

PRELIMINARY REPORT
of
CHAMPION MINE
in
BOHEMIA MINING DISTRICT
Lane County, Oregon

By Fred J. Bartels,
Mining Engineer
November 2, 1934

BOHEMIA MINING DISTRICT

Location: The Bohemia Mining District is situated in Lane County, Oregon, Willamette Meridian, in the west central part of the State.

The nearest town is Cottage Grove, a town of about 5,000 people, distant about 35 miles from the center of the district, situated on the S.P. Railroad, 140 miles south of Portland, Oregon, and about 600 miles north of San Francisco, California.

The nearest railroad station is Disston, the terminus of the Oregon Pacific and Eastern R.R., a common carrier logging road, a distance of 12 miles by road from Champion Basin. The nearest Post Office is a cross roads star route office at Culp Creek, where mail is delivered daily except Sunday.

The district may be reached by automobile from Cottage Grove up Row River. At Sharp's Creek the road forks, one road going to Land Park and up Champion Creek to the heart of the District; the other up Sharp's Creek to the Musick Mine, a distance of approximately 18 miles. The Champion road and the Musick road connect at the Champion Saddle which is near the Evening Star Camp. A road was completed in November, which leads from the Champion Saddle to the Grizzly Saddle which makes the top of Grouse Mountain accessible.

During the last three years approximately \$40,000 has been spent on roads on the Champion property alone.

Mineralized Area, Topography: The region comprises a mineralized area of about 5 miles easterly and westerly and 6 to 7 miles northerly and southerly, and lies along the crest of the Calapooya Mountain, a westerly arm of the Cascade Range.

The relief of the district is marked. Bohemia and Fairview peaks have elevations of 5,960 and 5,925 feet respectively, while narrow valleys of Champion and Sharp's Creek three to four miles distant, have elevations of 2000 feet.

Champion Basin, the center of the district, is surrounded in a semi-circle by four prominent peaks; Fairview, Bohemia, Grouse and Grizzly. Erosion by glaciation and glacial streams has been rapid, resulting in deeply incised cirques and gulches with steep walls. The easterly slope of Bohemia peak is cut by glacial action at a remote period and is still almost perennial occupied by snow.

Climate and Economic Conditions: The altitude at the camp buildings in Champion Basin is about 4,200 feet above sea level. Snow fall begins about December 1st and lies on the ground to May 1st in normal years. A depth of five feet is frequent and sometimes fifteen feet of snow is attained at the camp buildings. Annual precipitation is about 50 inches, most of which is in the form of snow; extreme low temperatures, however, are uncommon. Six months of the year climate is ideal and the year around temperature is equable with no extremes of heat and cold.

Improvements recently made on the road by Federal and county agencies have sufficiently improved the road so that transportation by motor truck may be expected for nine months of the year. During the remaining three months of the year entry to the property by motor truck, while possible about 50% of the time, will have to be undertaken as dictated by weather conditions.

One Forest Service owned telephone line serves the district, and at the present time a telephone is installed at the Champion Mine.

Timbers: While the timber on the Champion group has not been cruised it would appear from small areas cruised that there will be at least thirty-five million feet of timber on the property.

Power: Conditions make it seem most expedient that power for present purposes be derived from internal combustion engines of the diesel type, either used as units or one large unit, directly connected to a generator with such motors as may be required for separate units in mill and at mine.

Water: Milling water for reasonable sized operations, about 100 tons or more per day, may be obtained from the mine, some springs, upper portion of Champion Creek, and Fairview Creek.

Topography: Backs of 1800 feet can be attained by use of tunnels, or tunnel entry on the veins of this property.

Country Rocks: The country rock is firm and stands well, and other than chutes the only timbering necessary is stulls for the support of workmen in the stopes.

At Cottage Grove are good stocks of general provisions and mine supplies. The country between the town and the mining district affords fresh meat and vegetables at low cost.

In general, as may be seen, the economic conditions are favorable, the question of transportation for a short period each year being the major problem.

General Geology of the District: The Oregon Bureau of Mines and Geology has published a somewhat detailed description of the geology of this district. The Mineral Resources of Oregon, vol. 2, Bulletin No. 4, says in substance as follows: "The Calapooya Mountains are similar in structure and composition to the Cascade Range of Oregon. Its andesitic lavas probably poured forth from the early miocene vents and the inter-bedded volcanic breccias and tuffs are but a hint to us of the igneous activity of tertiary times. The individual flows are about 100 feet in thickness, some less. On the southeast side of Bohemia Mountain seven flows are clearly shown having a total thickness of about 500 feet. As far as has been ascertained, the andesite and some dacite flows have not been tilted or folded to any great extent by subsequent uplifts. Pyroxene andesite predominates in the district. A thickness of about 4,000 feet is exposed in this region".

*At the close of, or perhaps during the period of uplift, there was a

deep seated intrusion of igneous material and there is much direct evidence in this particular district of intrusive rocks into the andesite flows. Dacite porphyry and andesite porphyry in the form of dikes are the intrusives."

"The later stages of intrusive activity is shown by the formation of many veins and lodes and the great amount of rock alteration which takes place adjacent to the fissures and fractured zones. These fissures and fractured zones forming conduits for mineral charged solution and gases rising from favorable places and mineral deposition and in this way they become the ore veins and lodes. The vein solutions and gases also acted upon the wall rocks, altering them in many cases for several feet on each side of the fissures."

"Since the general uplift of the region, extensive erosion has taken place. During the Glacial period the development of Mountain-Valley glaciers was prominent and since then streams have been actively engaged in their work of degradation so that now a mature stage of erosion has just about been reached."

Veins: The veins of the Champion Mine are well defined fissure veins and lodes which cut the andesite flows. In the underground development of the Champion vein it is found at nearly all points to follow a large and persistent intrusive dike.

There has been two periods of vein formation; first: a vein system having a general strike of north 15° west, which appear to be the older system; second: a system of veins of which the Champion is one having a strike of north 60° west and dip southerly from 45° to 70° .

The veins of the East West system are the major veins and the ones from which practically all of the production has been made. They vary from one or two feet to an extreme of eighty or ninety feet in width. A vein may be single or composed of several parallel veins only a few feet apart.

Insofar as exposed by development the ores are found to be oxidized to a depth of about three hundred feet. These oxidized ores yield large returns in free gold. Below the oxidized zone the veins contain galena, chalcopyrite and sphalerite with probably small amounts of pyrite in a quartz gangue. Occasionally what appear to be primary sulphides are found at the surface.

Gangues: The principal gangue mineral is quartz which is more or less abundant throughout the veins. An interesting gangue mineral in the veins is a white clayey substance resembling kaolin. It has been determined that the white argillaceous material contains only a small amount of kaolin and is made up chiefly of sericite, a white foliated form of mica, derived from the alteration of feldspar by hot alkaline solutions.

Mr. Waldemar Lingren shows the importance of sericite in the veins of the Idaho Basin Mining District, at the same time called attention to the scarcity of kaolin under such conditions.

Another interesting gangue mineral quite abundant in the Champion Mine is Specularite, a contact or high temperature type of mineral which indicates close proximity to the source of the emanations from the underlying magmas.

Historical Data: Gold was first discovered in the Bohemia district in 1858. In 1875 a five stamp mill was built on the Knott claim and run until 1877 on free milling surface ore. From 1877 to 1891 little was done in the district. In 1892 prospectors again entered the district and many locations were made. This mining activity resulted in the opening of the Champion and other mines in the near vicinity, and profitable operations were carried on from the mining of the free milling ores developed.

During this period gold and silver ores of high value were worked but when sulphide ores were encountered profitable milling in the plants then in use became very difficult, and about 1900 several mines of the district were consolidated.

Between the time of this consolidation and 1908 considerable money was spent for the installation of a plant on the Champion group to treat the ores from the mines included in the consolidation. This new plant, a thirty stamp mill, equipped with amalgamation plates and concentration tables, was operated until 1916 with considerable success, notwithstanding the fact that the concentrate made was a bulk concentrate containing sulphides of lead, copper, zinc, and iron which carried the gold and silver.

This mixed product at that time was not particularly sought by smelting plants, and penalties for zinc contained were charged in addition to the usual smelting charges, and it is safe to say that not more than 40% or possibly 45% of the gold contained in the ore could be recovered by amalgamation.

It may here be noted that present ore treatment practice using flotation the ores from the Champion can successfully be concentrated making separate products of the various sulphides contained, which may be sold to different purchasers to best advantage, and at the same time a considerable proportion of the gold and silver contained may be recovered as bullion by introducing amalgamation, and cyanidation, in the treatment plant.

It appears that the unusual conditions imposed on gold mining during the late World War was the primary cause for stopping operations at the Champion mine, and since 1916 little or no work has been done except at the Evening Star mine, now part of the Champion Group, which has been in constant, though small, operation for several years, mostly on oxidized, or semi-oxidized ores.

According to data furnished by Senator R. M. Stanfield, the Bohemia district has produced more than \$9,000,000 in gold and silver, and the Champion mine is credited with about 25% of this entire amount.

Champion Mines: List of claims as follows:

Bohemia	Ida May	Blue Bird	Good Hope
Evening Star	Sunshine	Forsaken	Bertha
Annex	Triangle	Columbia	Mahala
Champion	Broadway	Jumper	Webfoot
Excelsior	Diamond	Snow Slide	Sunrise Fraction
Mable	Oversight	Vindicator	Sunrise
Surprise	Ruth	Frank Brice	Highland
			Mitchell

Development Work: The mine so far has been opened up by six main levels driven along the vein. Altogether the workings consist of over 10,000 feet of tunnels, raises and cross cuts.

The old 6th, 5th and 200 levels were adits driven on the vein. The portals of these levels now are caved. The 7th, 8th 8½ and 9th levels are reached through the main working cross cut 950 feet in length in excellent condition. The Diamond cross-cut (also on the 9th level) 450 feet in length is caved at the portal. From the 9th level raises lead to the various stoped and upper levels and are open and in excellent condition. The east face of the 6th level is reached by a new cross-cut 250 feet to the vein. At this point access is gained through raises and stopes to the 5th and 200 foot levels. No. 12 cross-cut tunnel now is 456 feet, is 320 feet vertically below No. 9 cross-cut and the 9th level. If the Champion lode maintains its average pitch downward, this cross-cut will tap the vein 440 feet farther in and will give about 350 feet of new backs on the main Champion lode.

The Champion lode has so far been explored underground for a length of 2500 feet and a depth of 600 feet. Reference is here made to attached map, showing present development on the main Champion lode, stoped area, blocks of ore now in sight.

Estimated Available Tonnages: The following estimate was made by Arthur E. Hepburn and E. A. Ritter, and later checked by Howard W. Squires. A small proportion of not to exceed ten thousand tons has probably been mined from the No. 1 block since the figures following were made and this block should be decreased by that quantity.

Block No. 1	- 360' x 255' x 4'	- 18,246 x \$25 per ton	\$ 456,150
" "	2 - 200 x 88 x 8	- 10,330 x 20 " "	216,600
" "	3 - 240 x 285 x 5	- 24,000 x 21 " "	504,000
" "	4 - 225 x 222 x 3	- 14,935 x 25 " "	373,375
" "	5 -	3,970 x 33 " "	127,710
			<u>\$1,677,835</u>

(Gold at \$20.00)

Of the tonnage above shown it is estimated that 52,000 tons are sulphide ore containing about 5% lead, 1½% copper, 11% zinc. These base metals, by proper milling, can be made available and will increase the value of the ore in the amounts of their value at the time of marketing.

It has been above noted that in many of the places where stoping has been done, that on one or both walls considerable quantities of sulphide ore has been left. These ores, not being amenable to treatment by the milling processes then in use, and while the quantity of this ore is questionable, it would appear reasonable that careful survey would bring forth evidence to admit the increase of the above figures by about 50,000 tons of semi-oxidized or sulphide ore. While fixed value for this tonnage can hardly be given at this time, from such samples as assayed, it would appear reasonable that the gold and silver value of this 50,000 tons of ore would be between \$6.00 and \$10.00 (gold \$20.00).

I would like to call attention to the fact that there are between 30,000 and 40,000 tons of ore in various dumps on the property of an average gold value of \$6.00 per ton (gold at \$20.00) which will be available for mill feed as soon as this mine has been provided with the proper milling facilities.

Economic Geology - Mineralization: Like most all veins or lodes of this character, the values were not found uniformly distributed throughout, but are in richer ore shoots. It is a well known fact that where a cross fracture or other vein intersects the main lodes, an enrichment of the ore occurs. Four of these shoots have been disclosed by the exploration work thus far over a horizontal distance along the vein of about 2500 feet. The length of these shoots varies from 200 to 600 feet in length. Distance between shoots, where one stops and another begins, varies from 8 to 15 feet. The vein material between shoots is low grade ore and on a large operating scale may possibly all pay to stopes and mill. In each case the downward extension of these shoots are exposed by the lowest workings on the vein and have every appearance of extending many hundreds of feet further.

The vein material is made up of brecciated fragments of the andesite country rock, which have been cemented together and replaced by silica and sulphides of lead, copper and zinc, and carrying good values in gold and silver.

A study of the Champion ore bodies shows that the ore has been oxidized for a distance of three hundred feet or more below the surface. Ore exposed below these depths contain some oxidized ore, but in the main is composed of the unoxidized sulphides, sphalerite, galena, chalcopyrite and pyrites. These sulphides almost always carry good values in gold and silver.

Before taking up the subject of ore bodies, I think it only fair to note the following observation as to width of ore. Where stoped and exposed by development work, the ore varies from 2 feet wide minimum up to 12 feet wide maximum on the 9th level. In many places throughout the mine, ore was stoped only two to three feet wide because it was oxidized or semi-oxidized and yielded free gold for this reason. Exposed on each side is heavy sulphide ore which could not be handled in the mill, or, if broken, had to be deposited on the dumps. Just how much of this ore has been left in old stopes no one can tell but I saw a number of places where cross-cuts and holes had been blasted into sulphides and drill holes put in several feet and still in sulphide ore. For this reason it is fair to assume that when properly equipped to save the values in the base ores, the mine will stope a greater width than has been allowed in figuring present tonnage in sight.

GROUSE MOUNTAIN

The Bohemia claim which is part of the Champion Group covers the highly mineralized area on top of Grouse Mountain. Over a dozen veins have their intersection or radiate from this area, the main Champion lode being one of them.

This area is a large mass of quartz, quite similar in appearance to all the oxidized vein materials and covers approximately 350 feet wide by 400 feet long. Three shafts have been sunk to a depth of 75 feet, and many test pits, cuts and trenches have been run over this mass. The ore all pans free gold. In early days ore was packed from this area and milled in a stamp mill.

The evidence of ore shown in this area is sufficient to warrant development, and the size of the mineralized area would indicate a tonnage of 10,000 tons for each foot of depth. The No. 6 level driven east on the Champion vein, and under this large mass of quartz will give backs of 500 feet.

Proposed Development Work: The suggested development for the Champion Mine is shown in detail as follows:

Continue No. 12 cross cut 440 feet where it will	
encounter the main lode, Champion Lode	440 feet
Drift on the 12th level east on the vein	1500 "
Run 4 raises on ore from 12 to 9th levels	1280 "
Run 2 more raises on ore from 9 to 6th levels	540 "
Continue present east face 6th level on	
over toward Grouse Mountain	1500 "
Continue No. 9 level east on the vein	900 "
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	6160 feet

I estimate it will cost an average of \$10.00 per foot to do this development work.

6,160 feet at \$10.00	\$61,600
Equipment necessary, machine drills, steel, pipe tugger, etc.	13,400
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	\$75,000

It is estimated this work will develop an additional 150,000 tons of oxidized ores above the 6th level, carrying chiefly gold and silver values and 300,000 tons of sulphide ores carrying gold, silver, copper, lead and zinc.

Milling Plant: The old milling plant in Champion Basin is too near destroyed to be recovered.

Milling tests made by Carl F. Williams in behalf of the Mineral Separation N.A.C. indicate the possibility of selective flotation being able to efficiently and cheaply handle the sulphide ores from the Champion Mine. It would appear that a mill containing crusher, grinding element, probably ball mill enclosed circuit with classifier, overflow from classifier to thickner, thickner to discharge to Mineral Separation flotation machine of desired capacity making a bulk concentrate, and tailing; the concentrate from this machine taken to a second machine in which the lead would be floated and the tailings, the zinc concentrate would appear to be the required practice for the efficient treatment of these ores. (See mill tests appended.)

It may be found expedient to introduce amalgamation before taking product to flotation machines owing to fact that some of the gold seems to be coarser than might be expected to be satisfactorily floated. To accomplish this I would suggest introducing an amalgamator similar to Pierce amalgamator to receive the discharge from the ball mill and by having a classifier built a little longer than standard, all this could still be included in a closed circuit. Oxidized ores and semi-oxidized ores can best be treated by amalgamating, flotation and cyanidation. This would mean adding necessary cyanide equipment for capacity desired to the mill above suggested and delivering the tailings from the flotation unit to the cyanide plant.

EVENING STAR MILL

There is at present located on the Evening Star claim a small mill not yet completed estimated to handle about 15 tons per day.

At present time this mill consists of a five stamp battery with 5" x 6" jaw crusher, feeder and amalgamating plate. Tailings from amalgamating plate going to a home built drag classifier, and the sand to leaching plant which is equipped with 3-10' x 6' leaching tanks, four solution tanks, one lime tank, one small gas engine, solution pump and necessary piping.

The slime treatment plant to handle the overflow from classifier and not yet completed will consist of the following: 1 10' x 6' thickener, agitation tank, 4 solution tanks, and three thickeners, and there is yet to be acquired one small air compressor, four small mud pumps together with necessary pulleys and belting.

While at present the sand plant is equipped with zinc precipitation boxes, undoubtedly the use of zinc dust precipitation of Merrill-Crowe type will be found more efficient and save considerable labor.

The stamp mill as now used will grind about 800 lbs. per hour to pass a 30 mesh screen and the saving of gold and silver to date has been about 30%. Inspection of thin sections indicate finer grinding necessary in order to obtain savings usually expected from cyanide process.

Recent tests made by Merrill-Crowe and Minerals Separation N.A. Corp., where the ore was ground to all pass 60 mesh screen, using flotation followed by cyaniding, it is possible to recover from 95-96% of the gold and silver from the ore. Consequently it would appear that there should be installed a ball mill or similar grinding element, three cell flotation unit, classifier and feeder, air compressor with power unit, erect a building for air plant and concentrate storage, rebuild ore bin, complete the slime treatment plant and install zinc dust precipitation; to do this including supply of fuel oil, necessary labor, camp supplies for winter, I estimate will require about \$15,000. With the above improvements made, the grinding of 15 tons per day of oxidized ore averaging about 3/4 oz. gold per ton could immediately be started. This would mean assuming a 95% extraction that the mill would produce about \$393 per day at a total estimated cost not to exceed \$90.00 per day. At the present

time it is estimated that there is blocked out and partially blocked out an estimated 20,000 tons of ore such as used in obtaining these results.

Consequently it would appear, because of lateness of season, that the arranging of this mill for use this winter would permit highly profitable operation, leaving the building of a new and larger plant, justified by present development until next spring.

ESTIMATED COSTS:

Figures written above show an available ore tonnage above the 9th level of the Champion Mine of 71,981 tons of ore containing \$1,677,835 in gold and silver alone, or an average value of about \$23.30 per ton (gold at \$20.00).

The conditions found to obtain are such as to lead to the expectation of very low mining costs, and I am of the opinion that with proper milling facilities the ore now exposed may be mined and milled and product marketed for a cost of not to exceed \$6.00 and \$6.50 per ton, roughly distributed as follows:

Mining	\$1.50 per ton
Development50
Milling	1.25
General expense, assaying and engineering .	1.25
Metallurgical	1.25
Marketing65
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	\$6.40

While the above figures are estimated on the basis of not less than 50 tons per day ore production, the unusual situation in the Evening Star indicates that costs will not exceed the above figure on a production basis of no more than 15 tons.

The ore to be mined from the Evening Star approximately 20,000 tons of which a composite sample gave assay returns of 8/10 of an ounce gold per ton. This would indicate at present price of gold a value of \$28.00 per ton. If the above working cost of \$6.40 be deducted from this, would leave a net operating of \$21.60 per ton, or a total profit of \$432,000. It will be noted that these figures do not include any silver value that may be found in the ore which numerous assays made indicate will be between 3 ozs. to 6 ozs. per ton, the greater proportion of which will be recovered in the mill above suggested.

It will be seen in the estimated cost that provision is made for the spending of 50 cents in development for each ton of ore mined, and the proper expenditure of this development fund will add to the ore now in sight more rapidly than the contemplated mining will exhaust it, or, in other words, the complete mining of the 20,000 tons now exposed under the scheme here suggested will leave an equal, or greater tonnage, of ore developed for future mining.

CONCLUSIONS:

The Champion Mine embraces the heart of the Bohemia mining district. The development of the Champion vein has produced approximately \$2,000,000 in gold and silver, and there is still developed for mining 71,981 tons, the gold and silver value of which are estimated to be \$1,677,835 (gold at \$20.00, silver at 50¢).

The ore occurs under favorable geology, the veins of a nature typical of many of the most valuable ore deposits in the western part of the United States, and conditions obtaining lead to the expectation of unusual permanency.

Tests clearly indicate that these ores may be easily, cheaply and satisfactorily treated by present metallurgical processes.

With the possible exception of winter transportation for a short period each year, all of the mining conditions are favorable.

The available ore blocked out and partially blocked out in the Champion fully and completely justifies the spending of the sums of money necessary to completely equip and start operations.

In the Champion Mine there is what in my opinion is one of the best mining operations capable of being acquired on the Pacific Coast, it being a mining operation of unusual merit, and as such I hereby wish to recommend it.

Respectfully submitted,

Fred J. Bartels

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REPORT
ON THE PROPERTIES
OF THE CHAMPION GOLD MINING COMPANY
LOCATED IN LANE COUNTY
OREGON

By **E. A. Ritter, M.E.**
Denver, Colorado
1927

REPORT ON THE PROPERTIES
OF
THE CHAMPION GOLD MINING COMPANY

Introduction

The properties of the Champion Gold Mining Company are located in the Bohemia mining district, in Lane County, State of Oregon.

They contain a number of quartz veins, carrying free milling gold ores near the surface. Farther down the sulphides of lead, zinc and copper are found to accompany the gold and the silver in the veins.

Only part of the upper portions of the veins, which contain the free milling gold ores, have yet been mined, but the lower mine workings have exposed large quantities of ores rich in sulphides of lead, zinc and copper, but yet containing very good values in gold.

History of the District

The Bohemia mining region was discovered, according to Dr. W. W. Oglesby, an old resident of Cottage Grove, Lane County, Oregon, by himself and Frank Brice, in August 1858.

The region was named from James Johnson, also called Bohemia Johnson, who, with George Ramsey, reached it in 1863 from Roseburg, by way of the North Fork of Umpqua River and Steamboat and City Creeks. Free gold was found in a vein near the headwaters of City Creek, near the Musick mine. This discovery brought many prospectors. Bird Farrier discovered what, by purchase became later the Bohemia claim, where a five stamp mill was erected in 1875. According to many old timers, the mill produced many large bricks of gold bullion.

The Musick was discovered in 1891 and in 1892, the Champion, the Helena and other veins were discovered. In 1895 the Champion erected a ten stamp mill. In 1902 this mill was rebuilt and enlarged to 30 stamps. A 300 horse-power hydro-electric plant was erected 7 miles down the Champion creek and it was operated till 1916, when it was shut down due to war conditions.

A good deal of development work has been done in the mine since 1921, but practically no ore milled from it.

Location and Topography

The Bohemia mining district of Oregon, is situated in the west central part of the State, 35 miles southeast of Cottage Grove, a town of about 5,000 inhabitants, on the main line of the Southern Pacific railroad, and 144 miles south of Portland. The Oregon and Southern railroad runs from Cottage Grove to Disston, within 12 miles of the mine.

The Bohemia mining district may be reached by auto from Cottage Grove, up Row River. The road forks at the mouth of Sharps creek, one fork leading to the Champion mine and the other to what is known as the Champion Saddle.

The region comprises a mineralized area of about 8 square miles and is rugged. The elevations range from about 2,000 feet above sea-level in the canyons up to 6,000 feet on the highest peaks. The district is located on the Calapooya mountains, which form a connecting link between the Cascade Mountains and the summits of the Coast Range.

The main divide of the Cascades is about 30 miles to the east and the Coast Range is about 40 miles west of the district. The annual precipitation is about 50 inches, most of which falls in the form of snow and rain, during the winter months. Although snowfall is heavy, low temperatures are the exception. The luxuriant vegetation, due to the humid climate has somewhat masked the geological features. Great forests cover the area and it is noted for its fine timber. A heavy over-burden of soil covers all, except the steepest slopes and some of the peaks.

Geology of the District

The Calapooya mountains are similar in structure and composition to the Cascades of Oregon. Andesitic lavas probably poured forth from early Miocene vents and the interbedded volcanic breccias and tuffs are but an indication to us of the igneous activity of Tertiary time.

The individual flows are about 100 feet in thickness, or are less thick. On the southeast side of Bohemia mountain seven different flows of lava are clearly seen, having a total thickness between them of 500 feet. These andesite flows and some dacite flows have not been folded or even tilted to any great extent by some subsequent uplift.

Pyroxene and hornblende andesites are the prevailing rocks, though a tourmaline andesite has also been noted. The pyroxene-andesite is the predominating rock in the district and the thickness of the lava flows exposed is about 4,000 feet.

At the close of, or perhaps during the period of uplift, there was a deep seated intrusion of igneous material and there is much evidence in this

particular district of intrusive rocks into the andesite flows. Dacite-porphry and andesite-porphry, in the form of dikes, are the intrusive rocks.

The last stages of volcanic activity are shown by the formation of many veins and lodes and by the great extent of rock alteration which has taken place adjacent to the fissures and to the fractured zones. Thus were the veins formed.

Since the general uplift of the region, extensive erosion has taken place, so that now a mature stage of erosion has been reached.

The Veins

The veins of the district are well defined fissure veins and lodes, which cut the andesitic flows. Very frequently, the veins follow the intrusive dikes.

There seems to have been two periods of vein formation. The veins which strike approximately North 15 degrees West have been cut by larger and more numerous East and West veins. The average course of 35 veins is North 70 degrees West with a variation of 10 degrees to the west or the east from the 70 degrees. The later veins have been the largest producers. They vary from 1 foot to 20 feet in width.

A vein may be single; or an ore body may be formed by the coalescence of several veins, only a few feet apart, as is the case in the Champion mine.

In a number of cases, the veins have been oxidized to depths of from 100 feet to 400 feet below the surface and have yielded large returns in free gold. Below the oxidized zone, the veins contain galena, sphalerite, chalcopyrite, and a small amount of pyrite in a gangue of quartz. In many cases also, the sulphides show right at the surface. The sulphide ores carry large amounts of gold and silver.

Many of the veins which show on the surface have not yet been explored and no doubt many others have not been found, covered as they are by the dense vegetation and soil.

The veins are strong and persistent. Some may be traced for several miles. They show in the bottom of the canyons and on top of the ridges, with two to three thousand of feet of difference in elevation, giving every indication of great depth and permanency.

The gangue mineral is mostly quartz, accompanied by a large amount of sericite. Another gangue mineral, quite abundant in the Champion mine is specularite, an iron oxide.

The Champion Group of Claims

The Champion Group consists of ten Lode Mining Claims not yet patented.

In the Champion mine, the main vein has an average width of four feet and in places reaches a maximum width of sixteen feet. The strike is about North 60 degrees west. The dip varies between vertical and 60 degrees to the southwest. The vein has been traced for about five miles on the surface.

The profile added to this report shows the main workings of the Champion mine. The main tunnel is the No. 9 crosscut tunnel. Outside of the workings near the surface on the Evening Star claim, all the main workings of the mine have been in the Champion claim. Ore has been extracted from the levels Nos. 5, 6, 7, 8, 8½ and 9. All these workings are connected together by raises and ladderways.

The No. 9 crosscut tunnel is 950 feet long. Another tunnel driven to cut the vein at a point 320 feet lower than No. 9 has been started. It is the Diamond Crosscut tunnel. It is now 450 feet long and will have to be driven a further distance of 450 feet to cut the vein.

If the strike and the dip of the Champion vein and the second vein, parallel to the Champion and located 8 feet north of the Champion do not change between the No. 9 level and the Diamond crosscut level, the two veins will intersect each other at a horizon about 200 feet below the 9th level. They may then continue down as a single vein of great width and value.

In the course of mining the Champion Lode, free gold assaying as high as \$40,000 per ton has been encountered and in the sulphide zone, assays as high as \$28,000 per ton have been obtained.

If the Champion and the parallel vein coalesce at the 12th level, this will be a wide and rich ore body. At the present time, the ore bodies in the upper levels of the Champion mines are approximately 1,200 feet in length, but their total extent has not yet been determined and from the surface indications, and the surface cuts, along the strike of the vein, it is likely that the ore body will eventually prove to be twice as long.

There is in the Champion mine an estimated tonnage available of 81,981 tons of oxide and sulphide ores, estimated at \$1,927,835.00 gross for its gold and silver contents. To this amount should be added the values in lead, zinc and copper for about 40,000 of the 81,881 tons. It is estimated that the sulphides will average 16% zinc, 3% lead and 2% copper.

Estimated Tonnage Available in Five Blocks

Block No. 1	360 ft. x 255 ft. x 4 ft.	28,246 tons
" 2	200 " 88 " 8 "	10,830 "
" 3	240 " 285 " 5 "	24,000 "
" 4	225 " 222 " 3 "	14,935 "
" 5		<u>3,870 "</u>
	Total	81,880 tons

Estimated Value of the Ore

Block No. 1	23,246 tons at \$ 25.00 per ton	\$ 706,150.00
" " 2	10,830 " " 20.00 " "	216,600.00
" " 3	24,000 " " 21.00 " "	504,000.00
" " 4	14,935 " " 25.00 " "	375,375.00
" " 5	3,870 " " 33.00 " "	<u>127,710.00</u>
	Total	\$1,927,835.00

These amounts are for the gold and silver contents in the ore only.

Besides these amounts, it is estimated that approximately 150,000 tons of oxidized ore, near the surface, in the workings of the Evening Star claim, of an average value of \$20.00 per ton can be opened up there by the proper amount of development work.

The Champion vein has been mined for a horizontal length of 1,500 feet and to a depth of 600 feet. By referring to the map and the profile, it is easy to see that the ore, east of and below the 9th level can be developed with a minimum amount of tunnel work.

This program of development work would comprise the extension of the 9th level east 900 feet. It would comprise the completion of the No. 12 crosscut tunnel to the Champion vein, a distance of 450 feet, and also the drifting of 1,500 feet on the vein; raises from level 12 to level 9 and raises from level 9 to level 6. It is estimated that this work should develop 300,000 tons of ore. At a value of \$20.00 per ton, it would give \$6,000,000.00 for this block of ore.

The Champion Dump

According to H. R. Spencer, engineer in charge of the Champion mine in 1915, the Champion dump contains an approximate tonnage of 30,000 tons of a value of \$6.00 per ton in gold. With the present value of the base metals, the value of this dump is close to \$300,000.

Past Production of the Champion Mine

A report from former U. S. Senator R. H. Stanfield gives an estimated production of the Bohemia district at \$9,000,000.00. If the known production of the other properties is deducted, it would leave \$6,000,000.00 as the past production of the Champion mine.

The Bohemia Mining Claim

An area of virgin and very valuable ground, which is a part of the Champion group is the highly mineralized area on top of Grouse Mountain. This area is several acres in extent and has given up a large amount of rich float. There is a large mass of gold bearing quartz, from which radiate 15 different veins. The area has been prospected by three shafts 75 feet deep and numerous pits and has shown a great deal of ore.

The number 4 tunnel has been driven towards it and 300 feet more will reach under the ore body. It will tap it 250 feet below the surface. Level 6 of the Champion will give 500 feet of backs, and level 12 will be 1,150 underneath it.

In the course of previous operations, it has been shown that at the intersection of the Champion vein with other veins, good ore bodies have been found of a gold ore averaging over \$20.00 in gold per ton.

It is likely that a large tonnage of high grade ore will be extracted from the important ore body outcropping at the surface at the top of Grouse Mountain.

Development on the Other Claims of the Property

While all the workings of importance are concentrated in the Champion mine, there has been some work done at other places.

A shaft 60 feet deep has been sunk on an ore-shoot and a level driven towards the east at the bottom level for a distance of 110 feet. The ore milled from these workings was put through a stamp mill, and all the rock extracted milled. A value of \$44.12 in gold per ton was recovered from the amalgamation plates and a value of \$18.00 per ton in gold was left in the tailings.

At another place, two veins have been discovered. They have approximately the same strike and dip; yet there is a slight difference in the dips, so that they should intersect at a depth of 250 feet. Thirty tons of ore from one vein on the dump shows sulphides and by assay carries considerable gold. The north vein is opened up by several cuts and a great deal of free gold by panning.

The two veins have been traced for a distance of 800 feet and should give at their junction a long and rich body of ore.

These other prospects, as well as the Champion mine can be worked by tunnel. And the Champion can be mined to a depth of 1,500 feet below the No. 12 level, by tunnel, in starting farther down steep Champion Creek.

Local Conditions

There is an abundance of timber on the property for all mining requirements; there is ample water for milling purposes. The character of the veins make them well adapted to mining by shrinkage stopes.

The old mill and the old partly destroyed hydro-electric plant are not assets.

From 1929 to 1931 approximately \$25,000 have been spent on surface improvements of the property. These consist of a boarding house and of a new substantial tunnel house at the mouth of No. 12 tunnel, 40 feet by 50 feet. A number of roads have been built, making the access to the property easy.

(SIGNED) E. A. Ritter, M.E.

DESCRIPTION

of the

BOHEMIA MINING DISTRICT

of the

CASCADE MOUNTAINS, OREGON

by

Elmer Fisher and Fred J. Bartels
As part of the course in Economic Geology,
School of Mines, O.A.C. 3rd term, 1919

PREVIOUS WORK

The authors wish to express gratitude to G. E. Goodspeed Jr., who generously loaned his ores, thin sections, notes gathered on a ten days trip in August and September, 1915, for the Oregon Bureau of Mines and Geology, and offered suggestions in compiling this report. We are also indebted to Mr. J. S. Diller of the U.S.G.S. who made a report of the region in 1898-99 (20th Annual Report U.S.G.S. Part 3-1900); and D. F. MacDonald, also of the U.S.G.S. who published a report in 1908, U.S.G.S. Bulletin 380.

HISTORY

The Bohemia mining district was discovered, according to Dr. W.W. Oglesby of Cottage Grove, Oregon, by Frank Brass and himself, in August, 1858. The district was named from James Johnson, also called Bohemia Johnson, who, with George Ramsey, reached it in 1863 from Roseburg, by way of the North Fork of Umpqua River and Steamboat and City Creek. Free gold was found in a small vein near the head waters of City Creek but gave out at a few feet in depth. This discovery brought many prospectors. Bird Farrier discovered what, by purchase, became later the Knott claim, where a five-stamp mill was erected in 1875. It shut down in 1877, and the Bohemia district was almost forgotten until interest in it was revived by Dr. W. W. Oglesby, O. P. Adams, and others in 1891. The first lode of importance, located the same year was the Musick which installed and operated a five-stamp mill continuously until 1895. An addition of a five-stamp battery was then made and the ten stamps operated during the summer months until 1908. There has been very little activity in the entire district during the last five years.

OUTPUT

The output of the Bohemia district since its discovery has been chiefly from the Champion, Musick, Galena, Noonday, and Vesuvius, which estimated approximately for the entire district is about 5,000,000. The average running time has been about 6½ months out of the year, because of heavy snows in winter which interfere with the work.

LOCATION AND TOPOGRAPHY

The Bohemia mining region is situated at an altitude of between 4,000 and 6,000 feet above sea-level along the crest of the Calapooya Mountain and upon both slopes, about 35 miles directly southeast of Cottage Grove, from which point it may be reached by a good road up Row River. The road forks at the mouth of Sharp Creek, one road leading to the Noonday and Champion mines, and the other a good road leading up Sharp Creek by a shorter route to what is generally known as the Musick Mine. The region may be approached also from the railroad at Oakland, on the southwest by road and trail, but the distance is somewhat greater than from Cottage Grove. The slopes throughout the region and its approaches are steep and generally well wooded, but offer no special difficulties in the way of road construction.

The mines cluster about Bohemia Mountain and lie close to the crest of the Calapooya Range, where it forms the divide between Steamboat Creek, flowing south into the Umpqua, and Sharp Creek with Frank Brass Creek, flowing north into Row River and the Willamette. The divide between this stream and the North Fork of the Umpqua is comparatively low, so that Bohemia and Grouse Mountains and the other peaks in that vicinity are separated from the crest of the Cascade Range, 40 miles to the eastward, by lower ridges and hills. The higher peaks of the Cascade Range may often be seen from the Bohemia region above the clouds which lie over the interval. Seen from the Cascade Range, the Bohemia Peaks of the Calapooya Range stand out prominently in the distance. Next to Bohemia Peak the prominent elevations of the Bohemia region are Fairview, Grouse, and Grizzly peaks, each of which stands at a marked bend of the serpentine crest of the Calapooya Range.

GEOLOGY

The rocks of the district consist of andesitic lava flows interbedded with pyroclastic material, the product of Tertiary volcanos, and perhaps fissure eruptions. These flows and tuff beds have been more or less altered by subsequent hydrothermal metamorphism and have been slightly tipped in various directions by the same orogenic forces which probably caused the uplift of the Cascade Range. A porphyritic dacite cuts the andesites and interbedded tuffs in several places along the road about half way between Disston and Orseco. It also occurs within half a mile northeast of the Musick Mine, and about one mile southeast of Bohemia mountain on Churchills property. Basalt occurs in one or two small outcrops. It is a fine grained lava, best shown on the south edge of Bohemia Mountain. Its small outcrop suggests that it is intrusive in the andesites.

PETROLOGY

Rocks of the Bohemia Mining District

ANDESITES:

With very few exceptions all of the rocks of the Bohemia district might be included under this heading. The tuffs, too, and most of the basalts are andesitic. In several of the andesites hornblende is present, but generally pyroxene is the only characterizing ferro-magnesian silicate. Although widely distributed, the andesites are much altered. At the Champion mine is a fine even grained andesite, containing small veinlets of epidote. In thin sections shows feldspars altered to kaolin, considerable magnetite, abundant chlorite, and veinlets of epidote and chlorite. At Champion crosscut is a gray greenish porphyritic andesite. Megascopic examination shows feldspars partly altered to kaolin, hornblende, phenocrysts partly altered to chlorite. Pyrite is present in the rock. Microscopic examination shows the rock to be porphyritic, with a few much altered, somewhat resorbed phenocrysts of plagioclase. The groundmass is a confused fine grained aggregate of altered feldspar, chlorite, and epidote with some magnetite and impregnated pyrite. The altered feric phenocrysts contain the larger grains of pyrite.

A specimen from the Champion dump is a highly altered gray to greenish andesitic breccia, the feric minerals having been altered to chlorite, and the feldspars kaolinized. The fragments were probably an earlier dark colored andesite. The thin section shows that the rock consists of highly altered angular fragments imbedded in an altered tuff-like groundmass. Kaolin and chlorite are the chief alteration products. There is some epidote present. Also some secondary opalised silica in small seams.

A specimen from the lower Champion dump is a gray porphyritic andesite, the hand specimen showing phenocrysts of plagioclase, hornblende, and pyroxene. Texture is medium grained. Thin section shows two generations of phenocrysts consisting of plagioclase and augite. The larger sized plagioclase is considerably altered. The larger sized augite is also much altered. Several phenocrysts showing the change from pyroxene to uralitic hornblende in so-called reaction rims. The larger first generation of phenocrysts appear to be somewhat resorbed.

The second generation of plagioclase is comparatively fresh and appears to contain some inclusions of a black glass. The groundmass consists of fine grained plagioclase crystals surrounded by small irregular grains of augite. There is some magnetite present.

Another specimen taken near the Champion mine shows the rock to be an amygdaloidal andesite, the amygdules containing epidote and quartz with a few crystals of pyrite. The thin section shows the rock to be a fine grained amygdaloidal, - some amygdules filled with epidote entirely, some with quartz, pyrite, and chlorite. Some of the plagioclase phenocrysts are fractured and

impregnated with calcite. Few greatly altered femic minerals. The groundmass is fine grained and altered with abundant chlorite, calcite, epidote and magnetite.

A specimen taken on the trail near the Champion is a gray porphyritic andesite, showing phenocrysts of plagioclase and pyroxene. The hand specimen shows alteration. In thin section shows plagioclase phenocrysts in many cases resorbed. The femic phenocrysts, which were probably augite are completely altered to a mass of epidote and chlorite. The groundmass consists of small plagioclase feldspars surrounded by altered femic minerals. Field name augite andesite.

A specimen of the country rock taken from Churchills property about one mile southeast of Bohemia mountain is a light colored porphyritic dacite or quartz porphyry. In the hand specimen there is prominent quartz phenocrysts which shows resorption, also phenocrysts of plagioclase. There are small veinlets of quartz running through the rock in all directions. The specimen contains considerable disseminated pyrite.

A specimen of rock taken from the lower dump of the Vesuvius mine on Fairview Mountain is light gray in color, showing flow structure. The rock contains phenocrysts of plagioclase and hornblende in a felsitic groundmass.

ECONOMIC GEOLOGY

The ore deposits of this district are lodes and fissure veins which cut the andesites and tuffs. They have a general strike of 60 to 80 deg. west and dipping steeply to the southwest. The ore bodies vary from 1 to 12 feet in width. The principal ore minerals are pyrite, chalcopyrite, sphalerite, galena, gold and silver, in a quartz gangue and altered country rock. The character of the ores is such that it would lead one to believe that they were for the most part formed near the surface. Some of the deposits are highly oxidized, extending in some veins to a depth of 800 feet. The oxidized bodies exhibit fissuring, chambering, brecciation, and crustification, with some lamellar quartz and comb structure. The walls are more or less irregular, and frequently the vein matter is frozen to the walls. As a rule, the ore occurs in pipe-like form. The quartz aggregates are generally not glassy or milky, but usually fine grained, an amethyst color is often noticeable. Kaolin is present in most of the veins which is a product of secondary changes by descending waters. Sericite and chlorite appear in the altered country rock in greatest amounts close to the veins, which is a product of porphyritic alteration. It seems quite evident from a study of the vein characteristics and rock alteration that the ore deposits may be classed under heading given by Lindgren as "Metalliferous Deposits Formed Near the Surface by Ascending Thermal Waters, and in Genetic Connection with Igneous Rocks". In some cases it is probable that veins formed at intermediate depth are present.

Veins in the district which have not been fractured since they were

mineralized, or which are situated in regions of maximum erosion, such as old glacial cirques, show sulphide ores at the surface. These are tightly cemented and relatively impermeable and represent the conditions of mineralization that prevailed in all the veins at the time of mineralization. The minerals which these tight veins contain are sphalerite, pyrite, a little galena, and a very little chalcopyrite, with a gangue of quartz, country rock, and some calcite. So far these veins have not been profitably exploited, because their sulphide ore cannot be cheaply treated, as a rule. The gold tenor is considerably less than that of the oxidized material.

ORE SPECIMENS

Champion

A specimen of ore from the Champion Mine No. 8 level, is a fine example of crustification, which probably was deposited on country rock. There is an abundance of free gold present. The specimen is coated with limonite, and pyrolusite, with some kaolin. The country rock was probably completely altered and rendered soft, the silica remaining as a hard crust.

Another sample of ore from the same mine on level 8 is a massive piece of galena through which is disseminated a small amount of pyrite. The specimen is coated with cerrusite which is due to the oxidation and carbonization of the lead sulphide. Such alteration is characteristic of alteration by descending solutions.

In another specimen from this mine, level 7, the ore is high in quartz. There is a considerable coating of hematite and an abundance of chalcopyrite. The structure of this ore shows brecciation and successive deposition.

A specimen from level No. 9 shows banding and little veinlets of quartz running in all directions. The specimen contains both primary and secondary galena, a little chalcopyrite, and abundant pyrolusite. Extensive alteration is in evidence.

-A piece of the ore taken on level No. 7 is a massive coarsely crystalline galena, containing a little sphalerite, and some secondary quartz. The specimen shows some alteration.

Musick

A specimen from the upper level at a depth of 150 feet is principally quartz, which contains many small cavities some of which have assumed the shape of vugs which are lined with small crystals. There is considerable marcasite present, some of which has been altered to limonite.

A sample of the ore taken from Level No. 2 shows extensive brecciation. The inclosed fragments are probably porphyritic dacite which are cemented together with quartz. The specimen contains abundant chalcopyrite, a little marcasite and manganese.

An ore specimen taken from level No. 4 is a massive coarsely crystalline galena, containing some chalcopyrite, part of which has been altered to covellite. There is also some sphalerite and kaolin present.

Another specimen taken from level No. 4 is considerably brecciated, containing inclusions of country rock which has been altered to chlorite and kaolin. The sample is a high grade ore of chalcopyrite.

Vesuvius

A specimen of ore taken from the Vesuvius mine in the upper level at a depth of 200 feet shows extensive crustification. It consists of alternate crusts of quartz, marcasite, iron oxide, and chalcedonic silica. Such crustification is characteristic of secondary deposition, a change in the solution and deposition from cool solutions.

An ore specimen taken at a depth of 600 feet shows brecciation and a combination of geodetic and crustification structure. The small quartz crystals are capped with trigonal pyramids, and crustified with minute crystals. The enclosed fragments are altered andesite, cemented together with quartz. The ore contains an abundance of chalcopyrite which is somewhat altered.

Another specimen of ore taken in the wild hog tunnel at a depth of about 900 feet shows coarse inclosures of brecciated country rock, which is considerably silicified and shows replacement. The ore contains a little chalcopyrite.

Churchills

A specimen of the ore taken from the upper workings is an andesitic breccia cemented together with quartz. It also shows a crustification of quartz and some hydrous silica. The specimen contains a stibnite, galena, and a little chalcopyrite. The sample is extensively oxidized.

Another specimen from the upper workings is a quartz breccia containing some inclusions of silicified country rock. The ore minerals are galena, sphalerite, and a little chalcopyrite which occurs mostly in small seams. The specimen has been considerably oxidized.

A specimen from the lower workings contains chalcopyrite, galena, sphalerite, pyrite, covellite, calcite, and quartz. The covellite occurs as a thin coating on the chalcopyrite, probably resulting from its alteration. The sample shows the result of considerable leaching and oxidation.

DESCRIPTION OF MINES

The principal mines of the district which have produced values are the Musick, Champion, Vesuvius district, Noonday, Helena, California, Gold Leaf, and there are others of lesser note. The Musick leads in development, with about a mile of drifts along six 50-foot levels. Of these, levels 4 and 5 are reached by short crosscuts which tap the vein from the basin at the head of City Creek. About 2,000 feet to the west, on the other slope of the divide, a portal from one of the lower drifts opens out close to a good stand of mining timber. A shaft 80 feet deep connects directly with the two upper levels and through various stopes with most of the lower workings, thus giving good ventilation to the mine. Most of the ore was hauled out at the lower level, which attains a maximum depth of about 300 feet.

The Champion, Vesuvius, and Noonday have each about half a mile of workings. In the Champion most of the development work has been done on two levels, the lower of which attains a maximum depth of about 300 feet and is reached by a crosscut a few hundred feet in length through which all the ore is brought out. A considerable amount of stoping has been done, particularly where the greatest oxidation occurred. The lower workings here show considerable amounts of primary sulphides. The Vesuvius has been worked from several levels to a depth of about 500 feet and has many stopes. The steep slope on which it is situated has facilitated its development by tunnels, and has afforded a gravity transfer for the ore from stope to mill, as well as good ventilation and drainage for all the workings. The Noonday has three principal levels, all tapped by adits from the steep slope of the Horse Heaven basin; the lowest level attains a maximum depth of about 500 feet. Considerable stoping was done and the ore from the stopes was sent down to the mill on an aerial tramway about one-third of a mile in length. The Helena has more and the California somewhat less than 1,000 feet of workings. Both are developed by tunnels which will attain 100 to 300 feet of depth. The Helena has two levels and has produced some very rich specimen ore.

The ore from the Musick mine was hauled over a practically level electric tramway about a mile in length and dumped into the ore bins of the Champion mine. Thence the ore of both mines was sent down to the mill on a steep incline, 3400 feet long. Haulage was effected by an endless cable to which the mine cars were attached by means of an automatic grab, the loaded cars going down pulling the empties up. The Musick-Champion mill, the largest in the district, has 30 stamps and is run by a water-driven electric generating plant located on Frank Bryce Creek, 7 miles below the mine. It handled the ore from both the Musick and Champion mines. The electric plant was designed to develop 300 horsepower and to operate the stamp mill, a small sawmill, and a local electric-light plant and to furnish mine power. A small auxiliary steam plant is provided for use in case of need. Other milling plants in the district are a 10-stamp mill at the Vesuvius mine, a 5-stamp mill at the El Calado property, and a 20-stamp mill on the Noonday group.

SILVER AND COPPER DEPOSITS

The Riverside and Oregon-Colorado claims are promising copper prospects which show some good chalcopryite ore and are located on strong veins. The Combination property covers a somewhat extensive lode, consisting of one large vein and some smaller veins, and is said to have produced ore which assayed more than 100 ounces of silver to the ton.

FUTURE OF THE DISTRICT

The Bohemia district contains many well-defined veins and lodes. Many of those which show on the surface have not yet been explored, and no doubt many more are obscured by the dense vegetation which covers a large part of the district. It seems reasonable to suppose that other mines will yet be opened, and will find workable gold ore at least in the upper and oxidized portion of the veins. Workable bodies of copper and silver may possibly be discovered in the district.

Champion Mine
Mining Jour. (Phoenix) v. 21, no. 6, p. 32, Aug. 15, 1937.

see Mahala Mines Inc.

"The Mahala Mines, Inc., which was incorporated early in July, is developing the Champion mine, and the flotation plant and 60-ton ball mill have been placed in operation. A trestle is being constructed to replace the old aerial tramway in conveying ore from the mine to the concentrator. The Champion mine was obtained from the Bartels Mining Co., and it is understood that Fred G. Bartels, the president and general manager of the Bartels Co., will be employed by Mahala Mines, Inc., at the Champion. It has been reported that the Mahala Co., has secured control of the Musick mine and others in the Bohemia district and is preparing to develop them.

(Over)

Kenneth Watkins of Misston, Oreg., together with C. L. Kelly and David B. Evans incorporated the Company. Watkins has taken chage as manager."

MONTHLY REPORT OF PURCHASES

Machinery, Supplies, Maintenance items and Repairs Under
Preference Rating Order P-56

Name of Mine Operator or authorized agent for such Operator H & H MINES

Address 1303 Public Service Building, Portland, Oregon

Mine Serial No. 33-4

Purchases made in month of January, 1942

PURCHASES TO WHICH RATING A-8 HAS BEEN APPLIED DURING MONTH:

<u>Material</u>	<u>Quantity</u>	<u>Supplier</u>	
4 Ply Aircell P.C.	2004 ft.	Asbestos Supply Co.	Portland, Ore.
Black Pipe 2"	1407 ft.	Babb Hardware Co.	Eugene, Ore.
Equalizing Springs	12	" "	
Black Ties 3"	16	" "	
Black Ells 3" - 90°	20	" "	
Black Ells 3" - 45°	10	" "	
Reducers 3" x 2"	10	" "	
Bushings 3" x 2"	20	" "	
Plugs 3"	20	" "	
Standard Ells 3"	10	" "	
Unions - G.J. 3"	10	" "	
Unions - Flange 3"	10	" "	
Nipples - Short 3"	10	" "	
Nipples - Black 3" x 4" to 3" x 12"	80	" "	
Machine Bolts 3/8" x 1"	50	" "	
Machine Bolts 1/2" x 2"	50	" "	
Cap Screws 3/8" x 1"	25	" "	
Hex Nuts 5/8"	6 lb.	" "	
Cut Washers 3/8"	51 lb.	" "	
Mill Files 6"	12	" "	
Mill Files 8"	6	" "	
Brass Machine Screws 10/32" x 1/2"	24	" "	
Rubber Plug	10	" "	
Spark Plugs 18 M M	6	" "	

PURCHASES TO WHICH RATING A-8 HAS BEEN APPLIED DURING MONTH:

<u>Material</u>	<u>Quantity</u>	<u>Supplier</u>
Black Ells 90° - 1/4"	20	Babb Hardware Co. Eugene, Ore.
Black Ells 90° - 1"	20	" "
Black Ells 90° - 1 1/2"	6	" "
Galv. Ells 2"	20	" "
Black Ells 45° - 1/2"	20	" "
Black Ells 45° - 1 1/2"	10	" "
Short Nipples - Black 1/4"	10	" "
Short Nipples - Black 1/4 x 2"	10	" "
Short Nipples - Black 3/8"	10	" "
Short Nipples - Black 1/2"	20	" "
Short Nipples - Black 1" x 3"	10	" "
Short Nipples - Black 1" x 6"	10	" "
Short Nipples - Black 1 1/4"	10	" "
Short Nipples - Black 1 1/2" x 3	5	" "
Short Nipples - Black 1 1/2" x 4"	5	" "
Short Nipples - Black 1 1/2" x 6"	5	" "
Pipe - Black 1/2"	105 ft.	" "
Short Nipples - Black 1/2" x 3"	10	" "
Bushings 2" x 1 1/2"	10	" "
Bushings 2" x 1"	20	" "
Gate Valves 3/8"	5	" "
Gate Valves 1/2"	10	" "
Black Union G.J. 1/2"	20	" "
Black Union G.J. 1-1/2"	5	" "
Black Union G.J. 2"	10	" "
Black Ties 2"	17	" "
Black Ties 1/2"	10	" "
Black Ties 1-1/2"	10	" "
Black Ells 90° 1/2"	20	" "
Plugs 1/4"	10	" "
Plugs 3/8"	10	" "
Plugs 1/2"	20	" "
Plugs 3/4"	20	" "
Plugs 1-1/4"	4	" "
Plugs 1-1/2"	5	" "
Bushings 1/2" x 3/8"	10	" "
Bushings 3/4" x 1/2"	20	" "

PURCHASES TO WHICH RATING A-8 HAS BEEN APPLIED DURING MONTH:

<u>Material</u>	<u>Quantity</u>	<u>Supplier</u>
Bushings 1" x 3/4"	20	Babb Hardware Co. Eugene, Oregon
Bushings 1 1/4" x 1"	10	" "
Bushings 1 1/2" x 1 1/4"	10	" "
Black Pipe 1/2"	210	" "
C & H Hooks	2 gross	" "
Putty knives	2	" "
Electric Plate - 2 hole	1	" "
Strap Hinges 10" H.	4 pair	" "
Strap Hinges 10" H.	2 pair	" "
Acetic Acid C.P.	10 lbs.	Braun-Knecht-Heimann Co. San Francisco, Calif.
Ammonia Hydroxide	16 lbs.	" " "
Deflecting Bricks	2	" " "
Filter Paper 15 C M	12 Pkgs.	" " "
Filter Paper 10 in.	6 Pkgs.	" " "
Filter Paper 10 1/2 C M	24 Pkgs.	" " "
Ampules Bromine C.P.	6 1/4 lbs.	" " "
Ammon. Chloride Gran.	50	" " "
Carboy	1	" " "
Ammonium Hydroxide	95 lbs.	" " "
Silica Powder 200 mesh	50 lbs.	" " "
Potass. Iodide C.P.	5 lbs.	" " "
Beakers 1000 CC	12	" " "
Potass. Iodide C.P.	5 lbs.	" " "
Re-agent Feeder Nuts	4	Paul Brong Machine Works Portland, Oregon
Vibrating Feeder 3" x 17"	1	Berg Evans Chain Co. " "
Spied Heaters #25 & #200	4	Harry A. Brod " "
Rex Cut Steel Sprockets	3	Chain Belt Company Milwaukee, Wisconsin
Rex Roller Chain Belt	9.2 ft.	" " "
Rex Spray Nozzles	4	" " "
Black Wire Cloth 3/16"	245 sq. ft.	Cyclone Fence Division Oakland, Calif.
Water Valves 3/8"	36	Drullard, Howard San Francisco, Calif.
#30 Volute	1	Fairbanks Morse & Co. Seattle, Wash.
1" Centrifugal Pump	1	" "
Rifle nuts	10	Gardner Denver Co. Denver, Colo.
Water Tubes	10	" "
Water Tubes gaskets	10	" "
Flashlight batteries	24	Graber-Gettys Hardware Co. Cottage Grove, Ore.
Flashlight bulbs	24	" " "

PURCHASES TO WHICH RATING A-8 HAS BEEN APPLIED DURING MONTH:

<u>Material</u>	<u>Quantity</u>	<u>Supplier</u>
Elbows - stove	4	Graber-Gettys Hardware Co. Cottage Grove, Ore.
Adjustable Elbows - stove	2	" " "
Roof Plates	2	" " "
Nails 60 D	4 kegs	" " "
Paint Brush	1	" " "
Roofing felt	15 lbs.	" " "
Johnson Bushings	4	Haseltine & Co., J. E. Portland, Oregon
Stove Bolts 1/4" x 2"	8	" " "
Tractor Carrier Roller	1	Interstate Tractor & Equip. Co. Portland, Ore.
Alemite Fittings	6	" " "
Ore Car Wheels 10"	10	Miners Foundry & Supply Co. Nevada City, Calif.
Ore Car Wheels Timken cups	20	" " "
Mining & Construction lumber	12,150 bd. ft.	Row River Lumber Co. Portland, Ore.
Bands for hard hats	18	Sanderson Safety Supply Co. Seattle, Wash.
G. E. Transformer 800/1 Amp.	1	Tinling & Powell Spokane, Wash.
Transformer 600/5 Amp.	3	" " "
Rheostats	3	" " "
Rheostats Brackets	3	" " "
Jaw & check Plates	6	Straub Mfg. Co. Inc. Oakland, Calif.
Air Valve & cage with disks	1	Washington Iron Works Seattle, Wash.
Electrical Supplies & Equipment	\$403.32	Westinghouse Electric Co. Portland, Oregon
Gates Belts	6	Woodbury Company Portland, Oregon
Choker Hooks	4	" " "
Block - Single Wood 3"	1	" " "
Block - Double Wood 3"	1	" " "
Sash Cord	4 lb.	" " "
Come Along	2	" " "
Tree Climbers	1 pr.	" " "
Machine Bolts 3/8" x 1 1/2"	50	" " "
U.S.S. cap 1/4" x 3/4"	25	" " "
Machine Bolts 1/2" x 2-1/2"	50	" " "
Machine Bolts 5/8" x 10"	50	" " "
Screws, Lge. 5/8" x 4 1/2"	25	" " "
Ells 4"	6	" " "
30 Amp fuses	48	" " "
100 W - 120 V lamps	1 case	" " "
Eagle oiler	1	" " "
5 gal. gas cans	2	" " "

PURCHASES TO WHICH RATING A-8 HAS BEEN APPLIED DURING MONTH:

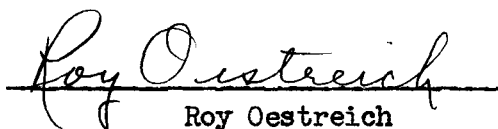
<u>Material</u>	<u>Quantity</u>	<u>Supplier</u>
Skookum blocks	6	Woodbury Company Portland, Oregon
#0 Carbo paper	12	" "
#1 " "	12	" "
#2 " "	12	" "
Alox cloth #40	12	" "
" " #60	12	" "
" " #100	12	" "
" " 1 $\frac{1}{2}$ " #50	1 roll	" "
" " 1 $\frac{1}{2}$ " #80	1 roll	" "
Wrenches H H Set $\frac{1}{4}$ " to $\frac{3}{4}$ "	14	" "
Brite Shed Washers 1/8 KD	1/4 lb.	" "
" " " 3/16 KD	1/4 lb.	" "
Cut Washers 1/2 "	10"	" "
Sheet Packing 1/16"	80 lbs.	" "
Red Rubber Sheet Pkg. 3/32"	31 lbs.	" "
Roofing Nails	100"	" "
Vellumoid Packing	5 sq. yd.	" "
Sheet Cork 1/16" & 1/8"	2 box	" "
Permatix #1 & #2	12 tubes	" "
Soldering Salts	60 lbs.	" "
Bronze welding bars	10	" "
Pressure gauge	1	" "
Wiping rags	200 lbs.	" "
Lock washers 9/16"	500	" "
Lock Washers 5/8"	500	" "
Maltese Water Hose 1"	100 ft.	" "
Hose clamps	6	" "
Copper tubing 1/4"	10 ft.	" "

CERTIFICATION

The undersigned hereby certifies to the Office of Production Management, that

- (1) he executed the foregoing statement on behalf of and by authority of the above-named Mine Operator;
- (2) the above-named Mine Operator has, during the period covered by this report, complied with all the provisions of Preference Rating Order P-56 and has applied Ratings only in accordance therewith;
- (3) during such period the Mine Operator's inventory of operating supplies and other material has not been greater than the minimum necessary for the efficient operation of his business, and the ratio of inventory (quantity) to current production has not exceeded the ratio of average year-end inventory (quantity) to average production for the years 1938, 1939, and 1940;
- (4) the facts stated herein are, to the best of his knowledge and belief, true and correct.

February 14, 1942


Roy Oestreich

Auditor H & H Mines
1303 Public Service Bldg.
Portland, Oregon

MONTHLY REPORT OF PURCHASES

Machinery, Supplies, Maintenance items and Repairs Under
Preference Rating Order P-56

RECEIVED
MAR 20 1942

STATE DEPT OF GEOL
& MINERAL IND.

Name of Mine Operator or authorized agent for such Operater H & H MINES

Address 1303 Public Service Building, Portland, Oregon

Mine Serial No. 33-4

Purchases made in month of February, 1942

PURCHASES TO WHICH RATING A-8 HAS BEEN APPLIED DURING MONTH:

<u>Material</u>		<u>Quantity</u>	<u>Supplier</u>	
Cant saw files	6"	12	Babb Hardware Co.	Eugene, Ore.
" " "	8"	12	" "	" "
Sodium Acetate		50 lbs.	Braun-Knecht-Heimann Co.	San Francisco, Calif.
Filter Paper	8"	20 pkgs.	" " "	" " "
" "	18½ cm.	12 pkgs.	" " "	" " "
Chain Belt	#32	10 ft.	Chain-Belt Co.	Milwaukee, Wis.
Sprocket	#32	1	" "	" "
Brass Cocks	1½"	3	Crane Company	Portland, Ore.
Gas Cocks	1½"	6	" "	" "
Mall Iron Wrenches	#6	3	" "	" "
Brass Relief Valve	2"	1	" "	" "
Close Black Nipples	1½"	6	" "	" "
" " "	1½"	12	" "	" "
Black Gem Unions	1½"	3	" "	" "
" " "	1½"	6	" "	" "
Black Mall Reducers	1½"	6	" "	" "
" " "	2"	3	" "	" "
Galv. Mall Ties	1½"	3	" "	" "
Black Mall Bends	2"	11	" "	" "
Crouse Hinds	½"	20	General Elec. Supply Corp.	" "
Annum Wire	#18	20 lbs.	" " "	" "
Chicago Pencil Sharpener	#2	1	J. K. Gill Company	" "
Waste Basket	#E	1	" " "	" "
Key for Tractor		1	Interstate Tractor & Equip.	" "
Plate for "		1	" " "	" "

PURCHASES TO WHICH RATING A-8 HAS BEEN APPLIED DURING MONTH:

<u>Material</u>	<u>Quantity</u>	<u>Supplier</u>
Gasket for tractor	1	Interstate Tractor & Equip. Co. Portland, Ore.
Disc " "	2	" " " " " " " "
Rivets " "	10	" " " " " " " "
Ball Mill Scoop Lips	6	Miners Foundry & Supply Co. Nevada City, Calif
Mine Timbers	597 Bd. ft.	Row River Lumber Co. Portland, Ore.
Mine Stretcher	1	Sanderson Safety Supply Co. Seattle, Wash.
Black O P Return Bends	25	Standard Supply Co. Portland, Ore.
Lightning Arresters	8	Tinling & Powell Spokane, Wash.
Recording Sheets	500	" " " " " " " "
Recording Blue Ink #21	1	" " " " " " " "
Masonite Boards & Arch	4	Valley Printing Co. Eugene, Ore.
Electrical Supplies	\$284.10	Westinghouse Elec. Supply Co. Portland, Ore.
Mine signal switches	3	Coeur d'Alene Hardware Co. Wallace, Idaho
Pipe Dies 2"	1 set	Woodbury Co. Portland, Ore.
Pipe Dies 1"	1 set	" " " " " " " "
Belt Sheave 1 1/4"	2	" " " " " " " "
Toledo Thumb Screws	3	" " " " " " " "
Asbestos Sheet Packing 1/16"	20 lbs.	" " " " " " " "
Pipe Dies Segments 1 1/2"	1	" " " " " " " "
" " " 2"	1	" " " " " " " "
" " " 2-1/8"	1	" " " " " " " "
Pipe Cutter Wheels	6	" " " " " " " "
" " " pins	6	" " " " " " " "
Pipe ratchet pawl	1	" " " " " " " "
" " " pin	1	" " " " " " " "
" " " spring	1	" " " " " " " "
Hose menders 1 1/2"	12	" " " " " " " "
" " 1"	12	" " " " " " " "
Wire Clamps 1/2"	36	" " " " " " " "
" " 1"	36	" " " " " " " "
Lunckenheimer Check Valves 3/4"	12	" " " " " " " "
Graduated Cylinders	8	Braun-Knecht-Heimann Co. San Francisco, Cal.
Fisher Grass Burner	1	" " " " " " " "
Pr. Asbestos Mittens	1	" " " " " " " "
Plate for Braun Pulverizer	1	" " " " " " " "
Ore Pan	1	" " " " " " " "
Bone Ash	100 lbs.	" " " " " " " "
Carbofox	50 lbs.	" " " " " " " "
White vanning placks	4	Mine & Smelter Supply Co. Salt Lake City, Utah

PURCHASES TO WHICH RATING A-8 HAS BEEN APPLIED DURING MONTH:

<u>Material</u>	<u>Quantity</u>	<u>Supplier</u>	
Pulverizer grinding plates	1 set	Mine & Smelter Supply Co.	Salt Lake City, Uta
Stoper chuck driver	2	Gardner Denver Co.	Denver, Colo.
Piston Rings	12	Ingersoll Rand Inc.	Seattle, Wash.
Blasting Caps	500	Columbia Powder Co.	Tacoma, Wash.
Coppered wire	8 ft.	" " "	" "
Complete set ball mill liners	1	Columbia Steel Casting Co.	Portland, Ore.
Lamp bulbs 100 W - 120 V	6 doz.	General Elec. Supply Co.	" "
" " 75 W - 120 V	9 doz.	" " "	" "
" " 60 W - 120 V	9 doz.	" " "	" "
" " 50 W - 120 V	6 doz.	" " "	" "
Bar Solder 50-50	10 lbs.	" " "	" "
Braidx Staples	2 lbs.	" " "	" "
Box Covers	3 1/4"	" " "	" "
" "	4 3/4"	" " "	" "
Shallow Box	3 1/4"	" " "	" "
Box Extension	4 1/4"	" " "	" "
Plug Fuses 30 amp.	100	" " "	" "
Repairs to motors	16	Industrial Elec. & Eng. Co.	" "

PURCHASES TO WHICH RATING A-3 HAS BEEN APPLIED DURING MONTH:

Cup leather #20 V	4	Gardner-Denver Co.	Denver, Colo.
Water Tubes #27	10	" "	" "
Repair diesel main bearings	14	Klingbeil & Oetinger	Portland, Ore.
Repair connecting rod bearings	12	" "	" "
Segment Screws	25	Mancha Storage Battery Locomotive	Chicago, Ill.
Long Segments	12	" " " "	" "
Short Segments	20	" " " "	" "
Dowel Pins	10	" " " "	" "
Finger Bar with Tip	2	" " " "	" "
Finger Tips	12	" " " "	" "
Springs for Baldwin Locomotive	4	" " " "	" "
Resistor Units	2	Westinghouse Electric Supply Co.	Portland, Ore.
Short Controller Contacts	16	" " " "	" "
Long " "	16	" " " "	" "
Dowels	20	" " " "	" "
Flat Machine Screws	25	" " " "	" "

-4-

CERTIFICATION

The undersigned hereby certifies to the Office of Production Management, that

- (1) he executed the foregoing statement on behalf of and by authority of the above-named Mine Operator;
- (2) the above-named Mine Operator has, during the period covered by this report, complied with all the provisions of Preference Rating Order P-56 and has applied Ratings only in accordance therewith;
- (3) during such period the Mine Operator's inventory of operating supplies and other material has not been greater than the minimum necessary for the efficient operation of his business, and the ratio of inventory (quantity) to current production has not exceeded the ratio of average year-end inventory (quantity) to average production for the years 1938, 1939, and 1940;
- (4) the facts stated herein are, to the best of his knowledge and belief, true and correct.

March 18, 1942


G. S. Hinsdale

Manager H & H Mines
1303 Public Service Bldg.
Portland, Oregon

(1) —

MONTHLY REPORT OF PURCHASES

Machinery, Supplies, Maintenance items and Repairs Under
Preference Rating Order P-56

Name of mine operator or authorized agent for such operator H & H MINES

Address 1303 Public Service Building, Portland, Oregon Mine Serial No. 33-4

Purchases made in months of October, November, and December, 1941

PURCHASES TO WHICH RATING A-8 HAS BEEN APPLIED DURING MONTH:

<u>Material</u>	<u>Quantity</u>		<u>Supplier</u>
	Oct. 15 to Oct. 31	Nov. 1 to Nov. 30	
Sequoia Fuse		30,000 ft.	Babb Hardware Company
Log screws $\frac{1}{4}$ " x 2" & $\frac{3}{4}$ " x $2\frac{1}{2}$ "		144	" " "
Flat iron $\frac{1}{2}$ " & $\frac{1}{4}$ "		11 bars	" " "
Flashlight batteries		24	" " "
Hex Nuts		200	" " "
Carborundum Stone & Slip Stone		1 each	" " "
Hacksaw		1	" " "
Window lights		60	" " "
Putty		25#	" " "
Cut washers $\frac{5}{8}$ "		10#	" " "
Ball pein handles 12" & 14"		12	" " "
Log screws $\frac{1}{2}$ " x 2" - 3" - 4"		75	" " "
Galv. & black close nipples.		96	" " "
Key stock $\frac{1}{2}$ "		3 ft.	" " "
Laundry stomper		1	" " "
Bread pans		6	" " "
Cast ells -4" - 45 & 90 degree		10	" " "
Nails 8 D		400#	" " "
Cast plugs 4"		6	" " "
Cast bushings 4"		6	" " "
Bolts $\frac{1}{2}$ " x 1"		50	" " "
Rags		50#	" " "
Unions - 4"		6	" " "
Blasting caps #6		5 M	" " "

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PURCHASES TO WHICH RATING A-8 HAS BEEN APPLIED DURING MONTHS:

<u>Material</u>	<u>Quantity</u>		<u>Supplier</u>
	Oct. 15 to Oct. 31	Nov. 1 to Nov. 30	
Black pipe 1" & 2"		2909'	Babb Hardware Company
Black pipe 3/4"			" " "
Pipe Plugs 1/8"			" " "
Windows			" " "
Black pipe 3"			" " "
Pulverizer plates	2 sets		Braun-Knecht-Heimann Co.
Lithorge	50#	100#	" " "
Acetic Acid	10#		" " "
Sodium Thiosulfate	1 lb.		" " "
Carboy Nitric Acid		148#	" " "
" Sulfuric Acid		192#	" " "
" Hydrochloric Acid		126#	" " "
Glass rods		24	" " "
Burettes		4	" " "
Clamps		4	" " "
Funnel		2	" " "
Burettes with rubber bulbs		2	" " "
Erle flasks		24	" " "
Rubber stoppers #4-5-6-7-8		12	" " "
Muffle		1	" " "
Ammon. Hydroxide C.P.		16#	" " "
Thermometers		3	" " "
Heating units for still		1	" " "
Pinchcocks		6	" " "
Electrometric PH Outfit			" " "
Lubriseal			" " "
Set Electrodes for PH Outfit			" " "
Deflecting bricks			" " "
Speed heaters with valves, traps & separators			Brod, Harry Co.
Speed Reducer			Chain Belt Company
Steel Sprocket			" " "
Chain Belt - #40			" " "
Steel Shaft 1-7/16"			" " "
Drop hangers 1-7/16 & 2-7/16			" " "
Collars 1-7/16"			" " "
Split pulleys			" " "
Sheave 4"			" " "

PURCHASES TO WHICH RATING A-8 HAS BEEN APPLIED DURING MONTHS:

<u>Material</u>	<u>Quantity</u>		<u>Supplier</u>
	Oct. 15 to Oct. 31	Nov. 1 to Nov. 30	
Offset link			Chain Belt Company
Powder		7½ T	Columbia Powder Co.
Truck Tires 8.25 x 20 with tubes		2	Commercial Tire Co.
Coppus Blower - Trade-in deal		1	Drullard Howard
Female 1" Air Spuds			" "
Electrolyte with bottles & stoppers		144	Electro Storage Battery Co.
Double beam portable scale 1000 lb.		21#	Fairbanks Morse & Co.
Centrifugal mounted Pumps with ½ HP motors			" "
Impellers and shafts			" "
Volute			" "
Ring oiling bearings			" "
Impeller bearings			" "
Water tubes and gaskets		12 each	Gardner-Denver Co.
G-D Unloader Pilot			" "
Arm Assembly			" "
Misc. electric equipment & material		\$452.44	General Electric Co.
Steel wool	6#		Graber-Gettys Hdw. Co.
Oxygen tanks	12		" " "
Acetylene tanks	6		" " "
Copper tubing ¼"		10'	Haseltine Co., E.J.
GB Bronze tubing		4	" "
Sheaves		4	Hesse-Ersted Iron Works
Fork Assembly for tractor		1	Interstate Tractor & Equipment Co.
Key		1	" " "
Spring for tractor		1	" " "
16# Rail	62,350#		Morse Bros. Machinery Co.
Splice bars	200 Pr.	800 Pr.	" " "
Rail bolts	5 kegs		" " "
Rail spikes	10 kegs		" " "
Crescent rivets L7; L8; L9	5 Gross		Munnell & Sherrill
Crescent Rivet Extractor	1		" "
Compensators, 25 HP			Newton, L. F.
Timken roller bearings		6	Nordling Parts Co.
Throttle valves - 1"		100	Peerless Machinery Company
T & G Flooring			Randall, Vinal T.
Dry lumber 1" & 1¼" x 6" & 8" x 12'			" "
Panel Doors			" "

PURCHASES TO WHICH RATING A-8 HAS BEEN APPLIED DURING MONTHS:

<u>Material</u>	<u>Quantity</u>			<u>Supplier</u>
	Oct. 15 to Oct. 31	Nov. 1 to Nov. 30	Dec. 1 to Dec. 31	
Roof jack			1	Randall, Vinal T.
Rubber Covered Copper Cable			1500 ft.	Roebbling's Sons Company
Construction Lumber & Mine timbers	352'	34,144'	33,898'	Row River Lumber Co.
Carbide Lamps			24	Sanderson Safety Supply Co.
S.K. Carrier Bearings		10		Stephens-Adamson Mfg. Co.
Troughing rollers with shaft & bearings		3		Standard Supply Company
Soil pipe 4" & 2"		120		" "
Quarter Bends 2" & 4"		6		" "
Eighth bends 4"		2		" "
Sanitary cross 4"		1		" "
Sanitary Tie 4"		3		" "
Cleanout ferrules 4"		2		" "
Closet bends		4		" "
Floor drains		4		" "
Cesspool Standard 6 x 6		7		" "
Caulking lead		100#		" "
Strainers		1		" "
Pipe Straps $\frac{1}{2}$ - $\frac{3}{4}$ - 1 - $1\frac{1}{2}$ - 2		550		" "
Petro Burners			1	C. C. Schenck Co.
Rouge Burners			2	" "
Electrical Equipment & material		\$64.05	\$1232.31	Tingling & Powell
Gages			2	Winks Hardware
Electrical Equipment & materials	\$32.05	\$353.66	\$650.38	Westinghouse Electric Supply
Agitator Propellers			4	Western Machinery Company
Connecting rod assembly for drill			1	Independent Pneumatic Tool Co.
Thermometers 30/240 degrees			18	Harris Supply Co.
Welding rods	930#			Woodbury Company
Lag screws	425	50		" "
Cut washers	55#			" "
Pipe wrench jaws & pins		6		" "
Pipe Wrench cutter wheels		12		" "
Wheelbarrows with rubber wheels		5		" "
Toledo Dies		4 sets		" "
Gates V Belts & Ropes		3	15	" "
Brooms		6		" "
Copper tubing		50 ft.		" "
Connectors		40		" "

PURCHASES TO WHICH RATING A-8 HAS BEEN APPLIED DURING MONTHS:

<u>Material</u>	<u>Quantity</u>		<u>Supplier</u>
	Oct. 15 to Oct. 31	Nov. 1 to Nov. 30	
Imp. Sleeves		50	Woodbury Company
Imp. Nuts		50	" "
Cans Shellac		3	" "
Pipe vise		1	" "
Files-Slim Taper		36	" "
Files-Extra Slim Taper		36	" "
Chalk Blue		1 Gr.	" "
White lead		5#	" "
Hcht. Chain		15'	" "
Emery wheel dresser		12'	" "
Round file gas lighters		4	" "
Perforated hanger iron		80'	" "
Stove bolts		200	" "
Couplings		48	48
Valves		12	48
Machine Bolts		500	" "
Elbows		240	134
Nipples		118	147
Unions		50	72
Pipe caps		144	" "
Reducers		3	" "
Set collars			2
Pillow Blocks			2
Saws			6
Crosses			2
Clutch & Gears for saws			1
Cold Rolled Steel			38#
Cold Rolled Shafting			84#
Square Key Steel			124#
Round Mild Steel			153#
Flat Mild Steel			51#
Octagon Steel			64#
Angle Iron			46#
HR Strip Iron			68#
B.A. Wire			186#
Ties			84
Pulleys & Sheaves			11

PURCHASES TO WHICH RATING A-1-a HAS BEEN APPLIED DURING MONTHS:

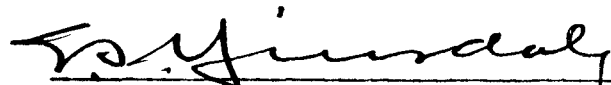
<u>Material</u>	<u>Quantity</u>	<u>Supplier</u>	<u>Month</u>	<u>O.P.M. Authorization No.</u>
Diesel Crankshaft	1	Washington Iron Works	December, 1941	C-98439

CERTIFICATION

The undersigned hereby certifies to the Office of Production Management, that

- (1) he executed the foregoing statement on behalf of and by authority of the above-named Mine Operator;
- (2) the above-named Mine Operator has, during the period covered by this report, complied with all the provisions of Preference Rating Order P-56 and has applied Ratings only in accordance therewith;
- (3) during such period the Mine Operator's inventory of operating supplies and other material has not been greater than the minimum necessary for the efficient operation of his business, and the ratio of inventory (quantity) to current production has not exceeded the ratio of average year-end inventory (quantity) to average production for the years 1938, 1939, and 1940;
- (4) the facts stated herein are, to the best of his knowledge and belief, true and correct.

January 24, 1942



G. S. Hinsdale

Manager H & H Mines
1303 Public Service Bldg.
Portland, Oregon

CHAMPION MINE

Bohemia District

Lane County

Operations have been resumed at the Champion Mine in the Bohemia district, thirty-five miles east of Cottage Grove, with Fred Bartels of Cottage Grove, owner of the property, in charge. Until the war the Champion was worked with other mines in the district as the H. and H. Mines. The ore is described as complex, with values in copper, gold, lead, and zinc.

From Mining World
Vol. VIII, No. 8
July, 1946
Page 26

The Bohemia mining district of Oregon will be shipping concentrate from the rehabilitated 100 ton flotation mill at the Champion mine late this summer. Bartels Brothers, who have recently purchased the mill built at the Champion by H & H Mines in 1941, are at present installing a diesel-generator set and are reconditioning the milling equipment. Besides treating the ore blocked out in the Champion, it will custom mill ore from other mines in the district. Copper, lead and zinc concentrates will be produced.

Kenneth O. Watkins, General Manager of Helena Mines, Inc., stated that the operation of this mill on a custom basis will give the Bohemia district a much needed chance at full development of its base metal reserves.

Taken from Raw Materials Survey NewsLetter, July, 1948

A BRIEF HISTORY OF THE CHAMPION MINE AND ITS
ENVIRONS

The champion Mine is the principal mine in the Bohemia District of Western Oregon. The mine originally was composed of some 23 unpatented claims. At present the group consists of 4 patented claims, (the Diamond, Broadway, Champion and Excelsior claims) 3 unpatented claims, (the Triangle, Evening Star and Evening Star Annex) and 4 unpatented Millsite Claims. It is located near Champion Saddle on the divide between Champion and City Creeks in the North $\frac{1}{2}$ sec. of Sec. 13, T.23 S., R. 1 E.

The principal development is on the west- to northwest-striking Champion vein over a total distance of about 2600 feet along the strike and to an average depth of about 800 ft. below the outcrops. The vein was originally developed in two separate properties. The Evening Star works entered from the City creek side and developed the Southeastern portion of the vein. The Champion workings entered from the North side of the ridge. The two workings were eventually connected on the 600 level. Total development includes more than 15,000 feet of drifts and crosscuts, and about 3000 feet of Raises on nine levels. Three of the main levels have Adits (600, 900 and 1200 levels).

The Champion vein varies in thickness from 1 to 8 feet and has averaged about 3 feet. Taber reports the remaining ore to be mainly sulfides similar to those found in the other mines in the district. These include: Sphalerite, pyrite, chalcopyrite, galena, hematite and cherty to coarsely crystalline Quartz. The Gold content is generally just under 0.5 ounces per Ton. A few small, partly oxidized ore shoots remaining in the mine contain as much as 2 ounces per Ton, and

a few shoots of oxidized ore of higher grade have been mined. Watkins (1946) states that an average of the 1548 samples taken by H & H Mines Co. from all parts of the mine (weighted against width of the sample) was as follows:

<u>Oz. Gold</u>	<u>Oz. Silver</u>	<u>% Lead</u>	<u>% Zinc</u>	<u>% Copper</u>
0.555	4.21	1.72	2.15	1.71

The Champion vein was discovered in 1892, and in 1895 a Ten-stamp mill was built on the property. In 1902 the Champion, Helena and Musick mines were consolidated under the West Coast Mines Co. A 30-stamp mill was built at the Champion mine and it ran until 1908, partly on ore from the other properties. Only a small amount of development work was done between 1912 and 1916, and no mining was done between that time and 1930. During the period 1932 to 1938 approximately \$100,000 was produced from the Champion by several operators, including the Mahala Mines and the Bartels Mining Companies. In 1939 the property was taken over by the H & H Mines (Higgins and Hinsdale) who built a mill and power plant and did several thousand feet of development work including most of the 1200 foot level. Operations were suspended in August 1942, however, due to the wartime L-208 order, before production had been attained. The property and mill were turned over to F. J. Bartels in 1944. From 1945 through 1949 a few cars of concentrated ore and some cars of run-of-mine ore were shipped. In 1964, Federal Resources Corp. of Salt Lake City performed a diamond-drilling program to explore the Champion and several other mines. Since 1965,

Page 3

the Champion mine as well as the rest of the district, has remained dormant.

Geology of the Bohemia Mining District, Lane County, OR
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Available from: University Microfilms International
Dissertation copies, PO Box 1764 , Ann Arbor, Michigan 4 8106

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& Mineral Industries, Bulletin #61 (196 8)

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Ore bin vol. 26 no. 5 p. 95

Ore bin vol. 19 no. 7 (map)

Ore bin vol. 40 no. 6 (Field Trip Guide) also no. 5

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W.W. Elmer, private report

CHAMPION

BOHEMIA

ANNUAL REPORT TO THE CORPORATION DEPARTMENT

FOR THE YEAR ENDING JUNE 30, 1936 NO REPORT SUBMITTED

Of MAHAIA MINES, INC. Cert. of Inc. issued 7/1/37 (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. Street, in the city of, in the state of

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

Table with 3 columns: NAMES, OFFICE, BUSINESS ADDRESS. Row 1: C. L. Kelly, President, Miner Bldg., Eugene, Oregon.

The date of the annual election of officers is

The date of the annual election of directors is

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

State amount of capital, represented by stock of no par value, with which the corporation began business

IN WITNESS WHEREOF, I,

of said corporation, have signed this report, this

[CORPORATE SEAL]

day of, A. D. 193

STATE OF OREGON,

County of

ss.

I, of the above and foregoing named corporation, being first duly sworn, depose and say, upon oath, that the foregoing report is a full, true and correct statement of the matters therein contained, according to the best of my information, knowledge and belief.

OPTION, LEASE AND AGREEMENT
FOR
SALE OF MINING PROPERTIES.

WHEREAS, BARTELS MINING COMPANY, an Oregon Corporation, is the owner of a Group of Mining Claims commonly known as the "Champion Group" situate in the Bohemia Mining District, Lane County, State of Oregon, and said Champion Group of Mining Claims consists of one patented claim known as the BOHEMIA and nine unpatented claims known, respectively, as

Evening Star; Annex; Hilda; Coolidge; Dot;
Peggy; Billy Boy; Sir Sidney and Banner,

and seventeen (17) additional unpatented mining claims, a list of which will hereafter be made and attached hereto, marked Schedule "A" and made a part hereof, the said Champion Group of Mining Claims comprising twenty-seven (27) claims; and

WHEREAS, R. E. TOBIN of Seattle, Washington, desires to obtain an option, lease and to enter into an agreement concerning the purchase of said mining claims for the price and on the terms and conditions herein set forth;

NOW, THEREFORE, THIS AGREEMENT entered into between said BARTELS MINING COMPANY, hereinafter for convenience sometimes terms "Company", and said R. E. TOBIN, hereinafter for convenience sometimes termed "Tobin",

W I T N E S S E T H:

ARTICLE I.

RIGHT OF EXAMINATION BY TOBIN

1.

Tobin and his duly appointed representatives is hereby granted the right to go and enter upon said Champion Group of Mining claims and every part thereof for the purpose of examining the same with the view of determining whether he, the said Tobin, desires to proceed further. Company agrees that it will in all proper ways and whenever requested by Tobin give aid, assistance and support and all available information to Tobin so that Tobin will not in any way whatsoever be impeded or interfered with in any examination that he may make or desire to make of said properties, or any part thereof.

ARTICLE II.

PURCHASE PRICE.

The purchase price to be paid by Tobin for said Champion Group of Mining Claims is the sum of ONE HUNDRED FIFTY THOUSAND DOLLARS (\$150,000.00), payable in installments and on dates, without interest, as follows:

- (a) \$5,000.00 on or before Sixty (60) days from the date hereof;
- (b) \$10,000.00 on or before One (1) year and Sixty days from the date of these presents;
- (c) \$20,000.00 on or before Two (2) years and Sixty (60) days from the date of these presents;
- (d) \$30,000.00 on or before three (3) years and Sixty (60) days from the date of these presents;
- (e) \$35,000.00 on or before four (4) years and Sixty (60) days from the date of these presents; and
- (f) \$50,000.00 on or before five (5) years and Sixty (60) days from the date of these presents.

ARTICLE III.

CONSTRUCTION OF MILL

Tobin shall on or before September 15, 1933

and with reasonable diligence proceed with the construction of said plant to completion and shall complete the same on or before One (1) year from the date of the payment of the installment of \$5,000.00 hereinabove specified.

However, it is expressly understood that Tobin shall have the right to construct said plant on whatever site he may select. In the construction of said plant and also in the construction of any other buildings or structures or improvements which Tobin may desire to construct or place upon said premises he shall have the right to cut and use such of the standing timber on said premises, except the timber reserved upon Company and now on the Evening Star, Hilda and Bohemia Claims, as may be needed in such construction.

It is expressly understood that Tobin will not change or interfere with or destroy any of the buildings now on said premises; and it is further understood that Tobin will not remove from any of the buildings now on said premises any machinery, appliances or equipment without first obtaining the consent of Company.

ARTICLE IV.

AUTHORITY OF COMPANY.

Company agrees that it will with reasonable diligence proceed to cause to be held a meeting of the stockholders, followed by a meeting of the Board of Directors of said Company, and cause authority to be given to the proper officers of said Company to make and enter into this

agreement and to consummate the same by the execution of any and all deeds of conveyance, instruments of assurance and such other writings as may be necessary, convenient and proper for fully vesting in Tobin the ownership of the aforesaid Champion Group of Mining Claims, subject of course to the laws of the United States of America and the laws of the State of Oregon, with reference to unpatented mining claims.

ARTICLE V.

ESCROW.

The First National Bank of Eugene (Eugene, Oregon) is hereby designated as the Escrow Agent in whose hands shall be placed a counterpart of this agreement, together with the hereinafter mentioned deed of conveyance and to said Escrow Agent Tobin shall make all payments by him herein required to be made.

Coincidentally with the payment of the aforesaid installment of \$5,000.00 Company shall, in conformity with the authority to be obtained as hereinabove provided, cause to be signed and acknowledged by its proper officers a good and sufficient deed of conveyance covering the said Champion Group of Mining Claims and naming as grantee either Tobin or such person, firm or corporation as he in writing may designate and said deed of conveyance shall be placed in the hands of said Escrow Agent to be held and afterwards delivered in accordance with the terms of this agreement.

All payments made by Tobin shall be made to said Escrow Agent for Company; and if Tobin pays in full at the times herein specified the installments making the full

purchase price of \$150,000.00 then upon the completion of the payment of said purchase price said Escrow Agent shall deliver said deed to Tobin, his heirs, legal representatives or assigns; but if Tobin shall default in the payment of any installment, or portion thereof, then and in that event said Escrow Agent shall forthwith and without notice return said deed to Company, it being expressly understood by the parties hereto that time is of the essence of this agreement in all particulars.

ARTICLE VI.

CONSTRUCTION OF THIS INSTRUMENT AS TO TOBIN.

IT IS EXPRESSLY UNDERSTOOD AND AGREED between the parties hereto that nothing herein contained shall be construed as an absolute covenant upon the part of Tobin to make any of the payments comprising the aforesaid purchase price of \$150,000.00, but it is the true intent and meaning of the parties hereto that Tobin shall have the right and option to keep this agreement in force and in effect by making the payments above specified and doing the acts and things herein set forth, and if the said Tobin fails to make any of said payments or if he fails to do any of the acts and things herein set forth and by him to be done then in such events or in either of such events this agreement shall forthwith terminate without any obligation upon the part of Company further to proceed with this agreement.

ARTICLE VII.

ROYALTY.

Out of all net smelter and mint returns from ores

taken from said Champion Group of Mining Claims, or any thereof by Tobin fifteen (15) per cent thereof shall be paid directly to said Escrow Agent by the smelter and applied on the then next accruing installment on the purchase price to be paid by Tobin. Smelter returns means the amount to be paid by the smelter after treating the ores; and it is expressly understood that the expense of preparing the ores for shipment to the smelter and the expense of shipping the ores to the smelter shall not be taken into consideration in determining the amount of smelter returns.

ARTICLE VIII.

RESERVATIONS UNTO COMPANY.

It is expressly understood that Company reserves unto itself all the ore in the vein along which Level No.6 is constructed, including all the ores along said vein within the said Level No.6 projected from its present end to the apex of said vein and also including all the ores in the Evening Star, the Hilda and the Bohemia Mining Claims above said Level No.6 as the same now exists and as the same will exist if Level No.6 were projected along the said vein followed by Level No. 6 to the apex thereof; and it is expressly understood that Company shall have the right to do and carry on all such mining operations as may be convenient, necessary or proper for extracting the said ores in the Hilda, Evening Star and Bohemia Mining Claims in said Level No.6, and the vein thereof projected to its apex, and together with all ores above said Level No.6

as herein explained.

Subject to the right of Company to extract the ores from the vein on and along said Level No.6 and the ores above the same, Tobin shall have the right to use as a passage-way the said Level No. 6 and all tunnels, levels and passage-ways above said Level No.6 and Tobin shall also have the right to conduct and carry on from said Level No. 6 and Levels above the same such exploration work as he may desire to conduct and carry on.

Company also reserves unto itself all the timber now standing upon the Hilda, Evening Star and Bohemia Mining Claims.

Company reserves the right to pump, not to exceed Twenty (20) gallons of water per minute from No.9 level to the Evening Star reservoir.

ARTICLE IX.

ASSESSMENT WORK.

Tobin agrees that so long as this agreement is in force and effect he will do all necessary assessment work on the unpatented mining claims included in said Champion Group and will not permit any of said mining claims to become subject to relocation by reason of the failure to do required annual assessment work; but nothing herein contained shall be so construed as to require Tobin to do any assessment work in any given year as to which a moratorium has been declared by the duly constituted authorities of the United States of America.

ARTICLE X.

BOND AGAINST LIENS.

Tobin agrees that he will save Company harmless from all liability for or on account of mechanic's liens or other liens filed against said premises for or on account of labor performed or materials furnished at the instance of Tobin; and Tobin agrees that he will at the time of the payment of the above mentioned \$5,000.00 installment deliver to the Escrow Agent for the benefit of Company a good and sufficient bond in the penal sum of \$500.00 signed by Tobin or his assigns and by a good and sufficient surety, the said bond in effect to provide that the signers thereof shall be liable to Company in the penal sum of \$500.00 if Tobin permits any lawful lien to be filed against said premises for or on account of labor performed or materials furnished at his instance.

ARTICLE XI.

COMPLIANCE WITH LAWS.

Tobin agrees that he will comply with all laws of the United States of America and of the State of Oregon relative to mining claims.

ARTICLE XII.

TITLE.

Company covenants to and with Tobin that it is the owner of said Bohemia Mining Claim and that it is also the owner of the aforesaid Twenty-six (26) unpatented mining claims, subject to the laws of the United States of America and of the State of Oregon relative to unpatented mining claims and Company covenants that it is the owner of

all said mining claims free from all encumbrances whatsoever, and that it is the owner of the actual title thereto except as limited and qualified by the aforesaid laws of the United States of America and of the State of Oregon and Company covenants that it has good right to sell all said mining claims and that it will defend the same against all lawful claims whatsoever.

Company covenants and agrees that it will within a reasonable time after the payment of the first above mentioned installment on the purchase price cause to be commenced a suit to quiet the title of Company as against all the world, except the Government of the United States of America, and will with reasonable diligence prosecute said suit to a final decree adjudging that Company is the owner of said premises.

ARTICLE XIII.

PARTIES BOUND.

The benefits accruing hereunder shall accrue to the respective parties hereto, their respective heirs, successors, legal representatives and assigns; and the covenants and agreements herein contained shall be binding upon the respective parties hereto, their heirs, successors, legal representatives and assigns.

ARTICLE XIV.

SHORT AGREEMENT.

The parties hereto do not desire that this instrument be recorded but for the purpose of enabling Tobin to record an instrument giving notice to the world, if he

desires so to do, it is agreed that coincidentally with the signing of these presents a Short Agreement shall be executed by the parties hereto for recording purposes.

IN WITNESS WHEREOF, Tobin has subscribed these presents and Company has caused its corporate name to be subscribed hereto by its President and its corporate seal to be affixed by its Secretary, first thereunto authorized so to do by a meeting of its stockholders and a meeting of its Board of Directors, all in triplicate on this 19th day of _____, 1934.

BARTELS MINING COMPANY,

By J. H. Bartels
Vice - President.

ATTEST: [Signature]
Secretary.

ISSUER HOLDS OPTION TO PURCHASE THE MINE FOR \$15,000.00; \$500.00 OF WHICH HAS ALREADY BEEN PAID.
ALREADY INSTALLED AT THE CHAMPION MINE FOR \$15,000.00; \$500.00 OF WHICH HAS ALREADY BEEN PAID.

IT IS THE ISSUER'S INTENT TO OPERATE THIS MILL FOR THE BENEFIT OF THE ISSUER'S MINES, AND AS A CUSTOM MILL TO HANDLE ORE FROM OTHER MINES IN THE DISTRICT IF AT ANY TIME ISSUER'S MINES FAIL TO PRODUCE FULL TONNAGE FOR THE MILL.

IN THE FOLLOWING DESCRIPTION OF THE ISSUER'S MINES AND OTHER MINES IN THE DISTRICT, CONSIDERABLE INFORMATION IS QUOTED DIRECT FROM REPORT ON BOHEMIA DISTRICT WRITTEN IN FEBRUARY, 1946, BY KENNETH O. WATKINS. THESE DIRECT QUOTATIONS ARE SHOWN BY QUOTATION MARKS IN THE BALANCE OF THE DESCRIPTIVE PART OF THIS PROSPECTUS.

LOCATION

THE BOHEMIA MINING DISTRICT COVERS ABOUT FIFTY SQUARE MILES LYING ON BOTH SIDES OF THE CALAPOOYA RANGE IN LANE COUNTY, OREGON.

THE CHAMPION MINE WHERE THE ISSUER PROPOSES TO OPERATE THE MILL FOR THE ORES FROM ALL OF THE ISSUER'S HOLDINGS IN THE DISTRICT, IS LOCATED ALMOST IN THE CENTER OF THE DISTRICT AND IS FOURTEEN MILES FROM DISSTON POST OFFICE AND IS THIRTY-SIX MILES FROM COTTAGE GROVE, OREGON. COTTAGE GROVE IS A TOWN OF ABOUT 4,000 PEOPLE IN THE UPPER END OF THE WILLAMETTE VALLEY AND IS ON THE U.S. HIGHWAY NO. 99 AND THE SOUTHERN PACIFIC RAILROAD. DISSTON LIES ABOUT TWENTY-TWO MILES SOUTHEAST OF COTTAGE GROVE AT THE END OF THE O.P. & E. RAILROAD. DISSTON IS A SHIPPING POINT FOR ORES AND CONCENTRATES FROM THE DISTRICT. ISSUER'S MINES AND OTHER DEVELOPED MINES IN THE DISTRICT ARE FROM TWO TO FOUR MILES BY GOOD ROAD FROM THE CHAMPION MINE.

GENERAL ECONOMIC AND PHYSICAL CONDITIONS

"THE RELIEF IN THE BOHEMIA DISTRICT IS QUITE MARKED. THE LOWEST MINERALIZED POINTS DEVELOPED BEING AT AN ELEVATION OF APPROXIMATELY 2,000 FEET AND THE HIGHEST NEARLY 6,000 FEET. THE WHOLE AREA IS QUITE STEEP, AND IS CUT BY DEEP RAVINES, ALL OF WHICH CARRY GOOD SIZED STREAMS.

THE DISTRICT IS COVERED WITH HEAVY TIMBER, MOSTLY DOUGLAS FIR. BRUSH AND OVER-BURDEN MAKES SURFACE PROSPECTING VERY EXPENSE AND DIFFICULT.

THE PRECIPITATION IS APPROXIMATELY 50 INCHES PER YEAR. VERY LITTLE RAIN FALLS DURING THE SUMMER MONTHS, BUT THERE IS CONSIDERABLE PRECIPITATION FROM OCTOBER TO MAY, PART OF IT IN THE FORM OF SNOW.

THERE IS A SURPLUS OF WATER FOR MILLING AND CAMP USE ALL OVER THE DISTRICT.

THE R.E.A. HAVE BUILT A POWER LINE, CARRYING BONNEVILLE POWER AS FAR AS DISSTON. IT WILL BE POSSIBLE TO EXTEND THIS POWER TO THE DISTRICT, BUT I DO NOT THINK IT ADVISABLE AT THIS TIME, AS IT WOULD BE NECESSARY TO CUT A RIGHT-OF-WAY 400 FEET WIDE THROUGH THE NATIONAL FOREST, AND PAY FOR ALL THE TIMBER CUT. THE COST OF THIS TIMBER WOULD BE MANY TIMES GREATER THAN THE ACTUAL COST OF THE CONSTRUCTION OF THE POWER LINE. DIESEL FUEL, DELIVERED IN THE DISTRICT, ONLY COST 10 $\frac{1}{2}$ PER GALLON. SO, FOR THE TIME BEING DIESEL POWER IS ADVISED.

THE LABOR SUPPLY IN THIS AREA CONSISTS MOSTLY OF LOGGERS AND FARMERS, THERE BEING VERY FEW EXPERIENCED MINERS IN THE AREA, EXCEPT THOSE FORMER FARMERS AND LOGGERS WHOM I TRAINED TO BE MINERS. IT HAS BEEN MY OBSERVATION THAT THESE MEN WILL PRODUCE MORE WORK THAN THE AVERAGE CALIFORNIA, NEVADA OR ARIZONA MINERS.

IT IS TRUE THAT THE WAGE SCALE AT THE PRESENT TIME FOR MINERS IN THAT AREA IS SOMEWHAT HIGHER THAN IN CALIFORNIA AND ARIZONA MINES, DUE TO THE FACT THAT AT THE PRESENT TIME THE LOGGING INDUSTRY IS PAYING A VERY HIGH WAGE."

GEOLOGY

"THE CALAPOOYA RANGE IS AN EAST-WEST RANGE CONNECTING THE CASCADES TO THE COAST RANGE. IT FORMS A WATER DIVIDE BETWEEN THE UMPQUA AND WILLAMETTE RIVER WATERSHEDS. AT A POINT ABOUT 25 MILES WEST OF THE SUMMIT OF THE CASCADES ARE FOUR PEAKS ABOUT 6,000 FEET HIGH. THESE FOUR PEAKS LIE IN A SEMI-CIRCLE AND ARE IN THE VERY HEART OF THE BOHEMIA DISTRICT.

THE BOHEMIA DISTRICT HAS NO RELATION GEOLOGICALLY OR OTHERWISE WITH THE MUCH PUBLICIZED SOUTHERN OREGON MINES. THE ROCK OF THIS AREA IS THE SAME AS A GOODLY PORTION OF THE WESTERN CASCADES. IT CONSISTS OF ANDESITE AND RHYOLITE FLOWS INTRUDED BY DACITE-PORPHYRY

DIKES. THESE DIKES APPARENTLY FORM THE FISSURES FOR THE VEINS.

THE AVERAGE STRIKE OF THE MAJOR VEINS - ABOUT 75 IN NUMBER - IS NORTH 70° WEST. THE VEINS HAVE A WIDTH OF FROM 16 INCHES TO 20 FEET, BUT MOST OF THE ORE PRODUCING VEINS ARE AROUND FOUR FEET IN WIDTH. THE DEVELOPED ORE SHOOTS IN THE DISTRICT VARY IN LENGTH FROM 40 TO 400 FEET. THE DIP OF THE VEINS VARY FROM VERTICAL TO 60 DEGREES.

THE METAL CONTENT OF THE VEINS CONSISTS OF GOLD IN THE FREE STATE AND COMBINED WITH SULPHIDES, SILVER, CHALCOPYRITE, PYRITE, GALENA, AND SPHALERITE, THE LATTER FOUR BEING THE SULPHIDES OF COPPER, IRON, LEAD AND ZINC.

I SEE NO EVIDENCE OF SECONDARY ENRICHMENT. I THINK ALL THE SULPHIDES PRESENT ARE PRIMARY AND THE COUNTRY ROCK BEING THE SAME 4,000 FEET OR MORE IN DEPTH, THERE IS NO REASON TO ANTICIPATE A SUDDEN CHANGE IN CHARACTER OR VALUE OF THE ORE. IN FACT, ORE EXPOSED ON BOTH SIDES OF THE MOUNTAIN RANGE, IN VEINS SUCH AS THE HELENA, SHOW THE SAME TYPE OF ORE IN THE CANYONS AS ON THE TOP OF THE MOUNTAIN THRU A VERTICAL RANGE OF 2,300 FEET."

HISTORY

"THE BOHEMIA DISTRICT WAS DISCOVERED IN 1858, AND THE FIRST ORGANIZATION MEETING WAS HELD ON OCTOBER 20TH OF THAT YEAR. THE RECORDS OF THIS MEETING IN THE OFFICE OF THE LAKE COUNTY RECORDER, INDICATE THAT ONLY SIX VEINS WERE FOUND AT THAT TIME. APPARENTLY VERY LITTLE WAS DONE FOR SOME YEARS AFTER THAT.

IN 1875, A FIVE-STAMP MILL WAS BUILT ON THE KNOTT CLAIM, NOW A PART OF THE CHAMPION MINE. I AM TOLD THAT IT TOOK TWO YEARS TO BUILD A ROAD OF SORTS ALONG THE RIDGES TO GET THIS MILL TO ITS LOCATION. THIS MILL WAS OPERATED UNTIL 1877, THE ORE COMING FROM THE SHAFT AT THE VERY TOP OF GROUSE MOUNTAIN.

IN 1887, THE ANNIE MINE, NOW CALLED THE NOONDAY, WAS DISCOVERED AND ORE SLEDDED TO THE KNOTT MILL.

IN 1891 AND 1892, LARGE NUMBERS OF PROSPECTORS CAME TO THE DISTRICT, AND MANY CLAIMS WERE LOCATED. AT THIS TIME THE CHAMPION AND THE MUSICK WERE DISCOVERED AND STAMP MILLS BUILT ON BOTH OF THEM. A BETTER ROAD WAS BUILT UP SHARP'S CREEK, A CANYON TO THE WEST OF CHAMPION CREEK, FOR TRANSPORTATION OF THE MACHINERY. THIS ROAD STILL EXISTS AND IS PASSABLE, BUT IS VERY STEEP.

IN 1898, AFTER A REPORTED PRODUCTION AT THE ANNIE MINE, NOW THE NOONDAY, OF \$700,000.00, FROM A SMALL FIVE-STAMP MILL, THE NOONDAY COMPANY BUILT ANOTHER ROAD ON THE NORTHEAST SIDE OF THE DISTRICT TO THE NOONDAY MINE, AND BUILT A THIRTY-STAMP MILL. BY THE TIME THIS MILL WAS READY FOR OPERATION, THE OXIDIZED ORE WAS ABOUT GONE. THE MINE WAS SHUT DOWN ABOUT 1899.

THE HELENA MINE, WHICH LIES A SHORT DISTANCE NORTH OF THE NOONDAY WAS OPERATED BY THE THREE JENNINGS BROTHERS, STARTING ABOUT 1902. THEY TOOK OUT VERY RICH ORE, PRODUCING ACCORDING TO UNVERIFIED REPORTS, ONE ONE AND ONE-HALF MILLION DOLLARS IN A FEW YEARS. THEY PROCEEDED TO ORGANIZE THE OREGON SECURITIES CORPORATION, AND ACQUIRED THE CHAMPION AND MUSICK MINES AS WELL. THE OREGON SECURITIES CORPORATION BUILT A THIRTY-STAMP MILL ON THE CHAMPION PROPERTY, A HYDRO-ELECTRIC POWER PLANT ABOUT EIGHT MILES FROM THE MINE, AND STARTED TO OPERATE ON A GRAND SCALE. REALIZING THAT THE OXIDIZED ORE WAS ABOUT GONE, THE JENNINGS BROTHERS VERY WISELY SOLD OUT THEIR INTEREST IN THE COMPANY.

FROM 1906 ON, NO WORK WAS DONE AT THE MUSICK OR THE HELENA, BUT THE CHAMPION WAS OPERATED INTERMITTENTLY UNTIL 1917. THE PRODUCTION FROM THESE OLD OPERATIONS IS IMPOSSIBLE TO DETERMINE EXACTLY, DUE TO THE SCARCITY OF RECORDS, BUT EX-SENATOR ROBERT N. STANFIELD OF OREGON EXAMINED THE GOVERNMENT RECORDS AT REQUEST OF INTERESTED PARTIES, AND HE REPORTED THAT THE PRODUCTION OF THE DISTRICT WAS IN EXCESS OF NINE MILLION DOLLARS.

THE BUREAU OF MINES DOES NOT GIVE THIS HIGH A FIGURE FROM THEIR RECORDS, BUT THEY ADMIT THERE WAS CONSIDERABLE PRODUCTION BEFORE APPROPRIATE RECORDS WERE KEPT. IN FACT, THE HEAVY PRODUCTION FROM THE NOONDAY, MUSICK AND HELENA WAS ALL BEFORE 1904.

IN 1932 I VISITED THE DISTRICT AND OBSERVED THAT THERE WAS A CONSIDERABLE AMOUNT OF SULPHIDE ORES IN THE VARIOUS MINES. IN THE SUMMER OF 1933 I OPERATED A COMMERCIAL ASSAY OFFICE IN EUGENE, OREGON, AND MADE A GOOD MANY ASSAYS FROM VARIOUS MINES IN THE DISTRICT. I WAS EMPLOYED BY ONE PARTY TO MAKE A COMPLETE ASSAY MAP OF THE LEAD-CRYSTAL.

IN THE EARLY SPRING OF 1934 I SAMPLED THE NOONDAY MINE FOR A GROUP OF EUGENE BUSINESSMEN, WHO ORGANIZED A COMPANY KNOWN AS THE GROUSE MOUNTAIN MINING COMPANY, TO OPERATE THE NOONDAY MINE, FORMERLY KNOWN AS THE ANNIE MINE. I BUILT A 25-TON FLOTATION MILL FOR THIS COMPANY AND OPERATED IT FOR A SHORT TIME, BUT THEY BECAME INVOLVED IN LITIGATION AND EVENTUALLY LOST ALL THEIR RIGHTS TO THE MINE.

IN 1935 I BUILT A MILL ON THE MUSICK MINE FOR THE MINERALS EXPLORATION COMPANY AND HAD CHARGE OF THE OPERATION OF BOTH THE MINE AND THE MILL FOR TWO YEARS. WE WERE ONLY ABLE TO HANDLE 22 TONS PER DAY IN THIS SMALL MILL, BUT WE MADE A PROFIT OF \$18,000.00 ON A PRODUCTION OF \$101,000.00 NET SMELTER AND MINT RETURNS. THIS MINE WAS SHUT DOWN BY THE PRESIDENT OF THE COMPANY IN THE FALL OF 1937, AS HE WAS NOT WILLING TO SPEND ANY MONEY ON DEVELOPMENT.

IN 1935 A GROUP OF PEOPLE OPERATING UNDER THE NAME OF EVENING STAR MINES CO., BUILT A FIFTY-TON FLOTATION MILL ON THE CHAMPION MINE. DUE TO POOR MANAGEMENT AND EXCESSIVE EXPENDITURES THIS COMPANY FOLDED UP VERY SHORTLY AFTER PRODUCTION STARTED.

IN 1934, F. DALE WYATT AND ASSOCIATES STARTED WORK ON THE HELENA MINE. WITHOUT ANY DEVELOPMENT THEY WALKED INTO THIS MINE, WHICH HAD LAID IDLE SINCE 1906 AND SHIPPED ORE DIRECT TO THE U.S. SMELTING & REFINING COMPANY, WHICH NETTED THEM \$21,187.27 AFTER FREIGHT AND TREATMENT. THEY THEN FORMED A CORPORATION AND BUILT A FORTY-TON MILL ON THE PROPERTY. DISPUTES AROSE AMONG THE STOCKHOLDERS AND NOT HAVING PROPER UNDERGROUND MANAGEMENT, THEY SOON FOUND THEMSELVES OUT OF ORE.

IN 1937 MR. WILLIAM REEVES, A MINE LESSEE FROM THE COUER-DE-ALENE DISTRICT, TOOK A LEASE ON THE HELENA MINE AND MILL, AND IN 100 DAYS OF OPERATION PRODUCED CONCENTRATES WHICH YIELDED A NET SMELTER RETURN OF ABOUT \$50,000.00.

BESIDES THE PRODUCTION FROM THE OLD OPERATIONS OF THE OXIDIZED ZONE, THE RECENT PRODUCTION IN TERMS OF NET SMELTER RETURNS, HAS BEEN APPROXIMATELY \$101,000.00 FROM THE MUSICK MINE, \$200,000.00 FROM THE HELENA MINE, AND \$12,000.00 FROM THE NOONDAY MINE. I DO NOT HAVE THE FIGURES ON THE RECENT PRODUCTION FROM THE CHAMPION MINE, BUT IT IS PROBABLY CONSIDERABLY IN EXCESS OF \$100,000.00.

IN 1939 THE H & H MINES COMPANY TOOK A LEASE AND OPTION TO PURCHASE ON THE CHAMPION, MUSICK AND NOONDAY MINES. I SUGGESTED TO THIS COMPANY DEVELOPMENT WORK IN NINE PLACES IN THE MUSICK AND NOONDAY MINES. I DID THIS WORK ON A CONTRACT BASIS AND FOUND COMMERCIAL ORE FOR THE COMPANY IN SEVEN OF THE NINE PROPOSED HEADINGS.

DURING 1940 AND 1941, THE H & H COMPANY CONCENTRATED ALL THEIR DEVELOPMENT ON THE CHAMPION MINE. FROM THE AMOUNT OF WORK DONE, I WOULD ESTIMATE THAT THE H & H COMPANY SPENT OVER \$500,000.00 ON THESE THREE MINES.

IN 1942 THEY BUILT A SELECTICE FLOTATION MILL ON THE CHAMPION MINE. AFTER MILLING 12,775 TONS, THEY CEASED OPERATION IN AUGUST OF 1942, DUE TO THE FACT THAT IT WAS IMPOSSIBLE TO GET LABOR DURING THE WAR AND WHAT LABOR THEY HAD DID NOT PRODUCE BUT A VERY SMALL PROPORTION OF THE AMOUNT NORMALLY EXPECTED PER MAN SHIFT.

IN DECEMBER 1944, I RETURNED TO THE DISTRICT, AFTER SPENDING THREE YEARS MINING TUNGSTON AND ANTIMONY IN SOUTHERN CALIFORNIA. I DID A LITTLE PREPARATION WORK AT THE NOONDAY AND MUSICK MINES LAST SUMMER (1945) FOR THE PRESENT LEASEHOLDERS."

SINCE THE COMPLETION OF THE REPORT QUOTED, THE H & H MINES COMPANY ABANDONED THEIR LEASE AND OPTION ON THE CHAMPION MINE AND MR. F. J. BARTELS, THE OWNER, DURING THE YEAR 1946, SHIPPED TO THE TACOMA SMELTER 202.77 TON OF ORE WHICH YIELDED A RETURN BEFORE COSTS, OF \$15,065.37 WHICH IS \$74.30 PER TON.

KENNETH O. WATKINS TOOK A LEASE AND OPTION TO PURCHASE ON THE HELENA MINE FROM THE OWNER, WHICH LEASE AND OPTION HAS BEEN ASSIGNED TO THE ISSUER. IN THE YEAR 1946 WATKINS DROVE THE LOWER LEVEL OF THE HELENA MINE UNDER ORE SHOOT FROM WHICH WILLIAM REEVES TOOK HIS ORE IN 1937. ORE FROM THIS DEVELOPMENT DRIFT WAS SHIPPED TO THE SMELTER. THE 106.88 TON IN THIS SHIPMENT HAD A GROSS PAID FOR VALUE OF \$3,890.10 OR \$31.22 PER TON. AFTER DEDUCTING FREIGHT AND SMELTING CHARGES, THIS ORE YIELDED \$2,421.39 OR \$22.65 PER TON. OTHER MINES IN THE DISTRICT HAVE BEEN IDLE, EXCEPT FOR A SMALL AMOUNT OF DEVELOPMENT WORK.

DEVELOPMENT

THE FOLLOWING DISCUSSION OF DEVELOPMENT COVERS SOME MINES NOT OWNED OR LEASED BY THE ISSUER, BUT THEIR DEVELOPMENT STATUS IS INCLUDED, AS THEY ARE ALL POSSIBLE PRODUCERS OF

"IN THE DISTRICT THERE ARE OVER 60 PROSPECTS DEVELOPED TO THE PLACE WHERE THEY ARE CONSIDERED MINES, OR AT LEAST HAVE THE NAME OF SUCH. THERE WERE OVER 700 LOCATED CLAIMS, BUT I BELIEVE THERE ARE LESS THAN 300 ACTIVE LEGITIMATE LOCATIONS AT THE PRESENT TIME. I KNOW OF OVER 400 ADITS OF VARYING LENGTHS AND THERE ARE UNDOUBTEDLY MANY HIDDEN PORTALS WHICH I HAVE NEVER SEEN.

I SHALL NOT TAKE THE TIME OR SPACE TO DISCUSS ALL OF THE DEVELOPMENTS IN THE DISTRICT, BUT WILL BRIEFLY MENTION THE DEVELOPMENT AT SOME OF THE MORE IMPORTANT MINES.

IN ROUND FIGURES THERE IS 14,000 FEET OF UNDERGROUND DEVELOPMENT AT THE CHAMPION MINE. MOST OF THIS IS IN EXCELLENT CONDITION, WITH AIR LINE AND TRACK IN GOOD SHAPE.

THERE IS 5,000 FEET OF UNDERGROUND DEVELOPMENT AT THE MUSICK, BUT THE UPPER LEVELS ARE MINED OUT AND ABANDONED. THE MAIN, OR CROSSCUT LEVEL IS IN GOOD CONDITION FOR MOST OF ITS LENGTH. ALL OF THE ORE IN THE MUSICK LIES BELOW THIS LEVEL, AND IS DEVELOPED BY A DRIFT FROM A 65-FOOT WINZE. THERE ARE TWO ORE SHOOTS, EACH 200 FEET LONG, AND AVERAGING 4 TO 4-1/2 FEET WIDE, DEVELOPED ON THIS WINZE LEVEL.

THERE IS APPROXIMATELY 3,000 FEET OF UNDERGROUND DEVELOPMENT CONSISTING OF 7 LEVELS, ALL DRIFTS INTO THE HILL ON THE VEIN AT THE HELENA MINE. THE 4 AND 7 LEVELS ARE THE MAIN WORKING LEVELS, AND BOTH HAVE TRACKS IN FAIR CONDITION. I PREPARED THE HELENA MINE FOR PRODUCTION LAST NOVEMBER (1945) JUST BEFORE THE SNOWS CAME.

THERE ARE THREE LEVELS, APPROXIMATELY 2500 FEET, DEVELOPED IN THE NOONDAY MINE. THE UPPER LEVEL IS STOPPED OUT AND ABANDONED; THE OTHER TWO LEVELS ARE BOTH OPEN AND IN GOOD SHAPE. THE NOONDAY HAS SOME VERY GOOD ORE EXPOSED, BUT THE ORE SHOOTS ARE SHORTER THAN IN SOME OF THE OTHER MINES. THERE IS A CROSSCUT FROM THE NO. 3 LEVEL OF THE NOONDAY TO A PARALLEL VEIN ON THE SAME PROPERTY KNOWN AS THE MAGGIE VEIN. THIS SHOWS AN ORE SHOOT THE LENGTH OF WHICH HAS NOT BEEN DETERMINED, WHICH HAS 312 FEET OF BACKS TO THE SURFACE. SAMPLES TAKEN ON THE SURFACE AVERAGE 1/2 OZ. GOLD AND SAMPLES TAKEN IN THE VEIN AT THIS DEVELOPED LEVEL HAVE AN AVERAGE GOLD VALUE OF .54 OZ. THIS ORE IS STILL ALMOST COMPLETELY OXIDIZED. THIS ORE SHOOT LIES UNDER THE FLAT TOP OF GROUSE MOUNTAIN, WHERE OXIDATION GOES MUCH DEEPER THAN IN MOST PARTS OF THE DISTRICT.

THERE IS OVER 2,000 FEET OF DEVELOPMENT WORK AT THE RIVERSIDE MINE. THIS IS MOSTLY ONE LONG DRIFT ON THE VEIN WHICH ATTAINS A DEPTH IN EXCESS OF 1,000 FEET. THE PORTAL OF THIS MINE HAS BEEN CAVED SINCE 1923. IT IS APPARENT FROM THE DUMP THAT THERE IS CONSIDERABLE COPPER-ZINC ORE IN THIS MINE. I HAVE TALKED WITH SEVERAL OLD MINERS WHO WORKED IN THIS TUNNEL, AND THEY ALL STATE THAT THERE IS ONE ORE SHOOT OVER 400 FEET LONG AND WIDER THAN THE DRIFT IN THIS MINE. THIS ORE BEING BASE AND CARRYING VERY LITTLE GOLD, NO ATTEMPT WAS MADE TO WORK IT IN THE EARLY DAYS.

THE OREGON-COLORADO MINE HAS DEVELOPMENT ALMOST IDENTICAL AS FAR AS LENGTH OF DRIFT AND DEPTH ATTAINED, AS THE RIVERSIDE. THE ORE SHOOTS ARE SHORTER BUT THERE ARE SEVERAL OF THEM. THE CHIEF VALUE OF THE OREGON-COLORADO ORE IS COPPER AND SILVER, WHICH MAKES IT DIFFERENT THAN ANY OTHER MINE IN THE DISTRICT.

THE SUNSET MINE HAS ABOUT 3,000 FEET OF DEVELOPMENT, CONSISTING OF A NUMBER OF DRIFTS ON THREE DIFFERENT PARALLEL VEINS.

THE COSMOS MINE HAS ABOUT 2,000 FEET CONSISTING OF A NUMBER OF SHORT CROSSCUTS AND DRIFTS.

I HAVE NOT BEEN IN THE WORKINGS AT THE MAYFLOWER MINE, BUT FROM THE SIZE OF THE DUMPS I SHOULD GUESS THERE IS OVER 1,000 FEET OF UNDERGROUND WORKINGS.

THERE IS ABOUT 600 FEET OF CROSSCUT AND DRIFT ON THE GOLD CROSS MINE, AND ABOUT 400 FEET ON THE EL CAPITAN.

DEVELOPMENT ON OTHER MINES SHOWING SOME COMMERCIAL ORE, IS IN EXCESS OF 10,000 FEET, BUT I WILL NOT TAKE THE SPACE TO DISCUSS THEM HERE."

NO WORK HAS BEEN DONE BY THE ISSUER. THE VALUE OF THE HELENA MINE HAS BEEN GREATLY INCREASED BY WORK DONE IN 1946 BY KENNETH O. WATKINS BEFORE ASSIGNMENT TO THE ISSUER. THIS WORK CONSISTED OF DRIVING NO. 7 LEVEL AHEAD AND PROVING THE DOWNWARD EXTENSION OF THE RICH ORE BODY ON THE NO. 4 LEVEL 268 FEET ABOVE.

BUILDINGS AND EQUIPMENT

THERE IS A 20-MAN BUNK HOUSE AND COOK HOUSE IN FIRST CLASS CONDITION AT THE HELENA MINE. A SHOP AND ORE BIN ARE LOCATED AT THE PORTAL OF THE 700 LEVEL, WHICH IS THE LEVEL FROM WHICH ORE WAS PRODUCED THIS PAST YEAR. THE MINE IS EQUIPPED WITH A 200 CUBIC FOOT COMPRESSOR, AIR DRILLS, MINE CARS, ETC.

THE MUSICK MINE HAS A 30-MAN BUNK HOUSE AND COOK HOUSE WHICH NEEDS SOME REPAIR, DUE TO THE FACT IT HAS NOT BEEN USED FOR FOUR YEARS. THE MINE IS EQUIPPED WITH TRACK AND AIR LINES, BUT THERE IS NO MACHINERY ON THE PROPERTY.

THE CHAMPION MINE HAS AIR LINE AND TRACK IN FAIR CONDITION IN ALL THE MAIN WORKING LEVELS. THE BUILDINGS LISTED BELOW ARE LOCATED AT THE CHAMPION MINE AND USE OF ALL OF THESE BUILDINGS ARE INCLUDED IN THE PURCHASE CONTRACT:

ONE LARGE BUNK HOUSE AND COOK HOUSE COMBINED, CONTAINING A VERY LARGE MODERN KITCHEN WITH OIL BURNING TWO OVEN RANGE, LARGE DINING ROOM, OFFICE, MAP ROOM, 32 2-MAN BEDROOMS AND 1 20-MAN BEDROOM. THIS BUILDING IS VERY WELL CONSTRUCTED.

SEVEN PRIVATE HOUSES OF VARIOUS SIZES.

A TUNNEL HOUSE AT THE 1200 LEVEL PORTAL, CONTAINING A NUMBER OF STORAGE ROOMS, MINE OFFICE, SHOWERS AND LARGE CHANGE ROOM.

A WELL CONSTRUCTED SNOW SHED CONNECTING THE TUNNEL HOUSE TO THE POWER HOUSE AND THE MILL.

A MILL BUILDING HOUSING A 100-TON SELECTIVE FLOTATION MILL. THIS MILL BUILDING WAS BUILT IN 1935 AND IS IN EXCELLENT CONDITION.

IN THE MILL BUILDING BUT NOT A PART OF THE LEASE FROM MR. BARTELS, OWNER OF THE CHAMPION MINE, IS THE 100-TON SELECTIVE FLOTATION MILL WHERE THE ISSUER EXPECTS TO MILL ORE FROM ALL THE MINES OWNED AND LEASED.

THE MACHINERY MAKING UP THIS MILL WILL NOT BE LISTED AS IT TAKES TOO MUCH SPACE, BUT IT CAN BE STATED THAT THE MILL IS FULLY CAPABLE OF HANDLING 100 TON PER DAY, IS WELL DESIGNED AND OPERATED SUCCESSFULLY FOR A FEW MONTHS BEFORE THE SHUTDOWN IN 1942 DUE TO THE WAR.

THE MACHINERY IN THIS MILL AND A 170x40 FOOT SHOP BUILDING SITUATED BETWEEN THE MILL AND THE TUNNEL HOUSE ARE BEING PURCHASED BY THE ISSUER FROM MR. JOHN C. HIGGINS, WHO OPERATED THE CHAMPION MINE IN 1942 UNDER THE NAME OF H & H MINES CO.

TONNAGE DEVELOPED AND INDICATED

THERE IS A CONSIDERABLE DIFFERENCE OF OPINION AMONG ENGINEERS REGARDING WHAT CONSTITUTES TRULY BLOCKED OUT ORE. IN ORDER TO AVOID ANY MISUNDERSTANDING ON THIS POINT, THE ORE DEVELOPED, AND DISCUSSED BELOW, WILL BE CONSIDERED AS HIGHLY PROBABLE OR INDICATED ORE AND IT WILL BE STATED WHETHER THIS ORE IS OPENED UP ON ONE, TWO OR THREE SIDES.

INDICATED ORE AS FAR AS THIS DISCUSSION IS CONCERNED, IS CONSIDERED AS ORE THAT HAS BEEN OPENED UP, MEASURED AND SAMPLED ON AT LEAST ONE SIDE; POSSIBLE ORE IS THAT WHICH IS NOT PROVEN ON ANY SIDE EXCEPT ON THE SURFACE OR ON AN UNDERGROUND LEVEL OVER 100 FEET FROM THE ASSUMED PROBABLE ORE BODY.

A GOOD PROPORTION OF THE DEVELOPMENT DRIFT IN THE MAJOR MINES HAS BEEN IN ORE. THE FOLLOWING LIST GIVES THE PERCENTAGE OF DRIFT WHICH WAS IN ORE IN THESE MINES:

CHAMPION 44% -- MUSICK 50% -- NOONDAY 30%
HELENA 33% -- LEAD CRYSTAL 80% -- OREGON-COLORADO 36%

NO ATTEMPT IS MADE TO ASSIGN A VALUE TO THE POSSIBLE ORE AS IT HAS NOT BEEN THOROUGHLY SAMPLED.

HELENA MINE

BETWEEN THE NO. 4 AND NO. 7 LEVELS PROVEN FOR ITS ENTIRE LENGTH ON THE NO. 4 LEVEL, BUT ONLY OPENED UP FOR 80 FEET ON THE 700 LEVEL BY LAST YEAR'S WORK, IS AN ORE BODY WITH THE FOLLOWING APPROXIMATE DIMENSIONS.

250' LONG X 160' VERTICAL X 4' WIDE

THIS TYPE OF SULPHIDE ORE RUNS ABOUT 11 CUBIC FEET TO THE TON. THIS BLOCK OF ORE AND ANOTHER BLOCK BETWEEN THE NO. 6 AND NO. 4 LEVEL ARE NOT POSITIVE, BUT ARE ALMOST CERTAIN ORE. NO RAISE HAS BEEN RUN THROUGH THESE ORE BODIES TO PROVE THEIR VERTICAL CONTINUITY SO THEY ARE CLASSED AS HIGHLY PROBABLE.

CHAMPION MINE

ORE DEVELOPED IN THE CHAMPION, MUSICK, AND OREGON-COLORADO MINES IS LISTED BELOW BY DIRECT QUOTATION FROM THE REPORT MADE IN 1946 BY KENNETH O. WATKINS.

"BLOCKED ON THREE SIDES (SAMPLED AT 5' INTERVALS)

WEST OF TERRY RAISE, BETWEEN 900-FOOT AND 1050-FOOT LEVELS.
(TERRY RAISE IS INCLINE RAISE ON THE VEIN WEST OF THE 1200-FOOT CROSSCUT AND ALSO WEST OF THE VERTICAL RAISE.)

290' LONG X 170' VERTICAL X 2-1/4' WIDE + 11 CU. FT. PER TON 10,084 TONS

EAST OF TERRY RAISE, BETWEEN 900 AND 1,000 FOOT LEVELS

208' LONG X 110' VERTICAL X 2-1/2' WIDE + 11 5,175 TONS
15,259

BLOCKED ON TWO SIDES (BOTH SIDES SAMPLED AT 5' INTERVALS)

900 EAST NO. 2 ORE BODY BETWEEN 800 AND 900 FOOT LEVELS

149' LONG BY 95' VERTICAL X 2.2' WIDE

1050 EAST

152' LONG X 170' VERTICAL X 2' WIDE

INDICATED ORE (ONE SIDE SAMPLED)

900 WEST

283' LONG X 100' VERTICAL X 3-1/2' WIDE

1050 WEST

290' LONG X 100' VERTICAL X 2-1/4' WIDE

1050 EAST

125' LONG X 100' VERTICAL X 1-1/2' WIDE

900 EAST -- ORE BODIES NO. 1 TO 8 INCLUSIVE

1,179' LONG X 100' VERTICAL X 2' WIDE

REFER TO
STATEMENT
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POSSIBLE ORE

THERE IS NO GEOLOGICAL REASON FOR NOT EXPECTING THESE ORE BODIES TO EXTEND DOWN TO THE UNDEVELOPED PART OF THE 1200 LEVEL AND EVEN LOWER, AS ORE HAS BEEN FOUND IN THAT SMALL PART OF THE MINE THAT HAS BEEN OPENED UP ON THE 1200 LEVEL.

SURFACE WORK HAS PROVEN EXISTENCE OF ORE BODIES ON THE UNDEVELOPED MAELE, EXCELSIOR AND OTHER VEINS ON THE CHAMPION PROPERTY.

MUSICK MINE

BLOCKED ON TWO SIDES (BOTH SIDES SAMPLED)

BETWEEN WINZE LEVEL AND FLOOR OF MAIN DRIFT

400' LONG X 60' VERTICAL X 4' WIDE

INDICATED ORE, (ONE SIDE SAMPLED)

BETWEEN WINZE LEVEL AND FLOOR OF 600 LEVEL, BUT NOT REACHED YET BY THE WINZE LEVEL DRIFT

150' LONG X 60' VERTICAL X 6' WIDE

POSSIBLE ORE

EXTENSION OF 3 ORE BODIES FROM THE WINZE LEVEL DOWN TO THE CHAMPION 1200' LEVEL

500' LONG X 480' VERTICAL X 4-1/2' WIDE

OREGON-COLORADO MINE

BLOCKED ON TWO SIDES

I HAVE NEVER BEEN IN THIS MINE AS THE PORTAL IS CAVED, BUT I TAKE THE FIGURES BELOW FROM THE REPORT OF MR. W. W. ELMER, WELL KNOWN CONSULTING MINING ENGINEER.

THE ORE IN THE SHOOTS LISTED BELOW IS CUT ON THE MAIN DRIFT WHICH GOES IN 2,000 FEET. A DRIFT AT A HIGHER LEVEL CALLED THE CONFIDENCE TUNNEL CUTS SOME OF THESE ORE SHOOTS AND THE ORE GOES TO THE SURFACE AND IS EXPOSED IN OPEN CUTS SO I THINK WE ARE SAFE IN CALLING THIS BLOCKED ON TWO SIDES. ACCORDING TO MR. ELMER'S REPORT, THE FOLLOWING FOUR ORE BODIES ARE ENCOUNTERED IN THE FIRST 1100 FEET OF DRIFT.

50' LONG X 75' AVERAGE DISTANCE TO SURFACE X 2-1/2' WIDE

137' " X 250' " " " " X 2-1/2' "

50' " X 350' " " " " X 2-1/2' "

140' " X 550' " " " " X 2-1/2' "

INDICATED ORE

ACCORDING TO OLIVER GILBERTSON, WHO HAD CHARGE OF THE LATER WORK ON THE PROPERTY, THREE MORE ORE BODIES WERE ENCOUNTERED BETWEEN THE 1100-FOOT POINT AND THE FACE WHICH IS IN 2,000 FEET. IF WE GIVE THESE ORE BODIES THE SAME WIDTH AND THE LENGTH REPORTED BY GILBERTSON, WE WILL GET THE FOLLOWING ADDITIONAL TONNAGE:

360' LONG X 750' AVERAGE DISTANCE TO SURFACE X 2-1/2' WIDE

OTHER MINES

MEASURED AND CALCULATED TONNAGES ARE DEVELOPED AND SAMPLED IN THE NOONDAY, LEAD CRYSTAL, SUNSET AND OTHER MINES IN THE DISTRICT, ALL OF WHICH ARE POTENTIAL MILL FEED FOR THE ISSUER'S MILL.

METALLURGY

"FROM 1875 TO 1917 ALL ORE MILLED IN THE DISTRICT WAS PUT THROUGH STAMP MILLS. EVEN-THO SOME OF THIS ORE WAS ALMOST COMPLETELY OXIDIZED, I AM TOLD THAT THE AVERAGE RECOVERY WAS FROM 45% TO 55% OF THE GOLD VALUE. THIS IS PROBABLY DUE TO THE FACT THAT THE GOLD IN NEARLY ALL OF THE BOHEMIA ORES IS VERY FINE AND STAMP MILLS DO NOT AS A RULE GRIND FINER THAN 40 MESH.

IT IS TOO BAD THAT ALL THE TAILING FROM THESE VARIOUS OLD MILLS WERE DUMPED INTO THE CREEKS AND WASHED AWAY, AS THERE WOULD BE A CONSIDERABLE VALUE TO BE RECOVERED FROM THE TAILINGS IF THEY HAD BEEN SAVED.

AS THE BASE ORES WERE ENCOUNTERED DURING THESE OLD OPERATIONS, SOME EFFORT WAS MADE TO SAVE THEM BY GRAVITY CONCENTRATION ON TABLES. ONLY IN A FEW CASES WERE THESE CONCENTRATES RICH ENOUGH TO SHOW A PROFIT BECAUSE THEY HAD TO BE HAULED LONG DISTANCES BY TEAM AND WAGON AND WHEN THEY REACHED A SMELTER THERE WAS A CONSIDERABLE ZINC PENALTY, AS IT WAS NEARLY IMPOSSIBLE TO COMPLETELY SEPARATE THE ZINC FROM THE LEAD AND COPPER UNDER THE METHODS USED.

THE FIRST ATTEMPT TO USE MODERN MILLING METHODS WAS AT THE NOONDAY MILL IN 1934. WE USED BULK FLOTATION, MAKING ONE CONCENTRATE CONTAINING ALL THE SULPHIDE MINERALS. OUR RECOVERY OF THE GOLD WAS QUITE HIGH AFTER WE WORKED OUT THE CORRECT REAGENTS.

MOST OF THE ORE MILLED AT THE MUSICK WAS ALSO CONCENTRATED INTO ONE CONCENTRATE CONTAINING ALL THE SULPHIDES. SHORTLY BEFORE THE MILL WAS SHUT DOWN, WE CHANGED TO SELECTIVE FLOTATION, WHICH WORKED VERY WELL.

THE H & H MILL, BUILT ON THE CHAMPION MINE, IS CONSTRUCTED TO MAKE TWO OR THREE FLOTATION PRODUCTS.

VERY EXTENSIVE FLOTATION TESTS HAVE BEEN MADE ON VARIOUS BOHEMIA ORES BY MINERALS SEPARATION COMPANY, U.S. SMELTING, REFINING & MINING COMPANY, AND GENERAL ENGINEERING COMPANY OF SALT LAKE CITY. THE MOST RECENT AND EXHAUSTIVE WORK WAS DONE BY THE GENERAL ENGINEERING COMPANY."

LISTED BELOW ARE THE AVERAGE RECOVERIES OF THE VARIOUS METALS MADE BY MANY GENERAL ENGINEERING COMPANY TESTS ON THE CHAMPION ORE, GENERAL ENGINEERING AND U.S. SMELTING TESTS ON THE MUSICK ORE, AND U.S. SMELTING TESTS ON HELENA ORE.

	<u>CHAMPION</u>	<u>MUSICK</u>	<u>HELENA</u>	<u>AVERAGE RECOVERY</u>
GOLD	89.4%	90.5%	93.8%	91.2%
SILVER	87.7	85.4	88.9	87.3
COPPER	90.6	67.8	83.7	80.7
LEAD	81.5	96.9	92.6	90.3
ZINC	86.8	81.8	83.2	83.6

EXPERIENCE IN THE NOONDAY, MUSICK AND CHAMPION MILLS IN RECENT YEARS HAS PROVEN THAT A BETTER RECOVERY CAN BE OBTAINED IN DAY BY DAY OPERATION THAN IN THESE MILL TESTS, THE REASON BEING THAT MILL TESTS ARE MADE ON RELATIVELY SMALL LOTS OF ORE AND THERE IS NOT ENOUGH TIME TO MAKE ACCURATE ADJUSTMENT OF THE AMOUNT OF REAGENT FED.

TITLES AND CONTRACT TERMS

THE HELENA MINE CONSISTING OF THREE PATENTED AND SEVEN UNPATENTED MINING CLAIMS HAS BEEN CONSIDERED AS A UNIT FOR MANY YEARS. L. M. CAPPS OF BLACKFOOT, IDAHO HAS BEEN THE OWNER FOR OVER TWENTY YEARS. ON APRIL 10, 1945 HE ENTERED INTO A CONTRACT TO SELL TO F. DALE WYATT OF SPRINGFIELD, OREGON. ON NOVEMBER 1, 1945 MR. WYATT SOLD ALL HIS RIGHTS UNDER THIS CONTRACT TO KENNETH O. WATKINS. DEEDS FROM BOTH MR. CAPPS AND MR. WYATT ARE NOW HELD IN ESCROW AT THE U.S. NATIONAL BANK OF PORTLAND, EUGENE BRANCH, AND MR. WATKINS HAS TRANSFERRED ALL HIS RIGHTS UNDER THIS ESCROW AND CONTRACT TO THE ISSUER.

THIS CONTRACT CALLS FOR COMPLETE PURCHASE OF THE MINE ON 10% OF NET RETURN ROYALTY BASIS, WITH FIXED MONTHLY PAYMENTS OF \$100.00 PER MONTH UNTIL APRIL 10, 1948, WITH FIXED ANNUAL PAYMENTS OF \$4,500.00 APRIL 10, 1948 AND \$2,000.00 EACH APRIL 10 THEREAFTER UNTIL THE FULL PRICE HAS BEEN PAID. ALL ROYALTIES ARE TO APPLY ON NEXT DUE ANNUAL PAYMENT. TOTAL PURCHASE PRICE OF MINE IS \$38,150.00 OF WHICH \$8,050.00 HAS BEEN PAID BY KENNETH O WATKINS BEFORE ASSIGNMENT.

IN 1940 JOHN BREEDING LOCATED A NUMBER OF MINING CLAIMS IN THE DISTRICT WHICH HE LATER DEEDED TO OTHERS. SOME OF THESE CLAIMS OVERLAP PARTS OF THE WESTERN CLAIMS IN THE HELENA GROUP. THERE IS NO OTHER CLOUD ON THE TITLE OF THE HELENA CLAIMS AND INASMUCH AS THE HELENA LOCATIONS ARE NEARLY THIRTY YEARS OLDER AND HAVE BEEN HELD AS A UNIT ALL THAT TIME, THESE LOCATIONS BY JOHN BREEDING ARE PROBABLY OF NO SERIOUS THREAT TO THE TITLE. IN ANY EVENT, THE BREEDING LOCATIONS DO NOT OVERLAP ANY PART OF THE MINE FROM WHICH ORE HAS BEEN PRODUCED OR THE ISSUER EXPECTS TO MINE AT THE PRESENT TIME. IN FACT, ALL THE DEVELOPED WORKINGS OF THE MINE ARE ON THE PATENTED CLAIMS.

THE CHAMPION MINE CONSISTING OF ONE PATENTED AND 26 UNPATENTED CLAIMS HAS BEEN HELD UNDER THE SAME OWNERSHIP FOR OVER TWENTY YEARS WITH THE EXCEPTION THAT IT WAS ORIGINALLY HELD UNDER THE NAME OF THE BARTELS MINING COMPANY OF WHICH MR. FRED J. BARTELS WAS THE PRINCIPAL STOCKHOLDER. IN MORE RECENT YEARS MR. BARTELS BOUGHT OUT ALL THE OTHER STOCKHOLDERS AND CLOSED THE CORPORATION.

THE ISSUER HOLDS A CONTRACT TO PURCHASE ALL THAT PART OF THE CHAMPION MINE BELOW THE 900 FOOT LEVEL AND THE BUILDINGS AND IMPROVEMENTS ON THE PROPERTY FOR \$75,000.00. 15% ROYALTY ON DEVELOPED ORE AND 10% ROYALTY ON UNDEVELOPED ORE WILL APPLY ON NEXT DUE MONTHLY INSTALLMENT AND FULL PURCHASE PRICE. MONTHLY PAYMENTS START AT \$300.00 PER MONTH AND INCREASE TO \$1,000.00 PER MONTH BY FEBRUARY 10, 1948. ADDITIONAL PAYMENTS OF \$5,000.00 EACH ARE DUE AUGUST 10, 1947 AND JANUARY 10, 1948. ISSUER HOLDS OPTION TO PURCHASE BALANCE OF CHAMPION MINE FOR AN ADDITIONAL \$75,000.00 WITHIN THREE YEARS TIME.

THE BUILDINGS ON THE CHAMPION GROUND ARE INCLUDED IN THE PURCHASE CONTRACT FROM MR. BARTELS. THE MACHINERY WHICH THE ISSUER IS BUYING FROM H & H MINES CO. RESTS IN THE BUILDINGS OWNED BY MR. BARTELS BY VIRTUE OF AN AGREEMENT BETWEEN BARTELS AND H & H MINES CO. THE PRESENT AGREEMENT BETWEEN THE ISSUER AND MR. BARTELS RECOGNIZES THE COMPLETE OWNERSHIP OF THE MACHINERY BY JOHN C. HIGGINS AND THE ISSUER AND THE RIGHT TO REMOVE THE SAME AT ANY TIME. THIS MACHINERY MAKING UP THE 100 TON SELECTIVE FLOTATION MILL AND CONSIDERABLE MINE EQUIPMENT AS WELL AS MILL SUPPLIES ON HAND IS BEING PURCHASED FROM JOHN C. HIGGINS FOR \$15,000.00, \$500.00 OF WHICH HAS BEEN PAID; BALANCE DUE JULY 1ST, 1947.

PURCHASE CONTRACTS ON HELENA AND CHAMPION MINES AND MILL MACHINERY ALL HAVE FORFEITURE CLAUSES CALLING FOR LOSS OF CONTRACT RIGHTS IF PAYMENTS ARE NOT MADE AFTER NOTICE OF DEFAULT.

THE FOURTEEN CLAIMS MAKING UP THE MUSICK MINE HAVE BEEN CONSIDERED AS A UNIT FOR MANY YEARS. ORIGINAL LOCATIONS ARE ABOUT 50 YEARS OLD. THE TAR BABY MINING COMPANY OF SALT LAKE CITY, UTAH, HOLDS COMPLETE TITLE, HAVING BOUGHT OUT IN FULL ALL THE EQUITY OF L. M. CAPPS, H. S. CLINE, H & H MINES COMPANY AND KENNETH O. WATKINS. THE ISSUER HOLDS A 15% NET ROYALTY TEN YEAR LEASE DIRECT FROM THE TAR BABY MINING COMPANY HELD IN FORCE AS LONG AS THE ISSUER WORKS THE MINE.

THE OREGON-COLORADO MINE HAS BEEN PATENTED SINCE 1927 AND THE ISSUER HOLDS A WARRANTY DEED FROM BERYL TOM OF ALSEA, OREGON FOR THREE AND A FRACTION CLAIMS, BEING ALL OF PATENT SURVEY NO. 453 EXCEPT THE SAMPSON AND A SMALL FRACTION OF THE DORA CLAIM, AND COVERING ALL THE DEVELOPED PART OF THE MINE.

12. THE ISSUER HAS HAD NO FUNDS FROM THE SALE OF SECURITIES, THE LEVY OF ASSESSMENTS, OR FROM OTHER SOURCES IN THE PAST TWO YEARS WITH EXCEPTION OF \$3.20 FROM THE SALE OF QUALIFYING SHARES OF STOCK TO THE DIRECTORS OTHER THAN KENNETH O. WATKINS.

13. NO EXPENDITURES HAVE BEEN MADE BY THE ISSUER IN THE PAST TWO YEARS, BUT \$4,000.00 HAS BEEN ADVANCED BY KENNETH O. WATKINS DURING MARCH AND APRIL, 1947 TO MAKE PROPERTY AND MACHINERY PAYMENTS AND TO PAY ORGANIZATION EXPENSES.

14. THE ONLY TRANSFER OF STOCK, SECURITIES OR ANYTHING ELSE OF VALUE, MADE TO ANY OFFICER, DIRECTOR OR PROMOTER, HAS BEEN THE ISSUANCE TO KENNETH O. WATKINS OF 1,000,000 SHARES FOR ASSIGNMENT OF HIS HELENA CONTRACT, HIS OPTION TO PURCHASE H & H MACHINERY AND HIS EFFORTS IN GETTING ALL THE OTHER LEASES AND OPTIONS FOR THE BENEFIT OF THE ISSUER; AND THE INSURANCE OF 200,000 SHARES OF STOCK TO BERYL TOM FOR WARRANTY DEED TO THE OREGON-COLORADO MINE. ONE \$10.00 BOND AND 80 SHARES OF COMMON STOCK HAVE BEEN SUBSCRIBED FOR AND THE STOCK ISSUED TO THE OTHER FOUR DIRECTORS.

15. THIS OFFERING OF ASSESSABLE SHARES OF COMMON STOCK OFFERED UNDER REGULATION A-M, TOGETHER WITH THE OFFERING OF BONDS UNDER REGULATION A, WILL YIELD \$97,200.00 BEFORE PAYMENT OF BROKERAGE. IF FULL BROKERAGE OF 25% IS PAID ON THIS AMOUNT, THE NET RETURN TO THE ISSUER'S TREASURY WILL BE \$72,900.00. ACTUALLY THE NET RETURN TO THE ISSUER'S TREASURY WILL BE A SOMEWHAT LARGER SUM AS KENNETH O. WATKINS WILL ACTIVELY ENGAGE IN SALE OF SECURITIES UNTIL ENOUGH FUNDS ARE IN THE TREASURY TO START PRODUCTION. NO COMMISSION WILL BE PAID ON STOCK SOLD BY WATKINS SO NET INCOME TO ISSUER'S TREASURY WILL BE LARGER THAN THE AMOUNT CALCULATED. ALTHO 25% IS SET AS THE MAXIMUM COMMISSION TO BE PAID BROKERS FOR SALE OF STOCK, IT IS THE ISSUER'S INTENT TO PAY 15% COMMISSION UNLESS IT IS FOUND NECESSARY TO PAY HIGHER COMMISSION TO COMPLETE THE SALE OF THIS ISSUE.

ADDITIONAL MATERIAL INFORMATION AND SUMMARY OF PROFIT
POSSIBILITIES OF HELENA MINES, INC.

ALTHOUGH ALL MINE INVESTMENTS MUST BE CLASSED AS SPECULATIVE, THE GAMBLE HAS BEEN LARGELY REMOVED FROM THE OPERATIONS OF THE HELENA MINES, INC. AS ORE HAS BEEN BLOCKED OUT AND IS READY TO MINE. OVER 2,000 SAMPLES HAVE BEEN TAKEN TO PROVE THE VALUE OF THE ORE, AND EXTENSIVE MILL TESTS HAVE BEEN MADE WHICH PROVE A HIGH RECOVERY OF THE VALUES.

THE VALUE OF THE ORE PROVEN AND INDICATED IS HIGH ENOUGH TO SHOW A SUBSTANTIAL PROFIT AFTER COSTS OF MINING AND MILLING ARE DEDUCTED. ANY OPERATION STARTING AT THE PRESENT TIME WOULD HAVE CONSIDERABLE DIFFICULTY IN ACQUIRING THE NECESSARY MACHINERY TO BUILD A MODERN MILL, IT BEING PARTICULARLY DIFFICULT TO ACQUIRE ELECTRIC MOTORS, STARTING SWITCHES, ETC. IN THE CASE OF HELENA MINES, INC. WHERE THE MILL IS BEING PURCHASED, COMPLETELY BUILT AND INSTALLED, FROM THE H & H MINES CO., THIS DIFFICULTY IS ELIMINATED AND WE HAVE THE ADDED ADVANTAGE OF BEING ABLE TO BEGIN PRODUCTION WHICH WILL ALLOW US TO GET THE PRESENT HIGH METAL PRICES FOR LEAD, ZINC AND COPPER. IT IS THE OPINION OF MOST MINING EXPERTS THAT THE METAL PRICES WILL CONTINUE HIGH FOR SOME YEARS, DUE TO THE FACT THAT WE HAVE A MARKED SHORTAGE OF LEAD AND COPPER AT THE PRESENT TIME IN THIS COUNTRY WITH NO INDICATION THAT THIS SHORTAGE CAN BE ALLEVIATED SOON.

THERE IS MUCH DISCUSSION REGARDING THE RISE IN THE GOVERNMENT PRICE OF GOLD. WE HAVE NO MORE KNOWLEDGE THAN OTHERS REGARDING THIS MATTER AND DO NOT PROPOSE TO CAPITALIZE ON THE PERSISTENT RUMOR AND OPINION THAT THE PRICE OF GOLD WILL BE INCREASED SOONER OR LATER. IF THE PRICE OF GOLD IS RAISED, WE WILL NATURALLY BENEFIT THEREBY AS 20% TO 50% OF THE PAID FOR VALUE OF BOMEMIA ORES IS ACCOUNTED FOR BY THE GOLD CONTENT.

DURING THE YEARS 1936 AND 1937 THE MINERALS EXPLORATION COMPANY SHIPPED 804.459 TONS OF CONCENTRATES TO THE UNITED STATES SMELTING, REFINING & MINING COMPANY, MIDVALE, UTAH. NET PAYMENT FOR THESE CONCENTRATES, AFTER DEDUCTION OF FREIGHT AND TREATMENT CHARGES, WAS \$45,738.54. THE METAL CONTENT OF THESE SAME CONCENTRATES AT PRESENT PRICES WOULD BE AS FOLLOWS:

1,449.4 OZ.	GOLD	\$ 46,109.91
6,665 "	SILVER	5,999.50
51,620 LBS.	COPPER	8,826.20
286,842 "	LEAD	28,787.77
308,752 "	ZINC	<u>25,319.14</u>
		115,042.52

IF TREATED BY SELECTIVE FLOTATION WITH THE SAME RECOVERY OF EACH METAL AND SENT TO TACOMA, U.S., AND SULLIVAN SMELTERS, THE FREIGHT AND TREATMENT CHARGES WOULD BE (ASSUMING 20% COPPER CONCENTRATE, 50% ZINC CONCENTRATE AND 60% LEAD CONCENTRATE) \$18,086.63. THIS WOULD LEAVE A NET OF \$36,955.89 OR \$51,217.35 MORE THAN WAS RECEIVED FROM THE SHIPMENTS IN 1936 AND 1937. THESE FIGURES ARE GIVEN TO SHOW SOME RELATIVE IDEA OF THE ADDITIONAL PROFITS THAT WILL BE REALIZED SINCE THE PRICE OF BASE METALS HAS INCREASED.

IT WILL BE NOTED THAT THE COPPER, LEAD AND ZINC CONTENT PER TON OF ORIGINAL ORE WAS NOT SO VERY HIGH. A GOOD PROPORTION OF THE ORE MILLED IN 1936 AND 1937 CAME FROM THE OXIDIZED ZONE OF THE MINE WHERE THE BASE METAL CONTENT WAS NOT VERY HIGH. THE LEAD, ZINC AND COPPER CONTENT OF THE ORE NOW DEVELOPED IN THE MINE IS MUCH GREATER THAN THAT PRESENT IN THE OXIDIZED ORE.

THIS OPERATION WILL BE IN THE HANDS OF COMPETENT AND EXPERIENCED MEN, THE DIRECTORS OF WHICH ARE:

DR. WM. E. CALDWELL, PROFESSOR OF MINING AT OREGON STATE COLLEGE, FORMERLY INSTRUCTOR OF MINE SURVEYING, MONTANA SCHOOL OF MINES, ASSOCIATE PROFESSOR OF CHEMISTRY AT OREGON STATE COLLEGE AND DURING THE WAR LT. COL. IN THE CHEMICAL WARFARE SERVICE.

KENNETH O. WATKINS, GENERAL MANAGER OF THE COMPANY, WHO HAS HAD MANY YEARS EXPERIENCE IN THE MINING BUSINESS AND HAS BEEN SUPERINTENDENT OF A NUMBER OF MINES PRODUCING GOLD, SILVER, LEAD, COPPER, TUNGSTEN, ANTIMONY AND MERCURY IN OREGON, CALIFORNIA, ARIZONA AND UTAH. HE HAS DESIGNED AND CONSTRUCTED A NUMBER OF PLANTS INCLUDING TWO FLOTATION MILLS.

MR. S. A. CUDEBACK, LOGGING CONTRACTOR.

MR. T. G. DONACA, REAL ESTATE DEVELOPER, WHO IS INTERESTED IN A NUMBER OF MINING ENTERPRISES.

ATTORNEY FOR THE ISSUER IS MR. EDWARD A. BUTLER OF THE FIRM OF HARRIS, BRYSON, RIDDLERBARGER & BUTLER, 201-210 MINER BUILDING, EUGENE, OREGON.

ACCOUNTANTS FOR THE ISSUER ARE PIQUET, LEE & CO., CERTIFIED PUBLIC ACCOUNTANTS, 212 MINER BUILDING, EUGENE, OREGON.

TRUSTEE FOR THE BONDHOLDERS IS MR. LLOYD DENSLOW WHO WAS ASSOCIATED WITH THE FIRST NATIONAL BANK OF EUGENE FOR 18 YEARS WHERE HE HAD CHARGE OF EXCHANGE AND COLLECTIONS. HE HAD CHARGE OF THE TRUST DEPARTMENT OF OREGON SETTLEMENT ASSOCIATION FOR THREE YEARS.

FOR COMPUTING ANTICIPATED PROFITS ON A REASONABLE BASIS, WE SHOW VALUE OF AND CALCULATED RETURNS ON THE ORE FROM THE ORE BODIES WHICH WILL BE MINED FIRST AND MILLED AS SOON AS POWER PLANT IS INSTALLED IN THE MILL.

THE AVERAGE VALUE OF THE HELENA ORE HAS BEEN CALCULATED FROM THE FOUR LOTS OF UNSORTED ORE SHIPPED LAST SUMMER TO TACOMA SMELTER. THIS ORE CAME FROM THE LOWER LEVEL DEVELOPMENT DRIFT AND SHOULD BE REPRESENTATIVE OF THE ORE PROVEN, ESPECIALLY AS ORE MINED IN 1934 AND 1935 ON THE NEXT LEVEL (200 FEET ABOVE) AND SHIPPED TO THE U.S. SMELTING, REFINING & MINING COMPANY SHOWS AN EVEN HIGHER VALUE.

THE MUSICK ORE WAS DEVELOPED BY KENNETH O. WATKINS FOR THE H & H MINING COMPANY IN 1939 AND EACH ROUND WAS SAMPLED AT THAT TIME. THE VALUE USED BELOW WAS THE AVERAGE SAMPLE OF THIS ORE TAKEN FOR GENERAL ENGINEERING MILL TESTS AND IS A LITTLE LOWER THAN THE DAY BY DAY DRIFT SAMPLES.

THE CHAMPION ORE HAS BEEN THOROUGHLY SAMPLED SEVERAL TIMES. THE H & H MINING COMPANY'S SAMPLING WAS MOST COMPLETE AND THEIR RESULTS ARE USED FOR THIS COMPUTATION.

IT IS PLANNED TO START OPERATIONS BY TAKING ORE FROM FOUR STOPES AT ABOUT THE FOLLOWING RATE PER DAY:

25 TONS FROM THE NO. 7 LEVEL OF THE HELENA MINE, 30 TONS FROM THE WINZE LEVEL OF MUSICK MINE, 15 TONS FROM THE EAST 1050 LEVEL OF THE CHAMPION MINE AND 30 TONS FROM THE WEST 1050 LEVEL OF THE CHAMPION MINE. THESE FOUR ORE BODIES HAVE ENOUGH TONNAGE TO FULLY SUPPLY THE MILL FOR ABOUT ONE AND ONE-QUARTER YEARS. DURING THIS TIME SOME MORE OF THE MANY ORE BODIES IN THESE AND OTHER MINES WILL BE PREPARED FOR STOPING.

THE FIRST MILL FEED WILL COME FROM THE FOUR ORE BODIES MENTIONED. TAKING A BALANCED AVERAGE OF THE VALUE IN PROPORTION TO THE TONNAGE MINED FROM EACH ORE BODY WILL GIVE AN ORE VALUE AS FOLLOWS:

GOLD	.424 OZ.
SILVER	2.945 OZ.
COPPER	1.628%
LEAD	5.745%
ZINC	4.665%

IT IS IMPOSSIBLE TO PREVENT SOME DILUTION BY WALL ROCK WHEN THE ORE IS MINED, BUT MOST OF THE WALLS IN THE BOHEMIA DISTRICT STAND VERY WELL. IF A DILUTION OF 10% IS ALLOWED, THE GROSS VALUE OF THIS AVERAGE MILL FEED WILL BE \$47.08 PER TON.

HOWEVER, SMELTERS DO NOT PAY THE FULL QUOTED VALUE OF BASE METALS OR THE FULL GOVERNMENT PRICE OF GOLD. TAILING LOSSES MUST ALSO BE CONSIDERED. THE COMPUTATION BELOW GIVES AS NEAR AS CAN BE CALCULATED, THE ACTUAL SMELTER PAYMENTS FOR THE RECOVERED VALUE FROM THIS ORE.

GOLD	.38 OZ. X 85% REC. X \$31.82 PER OZ.	\$ 10.28
SILVER	2.47 OZ. X 85% REC. X .90 PER OZ.	1.90
COPPER	29.2 LBS. X 85% REC. (LESS 5%) X 19¢ PER LB.	4.54
LEAD	103.4 LBS. X 85% REC. X 90% @ 13½¢ PER LB.	10.68
ZINC	84 LBS. X 85% REC. X 80% @ 10½¢ PER LB.	5.85
		<u>33.25</u>

CAREFUL CALCULATION OF TRUCKING, RAILROAD, FREIGHT AND TREATMENT CHARGES ON THE CONCENTRATES PRODUCED SHOWS \$5.63 FOR EACH TON OF ORIGINAL ORE BASED ON EXISTING RATES.

THIS LEAVES AN ESTIMATED NET RETURN PER TON OF ORE, OF \$27.62.

HELENA AND MUSICK ORE MUST BE TRUCKED TO THE MILL. AVERAGE TRUCKING COSTS FOR THE WHOLE TONNAGE CONSIDERED ABOVE WILL BE UNDER \$1.00 PER TON. ALSO, THERE MUST BE DEDUCTED, UNTIL THE PROPERTIES ARE PAID FOR, A ROYALTY OF \$2.76 PER TON. MINING AND MILLING COSTS HAVE BEEN CALCULATED IN GREAT DETAIL AND THIS COST WILL BE ABOUT \$10.00 PER TON.

TO SUMMARIZE:

GROSS VALUE AVERAGE ORE		\$ 47.08
PAYMENT FOR RECOVERED METALS		33.25
MINING & MILLING COSTS	\$10.00	
TRUCKING OF ORE TO MILL	1.00	
FREIGHT & TREATMENT CHARGES ON CONCENTRATES PRODUCED	5.63	
ROYALTY	<u>2.76</u>	<u>19.39</u>
ACTUAL PROFIT PER TON		13.86

ASSUMING MINING AND MILLING OF 100 TONS PER DAY FOR 300 DAYS PER YEAR, WE HAVE A CALCULATED PROFIT BEFORE TAXES, OF BETTER THAN \$400,000.00 ANNUALLY.

THE OREGON-COLORADO MINE HAS A LARGE MEASURED AND SAMPLED TONNAGE OF ORE IN WHICH THE CHIEF VALUE IS COPPER AND SILVER. THIS ORE IS NOT AS RICH AS THAT CONSIDERED ABOVE IN SOME OF THE OTHER MINES, BUT BASED ON ASSAYS FOUND IN OLD COMPANY RECORDS, ASSAYS TAKEN FROM MR. W. W. ELMER'S REPORT ON THE PROPERTY WRITTEN IN 1927, FROM VALUE OF ORE SENT TO MINERALS SEPARATION COMPANY FOR MILL TESTS, AND FROM SAMPLES TAKEN FROM THE ORE DUMP BY KENNETH O. WATKINS, IT APPEARS THAT THE AVERAGE ORE OF THIS MINE WILL ASSAY 4 OZ. OF SILVER AND 3-1/2% COPPER WITH A LITTLE GOLD AND ZINC CONTENT.

WITH THE LARGE TONNAGE AND THE GOOD WALLS IN THIS MINE, AND CONSIDERING THE FACT THE MILL TESTS SHOW AN EXTREMELY HIGH RECOVERY OF THIS ORE, A CONSIDERABLE PROFIT CAN BE MADE FROM MINING AND MILLING OREGON-COLORADO ORE AS LONG AS THE PRESENT HIGH PRICE OF COPPER HOLDS.

IT IS IMPOSSIBLE TO BE COMPLETELY ACCURATE IN CALCULATING A PROFIT FROM A MINING INVESTMENT BUT IN THE CASE OF THIS OPERATION, THE PROVEN TONNAGE OF ORE IS SO LARGE, THE VALUE PER TON SO HIGH AND THE CAPITALIZATION SO LOW, THAT EACH STOCKHOLDER CAN REASONABLY EXPECT A SUBSTANTIAL DIVIDEND. METAL PRICES ARE HIGH AND SHOULD CONTINUE SO FOR SOME TIME AND IT IS PROBABLE THAT OPERATING COSTS (PARTICULARLY LABOR COSTS) HAVE REACHED THEIR MAXIMUM.

IT IS SELDOM THAT SUCH A LARGE PERCENTAGE OF PROFIT CAN BE CALCULATED FROM A MINING VENTURE, ESPECIALLY WHEN THIS PROFIT IS CALCULATED ON KNOWN ORE. IT IS ALSO UNUSUAL TO HAVE AN OPERATION OF THIS SIZE IN A POSITION TO START PRODUCTION SO QUICKLY AFTER THE INVESTOR PUTS IN HIS CAPITAL.

17. THE ISSUER AGREES TO MAIL TO THE LAST KNOWN ADDRESS OR DELIVER TO EACH HOLDER OF THE CLASS OF SECURITY BEING OFFERED, WITH EACH ASSESSMENT NOTICE FOLLOWING THE COMMENCEMENT OF THE OFFERING, A STATEMENT CONTAINING THE INFORMATION REQUIRED UNDER (PARAGRAPH G) OF RULE 240, AS FOLLOWS:

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COPY TAKEN FROM ASSAYER'S BOOK SHOWING RECORD OF ASSAYS MADE

FROM FEBRUARY 5, 1916, to AUGUST 24, 1916.

FROM CHAMPION AND MUSICK MINES.

Gold at \$20.00 Oz; Copper 69 Volumetric;
Lead wet Volumetric; Zinc Volumetric;

(Gold values carried out only.)

Date	No. of sample.		
Feb. 5-	No. 54	Moon Stope, 12 inches	\$16.80
" "	" 55	Old diggings Yug. 5 ins.	12.00
" "	" 56	Cross streak ^{2nd} diggings	13.60
" "	" 57	Taplin Grab <i>as broken</i>	146.40
" "	" 58	E. 2 Stope 24 in. wide	10.40
" "	" 59	Foot Wall near man-way at Taplin	4.00
" "	" 60	Foot Wall below Taplin	22.40
" "	" 61	Above Taplin under No. 8	150.40
" 6-	" 62	Taplin Grab 20 ins.	118.40
" "	" 63	" E. Breast 7 Ft. under level 57 Ft. of manway 18 ins	45.60
" "	" 64	Grab No. 6	1.60
" "	" 65	In Back of 8½ Stope 30 ins.	15.20
" "	" 66	" " " " " 14 "	8.00
" "	" 67	East 9 Stope <i>Hanging Wall</i>	1.60
" "	" 68	Bst No. 6 6 ins.	1.20
" "	" 69	Moon Stope Grab <i>as broken</i>	11.20
" "	" 70	8½ Grab in drift	4.40
" "	" 71	Taplin Lowerdrift 3 ins.	95.60
" 9-	" 72	Breast No. 6 7 ins.	3.60
" "	" 73	Moon Stope H-Wall 16 ins.	10.40
" "	" 74	8½ Ft. wall streak 4 ins.	6.40
" "	" 75	E. 9 Stope Ft. Wall Streak 2½	44.00
" "	" 76	E. 9 " Hang Wall 4 ins.	.80
" "	" 77	Tap 4 ins wide	113.60
" "	" 78	Drillings E 9 Stope, 2 ft. into Ft. Wall	9.60
" "	" 79	Taplin Stope 5 ins. wide	115.20
" "	" 80	Breast No. 6, 7 ins. wide	1.60
" "	" 81	Grab Moon stope <i>as broken</i>	8.40
" 10-	" 82	Taplin 10 ins wide	159.60
" "	" 83	8½ Grab <i>as broken</i>	16.40
" "	" 84	Moon Stope Hang Wall 16 ins.	18.80
" "	" 85	Breast No. 6, 7 ins.	2.00
" "	" 86	E. 9 Stope Grab	23.60
" "	" 87	Taplin 5 ins. wide	16.00
" "	" 88	Moon Stope, 9 ins. wide	10.00
" "	" 89	8½ Streak in W Bst 18 ins.	2.80
" "	" 90	E. 9 Hang W. of St. 10 "	4.80
" "	" 91	E. 9 Grab St. <i>as broken</i>	4.00
" "	" 92	St. Ft. under Tap.	34.00
" "	" 93	Old Stope W of Musick, 10" wide (8.6 oz sil.)	170.80

Stope West of
and under Taplin Stope

Feb. 12-	94	Taplin 6 ins.	\$68.00
"	"	95 Moon Stope <i>as broken</i>	11.60
"	"	96 $8\frac{1}{2}$ Grab <i>as broken</i>	5.20
"	"	97 No. 6 Breast 8 ins. wide	3.20
"	"	98 Dup No. 94	72.00
"	"	99 " " 96	4.00
"	"	100 " " 95	8.80
"	"	101 Streak Hang Tap $3\frac{1}{2}$ " / in Stope	4.40
"	"	102 $8\frac{1}{2}$ - 16 ins. <i>E. end</i>	9.60
"	"	103 Foot W St. $8\frac{1}{2}$ <i>28 ins.</i>	5.60
"	"	104 Moon St. 18"	49.20
"	"	105 Chute No. 3 W	
"	"	106 " " 1 "	
"	"	107 " " 2 "	
"	"	108 E. 9 Stope 2' wide	29.60
"	"	109 No. 6 Bst 6 ins. wide	2.40
"	13	110 Taplin Lower St. 10 ins.	22.40
"	"	111 Old Stope W. of No. 4, 8" <i>wide</i> copper 7.86%	120.00
"	"	112 Old Stope W of No. 4, 10"	8.00
"	"	113 " " 30' W of 113	9.60
"	"	114 <i>Ab</i> -Slab on Hang W. $8\frac{1}{2}$ ins	5.60
"	14	115 E. 9 Stope Grab broken ore	5.60
"	"	116 $8\frac{1}{2}$ Grab broken ore	8.00
"	"	117 Moon St. H-Wall <i>20 ins.</i>	12.40
"	"	118 No. 6 Breast 8"	4.40
"	"	119 Old Work W. of No. 4, 14"	9.20
"	"	120 " " " "	4.00
"	"	121 Bst No. 6 <i>16 ins.</i>	6.80
"	"	122 " " " <i>12 "</i>	8.80
"	"	123 Grab Musick Shoot	10.60
"	17	124 Hang Wall near Man-w No.4	2.40
"	"	125 $8\frac{1}{2}$ 10 ins. wide	11.20
"	"	126 Moon St. Grab	6.40
"	"	127 " " Back 30"	2.80
"	"	128 Taplin 7 ins.	178.40
"	"	129 E. 9 Stope Hang 3"	8.80
"	"	130 Breast No. 6 5"	1.20
"	"	131 Back of old stope W. of No. 4 ch.	.80
"	"	132 Taplin 7 ins wide	25.60
"	18	133 Breast Moon West <i>30 ins.</i>	16.80
"	"	134 Back " " 36 ins.	.80
"	"	135 Hang W No. 6 Bst 5 "	Trace
"	"	136 Foot W. No. 6 " 10 ins.	.80
"	"	137 $8\frac{1}{2}$ Grab 14 ins.	4.00
"	20	138 Moon Stope 20 ins.	1.60
"	"	139 Breast No. 6 7 ins	1.60
"	"	140 Taplin 10 ins. Grab	2.40
"	"	141 No. 5 Chute E 9 <i>car sample</i>	4.80
"	"	142 Grab in same chute	.80
"	"	143 Grab E. 9 Stope E. end	1.60
"	"	144 E. 9 Foot Wall 6 ins Streak	.80
"	21	145 Taplin St. E. end 7 ins	2.00
"	"	146 " Hang wall 12 ins	12.00
"	"	147 " Grab	9.60
"	"	148 $8\frac{1}{2}$ W End 2 ins	410.40
"	"	149 Breast No. 6 Grab	.80

Feb.21-	150	Moon St. Grab	\$ 4.80
" "	151	No. 4 Chute E.	7.60
" "	152	" 2 " W	4.00
" "	153	" 3 " "	75.20
" "	154	No. 1 Chute West	1.60
" "	155	Taplin Grab 14 ins	96.00
" "	156	E 9 Stope Grab	1.60
" "	157	Taplin St. W Wall Waste	59.20
" 23	158	Breast No. 6 12 ins	Trace
" "	159	W. " Ft. Wall Vein at Crossing No. 8 level 3 cuts 3 ft. from or below back, 6 ft. below back and 9 ft. below back at crossing	} 8.80
" "	160	Junction 5' under 159 8 ins. wide	
" "	161	4' East and 2- ft lower than bl60 7 ins wide	193.60
" "	162	Moon Stope Grab in back at sample No. 47	48.00
" "	163	Moon St. W. end 20 ins wide	5.20
" "	164	Taplin lower stope at top of level, 10 ins	4.00
" "	165	Taplin Grab	20.00
" "	166	E 9 on Ft. E end 5 ins	17.20
" "	167	Slab on Ft. at top of No. 4 Man-way on 8 2 ins.	13.20
" "	168	E. 9 Ft.-Wall end of Lag. over W. end No. 5 ch.	136.80
" "	169	Grab E. 9 Stope, broken ore.	4.80
" "	170	E 9 Grab E. end	57.60
" 25	171	E 9 Grab W end	5.60
" "	172	E 9 " E end in place 2'	7.20
" "	173	8½ W over and stope 7"	4.00
" "	174	8 over No. 4 Manway	4.00
" "	175	No. 6 Breast 6 ins wide	14.40
" "	176	Grab E 9 Stope E end 30 ins	1.60
" "	177	E 9 Hang-wall 30" test-hole	3.60
" 26	178	No. 6 Breast Grab	1.60
" 27	179	E. 9 Grab 30 "	2.80
" "	180	Moon Stope Grab 30"	9.60
" "	181	8½ W Grab in stope 5 ins ore	4.00
" "	182	Back of 8½ W over und hand stope 9 ins	65.60
" "	183	Same, 10 in wide	28.00
" "	184	Hang-Wall 8½ 10 ins	6.40
" "	185	Taplin Lower Stope Hang 10"	32.00
" "	186	" " " foot 5"	80.00
" "	187	E. 9 Stope Grab 30"	23.20
" 28	188	No. 1 W. Chute	21.60
" "	189	No. 3 W "	5.20
" "	190	E. 9 Grab 30 ins	35.25
" "	191	E. 9 Stope 30 ins	2.40
" 29	192	Moon Stope Grab	2.00
" "	193	Bst No. 6 10 ins	3.20
March 1	194	No. 9 E Bst 12 ins	8.80
" "	195	Stope above taplin 2 cuts 12" and 14"	1.60

March	1	196	Under chute on $8\frac{1}{2}$ W end 5 ins.	\$14.40
"	"	197	Foot-Wall Taplin 9 ins	946.40
"	2	198	Moon Stope Grab $3\frac{1}{2}$ Ft	12.00
"	"	199	Taplin Stope Ft. wall 9"	1064.60
"	"	200	No. 6 Bst 9 ins wide	6.00
"	3	201	" " 14 " "	4.00
"	"	202	Moon Stope 36 ins.	7.20
"	"	203	No. 8 at Crossing No. 4 East of Manway 5'-3" wide	318.40
"	"	204	Taplin flat streak 14 ins) this cuts off values)	18.40
"	4	205	Taplin Grab 10 ins wide	132.80
"	"	206	No. 6 Bst 8 ins wide	2.00
"	5	207	Moon Stope Grab 20"	8.80
"	"	208	Back of $8\frac{1}{2}$ W. 8 ins	4.00
"	6	209	Moon Grab E end	3.20
"	"	210	No. 6 Breast 10"	1.60
"	"	211	Moon Stope W. end Grab 14"	6.40
"	"	212	Taplin Grab 14"	561.60
"	"	213	Chute No. 3 W	60.00
"	"	214	" " 1 W	6.40
"	"	215	Grab $8\frac{1}{2}$ W bet. under ^h and manw No. 4	23.20
"	"	216	Taplin Hang 3"	45.60
"	7	217	E 9 Stope Breast $3\frac{1}{2}$ Ft	5.60
"	"	218	Taplin Foot 5"	5.20
"	"	219	Moon Grab 14" W. end	7.20
"	8	220	No. 6 Bst 3"	3.20
"	"	221	E. 9 St. Bst 3 ft.	7.20
"	"	222	Moon Grab <i>as broken</i>	10.00
"	"	223	No. 4 Fines in waste	12.00
"	"	224	E. 9 Stope Grab 3'	18.80
"	"	225	Tap Grab ft. 12"	76.00
"	"	226	" " Hang 3"	326.40
"	9	227	Moon " 30"	6.80
"	"	228	No. 6 Bst 7"	9.60
"	10	229	Tap Grab Ft. ^{hard} and black 6"	40.00
"	"	230	Moon " 30"	8.00
"	11	231	Taplin Grab 10"	240.00
"	"	232	Moon Stope 26'	2.40
"	"	233	No. 6 Breast 7"	12.00
"	"	234	E. 9 Grab St. 20"	1.60
"	12	235	Taplin Gr. 16"	38.40
"	"	236	Moon Gr. E. $3\frac{1}{2}$	2.40
"	"	237	" " " 20"	25.60
"	"	238	Bst No. 6 7"	10.40
"	"	239	No. 3 W. (Chute)	92.80
"	"	240	No. 1 W	6.40
"	"	241	E 9 St. Grab 3'	1.20
"	13	242	No. 6 Bst 26"	7.20
"	"	243	Moon Grab	4.00
"	"	244	Taplin bottom drift fines	29.60
"	"	245	E. 9 Grab all of stope	1.20
"	"	246	E. 9 Grab E end 8'	1.60
"	"	247	Taplin Gr.	80.00
"	15	248	Johnson Spec.	1.60
"	"	250	Tap. ft. to hang 9"	40.00
"	"	251	$8\frac{1}{2}$ W near Manw small feeder	12.80

March	15-	252	Moon W. end 16"	\$16.00
"	"	253	Moon E. end 3'	4.00
"	"	254	No. 6 Bst 14"	18.80
"	17	255	No. 6 Bst 14" 3 <i>ins. cuts</i>	12.00
"	"	256	" " " Back, 14 <i>ins</i>	10.50
"	"	257	Moon Gr. 30"	9.60
"	"	258	8½ Gr. 18 <i>ins</i>	1.60
"	"	259	Tap Grab	86.40
"	18	260	8½ Gr. Chute	16.00
"	20	261	Tap Gr.	4.80
"	"	262	Moon E, 30"	8.80
"	"	263	Moon St. W. end 12 <i>ins</i>	67.20
"	"	264	No. 6 Face 14"	9.60
"	"	265	" " " 24"	11.20
"	"	266	" " " 14"	5.60
"	"	267	Moon W end 12"	5.20
"	"	268	Moon Gr. 30"	20.00
"	22	269	Taplin Gr. both streaks 15"	10.00
"	"	270	Moon E Gr. 30"	3.60
"	"	271	" Gr. W. 20"	8.00
"	"	272	6 Gr. No 6 Level grab	10.40
"	"	273	6 Br. 14" No 6 Breast, 14 ins	11.20
"	23	274	8½ W. Gr. 20"	21.20
"	"	275	Tap Gr.	5.60
"	"	276	8½ Gr. 2'	31.20
"	"	277	Moon W. end 12"	14.40
"	"	278	Moon E end 36"	8.00
"	"	279	No. 6 Bst 14"	7.20
"	"	280	Taplin Hang 12"	8.80
"	"	281	Taplin Streak <i>Crossing</i>	21.60
"	"	282	Taplin Foot 10"	5.60
"	24	283	Moon Gr. 24"	10.00
"	"	284	Moon Gr. E. 3'	8.40
"	25	285	Tap. Gr. both Streaks	13.60
"	"	286	Chute 3W	76.00
"	"	287	" No. 1 W	4.80
"	"	288	Brooks C C	10.40
"	26	289	Moon Gr. 3'	34.20
"	"	290	Moon Eas 30"	7.20
"	"	291	No. 6 Bst 16"	48.80
"	"	292	Taplin <i>Stope as broken</i>	6.40
"	"	293	No. 6 Bst	7.60
"	"	294	Moon E end 36"	2.00
"	"	295	" W end 20"	4.80
"	"	296	Old workings No. 5	10.40
"	30	297	8½ W. 24"	3.60
"	"	298	6 on Ft. wall 5' E of R	8.80
"	"	299	Moon Gr. 30"	4.00
"	"	300	" "	3.20
"	"	301	No. 6 Bst 16"	13.20
"	"	302	No. 6 at 76' mark 17"	8.40
"	31	303	No. 6 Gr. 76" 30"	8.00
"	"	304	No. 6 Bst Grab 20"	14.40
April	2	305	No. 6 Bst Grab	2.40
"	"	306	Br. C-C (Copper 1.80 per cent)	5.40
"	3	307	No. 6 level Drillings 65' <i>+</i> from raise 18'	2.40
"	"	308	No. 6 Grab at 76 <i>Mark</i>	3.20

No original
record.

April 3-	309	Moon St. W end 14 ins	\$39.20
" "	310	Moon Gr. 26"	4.80
" "	311	W. No. 7, 60' W. of Manway 7"	21.60
" "	312	E. 7 Raise 20"	1.60
" "	313	E 7 Raise 14"	1.60
# "	314	No. 6 Face Grab.	3.20
" "	315	No. 6 Str ick foot 10"	38.40
" "	316	No. 6 A " " 4'	.80
" "	317	Grad No. 6 in D-ft.	1.60
" 4	318	Moon St. 16"	13.60
" "	319	Back No. 6 at 76' from raise No. 1 16 ins wide	15.20
" "	320	Streak W of Split 10 ins 12' in length	4.00
" "	321	8½ W. 14" wide	12.80
" "	322	Bst No. 6 4" on ft. wall	44.00
" 5	323	6 B st 12"	14.40
" "	324	6" Grad No 6 Face	4.00
" "	325	8½ W Grad 16 ins	25.60
" "	326	Moon Cen Grad 16"	30.40
" "	327	Moon Grad W. 20"	27.20
" 7	328	6 B st 18"	5.60
" "	329	6 B st Hang 24"	1.20
" "	330	Ft. Wall 10"	2.40
" 9	331	No. 6 from 50' to 70' from raise 10"	22.80
" "	332	Moon W end 26"	22.40
" "	334	Moon Gr. cen 16"	15.60
" "	335	" " W 26"	6.00
" "	336	" " E 20"	2.40
" "	337	No. 6 50' E of raise 10"	lost
" "	338	No. 6 50' E of raise 10"	2.80
" "	339	No. 6 Grab 50 to 60' from raise	9.20
" 8	340	Timber shed special	Tr.
" "	341	Brooks & cut 10"	37.60
" "	342	No. 6 B st 14"	17.60
" "	343	Moon East end 24"	17.20
" "	344	" Cen 16"	33.60
" "	345	" W 20"	16.00
" "	346	8½ W Gr. 16"	7.20
" 9	347	No. 6 Face of floor 12"	3.20
" 10	348	No. 6 face " "	8.80
" "	349	" " at 76' 14"	4.80
" "	350	" " 50' from R 12"	3.20
" "	351	Moon W end 24"	10.00
" "	352	" Cen 26"	5.20
" "	353	8½ W 10"	16.00
" 11	354	No. 6 Face 4 cuts 7"	14.00
" "	355	No. 6 Gr. Face	2.40
" "	356	65' from raise No. 6 lev on ft	.80
" "	357	Moon Gr. 26" center	6.40
" "	358	1st stope above 7 12 ins	8.80
" "	359	2nd stope " " " "	8.80
" "	360	3rd " " " "	6.80
" "	361	Brooks C-C 12"	31.20
" 12	362	No. 6 Breast 22" 67' from R	10.40

April 12-	363	Moon Grab length of stope	\$ 9.60
" "	364	Brooks C-C 12"	40.80
" 13	365	No. 6 Face 18"	3.20
" 13	366	No. 6 Stope Grab	4.80
" "	367	No. 6 Old chute	
" "	368	Moon W end 20"	34.40
" "	369	Moon E end Grab	23.20
" 14	370	No. 6 70ft from R 22 ins	10.40
" "	371	No. 6 stoep 10" wide Grab	10.40
" "	372	Moon Grab	8.80
" 15	373	Brooks Cross cut waste	2.00
" "	374	" " Grab 14"	36.80
" "	375	No. 6 Face face 3 cuts 14"	8.00
" "	376	" " stope No. 1 W end 12"	5.20
" "	377	Drift under No. 7-3 cuts 10") upper taplin No. 11)	15.20
" "	378	Moon Grab W 30"	17.60
" "	379	" " E 30"	8.80
" "	380	W of No. 11 Moon Grab W end above No. 8	6.00
" "	381	No. 6 Grab in stope	2.80
" "	382	Special No. 6 stope	.80
" 17	383	Moon Grab 30" wide	5.60
" "	384	No. 6 Face 14" wide 130' from R.	8.80
" "	385	No. 6 Face Grab	6.80
" "	386	Moon Grab 3 Ft.	15.60
" "	387	No. 11 25 Ft. above No. 8 over No. 2 W chute	8.80
" "	388	35 Ft. above No. 8 over No. 2 W chute	16.00
" "	389	Slab on ft above No. 8 over No. 2 W chute	17.60
" 18	390	No. 6 face 16" wide 3 cuts	2.40
" "	391	No. 6 Grab at face	4.00
" "	392	No. 6 stope in place 10" 6' west of No. 3 chute	21.60
" 19	393	Brooks Grab	7.60
" "	394	No. 6 Face 14 Grab	4.80
" "	395	E face 12"	4.00
" "	396	No. 6 stope No. 1 over ch #2	2.40
" 21	397	No. 6 face 18" wide 80' E of R	3.20
" "	398	No. 6 face foot-w 5"	5.60
" "	399	Grab at face No. 6	1.60
" "	400	15' from face #6 at 135'	2.40
" 22	401	No. 6 face 16" wide	1.60
" "	402	" " No. 1 stope bet. No. 1 and 2 ch	27.20
" "	403	Brooks C-C Grab	12.80
" "	404	Special No. 6 Chunk Oxyd	36.00
" "	405	No. 6 face 20"	3.20
" "	406	" " " " foot 6" "	2.00
" "	407	No. 8 over No. 2 ch-12-(No. 11)	19.60
" "	408	" " Slab on foot do do	5.60
" 24	409	" 6 face in bet. 32" at 85'	8.00
" "	410	" " " " on foot	3.20

April 24-	411	No. 6 face 3½ cen face	4.00
" "	412	" " " Grab	2.80
" "	413	" " " bet. No. 2 & 3 ch (No. 1 St.)	20.80
" "	414	E 9 Test hole over No. 5 ch- 52", last 26" shows sulf	1.20
" "	415	E 9 test hole over No. 5 ch- 52" first 26" shows naught	.80
" 25	416	Face No. 6 Grab 3½" 146'	4.00
" "	417	Over No. 2 ch No. 6 7"	8.00
" "	418	Brook C-C Grab 18"	7.20
" "	419	No. 11 Slab on foot 10"	3.20
" 26	420	" " W End Gr. 12"	8.80
" "	421	" " Cen of Pillar 8"	40.00
" "	422	" " Slab on foot	2.40
" "	423	No. 6 Face cen face 150 from R.	5.60
" "	424	No. 6 No. 1 St. Hang "blue mud"	2.00
" "	425	No. 6 No. 1 St. Hang " blue mud "	1.60
" "	426	No. 6 No. 1 St. 8"	6.00
" 27	427	No. 6 Cen face 151' - 16"	4.00
" "	428	" " Ft-W face 151' 16"	4.00
" "	429	" " Grab	3.20
" "	430	" " Stope over No. 3 ch 14" 14"	12.80
" "	431	No. 6 Spec over No. 3 ch. @tz	.80
" 28	432	No. 6 Face 24" in place	5.60
" "	433	" " " Grab	4.40
" "	434	" " stope bet. ch 2 & 3 7"	4.00
" "	435	" " No. 2 stope w. end 12"	16.80
" "	436	" " " 11 E. end 8"	44.80
" "	437	" " " " W end 9"	16.40
" "	438	Brooks Brab from 2 cars	9.60
" 29	439	Special E 9, Copper 1.40%	1.20
" "	440	No. 6 face 155' 30" wide	8.40
" "	441	No. 6 face Grab	4.00
" 30	442	" " " Center 20"	1.60
" "	443	" " " foot wall	4.00
May 1	444	" " " 3½' 157'	3.20
" "	445	No. 6 Grab at face	2.00
" "	446	" " Stope bet. #2 & 3 chute	4.40
" "	447	" " 11 Stope W. end in place 8"	15.60
" "	448	No. 11 E end 12 ins.	19.20
" 2	449	" 6 face 3 wide	2.40
" "	450	" " " bottom 3'	2.40
" "	451	" " St. #1-W end 12"	6.40
" "	452	Brooks C-C Grab 10"	108.80
" "	453	Back over No. 11 St. bet. 7 & 8	12.00
" "	454	Near No. 1 Chute E-4' wide on No. 9 level	.80
" "	455	No. 6 "mud" at face 157'	1.60
" 4	456	No. 11 Stope 24" e. end	12.80
" "	457	" " Cen. 10"	32.00
" "	458	Brook C-C Grab	116.80
" "	459	No. 6 Stope bet. 2 & 3 chute 14"	11.20
" "	460	No. 6 Face Grab 22" wide 7	2.00
" "	461	No. 6 St. over 2 and 3	4.00
" "	462	Brooks C.C. 30"	63.20

May	6-	463	No. 6 face 28" 158" <i>ft from R#1</i>	\$ 2.40
"	"	464	" Fl Stope E end 20"	9.20
"	"	465	" " " W " 12"	18.00
"	"	466	" 6 Grab 150' from R.	
			Starting No. 2 stop	2.00
"	"	467	No. 6 St. over # 3 ch 20"	11.60
"	"	468	" 6 St W end 16"	5.60
"	7	469	" 6 St over # 3 ch 16"	6.40
"	"	470	No. 6 St. bet 2 and 3 14"	
			shows copper	10.40
"	"	471	No. 6 in back 130' from R	1.60
"	8	472	No. 6 W end stope No. 1	.80
"	"	473	" " H-Wall 12" bet. 2 and 3	2.80
"	"	474	" " gouge bet ch 2 & 3 10"	1.60
"	9	475	No. 11 Stope grab 20"	6.40
"	"	476	" " W end in place 14"	36.40
"	"	477	No. 6 No. 2 st over No. 4 ch 14"	3.20
"	"	478	Grab in drift west of No. 4 ch No. 6 level	1.60
"	"	479	No. 1 stope No. 6 16"	4.40
"	"	480	Brook C-C Grab 26"	26.40
"	10	481	No. 6 Gr. 30' Long over No. 4 ch 10"-30"	2.80
"	"	482	No. 6 No. 1 St. Gr. 20 ins.	1.60
"	"	483	Stope No. 11 Gr. W 14ins	38.40
"	"	484	Stope No. 11 Gr. E. 12"	7.60
"	"	485	Brooks C-C Grab 30"	53.60
"	11	486	No. 2 St. over No. 4 Ch, No. 6 level	17.60
"	"	487	No. 6 Face Grab	4.00
"	"	488	" " No. 1 St. bet. 2 & 3 16"	2.00
"	"	489	Brooks C-C Grab	16.80
"	12	490	No. 6 Face 20 ins	6.80
"	"	491	" " No. 2 St. over No. 2 ch 14"	25.60
"	"	492	No. 6 No. 2 St. Grab	4.00
"	"	493	" " " 1 St. over No. 2 ch 14"	4.00
"	"	494	No. 6 No. 1 St. Gr. bet. 2 & 3 ch.	1.20
"	13	495	No. 6 No. 2 St. W end gr. 24"	2.40
"	"	496	" " " 1 " Gr. 30"	8.40
"	"	497	" " Spec W end No. 2 St.	1.60
"	"	498	Brooks C-C face clean ore 10"	21.60
"	14	499	No. 2 St. No. 6 Lev. 14" 20' long	3.60
			Freak See # 505 - { No. 6-No. 1 Stope in back 4' E #1 Ch. 30.4 oz silver	2128.60
"	"	501	Brooks C-C Spec Zinc	6.00
"	17	502	" " Grab	31.20
"	"	503	No. 6 #2 St. Grab over #4 Ch	4.00
"	"	504	" " #1 " over #2 ch 12"	24.80
"	"	505	" " #1 " 3' E of No. 505 to check No. 500 10"	1.20
"	"	506	No. 6 #1 St. 6' E of No. 505 to check No. 500 16"	1.20
"	"	507	No. 6 No. 1 St. 9' E of No. 505 to check No. 500 20"	.80
"	"	508	Stope No. 11 12" west end	20.80

May	19-	509	No. 2 Stope No. 6 Lev. W. End.	\$ 6.00
"	"	510	Breast No. 6 10" wide 160'	2.00
"	"	511	No. 6 No. 1 St. Gr.	2.80
"	"	512	" " " 2 St. E. end 10"	1.20
"	"	513	Special 8' Breast of #6	trace
"	20	514	E. 9 - breast	.80
"	"	515	No. 1 St. # 6 Level 12" W.	6.40
"	"	516	" " " " " 24" E	4.00
"	"	517	" 2 " " " Wall test hole	.80
"	"	518	" " " " grab	4.80
"	"	519	Breast No. 6 Lev. 4'	4.00
"	24	520	No. 6 - No 1 St. 24"	1.20
"	"	521	" " Breast 36" hang	2.00
"	25	522	No. 6 " 14" foot	4.00
"	"	523	" " No. 2 St. W end 26"	2.40
"	"	524	Special No. 6 Blue qtz	9.60
"	"	525	No. 11 Stope Grab 16"	4.00
"	27	526	No. 6 over No. 5 ch Gr.	4.00
"	"	527	No. 6 over No. 5 3 1/2'	4.00
"	"	528	" " " " 4 Grab	9.60
"	"	529	" " " " 3 "	4.40
"	"	530	E. 9 Drillings from ft.	TR.
"	"	531	E 9 face 10"	1.60
"	"	532	Dump sample from end waste trench 25' No. 9 level	1.20
"	"	533	Dump sample trench 25' cont #532	2.80
"	28	534	No. 6 Face 14" clean ore	4.40
"	"	535	Face of dyke in road above mill	Tr.
"	"	536	" " " 150' up hill from 535	Tr.
"	30	537	E end high grade at Musick	14.40
"	"	538	E 9 stope special	lost
"	"	539	No. 2 W ch. Grab in chute on # 9	4.00
"	"	540	No. 6 bet. #4 & 5 chute 24 " "	9.60
"	"	541	No. 6 grab in drift 48"	1.20
"	"	542	No. 11 St. along back 10"	10.00
"	31	543	No. 6 Face Grab 4'	.80
"	"	544	" " St. " bet 4 & 5 Ch.	8.00
"	"	545	" " " " over No. 4 "	4.00
June	1	546	" " " " 3 ft. W end #2 st.	1.60
"	"	547	" " " Cen. 3 Ft. wide over #4	lost.
"	"	548	" " " E end 2 Ft.	6.40
"	2	549	" " " W. " grab 3 ft.	2.00
"	"	550	" " " bet No. 4 & 5 ch. 3 ft.	3.20
"	"	551	No. 6 St. Grab E end 3 1/2 ' "	4.00
"	"	552	" 11 St. E end 14"	13.60
"	"	553	No. 11 St. W. end 10 "	10.40
"	"	554	No. 11 Spec slab on ft.	7.20
"	"	555	No. 6 Test hole over 4 & 5 ch.	2.00
"	4	556	No. 6 West end #2 st. 3 1/2 Grab	.80
"	"	557	" " bet. 4 & 5 ch- 3 1/2 "	8.80
"	5	558	Dump sample No. 7 dump 3 1/2 deep	Tr.
"	"	559	" " " " " 3' "	"
"	"	560	E 9 face 14"	"
"	"	561	No. 6 No. 2 St. W end 26"	1.60
"	"	562	No. 6 No. 2 St. bet. W end and No. 4 ch 30"	4.00
"	"	563	No. 6 No. 2 St. E end grab 4 ft.	.80
"	"	564	No. 7 Dump No. 3 hole 3' deep	4.40
"	"	565	Hand sample, near Riddles, Ore.	
			copper 2.70%	427.20

June 5-	566	E 9 face grab 5 ft.	\$ 1.60
" 6	567	No. 11 St. W. end 2 Ft.	41.60
" "	568	" " " Cen 20 ins	11.20
" "	569	" 6 No. 2 St. bet No. 4 & 5 ch - 12"	19.60
" "	570	No. 6 Face 10 ins 178'	4.80
" "	571	" " " grab 178'	1.60
" 9	572	Back of No. 6 - 30' W R No. 1 8 ins.	1.20
" "	573	Bottom No. 7 20' E of Portal 10 ins.	.80
" "	574	No. 7 Dump Hole No. 3½' deep	.80
" "	575	No. 6 Test " in foot wall No. 5 stope	.80
" "	576	No. 6 at E end over last timbers	2.80
" "	577	No. 6 Face next ft-wall 181' E of Raise No. 1 4" wide	8.80
" "	578	Dump at shaft No. 2 Top of Hill	4.00
" "	579	Special same dump	tr.
" "	580	" " "	"
" 12	581	No. 11 E. end in place 2'	11.20
" "	582	" 11 cen in place 14"	20.80
" "	583	No. 6 175' Foot wall	1.60
" "	584	E 9 face 6" on hang wall	.80
" "	585	No. 6 floor at face 178' 7"	4.00
" "	586	No. 6 St. E end 20 ins	2.40
" "	587	No. 11 St. E. end Grab 24"	10.80
" "	588	No. 11 W end Grab 16"	5.20
" "	589	No. 6 Face 180' 8 ins	8.00
" "	590	No. 6 5 ft. W of face in back	2.40
" "	591	No. 6 " " " 590 " "	4.40
" "	592	No. 6 " " " 591 12' above 20" floor	2.40
" "	593	No. 6 5ft W of 592 16' above 7" floor	10.40
" "	594	" 6 10 W of 592 20' above floor 7"	4.40
" "	595	No. 6 25' above floor 16"	26.40
" "	596	No. 6 25' above floor 5 ft. W of 595 4"	22.40
" "	597	No. 6 30 above floor 5 ft W of 596 8"	20.00
" "	598	No. 6 along back 5' W of 597 10"	32.00
" "	599	No. 6 along back 5Ft. W of 598 8"	38.40
" "	600	No. 6 level stope No. 2 in back 10' W of 599 7 ins	3.20
" "	601	No. 6 Face on ft. 16" 181 from R	4.80
" "	602	No. 6 Stope No. 2 stope 5' west of No. 600 14" wide	.40
" "	603	5' w at 602 16" wide	.40
" "	604	5' W of 603 " "	.60
" "	605	" " " 604 " "	2.80
" "	606	West end same stope 16" side 18' from floor	3.20
" "	607	5' below 606 16"	5.60
" "	608	5' " 607 "	2.40
" "	609	9' above floor W end No. 2 St. 16"	1.60
" 16	610	No. 1 St. No. 6 lev. 21' above floor over No. 3 chute 16"	5.60

June 16-	611	Over No. 3, 24', 5' west of 610 above floor 16 ins.	1.20
" "	612	Over No. 3 25', 5' W of 611 above floor 16 ins.	1.20
" 18	613	Over No. 35' W of 612-25' above floor 16 ins.	1.60
" "	614	Over No. 3 27' above floor 3' 16" W of 613	.80
" "	615	Over No. 3 24' above floor 5' 16" W of 614	1.20
" "	616	Over No. 35' west of 615 16" same ht.	.80
" "	617	Over No. 35' West of 616-22' above floor 16 in. W end of st)	1.20
" 19	618	Upper dump Ev. Star	7.20
" "	619	Lower " " "	7.20
" "	620	No. 6 face left side 30" in place 3' above floor	8.40
" "	621	No. 6 No. 2 Stope raise 8 ins wd, 8' long	31.40
" "	622	Right hand drift face excelsior 3' above floor	3.20
" "	623	Left hand drift W side next foot 5' wide	Tr.
" 20	624	E 9 face on ft. grab	1.20
" "	625	No. 11 E end 30"	24.80
" "	626	Bob sample dup. of Bg Dyke	
" 21	627	No. 6 face grab 30"	33.20
" "	628	" " No. 2 st grab	3.20
" "	629	No. 6 No. 2 St. 12"	26.00
" "	630	No. 11 Gr. 9' below ft #7 30" wide	22.40
" 22	631	Diamond C-D dump	.80
" "	632	No. 6 face 10 ins r-hand 182' from R	2.40
" 23	633	No. 6 No. 2 St. Raise 16"	29.60
" "	634	No. 11 Gr. 30"	12.00
" 24	635	E 9 Gr. 24"	.80
" "	636	No. 2 St. Gr. in R	23.20
" "	637	No. 2 St. Gr. No. 5 ch	29.60
" 25	638	No. 5 dump below old crib cut 7' long, 16" deep	2.40
" "	639	Same dump average of 6 shallow pits	.80
" "	640	No. 11 Hang wall 6"	30.00
" 26	641	No. 6 Face Grab 5' wide	3.60
" "	642	No. 6 place 16" wide 32' from floor drift No 2 Stope	16.80
" "	643	No. 6 Hanging 183' from Post face 12" wide	4.00
" 29	644	5' wide face No. 6 at 183' from post at turn to right along dyke	2.40
" "	645	Opposite 644 36 ins wide	3.20
" "	646	No. 2 Raise No. 6 - 16 ins 3 cuts 35ft above floor	25.60
" "	647	No. 11 Grab 30 ins	10.80
" "	648	E. 9 Ft. in place	.80
July 1	649	No. 6 face foot wall clean ore	6.00

July	1-	650	No. 6 face left hand side 12" \$.80
"	"	651	No. 6 face hanging wall 12"	6.00
"	"	652	No. 2 stope 36' from floor drift 14"	24.80
"	"	653	East nine grab 30" wide	.80
"	"	654	East nine 18"	.80
"	"	655	No. 6 14"	6.80
"	"	656	No. 6 Grab at face	1.20
"	"	657	No. 2 stope raise grab	7.20
"	"	658	No. 2 stope in place 7" wide	10.80
"	"	659	No. 6 Face Grab	1.20
"	"	660	No. 2 raise 16" east end	10.40
"	"	661	No. 2 stoep grab in chute	28.80
"	"	662	No. 6 face 4" clean ore	10.80
"	11	663	Musick car grab	1.00
"	12	664	Old workings East beaver slide 8" wide	10.40
"	"	665	10' East old workings beaver slide	23.20
"	"	666	Cross vein in beaver slide 4" wide	382.40
"	"	667	No. 2 Raise 14"	45.60
"	13	668	Cross vein in beaver slide 6" wide	394.00
"	"	669	5' east from junction of beaver slide 8" wide	98.40
"	14	670	No. 2 Raise Grab 16" wide	89.60
"	18	671	Taplin 25' from underhand stope 10" in place	4.00
"	"	672	8 feet east of 671 14" wide	7.60
"	"	673	No. 6 face grab	2.40
"	"	674	No. 2 raise on No. 6 16" in place	45.60
"	"	675	Taplin 10' from hole broken (in place) through from E end of underhand 4"	458.40
"	"	676	7' East of 675 12" (in place)	5.60
"	20	677	Grab Raise No. 2 6 level	24.00
"	"	678	Taplin 12 Ft. E 5 ins underhand	192.80
"	"	679	Taplin 5 - 678 of 8 inches	22.40
"	21	680	No. 2 Raise 6 level grab	38.40
"	"	681	Taplin E end 9 inches	7.80
"	"	682	Taplin Cross streak Beaver slide 6"	297.60
"	23	683	Beaver Stope Grab 9 in	54.40
"	"	684	Taplin 15Ft east of underhand	2.00
"	"	685	Special Taplin H-Wall	12.80
"	"	686	Tip No. 2 Musick cars.	7.60
"	"	687	Trip No. 3 Musick	1.20
"	"	688	Bin Sample Musick should corres with No. 4 Trip	4.40
"	"	689	No. 2 raise on No. 6 16" 50' above level floor	8.00
"	"	690	25' E of E end of raise No. 2 from 60 to 5 in floor of 5- 2' wide	1.20 2.00
"	"	691	Musick cars Trip 4	13.60
"	"	692	Musick cars trip 5	3.20

July 23-	693	Floor of No. 5 5' feet E of No. 2 raise 2' wide	\$16.80
" "	694	15' east of No. 2 raise 2' wide	8.80
" "	695	35' east of No. 2 raise 16"	52.00
" "	696	45' east of No. 2 raise 16"	15.20
" "	697	4' west of winze on No. 5 16" wide	7.20
" "	698	Special in E end #5 stope 20"	220.80
" "	699	No. 2 Raise No. 6 lev 16" E end.	15.20
" "	700	No. 6 12' W of face on ft. 7"	3.60
" "	701	No. 6 - 12' W of face 6 ins	.80
" "	702	"A" tunnel at supposed vein 16" wide	Trace
" "	703	"A" Cut No. 2 24" wide	774.40
" "	704	"A" Cut No. 3, 26" wide	6.40
" "	705	Special from Sta 618 No. 6 level Musick	5.40
" "	706	Musick cars on track	trace
" "	707	No. 2 raise on No. 6 Grab	20.80
" 31	708	No. 3 raise on No. 6 Grab 30 inch	3.20
" "	709	Winze on No. 5 West end 14' from floor 12 in.	50.40
" "	710	East end of winze 15' from floor 16"	28.40
" "	711	No. 3 Raise on No. 6 10" in place E end 5' above level	14.40
Aug. 1	712	No. 2 S. Grab on No. 6 12"	5.60
" "	713	No. 1 E car grab on No. 6	23.20
" "	714	Old stope at Junction of veins on No. 5 20' above floor of 5 in first drift West of Manway	-trace
" "	715	About 30 feet above 714 14"	trace
" "	716	About 40 feet above floor of No. 5 10"	trace
" "	717	Winze from No. 5 East 3' above bottom at top of muck heap 30" wide from foot toward hanging, limited sulphide	46.40
" "	718	West end opposite 717 20" wide	34.40
" "	719	East end 3 $\frac{1}{2}$ ' above 717 next foot wall 18" wide	46.80
" "	720	Opposite No. 719 14" wide next foot	96.80
" "	721	3' above 710 14" wide next foot	8.00
" "	722	3' above 709 18" foot	83.20
" "	723	3' above 722 12" this is 4' below level E end	3.20
" "	724	4' below floor of level on E end 14" next to foot also part of slab on foot wall	17.60
" "	725	30" wide from surface above old stope at cave in 6 level	12.40
" "	726	Chunks from same place	20.40
" 2	727	Above and east of No. 5 shute grab in No. 2 stope on No. 6	3.20

Aug. 2-	728	No. 3 raise streak on hanging in place 12"	\$3.20	
" "	729	Spec 35 cars No. 6 chute On No. 6 level	4.80	
" "	730	W end No. 3 raise No. 6 level 14" above floor W and 4'	2.40	
" "	731	Face drift No. 3 stope No. 6 Level 10" below No. 5	.40	
" "	732	Special Brooks Ft. Wall	.40	
" "	733	Fine Stuff surf 3rd	.40	
" "	734	Grab No. 6 Level No. 2 St. 1 car	48.80	
" "	735	Grab No. 3 Raise 3 ft. wide	1.20	
" "	736	Car No. 3 Raise 17 cars	2.40	
" "	737	No. 5 Chute Sample 7 cars	8.00	
" "	738	Grab at surface	10.40	
" "	739	Lynn Waste	1.20	
" "	740	Test hole in foot-w No. 3 raise	trace	^{0.35} Silver
" "	741	Car No. 3 R 7	2.00	.5
" "	742	Grab No. 3 R 24' from floor 3' wide	2.40	.9
" "	743	Car sample # 3 raise 7 cars	2.00	.9
" "	744	Grab No. 2 Stope drift one car (small)	9.60	2.10
		W - 128 - No. 1 East 20 cars	5.60	.50
" 9	745	Grab over No. 6	6.00	.50
" "	746	Dump near old B.H.	11.20	
" "	747	Grab No. 5 Chute	7.20	
" 10	748	10 cars from N. 3 R No. 6 lev.	11.20	1.80
" "	749	No. 2 stope drift 16"	10.00	3.30
" "	750	Grab No. 5 Chute over No. 5 Chute	13.60	.80
" "	751	No. 5 chute car sample	9.60	.80
" "	752	Chippings from coarse ore at Surf over No. 6	24.80	
" "	753	Grab on surface above No. 6 fines only	7.20	
" "	754	No. 3 Raise No. 6 level 3 cars	11.20	
" "	755	No. 5 Chute Grab	1.60	
" 12	756	No. 3 Raise No. 6, 1 1/2 - 2 cars	8.00	
" "	757	No. 5 chute Grab	.80	
" "	758	No. 2 stoep intermed drift 16"	31.20	
" "	759	No. 3 Raise Grab in chute	14.40	
" "	760	No. 5 Chute car sample	1.60	
" "	761	No. 3 raise 12 cars	14.40	
" 15	762	Grab in Intermed. above No. 6	13.60	
" "	763	Vein in place 6" E of No. 5 in stope	6.80	
" "	764	No. 3 Raise Car sample	4.40	
" 16	765	W end No. 3 R No. 6 Lev 15' above floor grab 30"	2.80	2.00
" "	766	7 cars from same raise	4.40	1.90
" "	767	(?)	4.00	3.20
" "	768	Car Samples 12 cars E. 3 R No. 6 level	15.20	
" "	769	Grab E end No. 3 R 15' above level 30"	11.20	
" "	770	No. 5 chute Grab	12.00	3.00
" 17	771	Grab Inter. Level above No. 6 at No. 5. 12"	16.00	

				075 Silver	
Aug. 17th-	772	15' below 771	\$.80		
" "	773	No. 3 raise car sample 10 cars	4.00	3.20	
" "	774	No. 5 Chute 3 cars	6.80	3.00	
" 18th-	775	Prospect on hill face W- drift 12' 14"	.80		
" "	776	Next to hanging bottem shaft 6" wide	trace		
" "	777	2' above foot side same 2' wide	trace		
" "	778	Top of shaft 5" wide	trace		
" "	779	Special along old road on top ridge	trace		
" "	780	West of shaft	trace		
" 20th-	781	No. 3 raise car sample 9 cars	6.40		
" "	782	Drift in #2 stope on #6 level 22"	16.80		
" "	783	Grab between # 5 chute and # 3 raise	7.20		
" "	784	# 3 Raise car sample 7 cars	12.00		
" 22nd	785	# 3 raise car sample 9 cars	4.00		
			ag 1.00	1.00	
		1284 Musick 12" wide Aug 22, 13' E of Stab 618 face	5.20		
		car sample 119 cars # 1 East (No 6 Level Ore)	ag 1.80 6.40	1.20 1.90	
" "	786	Bet. No. 5 Chute & No. 3 Raise 30" wide	17.60	1.00	
" "	787	No. 2 Stope dft 20"	24.00	3.40	
" "	788	No. 5 ch 4 cars	10.80	.70	
" "	789	Surface 4 cars	8.80	.60	
" "	790	No. 3 raise 8 cars sample	5.20	1.90	
" "	791	No. 3 raise car sample 7 cars	20.00	2.80	ag.
" "	792	Grab between #5 chute and 3 raise 30"	4.80	.50	ag.
" "	793	No. 3 raise car sample 9 cars	12.00	2.60	ag.
" "	794	No. 3 raise car sample 21 cars			
" "	795	Between # 5 Chute and # 3 raise 54" wide.	2.40	.05	

This is to certify that I have compared numbers and contents of all assays noted within this book from No. 54 to 795 inclusive, and that this is an exact copy of original entries made by me in book of assay record for the numbers recorded, and that said assays were made by me between February 5th, 1916, and August 24th, 1916.

(Signed) Ben Mattice
Assayer for H. C. Mahon,
Lessee.

Subscribed and sworn before me a Notary Public for Oregon
this 27th day of August 1916.

(Signed) W. T. Hopkins.
Notary Public for Oregon.

My commission expires March 23rd, 1917.

BOHEMIA MINING DISTRICT OF WESTERN OREGON

By JAMES P. KIMBALL - GEOLOGIST.

(Director of U.S. Mint under President Cleveland)

Railway connection with the Southern Pacific system will serve to bring the Bohemia Mining District of Lane and Douglas Counties, Oregon, into new and increasing importance. Covered by not less than 2,000 mining claims of record, some of which, as may be assumed, are fractional and some re-locations, this district has been wrought since 1891 for free-drilling products from the oxidized zone of several well-known lodes. Mineral discoveries date from the year 1858. The district numbers about 60 head of stamps.

Development of its normal products in the form of heavy sulphides of the base metals has thus far been retarded for want of an outlet for shipping products - practicable only to the west. As all operations are still on the opposite side of the Calappa Mountains at elevated points, two wagon roads from the west, the one a 9 per cent grade to the Musick, and the other a ridge road to the Helena, have hitherto sufficed for free-milling operations. Of such rude facilities the best has been made - not without serious difficulties from excessive precipitation, especially in the winter months. Snow, however, rarely reaches the bottoms.

Transportation of concentrates proving impracticable except in the short dry seasons, their steady production from oxidized or free-milling material has been suspended. Neither surface space nor capital has been found for their accumulation in anticipation of railway facilities. Such facilities will soon be near at hand on the completion of the Oregon and Southeastern Railway now building from Cottage Grove to the Western base of Calapoois Mountain, and thence up one of its deeply sculptured basins. Extractions of a large tonnage of shipping ores practically "in sight" awaits its services. Concentrating operations yet to be located at the base of the mountains will depend largely upon facilities afforded by this railway.

Several important timber belts outside the Cascade Forest Reserve will be reached by the railway and will contribute to its traffic. The timber of the mining district itself is mainly protected from logging by mineral locations, and by adverse topography if not by forest reservation.

The Bohemia Mountains may briefly be described as culminating crags of Calapoois Mountain, the survival of a great volcanic mass as if left by erosion in the form of a narrow and tortuous ridge with numerous radical spurs or ramifications. From the summits at elevations of from 5,000 to 6,500 feet erosion has advanced in all directions toward the base. Deep V-shaped basins have

thus been sculptured on the west slope descending into the Willamette and Umpqua waters. The whole massif, essentially andesitic in character, is traversed from base to base by numerous powerful mineral lodes in nearly vertical attitude, with a NW-SE course. These occupy in part great clear-out fissures parallel to the divisional partings, and in part bordering shearing belts defined by planes of least resistance - all more or less separated - thus constituting divisional planes and walls, slickensided in places, and more or less warped. Unequal separation along with slight displacements on divisional planes give unequal sections, expanding up to 10 feet, as in the Helena and 10 feet as in the Musick. Between divisional planes the filling is more or less brecciated in ratio of section expanse. Mineralization of brecciated parts also appears in ratio of the expanse of breccia. Segregated quartz occupies the less brecciated parts, and is more or less interstitial throughout all brecciations. Both quartz and breccia are unequally mineralized with the metallic sulphides, carrying different ratios of gold and silver but generally as far as proved, uncommonly high. Mineralized expanses or parallelism of lenses and plates constitute ore-bodies of which three have been opened up by drifts and stopes in the Musick within a development of 1,100 feet longitudinally and 300 feet vertically. One of these has a length of at least 350 feet, faces of drifts still being within its limit. Another is about 100 feet in length, and the third about 300 feet. As far as wrought these are in divisions also three in number. Out-cropping extensions of the

lode are highly mineralized for 3,000 feet to the southeast and at least 1,000 feet toward the summit of Bohemia Mountain, beyond which the top of the lode is concealed. Sericitic clay is a common occurrence from decomposition of andesite, marginal to divisional planes and walls.

The Helena lode is distinctly traced for over a mile, and opened at this interval at several elevations. In October, 1901, a remarkable ore-body was opened from the East slope of Grouse Summit near the present mill at a depth of 75 feet. Its limits in any direction have not, so far as I am informed, yet been reached, though opened for a length of over 200 feet in the level by which it was first penetrated. An upraise on the outer edge follows the ore-body to the grass roots. When examined by me in November, 1901, this lens, 73 feet beyond the same edge, presented a face of 8 feet 10 inches including $7\frac{1}{2}$ feet of shipping ore as run-of-mine. The average assay value of gold in this product at that time was \$125 per ton. Divisional planes in the Helena so far as exhibited do not compound the lode by intervention of andesite as in parts of the Musick. A single plane, however, divided the lode into two parts, one a heavy galeniferous product, the other a dry ore, but nearly equally rich in gold.

The metalliferous ores of the region are of several types - according to the relative distribution of the several sulphides of copper and lead. Vannings from such material consist mostly of auriferous pyrite,

varying, doubtless, in ratio of the original sulphides. Oxidized ores widely differ in gold contents from locally and inordinately high tenor down to moderate richness. Low grades rarely fall below a value of \$10 while \$16 may be taken as a fair average. The depth of the superficial zone also varies as determined, first, by local erosion, and second by circulation of underground acidulated waters. Intermediate products are apt to occur next below the oxidized zone. This zone is thin in the Musick lode and generally wanting. In the California it is developed to an unknown, but to no great extent. In the Champion it has a deep development; in the Helena, an unequal development following a sharply undulating line, at which sound or unaltered sulphides make their appearance, sometimes at the surface, as generally in the Musick.

Heavy sulphides, mostly galena, are often of shipping grade, and richly impregnated with gold. The lower grades constitute concentrating material. Pan concentrates reduced to the specific gravity of dense or shipping material are also rich in gold, but even from material at equal depths prove of somewhat less value, probably from loss in siliceous tailings. The shipping product from the lower levels of the Musick averages about \$70 in value of gold; and of the Helena about \$125. Net values of Musick vannings in gold, after elimination of amalgamating values of gold in oxidized material under the stamps, may be taken at about \$45.; of Helena vannings of the same type about \$40.; the latter from ores giving \$26 of gold by pulp assay. No shipment of Musick high grade ore has yet been made. Typical samples, however, assay nearly as

lots.

This brief, general statement of value refers, of course, to present developments.

The oxidized zone of the Helena lode on the East slope of Grouse Summit is still good for a reasonably long supply of milling materials. That of a parallel lode remains untouched. The deepest development of the oxidized zone is observed in the Champion lode.

All slopes in the Musick have only been partially wrought for oxidized or amalgamating products. Unaltered ores have been left standing in reserves.

Space forbids anything like a detailed description of the Bohemia Mines, the development of none of which has so far advanced as to furnish all the factors of several important problems, like relative zones of enrichment with the precious metals, relative distribution of copper sulphides along with galena and sphalerite, or distribution, entire shape and full size of ore-bodies. Zinc has not yet been found in deleterious proportion.

In printed reports on the Helena and Musick mines such practical details have briefly been given as could be ascertained as late as November last.

Some twenty locations have since been collected as a third group under the name of "Calapoois Mining and Tunnel Company" - intermediate between the Musick and Helena groups. Each group is the property of separate corporations of which Mr. F. J. Jennings, of Portland, is President. To his sagacity and energy the recent development of the Bohemia District is chiefly due.

The Calapoois Group, including the Champion group of 16 locations, lie in a body at the head of the Champion Basin, and occupy the west side and summit of the culminating ridge.

The workings of the Champion and Broadway, together with discovery and representation developments, reveal the occurrences of several powerful lodes parallel to the general system of lodes well exhibited in the Helena and Musick groups, and all of the same type.

This group assumes definite importance, however, in advance of extensive development below the oxidized zone, as the key to deep development of the Musick and California lodes by means of two tunnels, or of an adit from the head of the Champion Basin at the terminus of the Railway.

The Calapoois is designed as immediately a developing proposition for the driving of at least one deep tunnel through to City Creek Basin, giving access to the Musick-California system of lodes, and egress for their products - thus obviating surface transportation over the summit. It is designed to drive on the Champion lode, and after establishment of suitable lines to cross-cut the whole system of lodes between the Helena and Musick-California systems. Milling material will incidentally be found for the present Calapoois 10 stamp mill. By the addition of vanners valuable concentrates can be immediately produced.

For twenty miles on the upper waters of the Willamette, which is followed by the railway, are distributed falls and rapids adaptable to water power

sufficient for air compression and for electric energy for all mining and milling purposes, and even for locomotion.

Advanced operations for the production of smelting ores and other shipping products in the form of concentration will be mainly by drifts and cross-cuts from which the sum of rise or backs will be up to 2000 feet.

The Helena is now driving a low drift from Champion Basin, eventually to connect with the several openings on the opposite side of Grouse Summit, at higher elevation.

Railway, tunneling and milling improvements will thus serve to change the Bohemia Mining District from a free-gold camp to essentially a producer of auriferous smelting ores both wet and dry. Galena has now come to be the most conspicuous base product within the present development of the Musick and Helena lodes. Chalcopyrite is developed in admixture with the base sulphides in places up to commercial values. Quantitative determinations of copper have been too few for practical purposes. Two hundred and ninety }
tons of Musick concentrates smelted at Tacoma in 1898 }
averaged 9.53 per cent of copper, along with 12.3 per }
cent of lead, \$24 of gold and \$2.82 of silver. These }
were produced from partially oxidized ores. Each of }
the galeniferous product of both mines as far as yet }
extracted has proved up to shipping grade without }
spalling.

In the Musick lode and in the Helena so far as wrought, the bulk of the lode is mineralized to separating grade even between ore-shoots, except in constricted parts, which thus far have proved few and short.

The local industry will therefore develop into shipping of high grade ores, and of the reduction products in the form of concentrates direct from the ore without amalgamation. The volume of the industry will, of course, depend on mining development and milling plant. These in turn will be in measure of the application of capital.

Resolute and extensive development of the Bohemia Mine, as now practicable with railway transportation at hand, will go far towards the establishment of a smelter in the Willamette Valley - perhaps, as long contemplated, near Portland, where may readily be assembled the various smelting products of eastern and southern Oregon, along with Washington or Vancouver coke, fire clay and flumes. No other available ores thus far excel the auriferous sulphides of the Bohemia District, or the dry ores of one part of the Helena lode, now exposed.

By the installation of water power for electric energy and for air compression, all mining and milling expenses will be reduced to a minimum. In the item of fuel alone, the saving will be great by dispensing with a wood cutting force, and with

sufficient for air compression and for electric energy for all mining and milling purposes, and even for locomotion.

Advanced operations for the production of smelting ores and other shipping products in the form of concentration will be mainly by drifts and cross-cuts from which the sum of rise or backs will be up to 3000 feet.

The Helena is now driving a low drift from Champion Basin, eventually to connect with the several openings on the opposite side of Grouse Summit, at higher elevation.

Railway, tunneling and milling improvements will thus serve to change the Bohemia Mining District from a free-gold camp to essentially a producer of auriferous smelting ores both wet and dry. Galena has now come to be the most conspicuous base product within the present development of the Musick and Helena lodes. Chalcopyrite is developed in admixture with the base sulphides in places up to commercial values. Quantitative determinations of copper have been too few for practical purposes. Two hundred and ninety tons of Musick concentrates smelted at Tacoma in 1898 averaged 9.53 per cent of copper, along with 12.3 per cent of lead, \$24 of gold and \$2.82 of silver. These were produced from partially oxidized ores. Each of the galeniferous product of both mines as far as yet extracted has proved up to shipping grade without spalling.

In the Musick lode and in the Helena so far as wrought, the bulk of the lode is mineralized to separating grade even between ore-shoots, except in constricted parts, which thus far have proved few and short.

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By the installation of water power for electric energy and for air compression, all mining and milling expenses will be reduced to a minimum. In the item of fuel alone, the saving will be great by dispensing with a wood cutting force, and with

the difficult maintenance of stables at high elevations. The preservation of timber is also a consideration of great importance.

The three groups of mining locations numbering 43 locations in all, should, as I have urged from the first, eventually be consolidated into a single commencing operation, even including the railroads. With such consummation, if not too long delayed, such duplication of plants will thus be avoided, while the magnitude of potentialities in such an industrial unit should insure an able and comprehensive administration with the unremitting aid of adequate capital.

Even if not immediately practicable such a consummation should be kept steadily in view, pending solution of what problems remain by continued development.

(From the Engineering & Mining Journal, June 28, 1902.)

EXTRACT FROM THE ENGINEERING & MINING JOURNAL.

May 12th, 1900- Page 569.

HELENA LODGE- BOHEMIA MINING DISTRICT: A suit in ejectment was tried last month in the United States Circuit Court at Portland. The present owners, Messrs. Jennings and Breneau, were defendants, and G. C. Warner, et al, plaintiffs. Jennings and Breneau were confirmed in their title and a temporary injunction was dissolved allowing ore to be milled for the first time. At present there is only a 5 stamp mill on the property but the bullion returns show \$12,000 per week for the past three weeks, a rich streak being milled first. Outside this rich streak the ore averages \$20 per ton, free, though most of the ground is already located. Reports of assays average \$35 gold. The ore is free-milling.

H. C. Mahon, Lesse West Coast Mines.

Champion, Oregon.

1915			1915		
Date	Mill		Date	Mill	
	Heads	Tails		Heads	Tails
Aug. 1-	\$ 4.80	\$	Oct. 25-	\$ 6.00	\$ 2.00
" 2-	5.20	1.60	" 26-	11.20	1.60
" 3-	6.80		" 27-	5.60	1.60
" 4-	10.80	2.40	" 28-	6.00	2.40
" 5-	11.20	2.40	" 31-	9.20	2.60
" 6-	12.40	1.60	Nov. 1-	6.00	2.00
" 7-	8.00	1.60	" 2-	7.60	2.40
" 8-	6.00	2.00	" 3-	7.60	2.51
" 9-	8.40	2.40	" 4-	7.20	2.40
" 10-	8.40	1.60	" 6-	7.60	2.40
" 11-	8.80	2.10	" 7-	7.60	2.66
" 12-	6.80	2.40	" 10-	16.00	4.30
" 14-	24.00	3.07	" 11-	10.40	2.60
" 15-	8.40	3.07	" 14-	6.40	
" 16-	14.40	2.26	" 15-	5.20	2.00
" 17-	6.00	2.26	" 16-	6.40	1.60
" 18-	12.00	2.80	" 17-	6.40	1.90
" 19-	5.60	1.10	" 18-	12.00	1.70
" 20-	4.00	.50	" 20-	6.00	1.20
" 25-	4.80	1.71	" 21-	4.40	1.20
" 26-	3.20	.80	" 22-	4.00	2.80
" 27-	6.80	.87	" 24-	7.20	1.90
" 28-	6.40	1.10	" 27-	4.40	1.20
" 29-	5.60	1.60	Dec. 1-	4.80	1.20
Sept. 1-	6.00	1.60	" 2-	2.40	1.40
" 2-	7.20	2.60	" 3-	2.00	.93
" 3-	5.60	3.66	" 5-	2.40	1.06
" 4-	9.60	1.70	" 6-	2.40	1.00
" 5-	12.00	2.80	" 7-	2.00	.80
" 6-	5.60	1.86	" 8-	1.60	.80
" 7-	5.40	1.60	" 9-	4.00	.80
" 8-	7.20	2.26	" 10-	4.80	1.20
" 9-	6.80	2.80	" 11-	2.80	1.00
" 10-	5.20	1.70	" 12-	2.80	1.10
" 11-n	6.00	2.66	" 13-	2.80	1.10
" 12-	6.00	2.51	" 14-	3.60	1.30
" 13-	8.00	2.51	" 15-	1.60	.90
" 14-	4.80	1.44	" 16-	3.20	1.40
" 16-	6.00	2.13	" 17-	2.80	1.60
" 15	5.20	2.00	" 18-	4.00	2.40
" 18-	8.80	3.06	" 19-	7.20	2.90
" 19-	9.20	2.70	" 21-	6.40	3.20
" 20-	6.40	2.50	Jan. 23-	2.40	
" 26-	9.20	2.00	" 24-	6.80	4.00
" 27-	6.80	1.48	" 25-	6.40	4.40
" 28-	5.60	1.60	" 26-	8.00	4.00
" 29-	12.80	2.80	" 27-	6.40	4.00
Oct. 1-	12.00	2.40	" 28-	6.00	
" 2-	20.00	3.20	" 29-	4.00	
" 3-	7.20	2.51	" 30-	8.00	3.20
" 4-	10.40	2.00	" 31-	2.80	2.40
" 5-	9.60	2.00	Feb. 1-	12.00	3.20
" 6-	5.20	2.10	" 2-	8.80	2.40
" 23-	4.80	1.63	" 3-	6.00	2.00
" 24-	8.80	2.20	" 4-	17.60	7.20

Mill			Mill.		
Date	Heads	Tails	Date	Heads	Tails
Feb. 12-	\$ 32.80	\$ 2.80	May 6-	\$ 7.20	\$ 1.60
" 13-	25.60	5.20	" 7-	4.00	1.20
" 14-	82.40	4.00	" 8-	4.00	1.60
" 15-	66.40	5.20	" 9-	2.40	.60
" 22-	14.40	4.80	" 10-	4.00	1.00
" 23-	4.00	2.40	" 11-	4.40	1.20
" 24-	5.40	2.80	" 12-	7.60	1.60
" 25-	7.20	2.80	" 13-	12.00	2.00
" 26-	5.60	2.80	" 14-	6.00	2.40
" 27-	8.80	2.40	" 17-	6.40	2.40
" 28-	13.60	3.20	" 18-	5.60	1.20
" 29-	9.20	3.20	" 19-	4.00	1.60
Mar. 1-	24.00	6.00	" 20-	7.20	2.40
" 5-6-	22-	4.80	" 22-	8.00	1.60
" 7-8-	20.80	4.00	" 23-	4.00	1.20
" 9-	25.60	5.20	" 24-	4.00	1.60
" 10-	16.00	2.40	" 25-	4.00	1.20
" 11-	12.00	4.00	" 26-	2.80	.80
" 12-	38.40	5.60	" 27-	3.60	1.20
" 13-	12.80	2.40	" 28-	3.20	.80
" 14-	15.20	2.40	" 29-	2.80	.80
" 15-	18.40	6.40	" 30	2.80	.80
" 16-	8.80		" 31	2.80	1.20
" 17-	10.40		June 1-	3.60	1.20
" 18-	5.60	2.00	" 2-	3.20	1.00
" 19-20-	7.20	3.20	" 3-	2.40	.80
" 21-22-	9.60	3.20	" 4-	3.60	.80
" 23-	8.00	3.20	" 5-	2.80	1.20
" 24-	25.60	4.40	" 6-	1.60	.40
" 25-	14.60	4.40	" 7-	3.20	1.20
" 26-	8.00	2.40	July 7-	2.00	.80
" 27-	5.60	2.40	" 8-	2.40	.80
" 28-	11.20	2.40	" 9-	3.60	1.20
" 30-	6.00	1.60	" 10-	6.40	1.40
" 31-	7.60	2.40	" 11-	6.00	1.20
April 3-	4.80	2.00	" 12-	8.40	2.00
" 4-	5.80	2.40	" 13-	3.20	.80
" 5-	4.80	2.00	" 14-	3.60	1.20
" 6-	6.00	2.40	" 15-	10.40	3.20
" 7-	13.20	4.00	" 16-	9.20	3.20
" 8-	17.60	5.60	" 22-	23.20	5.20
" 9-	8.80	3.20	" 23-	16.80	4.80
" 10-	7.20	3.20	" 24-	5.60	2.40
" 11-	5.60	2.40	" 25-	5.20	2.40
" 12-	8.80	2.40	" 26-	7.60	2.00
" 13-	6.40	1.60	" 27-	28.80	.80
" 14-	14.00	6.40	" 28-	12.00	6.00
" 15-	11.20	4.00	" 29	18.40	2.20
" 17-	3.60	2.40	Aug. 10-	6.00	1.00
" 18-	4.00	2.80	" 11-	6.80	1.60
" 24-	2.80	2.00	" 12-	7.20	1.20
" 25-	4.00	2.80	" 13-	8.00	1.20
" 26-	4.00	2.40	" 14-	5.60	2.40
" 27-	4.80	1.60	" 15-16-	8.00	2.80
" 28-	5.20	2.80	" 17-18-	10.80	1.20
" 29-	4.80	2.00	" 19-	7.40	1.60
" 30-	6.80	2.40	" 20-	7.20	2.00
May 1-	5.60	2.40	" 21-	7.20	2.40
" 2-	4.00	2.00	" 22-	8.80	2.40
" 4-	10.40	3.20	" 23-	8.00	2.80
" 5-	8.00	2.00	" "	7.20	2.40
			" 24-	21.60	2.00
			" 25-	14.40	
			" 26-	19.20	
			" 27-	21.60	

Champion, Oregon.

August 27, 1916.

This is to certify this is a copy of assays made of heads samples and tails samples made by me for H. C. Mahon, Lessee West Coast Mines, from August 1st 1915 to Aug. 24th 1916 inclusive- Work done under direction of R. H. Spencer from Aug. 1st 1915, to Feb. 1st 1916. From Feb. 1st to Aug. 24th 1916, under direction of Wm. W. Elmer, Engineer in charge. All gold values determined and based on \$20.00 per oz.

Signed Ben Mattice,
Assayer.

Subscribed and sworn before me a Notary Public in and for the State of Oregon, this 27th day of August 1916.

Signed W. T. Hawkins,
Notary Public for Oregon.

My commission expires March 23, 1917.

After two and one half months as Consulting Engineer for Mr. H. C. Mahon, Lessee, West Coast Mines in Lane and Douglas Counties, I beg to submit for the consideration of Mr. Mahon and his associates the following general statement of my findings in the time mentioned.

The property of this group, consisting of forty-seven claims and having an acreage of about 700 acres, lies in the later andesite up-lift which forms the Galapocia Mountains of Central Western Oregon. The early history of the mine is known to you so will not be discussed here.

Between 1900 and 1907, at the Champion and Musick Mines, a considerable equipment was installed and a large amount of ground was worked out. Returns from this work are not a matter of available record so cannot be stated here.

The installation referred to consisted of a 30 Stamp Free Milling Plant with plates, Wifley Concentrators and Frue Vanners, the ore delivering to the Mill from an incline tram-way about 3000 ft. long and having a vertical difference between terminals of about 800 feet.

The ore from the Champion Mine is delivered to this tram-way in cars hauled by an Electric Locomotive from the Mine ~~Shaft~~. *chutes* These cars are attached to the cable and delivered by power to the Mill in spite of the fact that there is sufficient elevation to have given gravity if proper installation had been made.

The Musick Mine is some 6000 feet from the Champion workings and connected with the Champion by a surface electric tramway not now in condition for operation though the installation is still complete. The ore from the Musick Mine is dropped through a shoot in No. 6 level on the Champion Mine through a No. 9 level and handled from there in the same manner as is the Champion ore. The transportation equipment at the two properties is complete insofar as the present tonnage goes, though it has been badly installed in the most part.

The Helena property of this group is not at present connected with either of the other properties except by wagon road but is so situated that it will deliver ore to the Champion Mill by means of an aerial tramway having a length estimated at 6000 feet, though the Helena vein outcrops not far from the Champion Mill and I am informed plans have been discussed to connect the Helena workings with the plant by means of a tunnel direct from the mill level and that surveys have been made showing that this tunnel will intersect a point under the present Helena workings at a depth of 800 feet below their lowest level.

Power is generated at a point seven miles below the property by means of a Tuthill Water Wheel under 135 feet effective head and capable of generating, with the present installation, 300 H.P. more or less.

Repairs on the Flume carrying water to the penstock will be necessary during the coming season as well as repairs on the high tension line carrying current to the Mill from the power house but under present operations the Plant, ~~at the present time~~, is doing good work. The buildings, though not in good shape, have been sufficient for operations this winter.

The workings done by former owners of the property began at the surface and followed the enriched lens, which started at the grass roots and has continued to date to a depth of 350 feet, more or less, under a point where it was first attacked. This lens has been formed by enriching solutions in two seams or veinlets crossing from the larger hanging-wall vein to the smaller and richer foot-wall vein and the heart of the lens has been of rather extraordinary high value and excellent persistency.

Old maps at the Mine are very incomplete but show some notations which indicate that part of that shoot gave a width of 4 to 5 feet, and \$1000 per ton or better. Beside this principal lens and distant from it some 600 feet a second shoot was opened and worked out to the depth of the 5th level which is some 150 feet below the surface outcrop. Up to January 20th the work done by me on the ground was investigation, examining and general underground organization.

Since February 1st, milling, which was stopped upon my solicitation, pending this examination, has been resumed, working the ores taken from the lower end of the principal lens above referred to, from the east edge of that lens and from the new development in the eastern extension of the lowest level which is called No. 9 level.

It has ^{is called} been assumed that the principal lens, which ~~is~~ called on the ground Taplin stoppe, was exhausted, but the work done during the period noted has demonstrated that there is still an appreciable quantity of narrow ore of good grade to high grade still available. This comes to us very slowly though it will be moved more rapidly now as development has gone ahead on the drift and Air Hammer Drills have been put into commission in the past few days. No. 9 east shows an average width of 30 inches of medium grade milling ore, ~~averaging~~ ^{valued} from \$6.00 to \$8.00 and the Moon stoppe gives the same class of ore.

Without reference to details but covering information which will be of interest to you, you will note that the output in bullion, which has been turned over to Mr. Mahon since the first of February, is \$3013.00 and we have on hand as of date March 1st concentrates having a gross value of \$850.00. The development done during the time this investigation has been going on amounts to 140 feet, more or less. This development is being done in the Taplin stoppe, in E-9 level and E-6 level.

No. 6 level is being extended to cut the continuation of ore which was worked out from No. 5 level to the surface as above referred to and which was or purports to have been ore of at least good grade. Upon the downward extension of this ore from No. 5 level a Winze was sunk by Mr. Mahon last year to a depth of 25 feet. The records show that the ore in the bottom of this winze was 30 inches wide with gold value of \$25.00 and better. No. 6 level is still 110 feet from a point projected downward on the normal plane of the vein below this winze but the sheet of ore as worked out from No. 5 to the surface at an approximate length of 140 feet with a drag to the west of 60 degrees from the horizon, approximately, as shown by the old workings above No. 5, and it is our belief that the ore which has been struck in No. 6 breast within the last week is the beginning of that sheet on No. 6. This ore has a width of 14 inches where first encountered with a gold value of \$8.80 per ton, and from ~~the~~ the point of ~~the~~ lens which is widening as it goes to the east.

The work on No. 9 level has opened a new lens and a new ~~shoot~~ in the east stope and this appears to be lengthening on its upward extension above the level.

Drifting in No. 9 east shows no results up to date but if the shoot referred to above, which was worked from No. 5 to the surface and which we ~~feel~~ ^{believe} has been encountered at No. 6, continues downward it should be intercepted within 100 feet of present face of No. 9 level east. If this shoot continues to this depth, with an average width of ore which is to be expected as shown by the openings which have been worked out, we will have ore with a width of 3 to 4 feet and height or backs of 240 feet.

The lowest workings at No. 9 level show ore then in two shoots, one of which has been worked out from No. 9 to the surface, and the other which is comparatively new, the extent of which has not as yet been determined, but both of which show ore in the bottom of the level.

Some years ago No. 12 cross-out was started at a point 325 feet vertically below No. 9 and extended 456 feet, ~~more or less,~~ leaving 440 feet yet to be run to intersect the vein ~~at the~~ ^{its} downward extension of the Taplin stope ore, ~~assuming~~ ^{assuming} ~~that~~ ^{that} the angle of dip remains the same as that of Taplin stope ore.

This, in my opinion, is the most important and best justified development from the standpoint of the best interests of the property, and every effort should be made and every resource strained to continue this tunnel or crosscut for the development of the property at the greater depth to be thus attained. The ore that has been encountered thus far during our work and that is being milled at present is semi-free milling ore.

Until the snow is off, important data is lacking upon which to form an opinion, but based upon a careful study of conditions as observed underground, it is my belief that the iron-pyrite-gold ores were the original depositions. Following these

letter

depositions came copper, lead and zinc sulphides accompanied by silver. The solutions bearing these sulphides never, however, traversing all of the vein area originally and in part still, occupied by the iron-pyrite-gold depositions.

The vein matter everywhere, except at No. 9 east, shows a marked effect of leaching and change of original contents, which have been redeposited either in oxidized shoots already worked out here, or below the present workings. Because of the topography and the deep gash cut by V-shaped gulch which approaches the vein from the north at a point just west of the present workings, and which has a depth of 750 feet below No. 9, it is my belief that the oxidized zone will, in part at least, go as deep as the mill level of 700 feet below No. 9, at least the ores nearest the gulch will be largely oxidized to that depth, in my opinion.

No. 12 level will, I believe, cut the vein system within the area of greatest gold enrichment, then, being continued into the mountain, will cut sulphide ores and finally unaltered pyrite.

In my letter of January 2nd to Mr. Mahon, I said, "The Champion vein, which is the only vein I have had opportunity to study, strikes relatively northwest and southeast, dipping slightly to the southwest. The ores thus far worked have occurred in elliptical lenses, the long axis of each of which has dipped or dragged toward the west. These lenses sometimes overlap at the ends but with a dividing of valueless vein matter wide enough to prevent picking up succeeding lenses within an ordinary sized drift. It is my belief that the last shoot east on No. 5 will be continuous downward and will be cut by advancing No. 6 and No. 9 level east."

Since that time 30 ft. more or less of drift has been done in No. 6 level and the ore now shown in the breast of that level proves the soundness of the conclusions expressed above as to the continuation of the shoot worked out in East No. 5. While we have demonstrated in our work in the Taplin shoot that the lens did exist which was overlooked in other days and the extent of which we cannot at this moment surmise, it is giving us a handsome grade of ore in the small quantity above referred to.

Ample timber is growing upon the property for ~~several~~ *many* years' requirements. Rough estimates place the amount at over thirty-five million feet of Yellow Fir of high grade.

Respectfully submitted,

(Signed) Wm. W. Elmer

Consulting Engineer.

DIGEST.
OF
ENGINEER'S REPORT
ON THE
MINES AND PROPERTY
OF THE
WEST COAST MINES COMPANY.
LOCATED IN
THE BOHEMIA MINING DISTRICT
OREGON
JANUARY FIRST 1913

DIGEST OF REPORT ON THE PROPERTY OF THE WEST COAST MINES COMPANY.

BY

William H. Adams, Mining Engineer.

MINERAL

DISTRICT- Bohemia-In Lane and Douglas Counties, Oregon.
(350 claims.)

LOCATION

GEOGRAPHICALLY. In N. latitude 23 deg. 60" and Longitude 122 122 deg. 75" W. from Greenwich. The district is 35 miles southeast from Cottage City, Lane County, a station on the Southern Pacific Railway. A logging railroad is constructed and working from Cottage City to Disston, twenty miles. A wagon road leads from Disston to the Champion group mines, and from there all the mines are easily found.

HISTORY

Mines discovered in 1858. District named in 1863. Operations on a practical scale with stamp mills, began in 1891, since which year workings have been continuous Claims combined into the groups mentioned herein, in the year 1902 to 1905.

GROUPS OF CLAIMS.

The West Coast Mines owns 49 claims, in three groups, The Champion Group has a length on known veins over 1 mile. The Musick group has a length on known veins, over 1½ miles. The Helena group has a length on known veins over 1½ miles. 2 claims are patented, 44 claims surveyed for patent, 3 claims un-surveyed.

GEOLOGICAL

FORMATIONS. Igneous rocks abound, altered in some cases beyond recognition. The central region of the disturbance was between the Champion and Musick groups, from which eight prominent crests radiate to the surrounding country. All the claims of the district are on these crests or on the slopes in either direction from the summits at elevation between 3000 and 4000 feet above sea level.

FISSURES IN

THE FORMATIONS; Fissures are regular, well defined, prominent along the crests deep seated and have more or less water in them. There are many cross veins and feeders appearing in the fissures, and at varying angles. The dip of the fissures is 60 deg. to 70 deg. from the horizontal and towards the N.W. as a rule.

VEIN MATTER

IN FISSURES. Quartz of varying characteristics, milky bright, porous and in some places stained with manganese and iron; also quantities of crushed igneous rocks, with kaolin (nearer cerecite in composition) and occasional lime spar.

ORES IN VEIN

MATTER. Pyrite, galenite, sphalerite, chalcopyrite, iron and manganese oxides. On certain zones native gold is found in bonanza, as mossy covering over slabs of siliceous secondary formations, and as deposited mid-gold in the red hematite seams. Sulphides are common throughout the fissures and ~~and~~ and sulphates are observable wherever the conditions are favorable.

VALUES IN

THE MINE ORES. All workings to date have shown that free gold is found in the ores to the extent of about \$10. per ton.

This is the amount of gold caught on the plates in the stamp mills, an average of many years working in the different mills of the district.

The sulphides in these ores have averaged from \$2.00 to \$5.00 in all the mines, but vary materially in the zones as developed from end to end of the claims.

Three carloads of sulphides were shipped last season by the West Coast Mines Company, the returns being about (?) of which an unt the company received net \$6,900.

There are 240 tons sulphides in the mill bins, inventoried on December 31st, 1912, at \$20,560.00 a value of \$85.00 per ton.

VALUES OF ORES

BLOCKED OUT IN

MINES OF THIS CO. Conservative estimates of values in ores in the area of developed ground in the three groups, are as follows:

Champion Group	5,900	feet	length	of	levels	and	cross-outs.
Musick	4,570	"	"	"	"	"	"
Helena	1,350	"	"	"	"	"	"
Total	11,820	"	length	of	levels,	etc.	

I estimate the tonnages as follows:

Champion Group	180,000	tons	at	a	value	of	\$900,000	in	place
Musick	140,000	"	"	"	"	"	700,000	"	"
Helena	50,000	"	"	"	"	"	250,000	"	"

Totals . . . 370,000 tons ores valued at \$1,850,000 in mine.

VALUES OF ORES LYING BETWEEN MILL LEVEL AND THE WORKING LEVELS OF MINES.

I estimate that an area 700 x 1500 x 5 of virgin ground lies between the present tunnel levels of the several claims and the level of the mill plant, which a tunnel would uncover and deliver to the mill floor - these and other areas to be secured at nominal cost. It is not unlikely that several new and hitherto unknown bodies of ores lie within this virgin territory, and there is no reason why these fissure veins should terminate at any stated depth, as the characteristics of ores and rocks accord with all successful and lasting propositions in the well known mining camps of the world. Allowing that the above area is properly a part of the ground belonging to the present scheme of working, above water level, there would be shown to us 5,250,000 cubic feet of ore bodies. At 15 cubic feet to the ton of

of workable ore, there would be shown in this block of virgin ground, on each group of claims, 350,000 tons, or, in the three groups of claims, there would be shown 1,050,000 tons of ores now buried but above the water drainage of the camp. I estimate this ore in place at \$5. per ton, and the resources of the property conservatively stated, are:

Ores in the three groups, blocked out, valued at \$1,650,000
 Ores in the three groups, above water level, at 5,250,000
 Total values as per statement \$7,100,000

WORKING From the information obtained in many ways, I estimate
 RESULTS the value of the bullion returns from the Company mines;
 FOR TWENTY From the mines other than worked by this Company \$111,200.02
 YEARS. From the mines worked by this Company 233,279.98
 \$344,480.00

To this add the acknowledged losses in mill work,
 dumps, etc. etc. 155,520.00
 \$500,000.00

PROPERTY OF THE COMPANY
MINES.

The Champion and Musick groups are in clean and workable condition from end to end tunnels, levels, winzes and stops in best of shape for extensive operations, work there having ceased the week before Christmas, 1912. The Helena group has never been opened since its purchase in 1905, and all the ores developed since the beginning of operations, (excepting those from which over \$300,000 was realized, by very crude milling methods) are intact at this date. The lower level of the Helena was driven 300 feet in good ore and not one pound stopped between this and the next level 60 feet above.

MILLING PLANT

AND POWER. The milling plant around which everything centers, has been in constant operation for two years (1911, 1912) and can be started up at a day's notice. This plant is combined from several mills of the groups operated prior to 1906, so far as crushers, stamps and accessories are concerned.

Everything in prime condition, with unusually fine buildings and fittings. Electric power is used throughout the property. Two air compressors for use in underground operations, with connections into mines of 4" pipe; a complete steam boiler and engine plant, for stamps or sawmill, and other machinery shown in detail in the inventory are now located in the mill. The special report of power and electrical plant, made by H. Heber, Elec. Engineer, accompanies this statement and will clearly show the conditions as they exist, the great possibilities of extension of the power lines and benefits to be derived from securing the water powers of this immediate neighborhood.

BUILDINGS

The buildings found on the three groups are unusual in size, are well constructed, well located, have water and electric lights, and it will be difficult to find a camp better prepared for the ordinary care and the comfort of its laborers and the official staff.

TIMBER.

The cruising estimate of timber belonging to these groups, is 50,000,000 ft. board measure. It is inventoried at \$1 per thousand feet. The railway expected to be constructed to the limits of this timber in the near future, will advance this price to \$3 per thousand feet at once. It is the very best of timber for saw mill purposes, with sufficient of intermediate sizes for all mine use for many years, in fact the growth is far beyond the needs of the district.

ORES
VALUES
AND
COSTS.

It is seldom that one finds so favorable a location for the development of mines in so extensive an area. From the milling plant, all the fissure veins of the three groups can be reached, the areas can be drained, the ores can be dropped down and brought to surface through one main tunnel which will reach from end to end of the Helena group. The length of these fissures and their feeders has never been determined, because the extravagant improvements on surface depleted the treasury of funds before any of the plans were completed, and much of the work was summarily closed by panic conditions of 1907. My judgment is that had proper ideas prevailed with regard to development and handling the ores of this district, a record would have been made in every respect satisfactory and exceedingly profitable, the district comparing favorably with others of acknowledged stability and long life. The ores can be mined and milled in a proper milling plant. The sulphides can be smelted and bullion produced, at as low prices that are known in any camp in the United States for like tonnages handled daily. The conditions are exceptionally favorably for all these ores to be worked to a finish on the ground, so that nothing but bullion would be sent out to market. In the Helena and Musick groups there are unlimited tonnages of sulphide ores averaging better than \$20 per ton and with no base constituents to interfere with simple metallurgical treatment. All plans for future operation of these groups should include complete treatment at the mines and by utilization of electric energy and gaseous fuel to be generated from the wastes of the forests.

OWNERS.

Referring to the operations of the present owners during 1911 and 1912, the cash income was \$64,752.26
The inventory shows sulphides on hand 20,760.00
The returns of the two years were \$85,412.26

STATE-
MENTS
OF

Ores mined and milled 6590 tons
Or at rate of about \$10 per ton of ores
The Analysis of this period, shows:

RECEIPTS \$7.55 gold taken from the mill plats.
 AND 2.45 taken from sulphides
 EXPENSES. 4.50 lost in tailings, etc.

14.50 is the value of mine ores sent to mill.
 This is not a very creditable showing in tonnage of
 ores worked for two years, but the mines were run by
 totally untrained people and their ignorance extended
 to the milling department. Even under these untoward
 conditions the business statement as rendered by them is
 an education to those versed in the art;

PROFIT	Income from bullion and concentrates shipped to Tacoma	
IN TWO	smelter.	
YEARS ON	Two year period	\$64,652.26
8590	Expenses of cleaning up mines, after purchase-	
TONS.	under foreclosure and idleness of 3 years -15,000	
	All expenses of working mines for 2 years	34,452.26
	Dividends paid to stockholders (preferred)	<u>15,000.00</u>
		64,452.26
	Difference in cash on hand Dec. 31st, 1912	200.00
	Add to this the sulphide concentrates on	
	hand in the mill, awaiting shipment.	<u>20,760.00</u>
	On hand at the beginning of new year	20,960.00
	In other words, the expenditure of . . . \$49,452.26	
	Produced in dividends - \$15,000	
	and in sulphides - <u>20,960</u>	
		<u>\$25,960.00</u>

Which is at rate of 72% on expenditures.

REMARKS I can learn of no good reasons for working the mines on
 IN so very small a scale as shown above, for the two years
 EXPLANA-since present owners obtained possession, except abso-
 TION lute want of knowledge of the business-none of them ever
 having seen a mine until this one was purchased at
 foreclosure sale. The information was to effect that
 bonanza ground could be shown to them, from which the
 price of the mine could be secured in a very short time.
 The returns for the first year were \$30,320.36 and this
 encouraged them to try it another year, with results as
 heregiven.

RESULTS The following statement is offered as a conservative
 POSSIBLE estimate of business possible to be done in this dis-
 TO triot, with slight additions to the present mechanical
 ACCOMP- plant, at the mill, and with reasonable mine operations
 LISH in advance of the milling operations:

MINING AND MILLING OPERATIONS, 100 TONS DAILY.

RECEIPTS
 100 tons daily is 30,000 tons annually.
 30,000 tons mine ores from 3 groups, value
 \$12. per ton in all the metals
 (NET) \$360,000.00

EXPENDITURES
 Mining and tramming 30,000 tons ores
 from the 3 groups at average \$2.. \$60,000
 Milling and Treatment 30,000 tons \$2. \$60,000
 Management and incidentals, taxes

interest, etc. etc.	25,000	<u>145,000.00</u>
Difference is profit annually	215,000.00	
Or profit per ton of mine ores- say \$7.00		

I am of opinion this result can be accomplished during the year 1913, and that results will never be less than named per ton of ores worked from start to finish, whatever the extent of mine and milling operations may be. As a matter of fact, the chances are that proper development of the known bonanza ground in the Musick and Helena groups will show ores in a very large quantities with values around \$25. per ton.

In conclusion I cannot too strongly emphasize to you the value of the district as a whole. It is without any qualification one of the best undeveloped districts to be found on the Pacific Coast, with great possibilities in the way of sulphide ores, all of which are gold bearing and will be lasting in depth and extent, while holding to their present values per ton for all time. There is no example of failure to record, when ores of this kind are found in so great abundance and over so wide areas, and under so favorable conditions for mining and treatment.

I shall be pleased to add any special details to the above

and beg to remain

Very truly yours,

(Signed) W. H. Adams.
Mining Engineer and Metallurgist.

Address, 18 Broadway, New York,
Box 200, Portland, Oregon.

INVENTORY OF PERSONAL PROPERTY BELONGING TO THE WEST COAST MINES

COMPANY, BOHEMIA DISTRICT, OREGON.

December 31, 1912.

Champion Mine	Buildings, dwellings, etc	8,013.02
"	Milling plant and machinery	27,132.57
"	Buildings around the mines	4,104.14
"	Assay Building	345.00
"	Compressor buildings and machinery	10,342.78
"	Incline Tramway, double track and covered	10,132.61
"	Saw mill Machinery	2,344.36
"	Lumber on Hand	250.00
"	Mine equipment, cars, extra rails, etc.	2,560.59
"	Pipe and fittings	211.65
"	Machine parts and fittings	271.01
"	Compressor parts in stock	63.69
"	Power drills, parts and fittings	466.66
"	Tools for compressors, pipe, mine carpenters	1,410.36
"	Boarding house supplies	550.00
"	Furniture and fixtures of boarding house, etc.	327.40
"	Mine supplies, powder, steel, etc.	1,591.73
E	Incline Tramway supplies	75.00
"	Office supplies	76.65
"	Blacksmith supplies of all sorts	980.37
"	Stamp Mill Supplies	254.25
"	Team Supplies	50.00
"	Assay outfit and supplies	252.60
Musick Mine	Mill and Dwellings,	2,493.25
Helena Mine	Mill and Dwellings	1,000.00
Power Plant	Buildings and machinery connected to ditch	34,477.26
	Dam and ditch	11,857.35
	Telephone line around the camp and in mines	319.42
WAGON ROAD	From Champion bridge to No. 9 Tunnel 6 miles	26,000.00
	TOTAL INVENTORY OF PROPERTY	\$144,753.71
	ADD to this the concentrates in bins in the Mill H use 240 tons at assay values	20,560.00
	TOTAL INVENTORY OF FIXED AND MOVABLE PROPERTY.	\$166,313.71

ITS EQUIPMENT OF HYDRO-ELECTRIC MACHINERY, OWNED BY THE WEST COAST
MINES COMPANY, BOHEMIA DISTRICT, ORE.

M. Haber, Electrical Engineer-Portland, Ore.

After a visit of ten days duration at the mines of the West coast Mines Company, in Bohemia District, Lane County, Oregon, I have disclosed the following facts:

The plant of this company is located on the Frank Brice Creek, at the mid-way station between mines and the town of Disston-the terminal station on the railway which ends at Cottage Grove, Lane County, Oregon.

The plant is located on the banks of the Creek, - the station is called Bonita, and it is seven miles distant from the Mill House of the Champion Group of Mines.

The Hydro-electric plant at Bonita consists of a Tuttle Water wheel, which develops 250 H.P. under a working head of 135 feet, the wheel regulated by a standard Governor.

The machinery consists of:

One 180 K. W. Two phase Westinghouse Generator, 1100 volts
~~144 amp per terminal 7200 volts, and 225 per amp-belt~~
driven.

Exciting Dynamo 5' 62 K.W. volts, 45 Amp 1400 R per min.
belt driven.

On a switchboard 2 panels equipped with 4 amp-meters,
2 volt-meters, one 4 pole switch in 1100 volt circuit,
4 fuses in the same circuit, 1 double pole switch with
fuses in the exciting circuit, and shunt regulator
for dynamo.

Two 100 K. W. transformers, 1100 to 11000 volts in reserve.
Two 100 KW transformers, 1100 to 11000 " " operation
or 1100 (not clear)

One station service transformer, high tension switching
frame with three high tension disconnecting fuses.
Lightning arrester in each phase of the 3 phase high
tension line. The low tension or generator side of
the Transformers in 2 phase and the high tension, or
transmission side is in 3 phase connected.

The Power House is a well constructed frame building,
the foundations resting on bed rock.

The Generating Room is 38x45 feet.

Foundations are already completed for installation of
a second water wheel and generating sett.

A storage and a work room are provided adjoining the
generator room.

A 6 mile, 3 phase Transmission line of No. 6 wire
connects the power station with the milling plant on
the Champion Group. This line has poles from 30 to

35 feet, the tops of poles 6 to 7 inches diam. and they are spaced about 120 feet apart. Glass insulators are used throughout the line.

The Dam in the Frank Beice Creek, is well constructed of logs. The head raise is 6,000 feet in length, partly ditch and partly wooden flume, along the steep hillside.

The flume is 5 feet in width, and 30 to 36 inches in depth. The ditch is 4 to five feet width and 3 to 4 feet deep. This ditch could be widened at small expense, in case of increase of the power plant at any time in the future.

A penstock of 18 inch steel pipe connects the flume with the power plant. This is 135 feet long.

One nozzle directs the water under pressure to the water-wheel. The tail water discharges into the Creek with sufficient fall to always give the maximum value of the head of water.

The quantity of water, measured on the 27th day of December, 1912, was 4375 cubic feet per minute. This will develop 796 effective horsepower on the shaft of the water wheel, under existing head of 135 feet. It is stated that the water in the dry season of the year is never less than one-half what is now seen.

ELECTRIC EQUIPMENT OF MILL AND MILERS.

Lightning arresters are placed in each phase of the high tension line.

One high-tension switching frame with 12 high tension disconnecting fuses.

Transformer switching frame (low tension side) with 2-- 100 amp double pole switches, 6-- 50 amp. double pole switches, 12 double pole fuse blocks, 1-- 2 phase starter for a 40 H.P. motor.

One switchboard, 1 panel for 2 phase oil starter for 100 H.P. motor 4 fuse blocks in this circuit.

One switchboard, 1 panel with 1 voltmeter, 1 ampere meter, 1 double pole switch for 100 amp 1 automatic disconnecting switch, 1 shunt regulator.

Two 76 K. W. Transformers,	11000 to 440 volts
" 50 " "	11000 " 2000 "
" 25 " "	11000 " 440 "
" 37½ " "	11000 " 440 "
" 25 " "	11000 " 110 "
" 60 " "	11000 " 440 " in reserve

One motor generator set A.C. 40 H.P. 2 phase 400 volt 48 amp per terminal with D.C. Dynamo 30 K. W. 580 volts, 54 amp. used to work the transway, inside the No. 9 tunnel.

One 100 H.P. 2 phase motor, 2000 volts driving an air compressor.

One 50 H. P. motor, 2 phase 2000 " in reserve. Never used.

One 75 " " " " 440 " driving stamp mill

One 15 H.P. motor, 2 phase 440 volts driving crushers.
One 15 H.P. " " " " " " " the concentrators
One 50 " " " " " " " " inoline tramway.
These motors are 7300 alts, per min. and are equipped
with suitable switches and starters.
One Baldwin Locomotive for the N. 9 tunnel service.
One " " " " " Trolley line Champion to
Musick mines.

All the electrical equipment and accessories, the mine
motors and inside lines and connections, are in best of
physical condition, having been in active service up to
the end of the year 1912.

The Milling plant, office, boarding house, lodging
houses, dwellings, stables, and inside the mines, and
shops connected with mines, are well lighted by use
of tungsten incadescent lamps.

There is a complete steam plant in the Mill, used prior to
installation of the electric plant. Details of this
plant I did not get.

DEVELOPMENT OF HYDRO-ELECTRIC PLANTS IN THE BOHEMIA DISTRICT.

There is an unusual opportunity for marketing power and
light in this district, and this phase of the question has been
submitted to me inasmuch as it will be necessary for the
West Coast Mines Company to very materially increase its
electric plants within a short time, and while doing this to
meet their own private requirements, it would seem to be a
wise course to construct plants of sufficient capacity to
meet the present and future demands of all the mines, and
to supply the surrounding valleys with all the power and
light that they may call for in years to come.

It is well understood that outside interest on the in-
vestment, hydro-electric plants which will generate 1000
kilowatts of electric energy, cost no more in labor and
attention than does the smaller plant now operated by the
Company of Bonita.

In additional investment of about \$13,000 will enlarge
the present plant at Bonita to double its capacity.

If this increase of electrical energy were sold at the
commonly accepted prices of the district, viz: at rate of
\$5 per H. P. month; or \$60 per H. P. year, there would be an
income to this company of \$1,250 per month, or \$15,000 per annum.

There is a market at the present time for about 300 K.W.
in the immediate neighborhood of the Champion and Musick groups of
mines, which estimate is based upon the knowledge that 45 stamps

are being operated by steam or gasoline engines, and these parties would most certainly prefer the electric energy were the opportunity offered them to secure it at any reasonable rate per month or year.

The 350 mining claims of this district are hampered to a greater or less extent at this time, by the excessive cost of power and light, and it is the consensus of opinion of mining men who have visited the region within a year, that modern methods of handling the operations of the mines and treating the ores must include the use of electricity - without which progress will be exceedingly slow.

Electric smelting of the vast ores of this district will be successfully inaugurated within a year. To handle the reasonable tonnages of ores which the district can easily supply, it would be necessary to plan for several times the electrical energy now supplied by this company.

Without going to details of figures, I state it as my opinion from general observation and from private information, that it would be possible to secure hydro-electric power to the extent of 20,000 H. P. all of it within fifteen miles of the Champion Group, and all of it at prices considered exceedingly favorable.

I state further, that all of this power could be sold to advantage at good profits, considering the conditions, and with certainty of stability in the business.

I am prepared to give details and specific information upon demand.

Respectfully yours,

(Signed) M. Hober,

Electrical Engineer.

Portland, Oregon.
January 10th, 1913.

Pion-Bohemia

11

pl & slopes or Raised

- $\frac{1}{2} - 2.89 = 15.895$
 - $5 - 2.48 = 12.40$
 - $2 - 0.21 = 0.62$
 - $4 - 1.04 = 4.16$
 - $12 - 1.24 = 14.88$
 - $2 - 1.03 = 2.06$
 - $4 - 18.19 = 72.76$
 - $2\frac{1}{2} - 3.10 = 7.750$
 - $1\frac{1}{2} - 0.21 = 0.315$
 - $2 - 6.40 = 12.800$
 - $1\frac{1}{2} - 5.99 = 8.985$
 - $1\frac{1}{2} - 6.40 = 9.600$
 - $1\frac{1}{2} - 8.26 = 12.390$
 - $2\frac{1}{2} - 1.86 = 4.640$
 - $2 - 30.38 = 60.76$
 - $3 - 13.85 = 41.55$
 - $1 - 14.88 = 14.88$
 - $1 - 13.23 = 13.23$
 - $\frac{1}{2} - 6.20 = 12.40$
 - $3\frac{1}{2} - 1.86 = 6.51$
 - $2 - 1.03 = 3.09$
 - $3\frac{1}{2} - 0.41 = 21.73$
- $\frac{2}{67} \text{ ave } j' = \frac{332.915}{21.73}$

289	
55	
1445	
1445	
15.895	
6.40	3.10
15	2.5
3200	1550
640	620
9.600	7.750
8.26	
15	2.1
4130	1.5
826	105
17.390	2.1
	3.15
1.86	5.99
25	15
920	2.995
372	5.99
4.640	8.985
1.86	
35	
930	
558	
6.510	

$67 \overline{) 332.915} \begin{matrix} 4.96 \\ .75 \end{matrix}$

268	
649	2480
603	3472
461	
402	3.7.200
59	4.96

$3' = 28.68 \text{ m}$

0.55

COPY

MINERALS SEPARATION NORTH AMERICAN CORPORATION

220 BATTERY STREET, SAN FRANCISCO

~~#####~~

October 11, 1932

Edward H. Nutter, Esq.,
Chief Engineer, Minerals Separation N.A.C.,
San Francisco, California

Dear Sir:-

RE: BOHEMIA DISTRICT. OREGON

Herewith are the tabulated results of 17 laboratory floatation tests on several samples of ores from the above mentioned districts.

Samples tested were as follows:

52246	Noonday	350 foot level-sulphide ore
52247	Noonday	150 foot level-sulphide ore
52248	Peekaboo	Oxide ore
52249	Peekaboo	Sulphide ore
52250	Musick	Oxide Ore
52251	Musick	Oxide-Sulphide Ore
52252	Champion	No. 6 level-sulphide ore ✓
52253	Champion	No. 9 level-sulphide ore ✓

The tests show that it would be possible to make from each of the types tested a concentrate which would contain most of the gold. In some cases, sulphide lead would accompany the gold; in other cases, for instance from No. 6 level of the Champion Mine, there would be little lead but some copper.

Sulphide zinc, from a practical standpoint, was present only in one sample tested, that one from No. 9 level of the Champion Mine. In that case a differential operation (wherein successive concentrates, gold-copper-lead and zinc, respectively, would be expected) would be difficult on ore like the sample tested owing to the presence of soluble salts of zinc, aluminum, and iron. While it would probably be possible to make differential concentrates on clean ores subsequent to extensive mining operations, pending work on such ores, a positive statement to that effect could not be made.

Test details are, we believe, sufficiently clear as to require no amplification.

Very truly yours,

CARL F. WILLIAMS

Engineer in charge of testing.

COPY

MINERALS SEPARATION NORTH AMERICAN CORPORATION
220 Battery Street, San Francisco

REPORT OF FLOTATION TEST.

Sample of Complex Ore, from CHAMPION MINE #6 LEVEL, sent by
Bartels Mining Company, Cottage Grove, Oregon. ✓
Date, October 6, 1932
TEST NO. 1
Sample no. 52252
Weight tested 1000 grams
Reference 27-69-1

PRODUCT	WT. %	ASSAYS			DISTRIBUTION PER CENT	
		Au	Ag	Cu	Au	Cu
Head	100.0	2.27		2.03	100.0	100.0
Cu Conc.	20.3	8.57	13.3	7.36	76.6	73.7
Fe Conc.	10.7	3.40		4.08	16.1	21.5
Tail	69.0	0.24		0.14	7.3	4.8
Comb. Concs	31.0	6.78		6.23	92.7	95.2

Cu Treatment

Potassium amyl xanthate .3#
Yarmor pine oil .15#
Barrett oil #4 .1#
7 minutes

Fe Treatment

Sodium sulphide 2.0#
Potassium amyl xanthate .3#
~~Yarmor pine oil .15#~~
Barrett oil #4 .2#
10 minutes

SIZING TEST---TAIL

Mesh	% Wts.	% Cum. Wts.
+ 65	1.2	1.2
+ 100	9.4	10.6
+ 150	12.8	23.4
+ 200	18.0	41.4
+ 300	58.6	

10 mesh ore reground with soda ash 4.0#/Ton.

CARL F. WILLIAMS Eng. in charge *W. Long*

MINERALS SEPARATION NORTH AMERICAN CORPORATION
220 Battery Street, San Francisco.

REPORT OF FLOTATION TEST.

Sample of Complex Ore, from CHAMPION MINE #6 LEVEL, sent by Bartels Mining Company, Cottage Grove, Oregon. ✓

TEST No. 2

Sample No. 52252

Weight tested 1000 grams

Reference 27-68-1

PRODUCT	WT. %	ASSAYS				DISTRIBUTION PER CENT	
		Au	Ag	Cu	Zn	Au	Ag
Head	100.0	2.10	3.8			100.0	100.0
Conc.	28.9	6.53	11.0	6.48	2.0	89.8	83.2
Tail	71.1	0.30	0.9			10.2	16.8

Treatment

Potassium ethyl xanthate .4# in stages

Yarmor Pine oil .25# in stages
15 minutes.

Sizing test - Tail

Mesh	% Wts.	% Cum. Wts.
+ 65	0.6	0.6
+ 100	5.4	6.0
+ 150	11.2	17.2
+ 200	19.2	36.4
-200	63.6	

10 mesh ore reground with soda ash 6.0#/Ton

CARL F. WILLIAMS Eng. in charge testing

MINERALS SEPARATION NORTH AMERICAN CORPORATION
220 Battery Street, San Francisco.

REPORT OF FLOTATION TEST.

Sample of Complex Ore, from CHAMPION MINE #9 LEVEL, sent by ✓
Bartels Mining Company, Cottage Grove, Oregon.

Date, October 6, 1932

TEST No. 3

Sample No. 52253

Weight tested 1000 grams

Reference 27-69-2

PRODUCT	WT. %	ASSAYS					DISTRIBUTION PER CENT				
		Au	Ag	Cu	Pb	Zn	Au	Ag	Cu	Pb	Zn
Head	100.0	.90	4.0	1.65	5.28	11.09	100.0	100.0	100.0	100.0	100.0
Zn Conc.	18.1	4.50	13.8	3.68	3.2	56.2	90.5	62.5	40.5	11.0	91.6
Pb Conc.	12.2	0.47	10.0	6.44	25.6	6.7	6.4	30.5	47.7	82.4	7.4
Tail	69.7	0.04	0.4	0.28	0.5	0.15	3.1	7.0	11.8	6.6	1.0

Pb-Zn Treatment

Condition Pb-Zn Conc.

Potassium amyl Xanthate .05#
Cresylic Acid .2#
7 minutes

Lime 6.0#
10 minutes

Separation Pb-Zn

Potassium ethyl Xanthate .04# in stages
Yarmor pine oil .15# in stages
6 minutes

Floated Zinc

10 mesh ore reground with soda ash 8.0#, zinc sulphate 2.0# and
sodium cyanide .4#/Ton
Grinding same as in Test No. 4

Carl F. Williams Engineer in charge of testing

MINERALS SEPARATION NORTH AMERICAN CORPORATION
220 Battery Street, San Francisco, California

REPORT OF FLOTATION TEST

Sample of Complex Ore, from CHAMPION MINE #9 LEVEL# sent by
Bartels Mining Company, Cottage Grove, Oregon

Date, October 6, 1932

TEST No. 4

Sample No. 52253

Weight tested 1000 grams

Reference 27-68-2

PRODUCT	Wt. %	ASSAYS					DISTRIBUTION PER CENT				
		Au	Ag	Cu	Pb	Zn	Au	Ag	Cu	Pb	Zn
Head	100.0	1.00	2.5	1.5	4.7	11.09	100.0	100.0	100.0	100.0	100.0
Pb Conc.	10.3	5.47	12.4	9.24	39.6	18.0	56.4	50.3	63.4	86.9	16.7
Zn Conc.	15.9	2.37	5.6	22.44	2.3	54.4	37.7	35.1	25.9	8.4	78.0
Tail	73.8	0.08	0.5	0.22	0.3	0.8	5.9	14.6	10.7	4.7	5.3

Treatment

Retreatment

Potassium amyl xanthate .1#

Zinc sulphate 1.0# agt. 5 min.

Cresylic acid .15#
5 minutes

Froth 5 minutes.
Retreatment tail is the Zn Conc.

Mesh	Sizing Test - Tail	
	% Wts.	% Cum. Wts.
plus 65	0.8	0.8
plus 100	7.2	8.0
plus 150	11.2	19.2
plus 200	18.0	37.2
minus 200	62.8	

10 mesh ore reground with sodium sulphate 2.0#/Ton and zinc sulphate 2.0#/Ton

CARL F. WILLIAMS

Engineer in charge of testing

77-2 ☉ UNITED STATES SMELTING REFINING AND MINING COMPANY

Rate L-4

NINTH FLOOR NEWHOUSE BUILDING
P. O. BOX 1980 SALT LAKE CITY 10, UTAH

Salt Lake City, Utah,

DECEMBER 27, 1950

CHAMPION LEASE

ased From

RESIDAND, FORT AND JOHNSON, ATTORNEYS AT LAW, 72 WEST BROADWAY

Shipping Point: **DREBTON, OREGON**

2 Product Mine Gold License No.
by **Mévale** Received Sampled Assayed
Proportions—Gold Silver Copper, N. Y. Lead, N. Y. Zinc

DAYS	GOLD OZS. PER TON	SILVER OZS. PER TON	COPPER %	LEAD %	INSOLUBLE %	IRON %	ZINC %	SULPHUR %	LIME %	%	NON-SULPHIDE LEAD %	NON-SULPHIDE ZINC %
R. & M. Co.	20.605	17.80		7.70								
Umpire												
Sulphide				1.50								
Assent	20.6120	17.83	5.00	6.20	7.00	33.90	4.70	35.20	.30			

NET WEIGHT		METAL VALUES				TREATMENT CHARGES					
		Gold	% @		686 79					DEBIT	CREDIT
		Silver	% @		15 24	Based on	% Lead			6 15	
		Copper			15 36	Variation from	% Lead			2 38	
		Lead			16 74	Labor					
		Zinc				Insoluble				70	
						Zinc, excess over	%			-	
						Sul., excess over	%			2 50	
						As., excess over	%				
						Iron					2 03
						Lime					
Weight	2974	Total Metal Value			734 13	Net Treatment Charge				9 70	
Less	16 sax 12	Less Treatment Charge			9 70						
Weight	2932										
9.5 %	278										
Weight	2654										

Handwritten signature/initials in red ink.

Weight	1.327	Dry Tons @	724 43	Per Ton	961 32
Value under	Per Ton)	Wet Tons @	Per Ton	DEDUCTIONS	
Tax 3%					
Charge					7 50
Charge					
Charge					
Charge					
Wet Tons @	Per Ton	As Billed			105 90
Tax 3%					3 17
ing & Tax to:	Murray Mévale Truck Line				
	671 West North Temple				
	Salt Lake City, Utah				
Sax Returned by P. P.					2 45

Total Deductions

Amount Withheld Pending Receipt of Silver Affidavit

Net Payment

118 62
842 70
2 24
840 46

For *W. H. H. H.*

*Last received from
Champion Mill*

Ret. to Mill

INTERNATIONAL MINING COMPANY
Champion Contractors
Pay Harold Barton & Ralph Leonhardy
Diaston, Oregon

7/19/51

Cottage Grove, Oregon

	6/29	7/2		Concts.	1		2245		As	Sb
O	11.85	2.9	7.1	24.1	3.75	16.9	24.4	27.0	1.0	.3
D	11.85	2.9		24.05	3.75					
O	12.12	3.2	6.7	24.6	3.81	17.0	24.8	30.6	.2	
D	12.22	3.2		24.5	3.78					
G&D Mix	12.05s			24.47s	3.78m					
		-1.5								
	12.05	1.55	6.9	24.47	3.78	16.95	24.6	28.8	.1	
			6/27	24 200						6 170
			6/27	17 000	Chg lead under 30%	.10				2 845
			7/7	90 160	As + Sb .3% @ .50					150
				335 000						
										9 165
	-15%	.176775		39 951						1 695
	90%	.148275		4 137						2 500
						.9				225
	95%	.20160		20 959						15 585
	91%	.35.000		120 393						1 476
				185 440						
				12 109						
				173 331						12 109

32.581 173.331 5647 30

Union Assay Office, Assaying 11 50
A. P. Bardwell & Co., Impire 3 00

Hauling @ \$7.00 per wet ton, pay W. R. Iarson, Dorena, Oregon 251.37
3% Federal tax 7.54
Vo. 54104 258 91

Billig charge, pay Bartels Mining Co., c/o Stephens Accounting Service, Cottage Grove, Oregon Vo. 54105 393 75

Royalty 12 1/2% or \$5056.49 pay Bartels Mining Co., c/o Stephens Accounting Service, Cottage Grove, Oregon Vo. 54105 632 06

Cash advanced Vo. 54081 2500 00

C.P.R. Switching charge 7 13
3% Federal tax 21

13.81 133.41 552 40
3% Federal tax 16 57

Champion Contractors
1 Cu Pb Zn Cts. 4375 53
2245 54106 1271 77

Minimum 80000
NH 58156
71820

ASSAY RESULTS AND ESTIMATES OF TENOR OF ORES
BOHEMIA MINING DISTRICT
OREGON

An average analysis of 1,543 samples taken by H & H Mines Co. from all parts of the Champion Mine production zones was:

	<u>Gold</u> <u>oz/T</u>	<u>Silver</u> <u>oz/T</u>	<u>Copper</u> <u>%</u>	<u>Lead</u> <u>%</u>	<u>Zinc</u> <u>%</u>	
	0.55	4.21	1.71	1.72	2.15	
<u>Estimated grade of mill feed based on production from presently developed horizons in the Musick, Helena and Champion Mines; with up to 50% dilution of higher grade ore bands:</u>	0.25	2.00	1.50	4.00	5.00	
JIG CONCENTRATE, 5,052 lbs. (Last car milled from selected Champion Mine ore - 1951)	28.44	22.60	5.43	?	1.80	
"LEAD" CONCENTRATE, 32.58 dry tons (Last ore from largely oxidized stopes, Champion Mine - 1951)	3.78	24.47	12.05	1.55	6.90	
<u>Average assay on five carloads, selected ore, Helena Mine, 1939:</u>	1.276	1.46	0.68	2.10	3.1	<u>SiO₂</u> 61.37%

ABSTRACTS

GEOLOGY AND MINERAL DEPOSITS OF THE BOHEMIA MINING DISTRICT, LANE COUNTY, OREGON, by Michael Paul Schaub (M.S. in Geology, Oregon State University, 1978)

The Bohemia District is located in the Western Cascade Range, Lane County, Oregon. Over one million dollars worth of metals have been produced from mines of this area since 1872, making it one of the most important districts of the Cascades.

Bedrock consists of a portion of the Oligocene-Miocene Little Butte Volcanic Series and is composed principally of a thick section of pyroclastic tuffs overlain by massive interstratified flows of andesite and basalt. Other volcanic lithologies include flows of dacite porphyry and a multi-lithic breccia. Folds of small amplitudes and low angle unconformities of local distribution are widespread throughout the volcanic sequence and are interpreted to have formed by gentle deformation related to shallow subvolcanic magmatism.

Felsic plutons of probable Miocene age intrude the volcanic pile, and there are over 40 small plugs in addition to the Champion Stock. The plugs are predominantly quartz diorites, whereas the composite Champion Stock contains granodiorite, quartz monzonite, and felsic aplite.

Vein-type mineralization is widespread in both the volcanic and plutonic rocks of the district. Although gold has been the most important metal, the deposits are dominated by zinc, lead and copper that occur in veins containing chiefly quartz, carbonates, sphalerite, galena, chalcopyrite and pyrite. The veins have two principal orientations; the dominant vein set trends N. 65° W. and the secondary cross-veins trend N. 20° E.

Contemporaneous with vein mineralization was the formation of at least eight breccia pipes. These bodies are roughly cylindrical in shape, vertically oriented, and vary from 3 m to over 100 m in diameter. The constituent clasts are derived from the nearby country rocks and range from 1 mm to 0.5 m in diameter. The breccia fragments and surrounding country rock have been intensely altered to a quartz-sericite ± tourmaline assemblage. An admixture of quartz and tourmaline cements the breccias. Because the pipes grade upward into shatter breccias of highly fractured rock with little displacement, they are interpreted to have originated by collapse.

Low temperature propylitic alteration is widespread throughout the district and affects both volcanic and plutonic lithologies. Smaller zones of higher rank quartz-sericite and potassic alteration are localized in areas of structural weakness, such as breccias, and shear and fracture zones.

Geochemical abundances of trace elements in rock samples indicate that the district is zoned with respect to base metals. Anomalously high concentrations of copper, zinc, and lead are progressively encountered from east to west across the district. The molybdenum

anomaly is coincident with that of copper, and these are roughly centered upon the zone of potassic alteration.

Hydrothermal alteration and mineralization of the district are related to the pluton. Evidence for such a genetic relationship includes the close association of all Cascades mineral districts with felsic intrusions, structural features related to these intrusions, and chemical and mineral zonations within the district. Geologic and geochemical evidence that includes alteration patterns, fluid inclusions, breccia pipes, and mineral and trace element zonations, collectively suggest that only the highest levels of the hydrothermal system are exposed, and that it is possible that porphyry-type mineralization is present at depth.

August 28, 1974

Mr. G.E. McKelvey
Homestake Mining Company
Suite 905, Old National Bank Bldg.
West 422 Riverside Avenue
Spokane, Washington 99201

Dear Greg:

On August 12 and 13, at your request, I made a reconnaissance examination of the Bohemia district, said to be the largest and most productive in the western Cascades. The district, located 25-30 miles southeast of Cottage Grove in Lane County, Oregon, is in an area of extremely rugged topography and although there are good roads to all of the major mines in the central part of it, most of the outlying portions are not readily accessible. Total production from the district is said to have been valued at slightly in excess of \$1,000,000, most of which is attributable to the Champion and two smaller mines.

Fairly recent exploration of a substantial portion of the Bohemia district was undertaken in 1964 and '65 by Federal Resources Corporation which diamond drilled the Helena vein and drove a long adit 440 feet below the lowest, or 600, level of the Musick mine. It is my understanding that the results of this work were entirely negative. In 1964, Bohemia Minerals was incorporated for the purpose of consolidating the various individual properties in the district, and at this writing the company owns or controls at least 40 patented claims (shown on the enclosed Metsker maps) and a hundred or more unpatented claims, including all of the Champion property. There is no current activity in the district, however, and Mr. L.M. (Bud) Stewart, president of Bohemia Minerals, indicated that the company would like to attract a prospective purchaser. Mr. Stewart's address is: 1045 South 11th Street, Cottage Grove, Oregon.

Although most of the mines in the Bohemia district have been idle for many years, substantial portions of the underground workings are still open and I was able, therefore, to inspect several thousand feet of drifts and crosscuts in the Champion, Musick, and Noonday mines. I also examined dumps and surface outcrops on a number of other properties and collected stream sediment samples wherever I thought they might be helpful. I have reviewed most of the literature pertaining to the district and have discussed it with Mr. Harold Barton, a Eugene mining engineer who is especially familiar with it. This brief report, then, is based on all of the information that I now have at my disposal.

Geology of the district

The most comprehensive and detailed investigation of the geology of the Bohemia district (and I assume the most recent) is that by R.J. Lutton, who presented the

results of his study as a PhD dissertation (University of Arizona, 1962). Since it would be most difficult for me to adequately summarize Lutton's paper for you without a much more detailed study of it than I have made, I think it appropriate that I include his abstract at this point in my report.

"The base- and precious-metal quartz veins of the Bohemia mining district are genetically related to middle Tertiary granitoid intrusives of the same igneous cycle that formed the volcanic country rock.

"About two thirds of the volcanics exposed in the immediate area are pyroclastics, mostly lapilli tuff that was deposited in a fluvial environment. The remainder are mostly flows of basalt, andesite, dacite, and rhyolite. Local centers fed the flows through hypabyssal dikes and plugs and viscous domes. The basement structural grain has probably determined the pattern of early intrusives.

"A composite stock of granodiorite and quartz diorite has been intruded along a north-northeast line parallel to the axis of the Western Cascades province. A large percentage of the rocks of the area are propylitized, and in a wide aureole of contact alteration surrounding the stock, the pyroclastics have at least locally been metamorphosed to the albite-epidote hornfels facies. Somewhat later metasomatism has replaced country rock and the intrusives with quartz, sericite, and tourmaline along restricted zones.

"The granitoid intrusives warped the gently dipping volcanics and developed a system of longitudinal and transverse fractures. Distention of the fracture system by the intrusives and subsequent normal faulting on individual fractures during the period of mineralization has provided space for deposition of vein minerals. Epidote, specularite, chlorite, and quartz locally accompany minor sphalerite, chalcopyrite, galena, and pyrite in an early stage of vein filling. During intermediate stages, the silica, with or without contemporaneous hematite and sulfides, accumulated in horizontal layers under the influence of gravity. Such bedding suggests a low specific volume for the hydrothermal fluid, and therefore, it also suggests a moderate temperature at the prevailing shallow depth.

"Mechanical washing of siliceous and minor argillaceous debris from the oxidized zone to just below the water table in the vein has developed secondary vein sediments. Secondary wad, which is interbedded with clastic debris in the oxidized zone, probably results from hydrolysis of manganese dissolved from carbonate gangue.

"The relatively low economic potential of the Cascades metallogenic province is considered to be a consequence of the position near the edge of the continent and of the old age of mineralization with respect to the beginning of andesitic volcanism.

"Ore controls in the Bohemia district include: 1) proximity to the center of mineralization, which was probably a cupola; 2) open channels, which resulted from preferential dilation of steep segments of irregular veins; 3) a concentration of subsidiary veinlets; and 4) vein intersections."

In regard to the economic geology of the district, it should be noted that all of the production has come from the shallow, oxidized portions of narrow, steeply dipping veins, most of which strike northwest to west and are clustered in an area of about five square miles. The mineable ore bodies have been found in definite shoots that typically comprise about 30% of the total volume of the veins, and in the Champion mine, for example, average little more than two feet in width. The narrow widths, low tenor, and complex mineralogy have discouraged mining of the sulfide zone.

Although Lutton states that the various rock types in the district have undergone more-or-less pervasive pre-ore propylitization and metasomatism, he also notes that the ore bodies do not seem to have an affinity for any particular type. So far as I know, neither massive replacement nor disseminated mineralization (with the exception of pyrite) have been reported anywhere in the district.

Champion mine

The Champion mine, the most extensively developed and the largest single producer of the district, has a recorded partial production of 24,297 tons of crude ore that contained 5,471 ounces gold, 16,434 ounces silver, 189,583 pounds copper, 63,196 pounds lead, and minor zinc; this would indicate an average grade of 0.225 ounce gold, 0.68 ounce silver, 0.39 per cent copper, and 0.13 per cent lead — hardly a bonanza.

The Champion vein, which strikes N65°W throughout most of the mine, has been developed on nine levels along a strike length of about 2,700 feet and over a maximum vertical interval of 1,200 feet. Nearly all the production has come from above the 900 level and the lowest, or 1200, level is said to have encountered little or no ore in 700 feet of drifting on the vein. I could not verify this statement since the 1200 is completely caved at the portal and full of water, although I believe it could be easily reopened. The 900 level, which is still open, has been stoped for considerable distances both east and west from the crosscut adit and it would appear that the average width of the vein on this level is less than four feet.

Conclusions

It seems apparent to me that the future economic potential of the veins in the Bohemia district is just about nil; they are narrow, erratically and weakly mineralized, and dependent almost entirely on their gold content for value. In addition, the reported absence of ore both on the 1200 level of the Champion mine and at a similar depth on the Musick property may be more than coincidence, i.e., the veins in this district may be bottoming at this depth.

So that would seem to leave us only with the residual possibility of a buried porphyry somewhere. Lutton has suggested that the veins in the central part of the district formed above a cupola similar to an exceptionally well altered one that he says is present southeast of the Bohemia stock, but at "greater depth". This, in turn, would suggest the possibility of a deeply buried porphyry but I would have to rank it a real long shot in the absence of some evidence, however weak, of widespread Cu-Mo mineralization. Quantitatively, there really isn't much mineralization at all in the Bohemia district.

Sincerely yours,

Ronald C. Parker

Enclosures