportation. The metallic minerals are free gold, pyrite, galena, and chalcopyrite. The pyrite crystals are frequently coated with a deep-brown lustrous oxidation crust and the chalcopyrite occasionally shows green staining. Movement along the vein is indicated by the soft mineralized gouge, which is frequently found along the vein walls. The country rock, for which the general term "granite" is used, is a granitoid rock varying in composition from diorite to gabbro and is often strongly epidotized.

The second set of five claims is located on a deposit in a fracture plane, striking N. 20° E. and dipping 20° NW. This vein crosses the first vein about 500 feet above the upper tunnel and likewise is contained in the granite country rock. The width varies from 1 to 3 feet and the values are lower than those contained in the northwest striking veins".

APPENDIX "C"

"The Treasure Group of Claims" (Last Chance 1, 2 and 3) - by Theodore Chapin; U. S. Geological Survey Bulletin 642, pp. 80-81, -
"Mineral Resources of Alaska, Report on Progress and Investigations in 1915".

"The Treasure group of claims, on Granite Mountain, was relocated in 1912 as the Last Chance 1, 2 and 3. These claims are on Granite Mountain and may be reached by trail from either Karta Bay or Hollis. At an altitude of 2,400 feet an adit has been driven for about 50 feet in a mass of brecciated granite. Masses of quartz occur here, but the vein in place has not been located. Above the adit the vein has been traced for several hundred feet by surface pits and short adits. In some places it pinches to a mere gouge seam, and in others it swells to 3 feet; the average width is about 18 inches. Outcrops of what appears to be the same vein have been traced for 2 miles. The vein strikes N. 45° W. and dips northeast at varying angles. The vein matter is rusty cavernous quartz with considerable free gold. In places pyrite is abundant, and a little chalcopryite also occurs. The country rock is granite. It is planned to treat the ore temporarily in an arrastre, which in September, 1915, was in course of construction. Other veins carrying galena, chalcopryite and pyrite and containing both silver and gold have been opened, and considerable ore has been extracted from them, but at present they are not being worked".

APPENDIX "D"

Flagstaff Group - Extracts from Memorandum
on examination of the Flagstaff property in
1937, submitted to the Commissioner of Mines
by H. G. Wilcox, temporary field engineer,
Territorial Department of Mines.

"Flagstaff Vein:

The principal tunnel on the property is 512 feet long and is driven on a vein which strikes N. 60° W. to N. 65° and has a vertical dip. The vein is exposed in a creek and can be traced for several hundred feet in a horizontal direction and also several hundred feet vertically. The width varies from 16 inches to 4 feet and the mineralization consists of free gold, pyrite, chalcopryrite and galena. About 400 feet above the portal of the tunnel an oreshoot 4 feet wide is exposed for a short distance in the creek. Tom Stevens reports a sample across the vein at this point assayed \$16.59 across 4 feet. A sample was not taken at this exposure as ropes were not available for a descent into the creek. An outcrop in the creek at elevation 1,600 feet showed white quartz 16 inches in width. The vein was free on both walls and showed horizontal post mineral movement in the plane of the vein. The quartz was sparsely mineralized with pyrite and chalcopryrite. A sample taken across the vein gave no values in gold or silver. The portal of the tunnel is at elevation 1,390 feet and the average width of vein as shown in the tunnel is approximately 2 feet. The mineralization along the vein in the drift is slight. One mineralized section is near the portal, another 180 feet from the portal and the third begins a few feet from the face of the drift.

Samples taken in the tunnel are listed below:

<u>Location</u>	<u>Width</u>	<u>Ounces per ton</u>		<u>Value</u>
		<u>Gold</u>	<u>Silver</u>	
512' (face)	18"	.78	7.86	\$ 30.80
475'	27"	.04		1.40
450'	20"	.06		2.10
365'	24"	.02		.70
315'	34"			Nil
260'	15"	.02		.70
230'	20"	.06		2.10
215'	28"	.04		1.40
200'	28"			Nil
185'	14"	.42	3.12	16.09
170'	20"	.04	.28	1.53

A tunnel 20 feet long (*) has been driven on a 3-foot quartz vein which lies about 300 feet south of the tunnel portal and about 150 feet lower in elevation. Other veins were said to have been opened by trenching, but were not examined.

"Upper" or "Cross-Veins"

The upper vein on this property is covered by four claims known as the Orion claims. The vein strikes N. 20° to 30° W. and dips approximately 25° W. and is exposed on both sides of a south-west trending ridge at elevations ranging from 2,550 to 2,700 feet. The vein is traced along the strike for approximately 500 feet. Three tunnels have been driven on the vein on the south side of the ridge, the longest being 155 feet. A tunnel has been driven 66 feet on the vein on the north side of the ridge and the vein is exposed by trenches where it crosses the ridge. The vein is a fissure vein in diorite in which post mineral movement has broken the quartz filling into small irregularly spaced remnants which are mixed with considerable gouge. The width of this vein varies from 1 foot to 3 feet and the percentage of quartz varies from 25% to 70%. Some high grade ore was reported to have been found in this vein and the high grade was mortared and panned. Tom Stevens' most recent work had been the driving of a 66-foot drift at elevation 2,660 feet on the north side of the ridge. Five samples were taken in this tunnel and the values ranged from 27 cents to \$3.72 and the vein width from 1 foot to 2 feet. Two samples were taken from the vein outcrop on the crest of the ridge. A sample across 4 feet of quartz at the highest exposure assayed \$1.40 in gold and a sample across 3 feet of quartz in the opencut above the upper tunnel on the south side of the ridge assayed \$1.40 in gold. The portal to the upper tunnel, north side, had been shot out. The lower tunnel on the north side is 165 feet long and follows the vein on an irregular course that varies from N. 15° E. to N. 45° W. Two samples taken across 18-inch widths gave no values".

(*) In their description Wright brothers give 50 feet as the length of this tunnel.

APPENDIX "E"

MILL PRODUCTION OF FLAGSTAFF MINING COMPANY
1938 to March 1, 1940.

<u>Mill</u>	<u>Period Operated</u>	<u>24-hour. Days, No.</u>	<u>Tons</u>	<u>Tons Milled Per 24-hr. Day</u>
Small mill	7/28/38 - 12/31/38	56.0	382.5	6.83
Small mill	1/1/39 - 4/21/39	45.0	222.0	4.91
Both mills	9/25/39 - 12/18/39	34.5	792.6	23.00
Large mill	2/6/40 - 3/1/40	<u>4.7</u>	<u>65.0</u>	<u>14.00</u>
		140.6	1,462.1	10.11 - average

Therefore in twenty months the mill operated only slightly over four and one-half months.

APPENDIX "F"

FLAGSTAFF TUNNEL - VEIN WIDTH AND VALUES.

<u>Dist. from Portal (feet)</u>	<u>Vein Width (inches)</u>	<u>Values (\$)</u>	
0	10		
2½	12		
4	15		
7	20		
11	23		
15	23		
20	22		
25	17	2.81	
30	16	4.66	
35	20	6.00	
40	14	4.27	
45	7		
47	14	14.92	
50	14		
55	13	2.04	
60	18	13.65	
66	18	3.54	
70	8		
76	7		
80	5		
86	5		
90	22		
96	28		
102	23		
105	6		
109			Sta. A
112	9		
116	9		
122	8		
127	30		
132	12		
137	14		
142	14		
147	10		
152	10		
157	5		
164	23	1.98	
167	20	7.72	Stope
170	33	3.38	Stope
172	34	1.44	
177			Sta. B.
182	18	10.65	Stope
186	12	5.75	Stope
192	30	4.50	Stope
202	34	Tr.	

<u>Dist. from Portal (feet)</u>	<u>Vein Width (inches)</u>	<u>Values (\$)</u>	
207	27	Tr.	
214	24	3.45	
217	21	1.50	
222	17		
227	25		
232	22		
237	15	2.17	
247	14		Sta. C (250 Wall)
252	18		
257	18		
267	14		Sta. D (270 Wall)
273	8		
293	20		
313	38		
318	39		
328			Sta. E (Wall 330)
338	22		
358	20 +		
363	30		
376	17		
383	6		
387	6		
393	8		
397	6		
404	8		
408	8		Sta. F. (Wall 410)
413	11		
418	12		
423	18		
428	8		
433	5		
438	18		
443	22		
448	20		
453	22		
458	31		Sta. G (Wall 460)
463	39	Tr.	
468	32	1.72	
473	28	1.40	
478	21		
483	22		
488	21	5.30-1.37	
493	19	1.05	
498	18	12.93	
503	17	10.72	
508	16	14.38	
511	15	20.48-13.20	Sta. H. (Wall 513-506)

<u>Dist. from Portal (feet)</u>	<u>Vein Width (inches)</u>	<u>Values (\$)</u>	
513	9	13.34	
518	11	5.25	
523	11	3.01	
528	8	49.02	
533	5	3.52	
538	15	9.38	
543	20	9.98	
548	26	26.68	
549		(Varied specimen)	
		(Pyrite \$3.55 Gal.-)	
		(Chalc. \$69.50)	
560-600	Pinch		
600-620			Stope 15' high
643-665			Stope 20' high
745-775	Pinch		
780	12		

APPENDIX "G"

FLAGSTAFF MINE - Major Items of Equipment

Drill sharpener & oil furnace Dies

Pumps : 1 Used Worthington Duplex 6x5 & 3/4 x 6
1 " " " 3x1 1/4 x 3

Drills: 6 stopers, Leyners, chipper etc.

Blower & Engine:

At portal - Wyoming Blower - 3 HP Briggs & Stratton gas engine

Outboard motors: 1 8 HP; 1 4 HP

Trucks: 1 1 1/2 ton used International 1936 model
1 " " " " 1936 "
1 1 1/2 " " Ford

Raft Engine: 6 cyl. - Chevrolet

Tractors: 1 used 50 HP Allis Chalmers
1 " 50 HP

Engine for mill and compressor:

1 9 m. - 90 HP Diesel Model E 1 C - C - 71

Compressor: Ingersoll Rand XB 440 cu. ft. No. 10 model

Compressor engine at portal

Compressor West Trac. Brake Co. 373 - 320 cu. ft.

Engine Wisconsin Motor Corp. 100 HP

Crusher - 6 x 12 Pacific

Run by 30 HP Waukiska 4 cylinder

Mill:

1 - 10 ton 3 x 3 Morse Bros. No. 33 Ball Mill
1 - 24 ton 4 x 3 " " " "
1 - 15' x 6" Wilfly table
1 - 4 cell Weining sub. 2-15" Flot. unit
1 - 15" x 12' Simplex Rake Drag classifier
1 - 27 x 14' 8" " " " "
1 - 1" Belt driven sand pump
1 - 2" " " " "
1 - 10' x 10' - 2" redwood tank
2 - 3" x 6" Morse plunger or feeder
3 - 12' Dodge friction clutch

SUPPLEMENTARY REPORT TO PRELIMINARY REPORT
ON FLAGSTAFF MINING COMPANY, KARTA

RAY

June 4, 1940

RECEIVED

The Flagstaff Mining Company has an expenditure to date of \$160,000. The returns from ore milled and concentrate smelter returns have only been a few thousand dollars,* on which a ten per cent royalty has been paid the owners, and nothing has been paid on the original purchase price of \$150,000. The royalties do not apply on the purchase price. However, the company may continue to mine as long as royalties of ten per cent of the gross returns are paid, and the mine operated nine months per year.

Apparently, since the mine was not producing a profit and the expenditure of more capital was needed this spring, the New York interests sent Mr. E. M. McCurdy, engineer from San Francisco, to make an examination and investigation. This examination, which was wholly for the purpose of determining returns on already invested capital, and strengthened by the numerous mistakes in mining, milling and the expenditure of development capital, resulted in a negative recommendation, which has resulted in closing operations since that time. There was considerable comment in the report as to the inaccuracy of the mine assays, the mill operation and the unaccounted-for \$43,000 of the total sum spent. The cost of this examination was reported amounting to over two thousand dollars.

No doubt the New York interests have more knowledge and a better sense of judgment as to the property and have decided on the present examination by Mr. U. S. Rush. With these conditions known and a fair knowledge of the property, the writer discussed the whole situation with Mr. Rush. Besides giving him verbally all the information regarding the property that was known, the writer went over the greater portion of the workings with him. It was pointed out to him the inaccuracy of charging all development costs on a few months of poor milling, and the small amount of development, against the possibilities. Further, I actually showed him where in the last 50 feet of tunnel work the drift turned 15° to the south and followed a vein which leaves the diabase dike and goes into the foot-wall, and contains no values, while ore shows in the dike on the surface further in the mountain. This fact was not mentioned in McCurdy's report.

While there are many angles and considerable could be written concerning the causes of the present conditions, at least the greater portion of these conditions would not have come about, had they taken this department's advice and obtained a capable mining man in the beginning instead of trying to operate among themselves. Who these New York interests are, the writer did not learn. However, the interests are all held by a small group of individuals and no stock has been sold to the public.

*For exact figures on production and expenditures, costs, etc. refer to copies of cost sheet, etc. by McCurdy on file.

(515) B.A.3

In the mine the tunnel has been advanced to a total length of 1120 feet. The tunnel length was 485 feet when the company took option July 28, 1937. During the last year's work, three additional raises have been driven to heights averaging 55 feet. This makes a total of six raises. A 50-foot winze was sunk on the vein last winter at a point 880 feet from the portal. Quartz shows down its entire depth ranging from 18 inches to nearly 3 feet and was reported as good ore. At a point 900 feet from the portal a cross-vein was encountered which contains only small values, and beyond which no values were encountered in the tunnel on the main vein. (Note McCurdy's map of workings).

Safety conditions in the mine are good. The raises are timbered and lagged, ladders good, and the drift timbered occasionally. The winze is not timbered, but has good walls and stulls on the footwall contain ladder and bucket guides.

The additions in the mill consist of another 100-ton ore bin, 3x4' Morse Bros. ball mill, Dorr classifier, and amalgam plates. The Caterpillar motor has been replaced with a 90 H. P. General Motors diesel. An Ingersoll-Rand type 10 - 440 cu. ft. double-cylinder compressor has been installed. As a result of both mills, the compressor and all other movable milling equipment being powered by the diesel, it has been overloaded and has given considerable trouble. The road was completed last summer from the lake to the mine, and trucks now run from the mine to the beach, with barging across Karta Lake on a powered raft. A total of four men are at present maintained on the property.

The following is a petrographic analysis of four samples from which slides have been made and are on file at the office of the Territorial Department of Mines, Juneau, Alaska:

T.D.M. 68 -

Flagstaff Mine, Karta Bay
High grade quartz lense
Lower tunnel
Distinct well shaped crystal faces
Some fine grained in between
Mineralization associated with olivine

T.D.M. 69 -

Same
Greenstone dike containing ore associated
Augite 30%
Feldspar plagioclase
Labradorite 55%
Chlorite and quartz, mineralized 15%
Diabase

T.D.M. 70 -

Same

Altered dike from tunnel

Mineralization 20%

Alterization extreme

No recognizable mineral except introduced quartz in
seamlets and chlorite

Altered to chlorite, calcite

T.D.M. 71 -

Formation of Flagstaff Mine inclosing ore

Quartz 30%

Augite and hornblende 20%

Zoned feldspar - orthoclase and biotite - microcline
and albite

September 24, 1938

Mr. Wm. Goodwin,
Flagstaff Mining Company,
Box 1698,
Ketchikan, Alaska,

Dear Mr. Goodwin,

Since the receipt of your recent letter I have seen Mr. Hesse and have discussed with him your needs as outlined by you. I have given him the record of achievement made by your company as stated to me in your letter and know that it will be a factor in his decision. You will no doubt hear from Mr. Hesse direct at an early date as to his response to your request for additional financial help, and I hope it will be favorable.

It was a pleasure to learn that the results of your operations have been gratifying recently and I was much interested in having the details given in your letter. I assure you of my continued interest and desire to be of help in any way I can.

During her visit with the Wilcox family we had the pleasure of becoming acquainted with your fine daughter of whom you may well be proud.

With kind regards,

Cordially yours,

E. D. Stewart,
Commissioner of Mines.

Flagstaff Mining Co.,
Box 1698.,
Ketchikan, Alaska.

Mr. B. D. Stewart,
Mining Engineer.,
Juneau, Alaska.

Dear Mr. Stewart;

Well the Flagstaff Mine is now well under way and into production, we have 3 raises working and another one about to start, have the mill running 18 hours per day and will soon get it running 24 hours with enough ore ahead to start the drift again, and contact 4 more possible ore shutes and a few intersecting cross veins that cut the vein we are working on.

Thanks to you and Mr. Hesse the road is now well along and we have our truck coming Monday on the Tongass to start graveling the road. Within a month I believe we can operate a oat on this road from the salt water to the lake and this will certainly help us a lot.

I have just written to Mr. Hesse trying to get another voucher after this road is completed to the lake to carry us thru to camp, of the two miles from the lake to camp all but about 600 feet is easy to construct and gravel as for the most part it is built on gravel along the creek bottom.

If the Forest Service could not continue, we could with the assistance from the Highway Department, carry on and have a truck road to camp. We are running about 15 tons of concentrate per month, and they are running around \$400.00 per ton and over. Have recently received a report from Selbys Smelter of San Francisco and they will pay us for lead, copper and iron which will pay the expense of shipping and smelting, and leave the Gold and Silver clear, this is a very good arrangement. Have had a hard time getting concentrate out over the puncheon road from lake to beach, but manage to get 500 lbs out to a trip with a fuel for back haul.

Hoping that we can continue to have your backing on the future of our district, and that you can get Mr. Hesse to see things here the way we do, I beg to remain,

Sincerely,
Flagstaff Mining Co.,
By,

Wm Fordman

NOTED
SEP 19 1938
B. D. STEWART
Commissioner of Mines

*Read by
Hesse
9/22/38
B.D.*

*Memo by Reckm-
of info
Source not given.
B.S.*

MILL PRODUCTION OF FLAGSTAFF MINING COMPANY
1938 to March 1, 1940

<u>Mill</u>	<u>Period Operated</u>	<u>24-hour Days, No.</u>	<u>Tons</u>	<u>Tons Milled Per 24-hr. Day</u>
Small mill	7/28/38 - 12/31/38	56.0	382.5	6.83
Small mill	1/1/39 - 4/21/39	45.0	222.0	4.91
Both mills	9/25/39 - 12/18/39	34.5	792.6	23.00
Large mill	2/6/40 - 3/1/40	<u>4.7</u>	<u>65.0</u>	<u>14.00</u>
		140.6	1,462.1	10.11 - average

Therefore in twenty months the mill operated only slightly over
four and one-half months.

INVESTED CAPITAL OF THE FLAGSTAFF MINING COMPANY

Expended for construction to 4/1/40 - - -	\$ 87,702.33
Expended for development to 4/1/40 - - -	<u>30,035.96</u>
Total expended - - - - -	117,738.29
Amount reported expended - - -	<u>180,000.00</u>
Unaccounted for - - - - -	43,000.00

Appendix - "G"
B.P.S. - Dec 1938 - Jan 1940
Smelting

MILL PRODUCTION OF FLAGSTAFF MINING COMPANY
 1938 to March 1, 1940

<u>Mill</u>	<u>Period Operated</u>	<u>24-hour Days, No.</u>	<u>Tons</u>	<u>Tons Milled Per 24-hr. Day</u>
Small mill	7/28/38 - 12/31/38	56.0	382.5	6.83
Small mill	1/1/39 - 4/21/39	45.0	222.0	4.91
Both mills	9/25/39 - 12/18/39	34.5	792.6	23.00
Large mill	2/6/40 - 3/1/40	<u>4.7</u>	<u>65.0</u>	<u>14.00</u>
		140.6	1,462.1	10.11 - average

Therefore in twenty months the mill operated only slightly over four and one-half months.

INVESTED CAPITAL OF THE FLAGSTAFF MINING COMPANY

Expended for construction to 4/1/40 - - - \$ 87,702.33
 Expended for development to 4/1/40 - - - 30,035.96
 Total expended - - - - - 117,738.29
 Amount reported expended - - - 160,000.00
 Unaccounted for - - - - - 43,000.00

Print

FLAGSTAFF TUNNEL - VEIN WIDTH AND VALUES

Dist. from Portal (feet)	Vein Width (inches)	Values (\$)
0	10	
2 $\frac{1}{2}$	12	
4	15	
7	20	
11	23	
15	23	
20	22	
25	17	2.81
30	16	4.66
35	20	6.00
40	14	4.27
45	7	
47	14	14.92
50	14	
55	13	2.04
60	18	13.65
66	18	3.54
70	8	
76	7	
80	5	
86	5	
90	22	
96	28	
102	23	
105	6	
109		
112	9	
116	9	
122	8	
127	30	
132	12	
137	14	
142	14	
147	10	
152	10	
157	5	
164	23	1.98
167	20	7.72
170	33	3.38
172	34	1.44
177		
182	18	10.65
186	12	5.75
192	30	4.50
202	34	Tr.
207	27	Tr.
214	24	3.45
217	21	1.50
222	17	
227	25	
232	22	
237	15	2.17
247	14	
252	18	
257	18	
267	14	
273	8	
293	20	
313	38	

*Mine samples
taken during
course of operations
info per J.C.R.*

NOTED

SC-17-19

W. B. STEWART
Geological Engineer

Sta. A.

Stope
Stope

Sta. B.
Stope
Stope
Stope

Sta. C. (250 Wall)

Sta. D. (270 Wall)

<u>Dist. from Portal (feet)</u>	<u>Vein Width (inches)</u>	<u>Values (\$)</u>	
318	39		
328			Sta. E. (Wall 330)
338	22		
358	20 +		
363	30		
376	17		
383	6		
387	6		
393	8		
397	6		
404	8		
408	8		Sta. F. (Wall 410)
413	11		
418	12		
423	18		
428	8		
433	6		
438	18		
443	22		
448	20		
453	22		
458	31		Sta. G. (Wall 460)
463	39	Tr.	
468	32	1.72	
473	28	1.40	
478	21		
483	22		
488	21	5.30-1.37	
493	19	1.05	
498	18	12.93	
503	17	10.72	
508	16	14.38	
511	15	20.48-13.20	Sta. H. (Wall 513-506)
513	9	13.34	
518	11	5.25	
523	11	3.01	
528	8	49.02	
533	5	3.52	
538	15	9.38	
543	20	9.98	
548	26	26.68	
549		(Varied specimen)	
		(Pyrite \$3.55 Gal.-)	
		(Chalc. \$69.50)	
560-600	Pinch		
600-620			Stope 15' high
643-665			Stope 20' high
745-775	Pinch		
780	12		

Major Items of Equipment

Drill sharpener & oil furnace Dies.

Pumps

- 1 Used Worthington Duplex 6x5 & 3/4 x 6
- 1 " " " 3x1 1/4 x 3

Drills

6 stopers, Leyners, chipper etc.

Blower & Engine

At portal - Wyoming Blower - 3 HP Briggs & Stratton gas engine

Outboard motors

- 1 8 HP
- 1 4 HP

Trucks

- 1 1 1/2 ton used International 1936 model
- 1 " " " " 1936 "
- 1 1 1/2 " " Ford

Raft Engine

6 cyl. - Chevrolet

Tractors

- 1 used 50 HP Allis Chalmers
- 1 " 50 HP

Engine for mill and compressor

1 9 m. - 90 HP Diesel Model E 1 C - C - 71

Compressor

Ingersoll Rand XB 440 cu.ft. No. 10 model

Compressor engine at portal

Compressor West Trac. Brake Co. 373 - 320 cu.ft.
Engine Wisconsin Motor Corp. 100 HP

Crusher - 6 x 12 Pacific

Run by 30 HP Waukiska 4 cylinder

Mill

- 1 - 10 ton 3 x 3 Morse Bros. No. 33 Ball Mill
- 1 - 2 1/2 ton 4 x 3 " " "
- 1 - 15' x 6" x 6 Wilfly table
- 1 - 4 cell Weining sub. 2-15" Flot. unit
- 1 - 15" x 12' Simplex Rake Drag classifier
- 1 - 27 x 14 1/2 " " " "
- 1 - 1" Belt driven sand pump
- 1 - 2" " " " "
- 1 - 10' x 10' - 2" redwood tank
- 2 - 3" x 6" Morse plunger or feeder
- 3 - 12' Dodge friction clutch

NOTED
Read from Rack
SEP 11 10

D. STEWART
Commissioner of Mines

FLAGSTAFF CINE & MILL RECORD FOR OCTOBER, 1939

(The largest productive month - with both mills operating)

1. 420 tons of oxidized ore from stopes #4 & #5 were milled during the month in 18 - 24-hr. days at the rate of 25.3 tons per day
2. The average mill heads (Gold at \$35.00, silver at \$0.706 - no copper or lead) by mine assay were \$15.42 per ton
3. " " " tails (" " " " " " " " " " " " " ") " " " " 6.48 " "
4. " indicated recovery (" " " " " " " " " " " " " ") " " " was 6.94 " " or 58%

(1) Date re- cd. by Smelter & Lot number	(2) Concen- trates & Bullion Wt. Dry tons (3) or ounces (Oz)	(3) Charac- ter of Concen- trates	(4) Gold Content Ounces	(5) Silver Content Ounces	(6) Copper Content % by Wt.	(7) Lead Content % by Wt.	(8) Total Gold Value & \$/oz.	(9) Total Silver Value & \$/oz.	(10) Total Gold & Silver Value & \$/oz.	(11) Smelter Silver Value & \$/oz.	(12) Settlement Copper Value & \$/oz.	(13) Values Total	(14) Smelter Charges Includ- ing Freight	(15) Smelter Net Check (13)-(14)	(16) Smelter Net (in Conc.) Per ton conc. Per ton ore	
6. 11-20-39	5860	0.9765T	Flota- tion	12.360	96.00	10.02% 196 lb.	12.9% 252 lb.	432.60	67.77	405.61	64.27	17.11	488.99	74.59	412.40	421.46 0.992
7. 5850 1/2	3.0760T	Table	2.022	19.00	0.3% 44 lb.	0.7% 44 lb.	70.77	13.41	84.33	12.01	0.00	75.34	29.93	46.41	12.62	
8. 5850A	2.9035T	Table	13.762	131.00	3.46% 200 lb.	13.5% 948 lb.	481.67	92.48	444.74	87.57	13.98	346.29	25.59	520.60	178.93	
9.	7.564		28.144	246.00	2.9% 440 lb.	8.9% 1251 lb.	965.14	173.86	914.38	183.85	31.09	1109.62	130.21	979.41	129.40 2.33	
10. Bullion 12/15/39 Bar #2515	9.18 oz.		4.860	3.90			170.10	2.75	159.45	1.97		171.25	1.79	169.46 (30.40/ T.Ore)		
11.			33.004	243.90			1115.14	176.41	1074.13	165.82	31.09	1280.87	132.00	1148.97 (32.78/ T.Ore)		
12.							1115.14 1291.55	176.41 1239.95	1074.13 1239.95							

13. From above table: 55.5 tons ore produced 1.0 ton of concentrate; in concentrates there is 1 oz. of gold to 8.74 oz. silver & \$5.87 gold to \$1.00 silver. The value of total gold and silver at \$35.00/oz. and \$0.706/oz. (100%) is the total of columns (8) & (9) - line 12 or 1291.55, or \$2.07 per ton of ore recovered as against \$8.94 recovery (line 4) indicated by mine assay. Obviously if this table represents all of the production for October, 1939, such recovery was only 34% of the recovery indicated by mine assays and indicates clearly inaccurate sampling and/or assaying at mine, provided always that the above table represents the entire production for the month of October 1939, and I think it does, with possibly slight adjustments which would not materially affect the above conclusions.

14. The cost of "Marketing Concentrates" - (Smelter charges and freight) exclusive of transportation to Ketchikan: \$17.18/ton concentrates, \$0.30/ton of ore.

15. The difference between totals of columns (8) & (9) line 12 and columns (10) & (11) line 12, or \$51.61 represents the Smelter "drag" or difference between gross value of gold and silver of \$35.00/oz. and \$0.706/oz. (100%) and values indicated upon which Smelter settles. The net settlement for concentrates was \$129.40 per ton concentrates or \$2.33 per ton ore, and the net settlement for concentrates and bullion was \$2.79 per ton of ore.

16. The cost of transporting concentrates from mine to Ketchikan is estimated at not less than \$3.00 per ton of concentrates (including sacks and return freight on sacks) making the total cost of "Marketing Concentrates" not less than \$20.00 per ton of concentrates or about \$0.48 per ton of ore for October 1959.

17. There was practically no profit in shipping the table middlings, over and above "Marketing Cost" not to speak of milling or mining.

FLAGSTAFF MI & MILL PRODUCTIVE RECORD FROM 7/28/38 TO 4/1/40
(From beginning of mining operations to 3/1/40)

1. Total tonnage milled was 1461 tons, including 100 tons from dump.
2. " 24-hr. days mill operated was 140 - or 4 months 20 days in about 20 months.
3. The ore came from driving tunnel 415 feet, from 485 feet West of portal to cross vein No. 1 at 900 feet west of portal, and from stopes #3, #4, #5, #6, #7 & #8.
4. No daily record of value of mill heads is available, such as are available indicate a mine assay value (gold and silver only) of about \$15.00 per ton. Sufficient mine assay values of tails were not available to even guess at the value of the tails. I am sure that the recovery, heads v.s. tails, did not exceed 80% for the entire period.

	(1) Tons Concen- trate Dry	(2) Total Ounces Gold	(3) Total Ounces Silver	(4) % & Wt. Copper in Con- centrate	(5) % & Wt. Lead in Concen- trate	(6) Gold Value @ \$35.00/ oz.	(7) Silver Value @ \$0.706/ oz.	(8) Total Receiv- ed for Copper \$	(9) Total Receiv- ed for Lead \$	(10) Smelter Value for Settle- ment \$	(11) Total Smelter Charge Includ- ing Freight \$	(12) Net Smelter Returns (10)- (11) \$	
5. Concentrates	36.00	235.52	1875.70					*146.46	162.00	8908.43	638.19	3272.24	(Recd. \$23.00 Net/ ton Conc.
6. 9.18 oz. Bullion		4.86	3.90									169.46	(Recd. \$5.68 Net/ ton Ore
7. Total		240.38	1879.60	2.7%	6.9%	1974 lb.	5001 lb.	8413.30	1326.99			8441.70	(Recd. \$5.79 Net/ ton Ore

8. *8 Tons concentrates shipped to Selby returned \$162.00 for lead - no other lead paid for.
9. As the mine assays are made using \$35.00 per oz. for gold and \$0.706 per oz. for silver, by multiplying the total ounces of gold and silver shown in columns (2) & (3) by such 100% unit prices we secure a total value of gold and silver of \$9740.29 (columns (6) & (7) or \$6.66 per ton of ore, which should have been the difference between the mill heads and mill tails by mine assay for gold and silver only. If, therefore, the indicated recovery by mine assay was, say 58% (as the mine assays showed it to be for October, 1939) the mill heads would have been \$11.50 per ton average for the total 1461 tons milled, and proportionally higher if the recovery had been higher. Do not confuse this calculated recovery with the actual \$5.79 received per ton of ore. The difference is due to "Smelter Drag" and Smelter Charges including freight etc. Unquestionably the mill heads were not as "high" as the management believed, or the ore milled was greatly diluted with waste.
10. Ratio of concentration - ore to concentrates was 40.3 tons of ore to 1.0 tons of concentrate
" " Gold to Silver in ounces was 1.0 oz. of gold to 7.8 oz. of silver, ratio of gold to silver values: \$6.34 gold to \$1.00 silver
11. The amounts received for copper and lead are unimportant.
12. The smelter charges (column 11) show it cost \$17.40 per ton of concentrate (or \$0.43 per ton of ore) to market concentrates, to which must be added at least \$3.00 per ton of concentrate to cover transportation etc. to Ketchikan, indicating a total marketing cost of \$20.40 per ton of concentrate or \$0.51 per ton of ore
13. Of this entire 1461 tons milled it is impossible to accurately determine how much came from ore produced in advancing tunnel 415 feet (from 485 feet west of portal to the cross vein #1 at 900 feet west of portal). The month of October 1939 produced and milled 420 tons from stopes #4 & #5 and this month is treated in detail hereafter. The month of October 1938 produced and milled 122.5 tons from stope #3 (Sulphide ore) - the mine assays showing average mill heads of \$18.49 (gold and silver) v.s. mill tails of \$2.27 (gold and silver) indicating an 88% recovery, but this month cannot be properly analyzed as the concentrates produced were not separately shipped, and the smelter return reports cannot, therefore, be balanced against the month's production as I have endeavored to do for the month of October 1939.

PLATE 5
 FLAGSTAFF MINE
 Plan of Camp
 Scale 1" = 40' - 4-20-40

