

446

Flagstaff Mine, see also--Yellow Jacket Group

Gold

NAME

OLD NAMES

PRINCIPAL ORE

MINOR MINERALS

9 S	41 E	5
T	R	S

PUBLISHED REFERENCES

Lindgren 01:724  
 Swartley 14:130  
 Parks & Swartley 16:93  
 Grant & Cady 14:152  
 Gilluly, Reed and Parks 33:74  
 Gilluly 37:96  
 Oregon Metal Mines Handbook 14-A, page 105

MISCELLANEOUS RECORDS

..Baker..... COUNTY  
 ..Virtue..... AREA  
 ..3900..... ELEVATION  
 ..... ROAD OR HIGHWAY  
 ..7 mi. Baker..... DISTANCE TO SHIPPING POINT

PRESENT LEGAL OWNER (S) ..... Ken Grabner.....

Address ..... Baker, Oregon.....

OPERATOR .....

Name of claims	Area	Pat.	Unpat.
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Name of claims	Area	Pat.	Unpat.
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EQUIPMENT ON PROPERTY

**REPORTS**

Yellow Jacket Group (Old Flagstaff) HKL 5/28/40			x
The Flagstaff Mine, Baker Co., Ore., Geo. Kirkbride (ME) 6/27/34			x
Assorted correspondence on mine by various engineers and former Superintendent			x

**SHIPMENT AND ASSAY RECORDS**

Statement by Kenneth Grabner re 1938-9 lease production			X
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**MAPS**

Flagstaff Mine--a geologic map of area	x		
Underground plan by D.M.A. Armstead 1906			x
Section of workings by C.M. Foster 1896			x
Plan of workings up to Feb. 1, 1898			x
Plan	x		

*Yellow Jacket Group - see Flaystaff*

*Gold*  
PRINCIPAL ORE

MINOR MINERALS

95      41E      5  
T                      R                      S

PUBLISHED REFERENCES

*Baku* ..... COUNTY

*Justin* ..... AREA

*3500* ..... ELEVATION

..... ROAD OR HIGHWAY

..... DISTANCE TO SHIPPING POINT

MISCELLANEOUS RECORDS

PRESENT LEGAL OWNER (S) ..... *Ken Grabner* .....  
.....  
.....  
.....

Address ..... *Baku Dwyer* .....  
.....  
.....  
.....

OPERATOR .....

Name of claims	Area	Pat.	Unpat.

Name of claims	Area	Pat.	Unpat.

EQUIPMENT ON PROPERTY  
.....  
.....

QUARTZ PROPERTY

1. Name of property Flagstaff Mine  
Operating company (or individual) \_\_\_\_\_  
Address \_\_\_\_\_  
Location of property \_\_\_\_\_  
Acreage of holdings \_\_\_\_\_  
*Letter of previous <sup>date</sup> describes findings.*  
*Albert V. Quine*
2. History of property, past and recent:
3. History of production:
4. Development: Number of levels, lengths of drifts and cross-cuts, raises, etc.:
5. General description and equipment on hand, topography, country rocks, elevation, timber, water, snow fall, climate, power, etc.
6. Geology - General and local. Ore geology - type of deposit, i.e., vein, mineralized zone, bed; contact relations, attitude and orientation, vein minerals, gangue, type of mineralization, alteration, enrichment, etc.
7. Metallurgy - nature of ore, hard or soft, free-milling, base, direct shipping, etc. Kind of mill and equipment in use or planned, current daily tonnage of ore or concentrates, approximate value, freight rates to smelter, etc.
8. Remarks - economics: High or low cost, principal drawbacks, reasons for success or failure, apparent life of operation based on apparent quantity of ore available.

YELLOW JACKET GROUP (OLD FLAGSTAFF)

VIRTUE DISTRICT

BAKER, OREGON

OWNER AND OPERATOR:

Kenneth Grabner Willow Creek, Oregon

AREA AND LOCATION:

Four unpatented claims called the Yellow Jacket No. 1, Yellow Jacket No. 2, Yellow Jacket No. 3 and Depot, located in sec. 5 T 9 S R 41 E W. M. The claims are about 7 miles northeast of Baker.

HISTORY:

Recent: The Flagstaff was abandoned and relocated as the Yellow Jacket Group in 1938 by George Ray, Isabell Hunnel, George Epperson and Kenneth Grabner. Shortly after relocation property was leased to Mr. Charles E. Nutter of Los Angeles with option to buy. In November 1939 the Flagstaff shaft burned and caved. Mr. Nutter released his option and the property reverted to the owners. Kenneth Grabner has purchased the interests of his partners and is now the **sole** owner of the group. No work is being done at present.

EQUIPMENT:

Practically all of the surface equipment of value has been removed. There are a few one ton cars and rail underground.

GEOLOGY:

See Oregon Metals Handbook 14 A

REMARKS:

The shaft fire of November 1939 caused the shaft to cave within 30 feet of the surface. The only entrance to the mine is a small air raise. The 260 and 360 levels can be entered, but there is no entrance to the 560 level since the shaft caved. The veins are narrow and none fifteen assays taken showed any appreciable value.

With a caved shaft, I believe, this mine is practically worthless. If the shaft were not caved it is possible that a leaser could take out a small amount of shipping ore.

The walls of the drifts and stopes are covered with a black soot, this is especially noticeable near the shaft.

INFORMANT:

Kenneth Grabner

HKL

5/28/40

*Rhugh K. Lancaster.*

Office numbers:

101-110-11-7

November 29, 1937

Samples taken by A. V. Quine

Location: Flagstaff and McIntyre-Balm Creek

	Sample No.	Gold	Silver
Flagstaff	1	0.01	0.8
"	2	0.04	0.4
"	3	0 .04	0.6
"	4	0.01	0.4
"	5	0.01	0.5
"	6	0.12	0.4
"	7	0.12	0.5

# Flaystaff mine

5/17/38

Information from W. C. Calder - Baker

Mr. Imhaus - engineer employed by French corporation examined mine when first small shaft was sunk. Found that the mine had been salted with ore from the Virtue mine. However, he was bound to his company by bonded contract & they, being a stock selling outfit, requested him to sink & develop the mine & build a mill, which he did. No ore was found according to his report.

This explains many features of the mine secured from our own observation

*[Signature]*

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Flagstaff

BLANK B—ANNUAL REPORT

This report must be properly executed and filed with the Corporation Commissioner on or before July 1, 1933, in order to entitle a corporation mining for any of the precious metals, coal, or prospecting or operating for oil, or operating an oil well, to pay a license fee of only \$10. If not so filed, such corporation must pay the same license fees as are required to be paid by other corporations for gain.—Section 25-244, Oregon Code 1930.

ANNUAL REPORT TO THE CORPORATION DEPARTMENT

FOR THE YEAR ENDING JUNE 30, 1933 1935

Of STANDARD GOLD MINES, INC. (Give legal name in full)

a corporation organized and existing under and pursuant to the laws of the State of Oregon.

The location of its principal office is at No. Baker, in the state of Oregon

The names and addresses of principal officers, with the postoffice address of each are as follows:

Table with 3 columns: NAMES, OFFICE, BUSINESS ADDRESS. Includes L.H. Sammons (President), Albert G. Porteous (Secretary), Albert G. Porteous (Treasurer).

The date of the annual election of officers is third Tuesday in January

The date of the annual election of directors is do

Table with 4 columns: Description, Common With Par Value, Common No Par Value, Preferred. Rows include authorized capital stock, subscribed, issued, and no par value stock.

State amount of capital, represented by stock of no par value, with which the corporation began business \$ none

Total amount of its properties in Oregon (name of claims, lodes, or placers) Flagstaff Mine, consisting of the White Frost or Bummer Quartz Mining Claim, the Flagstaff Quartz Mining Claim, the Jersey Quartz Mining claim, the Gertrude Quartz Mining Claim, the Empire Quartz Mining Claim, the Flagstaff Millsite Quartz Mining Claim, and the Flagstaff Placer Mining claim, also known as the Wzxahatchie Quartz Mining Claim.

The location of its properties Baker, Oregon

The amount of work done thereon and improvements made thereon since the time of filing last report none

The amount of output or products of the mines or wells of such corporation from January 1, 1932, to December 31, 1932, inclusive, none

The value of output or products of the mines or wells of such corporation from January 1, 1932, to December 31, 1932, \$ none

IN WITNESS WHEREOF, I, L.H. Sammons, President

of said corporation, have signed this report, this

[CORPORATE SEAL]

day of June, A. D. 1935

(signed) L. H. Sammons

STATE OF OREGON, County of ss.

I, being first duly sworn, depose and say, upon oath, that I am of the foregoing corporation; that said corporation is not engaged in or transacting any other business except that of locating, prospecting, developing or operating mines for any of the precious metals, coal, or prospecting or operating for oil, or operating an oil well; that the value of the output or products of the mines or wells of said corporation from January 1, 1932, to December 31, 1932, inclusive, did not exceed \$1,000; and that the above and foregoing statement is a full, true and



## FLAGSTAFF MINE

VIRTUE DIST.  
DEPOSITS

The Flagstaff mine, 4 miles north of the Virtue mine, and about 6 miles from Baker, is on the small knoll in the same low range of hills. Work was begun here about 1894. It has a 760-foot incline from which drifts on the different levels total approximately a mile. The vein roughly parallels the Virtue, but dips in the opposite direction about  $65^{\circ}$ . A 20-stamp mill and cyanide plant has been erected, but the production has not been large. Except for the time in the spring of 1910 it has not been worked since 1900.

The country rock here is the diorite previously described. The vein is said to have an 18-inch pay streak in a very persistent 5 to 8-foot vein. The ore is white massive quartz with little calcite and few sulphides. The average value of the ore is said to be \$16 in gold, about 800 fine.

D--A--T--A

on

F-L-A-G-S-T-A-F-F M-I-N-E

Baker, Oregon.

Personal

Flagstaff Mine.

Mrs. B. E. Dean,  
Portland, Oregon.

My dear Mrs. Dean:

In response to your request for my professional opinion of the Flagstaff property:

I spent a day on the property in August, 1927.

As it is possible that you may not have at hand a copy of Parks and Swartley's Report on the property, and as my examination confirmed the facts set forth therein, I am setting out certain parts of this report hereunder:

"The particular vicinity is near the contact of intrusive diorite into older greenstones. These rocks are overlain by recent basalt. \*\* The usual accompaniment of porphyrydikes is present. Mineralization occurs in distinct quartz fissure veins. One of these called the Flagstaff veins, upon which the shaft has been sunk, strikes N 30 deg. E. and dips 60 deg. to the S.E. and is a small persistent fissure with a maximum width of about eighteen inches. It has been drifted upon for several hundred feet and much of it has been stoped. The values are said to be in small high grade shoots.

The main vein of the property which is called the Big Ledge intersects the Flatstaff vein at a point about 800 feet N. of the shaft, and has a strike varying from N. 15 deg. W. with a dip of 60 deg. to the E. This a persistent and much larger vein than the Flatstaff, having a width of five to eight feet of solid quartz for several hundred feet. The values are said to be evenly distributed and run about \$16.00 in gold.

There is another vein, about 100 feet further North from the shaft, called the WhiteFrost, which has a strike of N. 30 deg. and dips at a high angle to the East. This vein is similar to the Flagstaff in size and values.

The development work consists of over 5,000 feet of workings. This includes a shaft 760 feet deep on the Flagstaff vein with several hundred feet of drifts to the North and South at the 260 feet level and the 360 feet level. There is also about 100 feet of drift at the 5560 feet level and there is an air-raise to the surface from the 360 feet level about 400 feet North of the shaft. The Big Ledge vein is developed by drifts on the 360 feet level also the 260 feet with an air-raise to the surface from the 360 feet level near the North face of the 360 feet drift and in the widest part of the Big Ledge; on the 360 feet level there is a winz 285 feet deep and a raise of about the same length. The three compartment incline shaft has been put in excellent shape. There is a 20 stamp mill driven by steam power and a cyanide plant."

Note: The above is copied from a typed sheet. It contains obvious errors and is probably not an exact copy of the original report.

The mill building is in very good shape. The hoist, crusher and stamps are in very good shape; in fact one battery of ten stamps is practically new. The steam power plant is no good. The shaft is double compartment and is in excellent condition. The Cyanide plant has been partly dismantled but a large part of it can be used. The underground workings are in fair shape. The character of the ground is such that very little timber is required.

I did not make any examination nor take any samples from either the Flagstaff or White Frost veins. In the present condition of the workings considerable time would be required to make such an examination of any value. This time was not at my disposal; and as I have explained to you before, the MINE is in the Big Ledge.

We know that the property was operated at a profit, several hundred of thousands of dollars. Sullivan states that heads from the Flagstaff vein ran around \$30.00. This I believe is true, both because Sullivan is ready to contribute his time toward the necessary examination to go into the old workings, but also because the property could not have been operated at a profit on anything but high heads under the methods that were used.

I did sample the ore in the Big Ledge. This ran \$7.02 per ton in gold. Samples were taken at both 260' and 360' levels. The values run very even. There is, at the present time, approximately 21,000 tons of this ore blocked out between the 260' and 360' levels. From the character of the fissures and the appearance of the shoots I should say that there is twice the blocked out tonnage in sight. On the same basis I feel confident that very little further work will develop large additional tonnage.

From a standpoint of mining the ore is ideal. With proper methods it can be put in the bin for \$1.00 per ton. As you know, I have conducted some treatment tests. Briefly, these lead to the conclusion that the ore will not give satisfactory results by amalgamation, even with very fine grinding. However, the results with cyanide are very satisfactory. The ore is highly oxidized with very little free acid but a considerable latent acidity which developed during treatment, and it is evident that rather large amounts of lime will have to be added to correct this acidity. I have no hesitation in stating that this ore can be very profitably treated by cyanide.

Whereas my figures on the ore may not sound very good to you when compared to those of Mr. Laymon, I would call your attention to the fact that they are good enough to warrant the placing of the mine in operation. As it stands today it is the most attractive mining proposition which has come to my attention in many years. There is every reason to be confident that there are hundreds of thousands of tons of very profitable ore to be taken out of the oxidized zone with the added lure of what may lie in the sulphide zone.

Very truly yours,

(signed) William H. Bissell

WM. HUNTLEY HAMPTON

Civil, Mining and Consulting Engineer  
Chemist and Metallurgist.

475 West Park Street,  
Portland Oregon.

July 8th, 1928.

THE FLAGSTAFF MINE  
Baker County, Oregon.

I visited the Flagstaff Mine on March 18th, 1928, and spent the greater part of the day examining the surface outcrops and the workings on the 260 foot level.

I found three important fissurings dipping at varying angles in the same general direction and intersected by some cross fissuring involving all three veins.

It was not possible, within the time, to go into the stopes to make a study of the features of the fissures.

I have relied upon Mr. Sullivan's statement as to the extent of the workings and it appears that the main production of the mine in the past was from one bodies above the 260 foot level, on the Flagstaff vein, which has been practically stoped out, and that very little exploratory work was done to find continuation of ore beyond the body mined. In re-attacking the mine this should be borne in mind.

The varying and converging dip of the three veins indicate that they will come together somewhere below the 360 foot level and exploratory work should be inaugurated to determine what exists in the ground between the 360 and the 560 foot levels before any plans are made for future operations. The Flagstaff vein is the high grade vein and its continuation should be determined. There should be all reasonable expectations that there are other important ore bodies on this vein both laterally and vertically of equal value s.

Each vein has characteristics not in common indicating three periods of fissuring. The Red or Big Vein and the White Frost are lower grade ores and are wide and massive. They promise a large quantity of low grade ore, which can be easily and cheaply extracted when the mine is properly opened. There is the probability that these three veins will practically become one large vein as they proceed in depth with large ore bodies and enrichments. Something pertaining to this should develop in the work that I recommend.

Respectfully,

(signed) Wm. H. Hampton

DESCRIPTION OF FLAGSTAFF  
PROPERTY, COST OF EQUIPPING, PROFITS TO BE DERIVED.

LOCATION:

About six and one-half miles north and east of Baker, Oregon, one-half mile north of Eagle Valley Highway, in the Virtue Mining District, elevation 4300 feet.

HOLDINGS:

Consist of nine claims on which there are mill buildings of sufficient size, as well as all necessary quarters for housing all employees and other work in connection with mining and milling. There is a twenty stamp mill installed and other equipment as follows: one double drum first motion hoist; one, one hundred ton rock crusher; two, seventy-five H.P. Boilers, which could be used for air storage; a sixty ton cyanide plant; ore bins, capacity 500 tons; concrete water storage tanks, size  $4\frac{1}{2} \times 20 \times 40$  feet; a double compartment incline shaft to 760 foot depth, equipped with two ore cages, with track, cable, etc., all in place ready for use.

The mine is said to have more than  $1\frac{1}{2}$  miles of underground workings with one mile of track in place in tunnels. All stations cut and in shape for handling ore in quantity. Mine is dry and requires a little or no timbering, walls are distinct and solid, ore breaking readily and is easy to treat. Ore veins are all well defined.

VALUES:

According to "Mineral Resources of Oregon", Volume 2, Number 4, Page 94, December 1916, the values are placed at \$16.00 in gold.

VEINS:

There are three well defined veins in the property as follows: Flagstaff, Red or Big Ledge and White Frost, of which, about one-half only, of the former has been mined. The values in this vein carried an average value of \$35.00 per ton according to reports. This vein is 18" in width and netted the original owners more than \$300,000.00, it is said. The Red or Big Ledge has a width of from 10 to 20 feet and is developed for about 600 feet. The White Frost has a width of from five to ~~six~~ feet, and is, also, developed for 600 feet. These bodies of ore are blocked out on three to four sides and ready to mill. There are more than 100,000 tons now in sight according to estimates without further development, this will yield \$10.00 or better, according to reports available. There are also numerous high grade stringers that have not been counted in estimates. None of the veins have been followed to either end or to depth, but are known to extend to at least 760 feet in depth, with all probabilities that there are many times greater tonnage than has already been developed.

MACHINERY NEEDED TO MILL 60 TONS PER DAY:

1 - Diesel Engine, 35 H.P.	\$3000.00
1 - 60 Ton ore mill	2000.00
1 - 12x14 air compressor	750.00
1 - 12x14 rolls	550.00
3 - sets copper silvered plates	450.00
1 - 36" amalgamating pan	280.00
3 @ Oregon Separators	600.00
1 - 6x4x6 water pump	250.00
1 - Bullion furnace	200.00
Fittings	800.00
Freight and hauling	500.00
Supplies, lumber for repairs, changes in mill and camp equipment	800.00
Labor for one month	1857.00
Fuel, oil, chemicals, powder, caps, fuse, and insur- ance for one month	903.00
Traveling expense, getting started	400.00
Assay Equipment	2000.00

PROFITS TO BE DERIVED:

Estimating all ore at \$10.00 with 85% recovery, with milling and mining costs at \$2.50 per ton, leaving a \$6.00 net profit per ton.  
Show one 60 ton mill will yield per month \$10800.00  
or one 60 ton mill will yield per year 129600.00  
By the addition of one more 60 ton mill 2000.00  
and one more engine 3000.00  
With operating expense for one month amounting to 903.00  
\$ 5903.00

Would show as follows two 60 ton mills per month \$21600.00  
Per year 259200.00

A third mill can be added without more power; this would show still greater profit, as no expense for overhead would be required.

SHAFT CAPACITY:

One compartment tons, per 24 hours, 420  
Two compartment " " 840

With one shaft running to capacity, would show results as follows:  
Per day \$ 2520.00  
Per Month 75600.00  
Per year 907200.00

To equip plant complete to handle 420 tons to advantage and install good assay equipment would entail an expenditure of approximately \$40,000.00

18 days operation with one shaft operating to capacity would pay for the whole equipment.

CONSUMPTION:

With the installation of Diesel Engines the fuel consumption will amount to .5 pounds per hour, per H.P., which would amount to 31 gallons of oil in 24 hours for each 35 H.P. engine used. Diesel oil at seven cents per gallon in Baker, would equal, per day, \$2.17.

Oregon Mining & Refining Co.,  
102 N. Broadway,  
City.

Gentlemen:

In response to your request for a history of the Flagstaff Mine, and its reasons for not being worked continuously are stated in the following letter. These reasons are known by me to be true, for I was in charge of the property for more than twelve years.

The Flagstaff Mine was operated by a French company from 1882 to 1900, with headquarters in France, and due to internal friction was finally closed down. It is reported they took out more than \$300,000.00 from the upper level, only, known as the Flagstaff vein. There is still quite a considerable tonnage left on this vein, besides all the Red or Big Ledge and White Frost veins, which are now blocked out and ready for milling.

Since that time there has been a number of attempts to secure a lease and bond on this property, all of which were unsuccessful until 1904, when a Mr. Campbell of Boston finally succeeded. He incorporated a company for \$100,000.00, commenced operations, developed the 260 foot level, cutting the Red or Big Ledge vein, and doing considerable development work. Mr. Campbell attempted to treat the ore by a Leaching process, which was not successful. As a result of his efforts there is now a rich tailing dump which can be recovered by your separators with little cost.

In 1906 the property was sold to the following group, Mr. Arthur Murphy, Mr. Savage, Mr. Oakman, Mr. Rowley, all of Boston. Mr. Murphy holding 65% of the stock started operations and experimenting on methods of treating the ore. They first installed a twenty stamp mill and amalgam plates, which saved only about 50% of the values. They then tried treating the tailings with the Garvin cyanide process, which was a complete failure on account of the Oxidized iron and antimony. In 1909 they installed a complete cyanide treating plant of about 60 tons capacity and in this way recovered about 85% of the values. This yielded a good profit and paid all overhead mining and milling expenses. This equipment is still on the property in good condition.

At this time, under the management of Harry McLean, the outlook of the Flagstaff Mine was very bright and satisfactory. I was superintendent of underground work and started in a systematic way to develop the large ore bodies in the mine. This work progressed satisfactorily until the resignation of Mr. McLean and the general management turned over to an Eastern Mining Engineer, who was inexperienced and incompetent with the results that the funds were grossly misused and lavishly spent until there was no money left for wages or running expenses.

The miners demanding their pay forced me to take the situation in hand myself. I shut down the mine, cleaned up the gold in the mill and had ample funds to pay all bills and indebtedness. I then notified Mr. Murphy in Boston, with the result that Mr. Cleary, his personal representative, was sent out immediately to investigate. Mr. Cleary placed me in full charge with instructions to keep the mine shut down and continue development work until further notice.

During this period I lost my wife and was compelled to take my children to Denver to be cared for and was gone five months. While in Denver I met Mr. Cleary, who decided to again reopen the mine, so we returned to Baker with that intention. On our arrival, we learned that the mine had been robbed of much valuable equipment, in the way of electrical fixtures, etc., which would entail a considerable expense to replace. Electricity was high so we decided to use



steam for power. Mr. Cleary arranged for this, ordering coal, supplies, etc., and left for the East, instructing me to continue operations and development.

I followed his instructions, developing large ore bodies and getting the mine in good shape until 1914 when Mr. Murphy came with the intention of operating the cyanide plant again, but upon investigation found the price of cyanide, zinc and other materials were almost prohibitive so decided to wait a while longer. Mr. Murphy returned to Boston and instructed me to continue as I had been, developing and storing the ore in drifts and tunnels.

I continued this work, without interruption, until 1917 when I received a letter from Mr. Murphy advising me that he had been advancing all this money that was being used and that the other partners interested, refused to assist with their share of the expense, and as he was getting well along in years, he had decided to turn all of his interest over to me as a reward for my faithfulness and assistance given him in the past. All who knew him could readily understand this act of generosity, as he was several times a millionaire.

I was preparing to operate the mine on my own account when a government inspector came along and condemned my boilers, leaving me without power to run the hoist and no money to buy new ones. I so advised Mr. Murphy, who instructed me to start procedure to acquire the other holdings for myself, which I did in the following manner.

I did assessment work until a year ago amounting to \$4500.00 and filed a lien on the other holdings for their share of the work, with the final result that all legal procedure was carried out and I procured deeds for all outstanding holdings with the exception of one party who had died in the meantime and left his interest to a school district. I carried this into court, which granted me a deed, so the entire interest in the Flagstaff Mine was finally vested in me, in fee simple, with a perfect title.

All this was costly to me and with no power at the Flagstaff to hoist ore that I might have shipped and received some revenue, I was forced to seek employment elsewhere, so took a contract to run a tunnel and unwater the Snow Creek Mine. I took this work too cheap but was forced to finish this work even at a loss, but in so doing I run into a very high grade vein of ore. After this discovery I took a lease and bond on the mine and am forced to commence operating by May 1st; in order to do this, I had to raise money, and all I had of value was the Flagstaff Mine.

I regretted to part with this property, as it is very valuable and my only reason in so doing is that I might receive the money necessary to work this bond and lease, where I can make all the money I will ever need in a short time.

In concluding, I want to say that the Flagstaff mine in my estimation is worth at the very least \$100,000.00 as it stands today, and that the above is a true history of the Flagstaff and my only and sole reasons for parting with it or for its idleness today.

Very truly yours,

(signed) J. H. Sullivan,

Superintendent Flagstaff Mine.

## GENERAL INFORMATION.

The Flagstaff Mine is a gold property incorporated under the laws of the State of Oregon under the title of Flagstaff Gold Mining Company, with a capital stock of \$500,000.00 divided into 500,000 shares of a par value of \$1.00 each.

## LOCATION.

The Flagstaff mine is easily accessible, being seven miles northeast of Baker, Baker County, Oregon. It is reached over a good automobile highway and road, the latter about one-half mile in length - the highway is known as the Baker-Cornucopia highway.

The Flagstaff mine is situated in the northwest end of the Virtue mining district, in Section 5, Township 9, south, range 41 east, Willamette Meridian. The elevation is 3,900 feet.

Baker is a city of 8,000 population and is the supply point for the region. It is on the mainline of the Union Pacific System, and is 340 miles east of Portland, Oregon.

The climate is mild, permitting the carrying on of operations the whole year without interference.

## HISTORY, REPORTS AND GENERAL GEOLOGY

In covering the history and geology of the Flagstaff mine and the district of which it is a part the writer has confined himself to quotations from various publications and reports.

In the year 1900 Professor Waldemar Lindgren, at that time geologist in the service of the United States Geological Survey, spent several months in reconnaissance survey of the goldfields of Eastern Oregon. The results of this survey were published in the Twenty-second Annual Report of the United States Geological Survey. Excerpts from pages 721 to 725 appear below.

(Statements omitted)

Note: The development of the showings on the Big or Red ledges was made subsequent to the visit of Professor Lindgren to the Flagstaff.

### SULLIVAN'S LETTER:

J. H. Sullivan, Baker, Oregon, for a number of years was superintendent of operations at the Flagstaff mine, and in a letter he makes the following statements:

(Statements omitted)

Since that time there has been no attempt to operate the mill; however, Mr. Sullivan did considerable development in the mine in adding to the ore reserves of the property and opening up additional ore bodies as he states.

The property since 1914 passed from the Boston owners mentioned above and eventually the title came to the present Flagstaff Gold Mining Company.

### PARKS AND SWARTLEY.

The following is taken from the Hand Book of the Mining Industry of Oregon, 1914, by H. M. Parks and A. W. Swartley, Oregon state geologists at the time:

(statements omitted)

BISSELL LETTER:

Here is given a paragraph from letter written after a visit to the Flagstaff mine by William H. Bissell, 144 Townsend Street, San Francisco, June 4, 1928:

(statement omitted)

HAMPTON LETTER:

Below is given letter from Wm. Huntly Hampton, Civil, Mining and Consulting Engineer, Chemist and Metallurgist, 475 West Park Street, Portland, Oregon, July 8th, 1928:

(statement omitted)

FELLOWS LETTER:

W. C. Fellows, E.M., Oregon Register 665, Sumpter, Oregon, September 17th, 1928, addressing Hon Mark D. McCallister, Corporation Commissioner, Salem, Oregon, stated:

"This is to certify that I have made a survey and examination of the Flagstaff Mine.

"I found the property has possibilities of becoming a producer if properly developed and equipped. The ore bodies are large, and a comparatively small amount of money expended should develop ample ore to warrant installation of a mill. The character of the ore is such that a high extraction of the values can be made with a very simple process."

## GEOLOGY

The predominating country rock of the Flagstaff hill is a light to dark greenish-gray diorite rock of granular texture. A thin basaltic flow covers the hills north of the mine and slopes eastward to the Lower Powder River Valley.

The country rock is a fine grained diorite at places changing into a coarse grained dioritic, with places showing evidence of much crushing. The country rock also has the appearance of andesite at some points, although no microscopic work has been done at this time.

There are three veins, viz., the Flagstaff vein, the Big vein (sometimes called the Red Ledge) and the White Frost vein. These veins have a general strike east-northeast and dip about 50 to 60 degrees toward the south.

## DEVELOPMENT

Plate 1. -- This is the claim map showing the location of the claims and buildings. The electric power line, 23,000 volts, is also shown.

Plate 2. -- This is a composite development plat of the underground workings that are now accessible. This is made from a "Brunton" survey.

The northwest drift of the Big Vein, 260-foot level, was driven along the footwall of the vein. Two short crosscuts, not shown on the map, have been driven to the hanging wall of the vein. As a further check on the gold values in the hanging wall of the drift and the stope above, 10 prospect drill holes were drilled 3 and 4 feet long and the drill cuttings assayed \$6 to \$12 per ton.

On the 360-foot level of the Big Vein and 130 feet southwest of the crosscut from the Flagstaff vein, the Big vein divides. The drift cuts across to the hanging wall and follows low grade ore, values between \$2 and \$4 per ton in gold, to the present face of the drift. A northwest crosscut was driven to prospect the footwall vein. The footwall vein was developed for a distance of 85 feet along ore averaging \$30 per ton in gold. A 60-foot prospect raise was put up in this ore sheet and the average value of the ore in the lower half of the raise was \$40 per ton, the values decreasing to \$10 per ton in the face of the raise.

Plate 3. -- This is a longitudinal projection in the plane of the Flagstaff vein. The main two compartments, 5 ft. x 11 ft., inclined shaft followed the vein down to about the 200-foot level. From that point the vein goes into the hanging wall of the shaft while the shaft continues at a uniform dip to the depth of 760 feet. The shaft is large enough to easily handle 1,000 tons of ore per day. It is straight, well timbered and in excellent shape. The water level in the shaft is now at 570 feet.

The Flagstaff vein is very persistent with an average width of from 4 to 5 feet. The ore is a white quartz, with some calcite. The average value per ton of the ore mined, according to reports, is \$16.00. The vein has been mined out from the 260-foot level to the surface. Plate 3 shows a pillar of ore left at the surface and another just below the 160-foot level. The costs would probably be high in recovering the surface pillar as the 160-foot level would have to be partly retimbered. The pillar of ore below the 160-foot level can be easily mined as the ore passes from the 160 to the 260-foot levels are in good shape, and the ore would be hauled out from the 260-foot level.

On the 360-foot level only enough ore had been removed from the vein to prepare the stope for mining operations. Available information points to the fact that the ore shoot will probably be over 200 feet long on this level with an average value of about \$10 per ton in gold.

On the 560-foot level a drift 400 feet long has been driven along the Flagstaff vein. The ore shoot on this level is only 50 feet long with values of from \$6 to \$12 in gold.

Plate 4. -- This plate is a longitudinal projection on the plane of the Big vein. Forty feet southeast of the Flagstaff vein is the Big vein or Red Ledge. This vein has been opened up on the 260-foot level for a length of 420 feet and on the 360-foot level for a length of 520 feet. The width of the vein is from 7 to 40 feet, average about 15 feet.

The Big Vein is composed of what might be termed a stock-work, or network of small veinlets cutting through the dioritic country rock, and between fairly uniform walls. Pyrite has been oxidized, giving the vein a reddish color. The country rock adjacent to the vein as well as the vein filling has been so much altered that it is impossible to determine its nature without the use of a microscope.

In the Flagstaff and the White Frost veins the gold values seem to be confined to the quartz veinlets alone but have impregnated all the vein filling and also the country rock on both sides of the vein.

The per ton values range from \$4 to \$7 in gold. Mr. William H. Bissell sampled the Big vein on the 260 and 360-foot levels and reports an average of \$7.02 per ton in gold.

The ore is soft enough to drill and break easily and yet it stands well in the stopes, so that little timber would be necessary.

The drift on the 560-foot level is along the Flagstaff vein and a 40-foot crosscut would be necessary to cut the Big vein at this level.

Plate 5. -- This is a vertical cross section A-A. By referring to Plate 1 it can be seen that the cross section is taken at a point 350 feet northeast of the shaft.

A cross section at the shaft would show that the shaft followed the Flagstaff vein to the 200-foot horizon then the vein flattened out and went into the hanging wall of the shaft.

The cross section A-A simply shows the projected position of the shaft.

This section cuts the Flagstaff vein at a point where the vein is cut by a series of northwest faults that have a horizontal movement which may explain the apparent reverse dip at this point.

Plate 6. -- This is a longitudinal projection in the plane of the White Frost vein.

This vein has been opened up for a distance of 250 feet on the 260-foot level. A production of \$30,000 is reported from the one small stope above this level.

The raise at the northeast end of the drift follows up on the White Frost vein a distance of 100 feet, with gold values of from \$5 to \$12 per ton. From the top of the raise a crosscut was extended to the Big vein and a raise to the surface on this vein reported gold values of \$4 per ton.

As none of the old assay maps are now available the writer is indebted to Mr. J. H. Sullivan, the former superintendent, for the above mentioned gold values.

## PROPOSED DEVELOPMENT.

360-foot Level. -- It is important to prove the Big vein and the White Frost vein on this level as it will give an additional 200 feet of ore by so doing. To do this drive a 4-foot southeast crosscut, which if the Big vein continues at its present dip as indicated on the 260 and 360-foot levels, should be sufficient to cut the vein. Then drift along the vein to the ends of the ore sheet, with several crosscuts to prove the width of the vein.

A further southeast crosscut of 80 feet should cut the White Frost vein and then it should be drifted on to the ends of the ore shoot.

360-foot Level. -- An east crosscut has been driven 50 feet toward the White Frost vein, by continuing this another 30 feet it would cut this vein, and then the vein should be developed to the ends of the ore shoot.

The crosscut to the drift that follows the high values along the foot-wall of the Big vein has been partly filled with a cave. This crosscut should be timbered and further development in this area should be carried on.

A raise on the Big vein from a point 20 feet south of the main crosscut should be driven through to the 260-foot level.

## EQUIPMENT.

The equipment of the property consists of the following: 1 Webster, Camp & Lane double drum steam or compressed air mine hoist and 7/8 inch hoisting cable. This hoist could be converted into an electric hoist at small expense.

- 1 Risdon jaw crusher, size 10 x 12 inches.
- 2 10-stamp mills with ore feeders completed.
- 2 Steel skips, 1½ tons capacity.
- 1 Steel water bailing skip.
- A 6-inch water line from the surface to the 560-foot level.
- 1 Concrete water storage tank, 35 x 13 x 4 feet deep.
- The 60-tons per day cyanide plant has been partly dismantled-- there are 8 wood stave solution tanks and some zinc boxes left.

Buildings. -- The foundations and frame work of the mill building and shaft house are in good condition. Some repair work would be necessary on the roof, floor and walls sheeting. The 500-ton capacity mill bin is in good shape and ready for use.

- 1 Boarding house.
- 1 8-room cabin.
- 1 6-room cabin.
- 1 2-room cabin.
- 1 Cabin, 18 x 24 feet.

## CO STS. MINING AND MILLING.

Mining. -- The mine is dry down to below the 500-foot level and above that horizon will entail no pumping cost. Owing to the ground in this portion of the workings being dry the tunnels and stopes hold up well and require very little timbering as compared with properties that have the water factor to overcome. There is also the advantage of the working being thoroughly ventilated with the result that there is no appreciable decay of timbers, requiring no retimbering expense to keep passages open. These conditions work for cheap mining and make it possible to estimate the cost of ore in the bin at \$1.00 per ton, except possibly portions of the narrower veins of higher grade ores.

Milling. -- The character of the ore is adaptable for cyanidation. In practice, in all probability it will be classified as wet crushing with cyanide solution in both instances, primary and secondary. It has been found

by experiment that only 1 or 2% of the gold content can only be recovered by amalgamation, except in the oxidized ores. At the present time it is rather premature to state anything bearing upon the mode of procedure that should ultimately be adopted in milling. Metallurgical tests will necessarily have to be made before finally determining exact process. Sufficient data, however, are at hand as to definitely state that the cost of milling this character of ore should not exceed \$1.50 per ton and possibly this figure can be reduced \$1.20 per ton. This cost will be governed to a considerable extent by the tonnage quantity treated.

#### CONCLUSION

The following factors that govern the Flagstaff property are summed up briefly:

1. Favorable location of property; its close proximity to Baker, the railroad and supply point.
2. Close to electric power line.
3. Sufficient development proving the existence of 3 well-defined vein systems, containing several well-pronounced ore shoots.
4. The splendid preservation of the shaft and all underground development.
5. Cheap and economical mining, particularly in the matter of breaking the ore as the veins are well protected by good standing walls, thereby effecting great saving in timbering, etc.
6. The vein matter breaks easily and clean, making for low cost and doing away with anything of a selective character in mining.
7. It is an ideal ore for cyaniding.

In the above is a brief outline of the physical features that are encountered at the Flagstaff. The present conditions as reflected in the falling prices of commodities and labor can only make for one thing and that is the difference between what is termed to be a low grade property of the past decade permitting it now to be classed as a medium ore presenting great possibilities.

With careful management and supervision this property under economical handling will more than justify any expenditures made upon it. The present development shows that after taking into consideration that the veins are of deep-seated origin and further possibilities are enhanced by a continuation of exploration of the east and west extensions on the present levels.

The merit of this property seems evident and surely justifies further work in carrying on examination, such as more complete sampling to determine the actual value of ores and offering much assurance of making a highly profitable operation.

Respectfully,

FLAGSTAFF GOLD MINING COMPANY

By \_\_\_\_\_  
Manager.

Dated at Baker, Oregon, this 13th day of October, 1930.

Cost of actual operating for 38 days given as a basis on which to estimate what Operating Costs would be if full capacity of 100 tons per day, 3,800 tons, were mined and milled.

Operating Expenses as per statement attached. . . \$4,158.33

"Other Charges"

Insurance. (This should be spread over 12 months, say 1/12 of \$290.48) . . . . .	24.20
Issue & Transfer Stamps, same, say 1/12 of \$246.30 . . . . .	20.55
Taxes, same, 1/12 of \$20.00 . . . . .	1.66
Office Expenses, All. . . . .	40.59
Postage & Petties, All . . . . .	7.27
State Insurance, All . . . . .	248.94
Telegrams, All. . . . .	8.41
Telephones, All. . . . .	16.30
Salaries, All. . . . .	150.00
	\$4,676.25
Add 33 1/3% extra which three shifts per day would cost . . . . .	1,558.75
	\$6,235.00

Divide this by the possible of 100 tons per day (3,800) and you get \$1.64 per ton.

As only 1,300 tons of ore were milled, and half of it was waste, we are left with 650 tons of ore actually milled (good ore so to speak as even this 650 tons were not carefully selected) which produced. . . . \$1,625.37

At the rate of 100 tons per day (3,800 tons), total production would work out at. . . . .	9,502.16
Less estimated expenses as shown above . . . . .	6,235.00
	Estimated Profit . . . . . \$3,267.15

Breakdown of "Operating Expenses" and "Other Charges".

OPERATING EXPENSES.

Assaying. . . . .	\$ 137.80	
Maintenance--General . . . . .	21.75	
Maintenance--Mill. . . . .	56.80	
Management . . . . .	184.78	
Mining, Labor. . . . .	757.38	
Mining & Milling Supplies. . . . .	751.02	
Milling, Labor . . . . .	561.19	
Miscellaneous. . . . .	33.40	
Payroll, General (Blacksmith, Hoist man, Watchman, etc.) . . . . .	549.92	
Supplies, General. . . . .	52.33	
Transportation, General. . . . .	115.49	
Power . . . . .	936.47	
	\$	\$4,158.33

OTHER CHARGES

Postage & Petties . . . . .	\$ 7.27	
Insurance (Part unexpired) . . . . .	290.48	
Issue & Transfer Fees (Stamps) . . . . .	246.30	
Office Expenses. . . . .	40.59	
State Accident Insurance . . . . .	248.94	
Taxes. . . . .	20.00	
Telegrams. . . . .	8.41	
Telephones . . . . .	16.30	
Salaries . . . . .	150.00	
	1,028.29	1,028.29





THE FLAGSTAFF MINE  
BAKER COUNTY, BAKER, OREGON

####

A REPORT

by

GEORGE A. KIRKBRIDE  
Registered Mining Engineer

JUNE 27, 1934

## LOCATION AND EXTENT:--

The Flagstaff Mine is located 7 miles in a N. E. direction from Baker, Baker Co., Oregon, and consists of nine unpatented lode claims and one placer mining claim, all located in the Virtue mining district, situated in Section 5, TWP 9 S., R. 41 E. with an elevation of 3900 feet.

The mine is easily accessible being one-half mile from the Baker-Cornucopia highway, which is a graveled road.

Baker is the nearest supply point, being a city of 8,000 population. All normal mining supplies are available in Baker, and the location is central to the supply points of Seattle, Portland, and San Francisco, being located on the main line of the Union Pacific.

## VIRTUE DISTRICT

The Virtue District, one of the oldest in Eastern Oregon, is, on its western extent, about seven miles east of Baker, and extends for about 12 miles in a N. W. Direction, the width varying between 3 and 6 miles. It covers a region of low arid hills, rising in the great bend of the Powder River, and may be considered as the northwesterly continuation of the Lookout Complex. The elevation ranges from 3400 to 5000 feet. The hills rise abruptly from Baker Valley and slope gently eastward toward the lower Powder River Valley. Most of the drainage is toward the Powder River Valley.

The largest production from this district came from the Virtue Mine and is reported at \$2,200,000. The depth of the Virtue shaft being 800 feet. The vein width averaged from 6 inches to 12 feet with an average width of 14 inches. The length of the ore shoot is reported as being 1200 feet with values ranging from \$20 to \$40 in the upper workings, and in the lower levels, \$15.

The White Swan, Norwood and Cliff Mines are also located in the Virtue District. A description of these properties is available in Mineral Resources of Oregon Bulletin, Volume 1, Number 8, Ore Deposits of Northeastern Oregon.

## GEOLOGY

The geology in the main essentials is similar to that of the other mining sections of Eastern Oregon, in that the ore deposits are the result of an intrusion into older flows and sediments. The intrusion exposed over a limited area in the Northern part of the district is a gray diorite, grading into gabbro and is probably a local development of a granodiorite intrusion. The argillites and greenstones into which the intrusion came have been much crushed and altered by regional metamorphism, doubtless both before and during the time of intrusion. Of the older rocks, greenstones predominate in the Northern part of the district, while argillites are the chief rocks in the Southern part. Thin basalt flows are found on the tops of the elevations and on much of the hillsides.

## THE FLAGSTAFF ORE DEPOSITS

At different times during this period, the intrusion was fractured and its roof of sediments and flows as well. Into these fractures was injected the dikes which grade from basic to acidic, the latter from granodiorite-porphry to aplite. Values occur in the later fractures which were filled with gold-bearing quartz in the case of the Flagstaff Vein.

The country rock is diorite or gabbro, showing evidence of irregular crushing and movement. The Flagstaff Vein ranges from 12 to 30 inches in width and the vein material is a white massive quartz with some calcite and occasional scheelite. Very little sulphide was noticed.

To the south, cross cuts on the 260 and 360 level cut a large vein known as the Big Ledge. This vein intersects the Flagstaff vein at a point about 800 ft. south of the shaft and has a strike varying from N. 15 degrees to N. 35 degrees W., dipping 60 East. The vein filler is a silicious crushed diorite of gabbro, porphyritic in character with interstices filled with quartz veinlets and calcite. On the foot wall a quartz vein of from 5 to 8 feet in width consistently accompanies the Big Vein which has a width of from 20 to 40 feet in the shoot where exposed. Values throughout the entire width are consistent in both the quartz and porphyry.

The third vein known as the "white Frost" striking N. 30 W. dipping about 75 E. Widths range from 12 inches to eight feet and the vein filler is a gold-bearing quartz. The White Frost vein was cut by a cross cut on the 260 level a distance of about 75 feet S. E. of the Big Ledge.

### HISTORY

The Flagstaff Mine was operated by a French company from 1882 to 1900. Records state that most of the developed ore was exposed during that period. The Mines Handbook states that \$750,000 was produced from the Flagstaff vein during the period in ore that averaged \$16 per ton. In 1906, Arthur Murphy and associates of Boston started operations and constructed a 20 stamp amalgamation mill which saved about 50% of the values. They then tried treating the tailings by the Garvin process, which was a complete failure due to the oxidized iron and antimony content. In 1909 they installed a complete cyanide plant which recovered about 85% of the values contained, but as the story has it, an engineer named McLean, due to too lavish spending and misuse of funds, deleted cash reserve until a shut-down was forced.

Following this, Mr. J. Sullivan of Baker was placed in charge until 1914, which time considerable development was done on the "Big Ledge".

Since 1914 no work has been done. All work was accomplished by hand mining methods and insofar as it is able to ascertain, there has never been a pneumatic drill in the mine.

### DEVELOPMENT

The Flagstaff Mine is developed by a 2 compartment incline shaft, with a depth of 760 feet. This shaft is square set and in good condition with the exception of a few sets and a small number of lagging that will have to be replaced. The present water level is just below the 560 foot station, all workings above this point being dry and accessible.

### 260 LEVEL

The Flagstaff vein is stoped to the surface from this level unless more ore is developed longitudinally.

The Big Ledge is exposed on the 260 level for a distance of length of 520 feet, and widths, where exposed, of from 8 to 24 feet. One stope is opened on this level for a length of 125 feet and old square sets are still standing. This stope is 3 sets high--all ore chutes are in place and in good condition. No cross cutting is done to determine the total width of the vein, all of the work except for the 125 feet length having been one of the wall quartz veins.

The White Frost vein which is cross cut from this level, is exposed for a length of 260 feet, and has a raise in the ore to the surface showing widths of from 2 to 8 feet.

### 360 LEVEL

The Flagstaff vein has now exposed and measurable 270 feet of drift. A stope is started on this vein which shows widths of from 12 to 30 inches. All chutes are in and mining operations could be started with very little work. A connecting raise exposes this vein from the 260 to 360 level and provides excellent ventilation.

### THE BIG LEDGE

The Big Ledge has been drifted along the strike for a length of 540 feet on this level. On this level and 130 feet S. W. of the cross cut the Big Vein divides. The main drift cross cuts the hanging wall and follows low grade ore to the present face of the drift. A N.W. cross cut was driven into the foot wall to prospect the foot wall vein, which was opened for a length of 85 feet. Reported values are stated as being an average of \$30 per ton. A 60 foot prospect raise was put up in this ore shoot, the lower half of the raise giving values of \$40 and the upper half \$10 at the old gold price. This cross cut and drift are caved but it is at present possible to get over the fallen rock and sample the vein which is quartz with a width of 30 inches. To the northeast the Big Vein is developed and a stope started. Ore is exposed the entire distance in widths ranging from 7 to 20 feet. The walls are not exposed. All ore chutes are in. Approximately 200 tons of ore are stored on the level under the stope, which is up from 1 to 3 sets. The White Frost vein has not been cut at this level.

### 560 LEVEL

The Flagstaff vein is exposed for a length of 400 feet on this level and is very consistent as to values and widths. The Big Ledge was not cut on this level but should be reached with approximately 30 feet of cross cutting. No cross cutting was done toward the White Frost Vein.

### 760 LEVEL

No work of consequence was done on this level aside from cutting the station.

### ORE VALUES -- BASED ON GOLD @ \$35.00

#### 260 LEVEL

##### BIG LEDGE--

<u>Width</u>	<u>Value</u>	<u>Place Taken</u>
18 ft.	\$14.00	Bottom drift under Stope N.W.
5 ft.	4.20	Small Cross Cut Hanging Wall
3 ft.	8.40	Hanging Vein
8 "	5.60	Foot Wall Vein
17 "	9.80	Stope Back
14 "	7.35	" "
8 ft.	4.40	" "
6 "	2.80	" "
7 "	4.20	" "
6 "	7.00	" "
34 "	5.36	Cross Cut Intersection
8 "	5.60	Stope Back S. E.
6 "	9.80)	- - - Short Cross Cut Hanging Wall
6 "	5.60)	
8' 6"	9.80	Stope Back S. E.
14 ft.	7.35	Stope Back
16 "	7.35	" "
6 "	10.50	Foot Wall Vein

## BIG LEDGE (continued)

<u>Width</u>	<u>Value</u>	<u>Place Taken</u>
14 ft.	\$ 7.30	Stope Back
18 "	7.70	" "
7 "	6.30	" "
8 In.	17.50	Hanging Vein Stope
16 In.	7.70	" " "
16 Ft.	6.30	Stope Back
4 "	6.30	Foot Wall Stope
8 "	4.20	Drift below Stope
8 "	2.80	Foot Wall below Stope
Average of quartz	6.83 -- Throwing out the 8 inches 17.50 Assay.	

## WHITE FROST VEIN--

<u>Width</u>	<u>Value</u>	<u>Place Taken</u>
1 Ft.	\$ 4.20	N. W. Face
6 ". Quartz	7.85	Drift Back
5 " "	10.12	" "
6 " "	7.85	" "
3 " "	8.50	Raise to Surface
3 " "	7.00	" " "
3 " "	3.50	Near Surface in Raise
Average	\$ 7.00	

## 360 LEVEL

## FLAGSTAFF VEIN--

<u>Width</u>	<u>Value</u>	<u>Place Taken</u>
Vary 10" to 30"	\$16.04	General Sample 360 Stope
30 In.	36.30	End of Raise 360 Level
12 In.	98.42	Up Raise to 260 Level
14"	8.40	" " " " "
12"	21.54	" " " " "
12"	11.40	" " " " "
30"	36.30	On Level Bottom of Raise
15"	4.80	Drift Back
12"	7.00	" "
10"	8.40	" "
10"	9.80	" "
Average	\$19.76	

## BIG LEDGE--

<u>Width</u>	<u>Value</u>	<u>Place Taken</u>
6 ft.	\$21.00	H. W. Vein Stope
6 "	32.20	" " " "
4 "	18.20	F. W. Vein Stope
16 "	8.05	Stope Back
12 "	7.00	" "
13 "	7.00	" "
16 "	5.60	" "
20 "	4.20	" "
6 "	3.50	F. W. Vein Stope
7 "	14.00	" " " "
12 "	7.00	Stope Back

3 6 0    L E V E L

BIG LEDGE (continued)

<u>Width</u>	<u>Value</u>	<u>Place Taken</u>
6' 8"	\$13.50	Cross Cut Foot Wall
4 Ft.	9.10	Drift Back
4 "	14.00	" "
Average	\$ 8.43	

Foot Wall Vein N. W. Cross Cut - Quartz Vein in Caved Portion

No. 1	2'	\$ 9.10
No. 2	30"	108.00
No. 3	24"	24.10

5 6 0    L E V E L

FLAGSTAFF VEIN--

<u>Width</u>	<u>Value</u>	<u>Place Taken</u>
14"	\$ 8.10	Drift Back
2' 8"	5.60	" "
2* (ft.)	8.40	" "
18"	9.10	" "
12"	11.50	" "
10"	6.30	" "
10"	7.00	" "
16"	16.10	" "
18"	10.50	" "
16"	2.80	" "
4 Ft.	7.05)	----- Crushed Diorite and Wall Rock
4 "	8.40)	
1 Ft.	11.10	Drift Back
1 "	7.00	" "
2' 8"	7.70	" "
9' 5"	6.30	Mixed Diorite and Vein Material
Average	\$ 8.31	

DUMP SAMPLES

No. 1	\$5.40
No. 2	4.20
No. 3	5.40
No. 4	7.00
No. 5	9.80

(See Plate Attached)

METALLURGY:

Recent tests conducted by John F. Beede of Portland indicate inadvisability of attempting to make a commercial shipping product and good recovery by flotation.

Amalgamation recovered 52.2%.

Cyanide tests recently conducted by a San Francisco firm indicate a recovery of 95.2% by agitation in cyanide solution. It is evident that cyanidation offers the most certain method of treatment.

ESTIMATED AVAILABLE TONNAGE.

Due to the nature of sampling, tonnage is calculated not based on actual ore exposed in drifts and stopes, but on widths as indicated by cross cuts, drifts and exposures indicating actual widths of veins and ore bodies. For this reason estimates do not check with widths shown on sampling.

The Big Ledge, where exposed on the 260, has a width of 40 feet and many 30 feet sections are exposed. Twenty feet is used as an average giving the below stated tonnage. Undoubtedly additional widths along the strike will be exposed with further exploration.

ESTIMATED AVAILABLE TONNAGE - FLAGSTAFF MINE.

Block #1 - Big Vein

Ore shoot 125' length x 20' width x 360' deep.  
75,000 tons developed - average value - \$7.00.  
75,000 x 7 - \$525,000.00

Block #2 - BIG VEIN

400' in length x 6' wide x 360' deep.  
72,000 tons average value per ton \$4.80.  
Total value - \$345,600.00.

Block #3 - White Frost Vein

260' level - to surface - 5' width - 260' length.  
Average value - \$7.00 per ton.  
28,166 tons @ \$7.00 - \$197,162.00.

Block #4 - Flagstaff Vein

260' level to 560' level developed three sides to 360' level  
300' deep - ore shoot 300' in length and  $1\frac{1}{2}$ ' wide  
or 300 x 300 x 1.5 - 13,500 tons

10  
13,500 x 14.58 - \$196,830.00



SUMMARY OF ORE RESERVES

Block #1 - Big Vein	525,000.00
Block #2 - Big Vein	345,600.00
Block #3 - White Frost Vein	197,162.00
Block #4 - Flagstaff Vein	<u>196,830.00</u>
Blocked out Ore	1,264,592.00

COST OF MINING AND MILLING

Block #1	
Mining 75,000 tons @ 1.20	90,000.00
Milling 75,000 tons @ 1.00	<u>75,000.00</u>
	165,000.00
Block #2	
Mining 72,000 tons @ 1.50	108,000.00
Milling 72,000 tons @ 1.00	<u>72,000.00</u>
	180,000.00
Block #3	
Mining 28,166 tons @ 3.00	84,498.00
Milling 28,166 tons @ 1.00	<u>28,166.00</u>
	112,664.00
Block #4	
Mining 13,500 tons @ 4.00	44,000.00
Milling 13,500 tons @ 1.00	<u>13,500.00</u>
	57,500.00

ESTIMATED PROFIT

Block #1	
Developed Ore	525,000.00
Cost mining and milling	<u>165,000.00</u>
Net	360,000.00
Block #2	
Developed ore	345,600.00
Cost mining and milling	<u>180,000.00</u>
Net	165,600.00
Block #3	
Semi developed Ore	197,162.00
Cost mining and milling	<u>112,664.00</u>
Net	84,498.00
Block #4	
Developed ore	196,830.00
Cost mining and milling	<u>57,500.00</u>
Net	139,330.00

NET PROFIT ESTIMATES

Block #1	360,000.00
Block #2	165,500.00
Block #3	84,498.00
Block #4	<u>139,330.00</u>
	749,328.00

Brought forward	749,328.00
<u>LESS:</u>	
Property Purchase	70,000.00
Rehabilitation of mine underground workings	22,035.00
Mill construction est.	<u>33,567.00</u>
	125,602.00
Plus for expense	<u>4,398.00</u>
	130,000.00
Net to Operation - over 3 year period	\$ 619,328.00

NOTE:

The foregoing estimate does not include any possible ore--

Below the 360' level on the Big Vein  
 Below the 560' level on the Flagstaff Vein  
 Below the 260' level on the White Frost Vein  
 or on the 360' level hanging wall vein, which could  
 possibly develop an appreciable tonnage of high grade  
 ore.

The Big Vein opened to the 560' level should develop  
 an additional 100,000 tons of ore.

The White Frost Vein developed to the 560' level should  
 open an additional 39,000 tons of ore.

The above estimated as probably ore on additional net of  
 \$465,000.00 less approximately \$50,000.00 for development.

Geological conditions are favorable for a downward extension  
 of all veins and it is logical to assume the possibility of  
 developing a large tonnage of ore, and providing an operation  
 over an extended period of time.

EQUIPMENT REQUIREMENTS  
 for  
 REHABILITATION OF MINE.

Pumping equipment	1,200.00
Compressor 750 cu.ft.	1,280.00
Motor for compressor	280.00
Air Receiver	200.00
4 mine cars	200.00
6 rotary stopers	1,200.00
2 jackhammers	200.00
1 drifter with mounting	250.00
Hose for above, water and air	150.00
2000 lb. steel @ 10¢	200.00
1 drill sharpener	500.00
Shop Equipment	180.00
Powder, caps, fuse, etc.	350.00
Air and water line - pipe	250.00
Valves and fittings	90.00
Converting hoist to electric	800.00
Power and transformer installation	1,000.00
Switcher - wire, etc.	125.00
Labor installation	<u>1,200.00</u>
Total	9,935.00

REHABILITATION OF SHAFT.

Clean shaft of debris to 560'	150.00
Replace sets between collar and 260	160.00
Replace skip rail between 260 and surface	30.00
Replace skip rail between 360 and 560	45.00
Replace 3 sets lagging below 260	80.00
Repair skip pocket - 360	150.00
Repair skip pocket - 560	600.00
	<u>1,215.00</u>

BIG VEIN.

260 Level:	
Pull old square sets - get in condition for shrinkage stoping	180.00
Labor	<u>900.00</u>

Total 1,080.00

360 Level:	
Pull square sets and lags main ore shoot for shrinkage stoping	Labor 850.00
Cleaning and retimbering drifts 260 and 360	Labor 200.00
Replace rails - both levels	<u>190.00</u>

Total Big Vein 2,320.00

FLAGSTAFF VEIN

Rehabilitation 360 level - labor	500.00
Cleaning level replace rail	<u>175.00</u>

Total 675.00

Starting stopes 360 level - labor	800.00
Clean level - replace rail	<u>150.00</u>

Total Flagstaff Vein 1,625.00

WHITE FROST VEIN

Starting stopes connecting pipe line, etc., labor 260 level	850.00
Replace rail	<u>90.00</u>

Total 940.00

General, cleaning up shaft house, installing shop and compressor and repair of buildings, including tearing down portion that covers shaft. Labor - tin roofing, etc.	1,000.00
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Total expenditure to rehabilitate and equip mine for 150 tons daily	17,035.00
Plus immediate development	<u>5,000.00</u>

Total requirement 22,035.00

Development to include:

1. Cross cutting to Big Vein and White Frost Vein on 560 ft. level.
2. Cross cutting to open Big Vein in faulted portions on 260 and 360 levels.
3. Opening High Grade Vein on 360 level.
4. Complete survey and assay map of property including sampling and platting and flotation testing.

Rehabilitation of Mill - Estimated Cost

There is at present a very good frame work for a milling plant. New roofing will be required and some new sheeting, but ore bin and timber work are sufficient and in good condition.

The twenty stamps are still standing with battery posts in good condition.

Considerable line shafting is in place and available. Clutches and drive pulleys are still in place. Tanks have been removed.

Reconstruct building-labor	1,250.00
Material	<u>500.00</u>
Total	1,750.00

Stamp Battery

Shoes and Dies	350.00	
Screens	75.00	
Repair Feeders	25.00	
Overhead Crane	175.00	
Replace 2 Mortar Blocks	<u>250.00</u>	875.00

Regrind Unit Used Equipment

Remove old cones - labor	100.00
Place mill floor in condition for Ball Mill	150.00
1 - 22" Hardridge Ball Mill	2,400.00
Installation	350.00
1 - door duplex classifier and motor	800.00
Installation - labor	250.00
Motor and Starter Ball Mill 60 H.P.	270.00
Installation - Labor, Wire, etc.	75.00
Belt for Mill Drive	125.00
Classifier Belt	12.00
Cement and Sand	<u>460.00</u>
Total	4,992.00

Coarse Crushing

Rebuild dump at head frame over bin	
Install grizzly	125.00
Crusher	<del>350.00</del> 350.00
Motor with starter	125.00
Installation	150.00
Total	<u>750.00</u>

Construction of launders, floors, foundation for motors, etc.	500.00
Electric wiring, lights, motors, etc., conduit, buss gutters, switches and arresters	<u>1,500.00</u>
Total	2,000.00

Cyanide Equipment

Quotation San Francisco f.o.b. on complete tank, agitator, filer, motor drives, starters, etc.	
f.o.b. Baker	14,200.00
Installation and freight	<u>3,950.00</u>
Total	18,150.00

General Costs.

Mill tools, vice, chain blocks, etc.	250.00
Supervision	1,200.00
Freight - R.R. to mine	800.00
Light truck used	450.00
Assay office equipped	1,250.00
House for watchman repaired	2,200.00
State Workmen's Insurance	750.00
Incidentals, cyanice, oil, grease, etc.	<u>150.00</u>
Total	5,050.00

Total Estimated Cost

Building	1,750.00
Stamp Battery Repair	875.00
Regrind Unit	4,992.00
Coarse Crushing Unit	750.00
Launders, etc.	2,000.00
Cyanide Equipment	18,150.00
General	<u>5,050.00</u>
	33,567.00

Estimated Total Cost to Place Flagstaff Mine and Mill in condition to produce 150 Tons per day:

Mill Construction and Equipment	33,567.00
Mine Rehabilitation and Equipment	<u>22,035.00</u>
Total Estimated Cost	55,602.00
Plus to carry expense until gold shipments are settled	<u>4,398.00</u>
Total Requirement	60,000.00

G-E-N-E-R-A-L .

That the Flagstaff Mine is favorably located and has bodies of ore that can be mined and milled at a profit, cannot be questioned.

The power line of the Eastern Oregon Light and Power Company crosses the Flagstaff property within 3/4 mile of the shaft. Ample water for milling purposes is available in the shaft below the 560 foot level.

Ore now exposed will pay for the property and equipment and leave a net profit of \$619,428.00 over a period of three years. Geology is favorable for a continuation of values with depth. The Flagstaff vein and walls are regular to the 560 foot level. A small amount of development should open an additional tonnage equal to that now exposed. Mining methods formerly used were expensive, all drilling by hand, and the stopes square set. Walls of the Big Ledge are ideal for shrinkage stopes which would allow a cheap mining cost. All workings are in excellent condition and very little delay should be experienced in getting production started.

It is without question the present price of gold that makes the Flagstaff an attractive mining venture, and makes available a large body of ore that can be profitably extracted.

C-O-N-C-L-U-S-I-O-N

The data contained in the foregoing report is the result of a thorough examination of all exposed areas in the Flagstaff Mine, and study of data available, i.e., mine reports, government statistics, etc.

Sampling was done by S. A. Matthews, Mining Engineer, and J. L. Fisher, Mine Superintendent, under my direct supervision. Conclusions concerning Metallurgy and method of treatment were formed by results obtained on representative samples, for warded for testing purposes.

Conclusions concerning equipment cost and rehabilitation of mine workings were formed through collaboration with Matthews and Fisher, and bids from equipment houses.

One week was spent on the ground sampling and studying conditions.

It is my opinion that the Flagstaff mine, properly financed and operated, will provide a large return for the investment involved in addition to paying the purchase price of the property, and that future development will open additional large ore bodies of as good commercial value as those now exposed, and I do not hesitate to commend it as an attractive mining venture.

Respectfully submitted:

(signed) Geo. A. Kirkbride

Registered Mining Engineer.

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**HAMPTON, William Huntley**, Cons. Engr., 2037 S. W. West Park Ave., Portland, Ore.; res. 2037 S. W. West Park Ave., Portland, Ore.  
Civil, Mining and Consulting Engineer, Chemist and Metallurgist; b. Salt Lake City, Utah, Feb. 9, 1866; s. Brigham Young and Helen Emily Huntley (Boone) Hampton; ed. Common Schls., St. Marks High Schl., and University of Deseret, all of Salt Lake City, Utah, Specialized in Chem.; m. Asanath Jane Leslie, Portland, Ore., March 3, 1892; partner, Hirsching & Hampton, Chem. and Assayers, Salt Lake, 1885-86; chair of chem., Willamette Med. Coll., Portland, Ore., Analyst for Water Commn. for Bull Run water supply for Portland 1888.; 1887-88; partner, Clayton & Hampton, Chem. Assayers and Min. Engrs., Portland, 1886-89; cont. business under firm name, spl. agent, 11th Census, Mines and Min. for Ore. and Wash., 1889-93; part owner and mgr., Columbia Mines Co., Placer, Ore. postmaster of Placer 6 yrs., from 1893; analytical work for Ore, Iron & Steel and Portland Smelting & Refining Co., 1886-93; Cons. Engr. for John C. Lewis operations in Southern Ore., 1890-1904; and Greenback Gold Mng. Co., Placer, Ore., 1898-1904; Maryland Gold Mines, Great Falls, Md., 1917-21. Cons. Chemist National Oil Machinery Corp., New York City, 1919-22; Cons. engr. Geol., Land Department, Oregon & California R. R. examining mineral and coal lands within land grant, 1893-1904; mgr. Jualpa Co., Juneau, Alaska, cons. engr. other Cos., 1904-06; apptd. deputy Co. Surveyor, Josephine Co., Ore., 1902; U. S. Deputy Mineral Surv., Ore., 1902; U. S. Dep. Mineral Surv., Alaska, 1905; U. S. Dep. Land Surv. Alaska, 1905; U. S. Dep. Surv. Calif., 1902; chf. engr., mgr., Alaska Pac. Ry. Term. Co., Katalia, Alaska, 1906-12; mem. of firm, Florance & Hampton, cons. and min. engrs., N. Y. C., 1912-16; chg. misc. Gas Defense Apparatus, L. I. Labs., rep. Gas Defense Div., Catalytic Chemical Warfare Service, U. S. Army, on Protective Clothing Com. Meeting at Am. Univ., Washington, D. C., 1918-19; pvt. practice, civil min., cons. engr., chem., met., spec. refined oil from oil shales, coal and peat equivalent to oil from wells (patents for processes for such production and also recovery of oil from oil sands); contributor to tech. journals; Mem. A. I. M. & M. E.; Soc. Am. Mil. Engrs.; Associate Am. Museum of Natural History. Mem. National Geographic Society; Republican; Protestant.