

A Special Meeting of the Board of Directors of the International Smelting Company was held at the office of the Company, No. 42 Broadway, New York City, Wednesday, October 9th, 1918, at 12.30 o'clock P. M.

PRESENT: Messrs. C. F. Kelly, B. B. Thayer, W. D. Thornton, A. H. Melin, L. D. Ricketts and C. E. Mills.

ABSENT; Mr. John D. Ryan.

The President, Mr. C. F. Kelley, in the Chair.

The minutes of the meeting of the Board of Directors held on September 26th, 1918, were read and approved.

The Chairman submitted to the meeting a communication from the Inspiration Consolidated Copper Company, accepting the proposition of the Company to add the sum of \$20.00 per ton to the item of \$34.00 per ton now in our contract with that Company covering the charges called "Converting, Freight East and Refining."

On motion, duly made and seconded, it was

RESOLVED: That the communication be placed on file.

On motion, duly made and seconded, it was

RESOLVED: That the action of the officers of this Company in purchasing from the Plumas Mines Company 630,000 shares of stock of the Walker Mining Company for the sum of \$630,000.00 be, and the same is hereby ratified, approved and confirmed.

On motion, duly made and seconded, it was

RESOLVED: That Mr. O. M. Kuchs and Mr. J. B. Whitehill, or either of them, be, and they are hereby appointed true and lawful attorney in our name to vote as out proxy upon the stock of the Walker Mining Company owned by us at the Stockholders' Meeting of that Company to be held at Phoenix, Arizona, on October 24th, 1918.

On motion, duly seconded, it was

RESOLVED: That the action of the officers of the Company in entering its subscription of Two hundred and fifty thousand dollars (\$250,000.00), face value, of the Fourth Issue of Liberty Bonds be, and the same is hereby ratified, approved and confirmed.

There being no further business before the Board, on motion, duly seconded, the meeting adjourned.

D. B. Hennessy,
Secretary.

MIN 00000185

CORPORATE NAME

WALKER MINING COMPANY

DATE INCORPORATED

OCTOBER 23, 1913

UNDER LAWS OF STATE OF

ARIZONA

CHARTER

25 YEARS - EXTENDED 10-23-1938 FOR 25 YEARS

CAPITAL STOCK

	<u>SHARES</u>	<u>PAR VALUE</u>	<u>AMOUNT</u>
COMMON:			
AUTHORIZED:			
ORIGINAL	1,250,000	\$ 1.00	\$ 1,250,000.00
INCREASED 5/ 1/1923	1,750,000	1.00	1,750,000.00
ISSUED	1,749,308	1.00	1,749,308.00

HELD IN TREASURY - NONE

NON-ASSESSABLE

PREFERRED:

AUTHORIZED 9/30/1915	100,000
ISSUED	100,000
REDEEMED 7/10/1925	100,000

TRANSFER AGENTS

H. I. CARSON	25 BROADWAY, NEW YORK, N.Y.
E. J. DUDLEY	25 BROADWAY, NEW YORK, N.Y. (ASS'T)
A. H. COSTELLO	25 BROADWAY, NEW YORK, N.Y. (ASS'T)
ROM WARBURTON	KEARNS BLDG., SALT LAKE CITY
MARJORIE A. BROWN	KEARNS BLDG., SALT LAKE CITY (ASS'T)

MIN 000001582

REGISTRARS

THE CHASE NATIONAL BANK, NEW YORK CITY, N.Y.
CONTINENTAL NATIONAL BANK & TRUST Co., SALT LAKE CITY

STOCK LISTINGS

SALT LAKE STOCK EXCHANGE
NEW YORK CURB EXCHANGE

ANNUAL MEETING

FIRST TUESDAY IN MAY AT 3:00 O'CLOCK P.M.,
PHOENIX, ARIZONA

OFFICERS

PRESIDENT	J. R. WALKER
VICE-PRESIDENT	P. J. GEISLER
VICE-PRESIDENT	J. O. ELTON
SECRETARY AND TREASURER	J. B. WHITEHILL
ASSISTANT SECRETARY	JAMES DICKSON
ASSISTANT SECRETARY	E. O. SOWERWINE
ASSISTANT SECRETARY	J. H. COLLINS
ASSISTANT SECRETARY	A. R. MUELLER

DIRECTORS

JOHN F. DUGAN	KEARNS BLDG., SALT LAKE CITY
L. D. FOREMAN	
P. T. FARNSWORTH, JR.	WALKER BANK BLDG., SALT LAKE CITY
E. L. MAY	912 EAST 2ND SO., SALT LAKE CITY
J. R. WALKER	NEWMOUSE BLDG., SALT LAKE CITY
J. B. WHITEHILL	KEARNS BLDG., SALT LAKE CITY
ROM WARBURTON	

ELECTED FOR ENSUING YEAR.

EXECUTIVES

GENERAL SUPERINTENDENT OF MINES	JOHN F. DUGAN
MANAGER	H. M. HARTMANN
MILL SUPERINTENDENT	RALPH HAYDEN

LOCATION OF OFFICES

EXECUTIVE OFFICES	KEARNS BLDG., SALT LAKE CITY
MINE OFFICES	WALKERMINE, CALIFORNIA

LOCATION OF PROPERTIES

SPRING GARDEN, PLUMAS COUNTY, CALIFORNIA

STATES IN WHICH AUTHORIZED
OR LICENSED TO DO BUSINESS

UTAH
CALIFORNIA
ARIZONA

5-2-44
GKD

MIN 000001583

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Report on
THE WALKER COPPER MINE.
Located in
PLUMAS COUNTY, CALIFORNIA.

Location	Page 1
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Conclusion	" 6

MIN 000011771

Salt Lake City, August 21, 1915.

Report on
THE WALKER COPPER MINE.

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LOCATION

This mine is situated in Plumas County, California, about 20 miles northwest of the town of Portola. This town is on the Western Pacific, the Boca & Loyalton and the Sierra Valley Railroads. There is a railroad owned and operated by the Feather River Lumber Company which extends four miles toward the mine. I am reliably informed that this Lumber Company next spring will extend this road 3-1/2 miles farther toward the lower end of Grizzly Valley. From this point to the mill would be exactly 12 miles.

PROPERTY:

The property consists of 34 claims, 10 of which are patented. The others are held by location. Most of these claims are covered with a heavy growth of the very finest kind of pine and fir timber; enough to last the mine for all time.

FORMATION:

The formation in which the veins occur, is a diorite. The diorite has been fissured by an upheaval to the east, as evidenced by the large lava flow which extends over a large area.

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VEINS

There is only one vein developed to any extent, and that is the one occurring on the Bullion Claim. This vein outcrops very strong and can be traced to the northwest for the length of three claims. Its strike is North, 25 West, and dips 65 degrees to the east. Both walls are diorite. Along the footwall there is a belt of decomposed diorite in which occurs some garnet with low copper values. This belt may be commercial ore at a greater depth.

DEVELOPMENT

The development on the mine consists of a shaft 125 feet deep, one tunnel 250 feet long, and one 300 feet long. At a point 65 feet down the shaft, a cross-cut was made to the hangingwall of the vein, a distance of 20 feet. A drift was run north for 75 feet. Forty feet north of the shaft, a cross-cut was made back to the footwall, a distance of 50 feet. This crosscut showed a well defined vein of 50 feet in thickness. The first 9 feet next to the hangingwall averages 6.5 per cent copper and \$3.00 in gold and silver. The other 41 feet assays from 1½ to 2 per cent copper and \$1.50 in gold and silver.

From the bottom of the shaft the vein was cross-cut for a distance of 35 feet. The cross-cut was not extended to the footwall, the face being in ore of 3½ value at the present time. The ore for a distance of 15 feet from the hangingwall averaged 5½ per cent copper and \$3.00 in gold and silver. The other part of the vein goes from 2½ to 3 per cent copper and \$2.00 in gold and silver. The bottom of the shaft, which is near the footwall, is in very good ore at the present time.

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The vein has improved greatly from the 65 to the 125 level. Undoubtedly in the next 100 feet, the entire vein will be a good grade ore. A tunnel has been run in the footwall near the surface, paralleling the vein for a distance of 200 feet. This tunnel shows a large body of decomposed diorite, carrying a good percentage of garnet with small copper, gold and silver values. The tunnel has not reached sufficient depth to get into the sulphide ore, and this garnet material is probably a capping of a large body of sulphides which will be found at a greater depth.

TREATMENT

The ore of this mine is admirably adapted for treatment by the flotation process. A test on a 100 lb. sample was made by the Mineral Separation Co. of San Francisco, and a saving was effected of 93 per cent of all values. An offer was made by this company to erect a plant guaranteeing a saving of better than 90 per cent on all the ores of the mine.

A thorough test has lately been made by the General Engineering Company of Salt Lake City, by which they obtained an extraction of 97% of all values. The concentrates made from this test averaged 20% copper and \$8.00 in gold and silver. Those made by the Mineral Separation Co. were somewhat higher, averaging 22 to 24% copper. The variation in the grade of the copper is explained by the difference in character of the ore treated in the two tests.

The ore next to the hangingwall for an average distance of 12 ft. will average in value 5½ to 6% copper, just as it is broken down. It will take 3½ to 4 tons of this ore to make one ton of concentrates

MIN 000011774

while the lower grade part of the vein will take 10 to 15 tons of ore to one ton of concentrates.

A conservative estimate of the value of this ore as treated by the flotation process would be as follows:

Cost of mining 3½ tons @	3.00	10.50
" " " " " " " "	.25	.87
" " " " " " " "	.50	1.75
" " " " " " " "		5.00
" " " " " " " "		10.00
Total cost of 1 ton of concentrates...		28.12

Value of 1 ton of concentrates of		
20% copper with copper at 17¢ per		
lb., New York quotation		68.00
Gold and silver values		10.00
		78.00

Less deduction of 2½% on 400% copper	7.00	
Net value		71.00

Cost of product'n	28.12
Net per ton.....	42.88

Or \$12.25 per ton of crude ore.

The ore in the 3 foot streak on the hangingwall side of the vein averages one ton of concentrates to every 3½ tons of ore. That obtained from the lower grade part of the vein would be one ton of concentrates from 10 to 15 tons of ore.

The facilities for working the property are good, except in the matter of transportation. A good wagonroad is already built to the Railroad Company, over which freight can be hauled for .50 per ton. A railroad could be constructed to the property at a distance of 16 miles, starting from the end of the railroad which belongs to the Lumber Company situated at Pericle.

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AVAILABLE ORE

The ore actually in sight above the 125 foot level is 10,000 tons, but the ordinary method of calculating ore is to allow fifty feet beyond each exposure. By this method there is in the mine a block of ground 175 feet long by 175 feet deep and 12 feet thick, making a total of 30,825 cubic feet. Allowing 12 cubic feet to the ton, this will yield 25,680 tons of ore. At the present price of copper (i.e. 17¢ per pound) this ore will net \$12.00 per ton, or a total net profit of over \$300,000. With a 15¢ copper market it will net \$8.00 per ton or \$200,000. This estimate is for a 100 ton plant and with a wagon haul to the railroad.

This deposit of copper will without a doubt go to the deep. It is so big and strong and every part of the vein is so thoroughly mineralized that there is no doubt whatever of its continuing to the deep. The outcrop is continuous for over a mile in length, and while we have no way of determining definitely the length of the ore shoot from surface indications, it is safe to say that it will continue for a long distance. With a large equipment and rail transportation the entire vein of 50 feet in width can be worked at a good profit.

The grade of the ore in the footwall side where the low grade ore occurs is improving with depth. The shaft is now in that part of the vein and it averages about 3% copper. The same ore on the 65 foot level averages only 1½ to 2%. The indications are that with another 100 feet of depth, the entire vein of 50 feet can be worked at a good profit even with a small mill.

MIN 000011776

CONCLUSION:

The main thing that recommends this mine is the large vein,
the high values and the easy treatment of the ore. It will prove a winner
if given good management and good equipment.

Respectfully submitted,

(Signed) Jno. W. Cowan

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REPORT
ON
COPPER MINE
OF THE
WALKER MINING COMPANY
Plumas County
California
9/3/15

G. T. Hansen

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REPORT
ON
COPPER MINE
OF THE
WALKER MINING COMPANY
Plumas County
California
2/3/15

REPORT
THE WALKER COPPER MINE.

LOCATION.

The copper mine of the Walker Mining Company is located about 24 miles by wagon road, or 20 miles by air-line, northwest of Portola in Plumas County, California. Portola is a town of about 500 inhabitants, on the Western Pacific, the Sierra Valley and the Boca and Loyalton Railroads. In general, Portola is about 60 miles northwest of Reno, Nevada.

HOLDINGS:

The property consists of 10 claims patented and 24 claims held by location, 34 claims in all. All of the claims which are located on the principal mineral belt, including the outcropping of the main vein, have been patented, and form the center or core of the property. The claims held by location surround this center and, outside of their mineral prospects, are valuable in their protection of the principal ore body against any possibilities of litigation. The holdings also include a millsite, held by location.

CHARACTER OF COUNTRY

The country surrounding this mine is mountainous and is cut through with numerous valleys, well adapted for road building. The head of one of these valleys extends to the Company's millsite, and through this is a road of favorable grade over which I had no difficulty in travelling by automobile. The country is heavily overgrown with virgin pine and fir timber; some of the finest trees I have ever seen. The timber on the

property will supply all of its needs.

FORMATION

The formation is diorite, which, where the veins occur, has but a scanty overburden. The fissuring in this diorite has evidently been caused by an upheaval to the east.

The veins which have been discovered are true fissure veins. The principal vein (on which is nearly all the development) occurs on the Bullion Claim. The outcropping of this vein can be traced for about 4000'. Its strike is north 25° west, its dip 65° to the east.

The ore is quartz and decomposed diorite carrying chalcopyrite and some bornite with gold and silver values.

The mineralization is regular and continuous. The vein is strong as to width, walls and mineralization and has evidences of continuity both in depth and length.

DEVELOPMENT

Development has been confined principally to the main vein on the Bullion Claim. It consists of a 250' tunnel, a 300' tunnel and a vertical shaft 125' deep. The two tunnels were early undertakings, the former having been driven near the surface in the foot-wall parallel to the vein. It shows decomposed diorite with garnet and some copper, gold and silver values. Its principal value lies in its indication of the large mineralized area and the possibility that this mineral belt outside of the vein may become commercial when the sulphide zone is reached at greater depth. The latter tunnel

was started as a crosscut from a point which would give about 200' vertical depth on the vein, was driven 300' and abandoned in favor of the shaft, which for several reasons, seems the preferable method of development. The shaft is sunk on the vein. At the 65' level, a crosscut reaches the hanging wall of the vein, 20' from the shaft. A drift in the vein follows this hanging wall for a distance of 75'. At a point in this drift, 40' from the shaft, a crosscut extends 51' to the footwall. Both walls are diorite and extremely well defined, the vein showing strong for a width of 51'. This vein is mineralized throughout, the high grade body following the hanging wall. A width of 9' from an average of three channels across at a point between the shaft and the face of the drift, showed 6 1/2% copper and \$2.50 in gold and silver. There are some zones of enrichment showing higher values, for instance, an average across 9' in the face of the drift gave 10.8% copper and \$2.40 in gold and silver. The remaining 42' of this vein averages 1 1/2% copper and \$1.25 gold and silver.

From the bottom of the shaft a crosscut extends 35' to the hanging wall. The high grade ore body on the hanging wall at this level has widened to 15' and gave an average of 5 1/2% copper and \$2.50 in gold and silver. The crosscut has not been extended to the footwall but is in ore at the present time showing an average of 2 1/2% copper and \$2.00 gold and silver. This is also the average for the 20' on the crosscut between the high grade and the shaft. The bottom of the shaft is in ore of about the same grade.

ORE BLOCKED OUT

Included within the boundaries of the development workings is a block of ore 110' deep, 75' long and 12' thick. I estimate the ore in place at 11 cubic feet per ton. It will probably be nearer 10 cubic feet per ton. In this block there are 99,000 cubic feet or 9,000 tons of ore averaging 5 $\frac{1}{2}$ % copper and \$2.50 gold and silver. There is on the dump at the mine 1200 tons of the same grade of ore, making a total of 10,200 tons within this block.

Where development work in a continuous fissure vein shows ore on every side, as this does, the ore is calculated by allowing 50' beyond each exposure. I am adding an additional factor of safety by allowing 50' in depth only and in cutting this to 25' beyond each exposure in length. This gives us a block of ore 135' long, 150' deep and 12' thick, equalling 240,000 cubic feet, or 21,800 tons which with the 1,200 tons on the dump, makes a total of 23,000 tons. This is commercial ore, based on present haulage, power and small production conditions.

In the block within the development workings, there is a very large tonnage of 1 $\frac{1}{2}$ % to 2% ore which is not being listed as an asset at the present time.

SURFACE EQUIPMENT.

The shaft is equipped with a new head-frame, new ore-bins and terminal for aerial tram, boilers, steam hoist, steam air-compressor, steam pump and new shaft-house and blacksmith-shop. The accommodations consist of a boarding-house and several cottages. All lumber for these

improvements was saved on the ground by the Company's mill at a nominal cost. A surplus of lumber for general improvements has been sawed and stacked at the shaft. The saw-mill has moved to the millsite where it is now sawing lumber for mill construction.

TREATMENT

This character of ore is well suited for concentration by flotation. This is a fortunate feature for the simplicity of the flotation process makes the cost of treatment and the first cost of a mill very low.

A test was made by the Minerals Separation Company of San Francisco on an average 100% sample of the ore. This test showed an extraction 93% of all values and a production of concentrates showing from 22% to 24% copper. A more recent test by the General Engineering Company was more thorough. The results from this test show it to be more profitable commercially to increase the extraction with a slight decrease in grade of concentrates. This test demonstrated conclusively that an extraction of 97% of all values may be obtained with concentrates grading 20% copper and \$8.00 gold and silver. The record of flotation is that a properly conducted test checks with the mill operation. The ratio of concentration will be 3½ tons ore into 1 ton concentrates. Milling and dressing costs will be within \$1.00 per ton on the basis of 100 tons per day.

HANDLAGE:

As a matter of advantage for water power and handlage the

millsite is located about 4200' from the shaft. An aerial tram has been purchased and will span this distance, transporting the ore by gravity.

A railroad spur extends from Portola toward the mine for a distance of 4 miles, making the net wagon haul for concentrates, 20 miles. The road has easy grades, is of good material for the greater part of the way, and with the expenditure of about \$5,000.00 in immediate repairing, and with reasonable attention, the wagon haulage will present no unusual problem. Wagon haulage will cost about \$5.00 per ton of concentrates, or at the rate of about \$1.50 per ton crude ore before treatment. Freight per ton of concentrates to Salt Lake Smelters, will be \$5.00 per ton of concentrates, or at the rate of \$1.50 per ton of crude ore.

POWER.

Power has been estimated on the basis of use of Diesel Oil Engine. Negotiations are now pending for the extension of a power line into the property, in which case, with a favorable contract, the power cost could be somewhat cheapened.

WATER

At the present time, there is very little water in the mine. Three hours pumping per day through a 2½" line, keeps the mine clear.

At the millsite, a stream, fed by springs, flows about 2 second feet for the whole year. It will be flumed to the head of the mill and is ample for milling purposes, for four or five times the mill capacity contemplated at present. Being spring water, it never freezes.

PROFIT

I estimate the overall cost of handling ore from mine to

settlement, at \$8.00 per ton of crude ore. The profit of a ton of ore at 17% copper would therefore be about \$11.00 per ton, or the total net value of ore would be \$252,000.00. At a 15% copper market, there would be a net value of \$184,000.00.

PRODUCTION:

I estimate the time necessary to put a mill into commercial operation on this property, with the progress already made, at 7 months from date. I estimate the total cost of bringing this mine from its present condition to a state of production, at \$100,000.00, allowing funds for mine development during mill construction. This is on the basis of a 100 ton per 24 hours mill.

PROSPECTS

The vein outcrops on the surface for about 4000'. It is mineralized for its full width of 50' from the surface to the bottom of the shaft. It does not show any narrowing with depth. The values of the entire vein are increasing steadily with depth. The high grade body on the hanging wall is 9' wide on the 65' level and 15' wide on the 120' level. All development workings in the shaft have been and are now in ore. The walls are clear and the vein is strong. I see no reason why the high grade should not continue to widen with depth until it covers the entire width of 50'. The indications are that the ore will continue along the fissure and go to depth, thus producing an exceptionally large tonnage of high grade ore.

CONCLUSION:

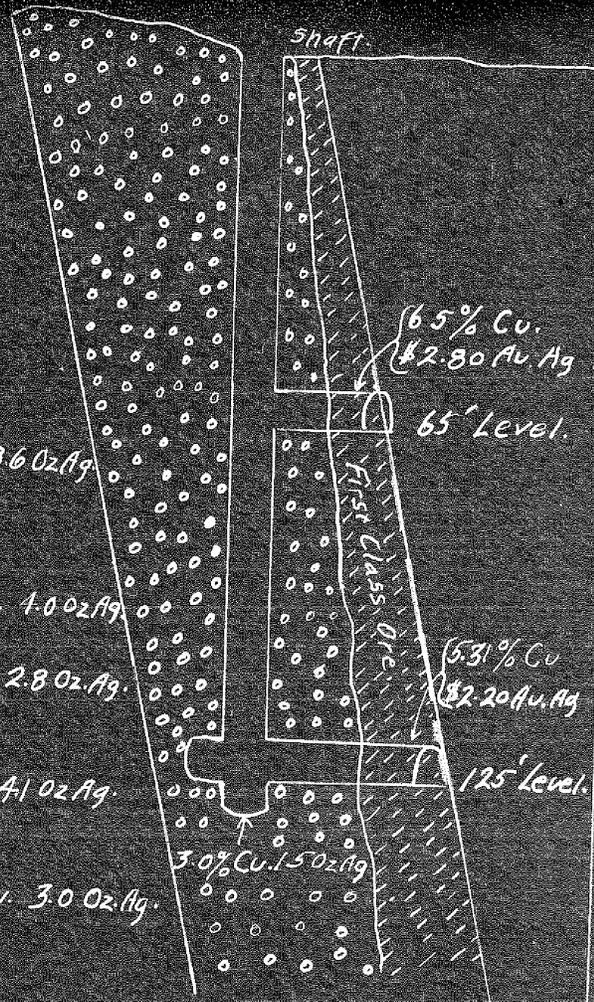
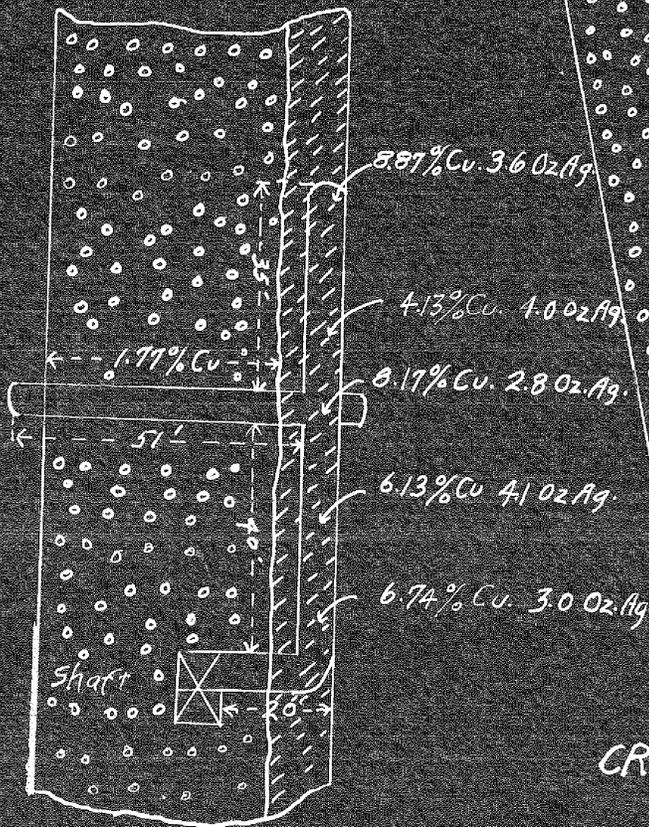
My conclusion is, since all workings are in ore, the mining of ore for milling purposes will develop more ore at low cost and the "mining probability" predicts a long life.

Respectfully submitted,

9-3-15
GUY

G. Y. Hanson

PLAN 65 FT LEVEL



CROSS SECTION.

WALKER MINE

Vein 50' Thick. 12' Average 6% Cu, 2.5 Au + Ag. Bottom of Shaft
in 3% Ore at present.

Aug. 30, 1915.

Scale 1 inch = 25 ft.

W 163

611

1920.07 137

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Ataconda Copper Mining Company

GEOLOGICAL DEPARTMENT

REPORT ON
RECENT DEVELOPMENT

IN THE
WALKER MINE

PLUMAS COUNTY, CALIFORNIA

BY
M. H. GIDEL

Butte, Mont.
Oct. 1920.

16304.10

Subject: Geological Department of Ataconda Copper Mining Company. This is a report on the Walker Mine, Plumas County, California, prepared by M. H. Gidel, Geologist, in 1920. The report is a copy of the original report, and is not a reproduction of the original report.

REPORT ON

RECENT DEVELOPMENT

IN THE

WALKER MINE

PLUMAS COUNTY, CALIFORNIA

INTRODUCTION

On August 23rd. and 24th., 1920, I took geologic notes in the new work in the Walker Mine. My previous examination was made in December, 1919, since which time considerable development has been done on the Third and Lower levels. The accompanying Long-Section has been prepared from data furnished by Mr. V. A. Hart for the purpose of showing the new ore developed on the Lower level in relation to the ore shoot on the upper levels. Geologic features such as faults and dikes are also shown, and portions of the vein averaging three percent or more in copper are colored red.

NEW DEVELOPMENT

Third Level

On the Third Level the main drift was extended 315 feet north-west on the vein. Three small shoots of ore having a combined length of 155 feet were developed here. See map. From this new drift, a 170 foot diamond drill hole into the hanging-wall cut no mineralization of consequence.

At a point 110 feet north of the winze beyond the intersection of the large ore-shoot and fault, another hole was drilled into the hanging-wall. No vein was found here. The purpose of this work was to determine whether or not the ore-shoot was displaced to the right by the fault.

The main drift southeast was extended 140 feet in irregular oxidized vein.

Adit or Lower Level

From the main crosscut on the Adit Level, the Walker Vein has been developed for a distance of 1400 feet, largely by drifting. A drill-hole from the main crosscut cut 2.1 percent copper ore, which point marks the present southern limit of development on the vein in the property. The discovery of ore bunches in the first 60 feet of drifting from the crosscut was encouraging in view of the fact that the main ore shoot in the upper workings was several hundred feet farther northwest, and that it had a flat pitch northward between the Third and Fourth levels. In drifting northwest-ward on the vein, a granite dike 40 feet wide was cut. This dike cut the vein and contained inclusions of ore and gneiss near the south contact. The vein was displaced by the granite, presumably to the left, although another vein was found to the right in drill-holes. The vein exposed in the crosscuts to the left (west) north of the dike is quartzite and contains much less sulphide than that portion of the vein south of the dike. The vein cut in the drill-holes to the right or hanging-wall corresponds mineralogically to the vein in drift south of the dike.

In drifting north on the vein, another granite dike six feet wide was cut. Small lenses of ore were developed. It is probable that the south portion of the main ore shoot occurs in the drift between points that are 220 feet and 160 feet south of the raise. For about 100 feet on either side of the raise

the vein contains less than two percent copper. Ore in the raise begins at a point about 35 feet above the sill. From a point 100 feet to 270 feet north of the raise, the ore is 10 to 15 feet wide and averages 3.40 per cent copper. Northward beyond this limit, the vein shows an average copper content under 2.5 percent. A clay seam has appeared on the hanging-wall side of the vein. It is probably the same fault or wall that terminates the ore body on the upper levels.

A portion of the above described drift does not develop the full width of the vein. Assays shown on the map without widths were obtained on car samples from a drift of normal size, that is, five or six feet wide.

From the drift on the lower level five holes were drilled. Two holes 580 feet apart were drilled into the foot-wall. No veins were cut, which fact would lead one to correlate the foot-wall vein in the main crosscut with that drifted on north of the forty foot granite dike.

Three holes were drilled in the hanging-wall side of the drift. The first one is located about 90 feet north of the larger granite dike. A strong vein was cut in this hole which contains ore. Another hole 200 feet north of this cut lean quartz, and a third hole near the raise cut no mineralization. This hanging-wall vein is probably a branch of the main vein, diverging from same to the southeast.

CONCLUSIONS.

Oct. 1920. The ore developed on the Lower level beneath the ore shoot on the Fourth level totals 320 feet in length, has a width of nine to fifteen feet, and contains about 3.3 percent

copper. On the Fourth level the ore shoot is 700 feet long, is 15 to 30 feet wide, and is estimated to contain 4.53 percent copper. The Lower level shows a split in the ore shoot with lean vein intervening. Briefly stated, the showing of ore on the new Lower level is not as good as that developed on the upper levels of the mine. There is more quartz in the vein on the Lower level than on levels above.

However, there remains the possibility that a flat pitching portion of the ore shoot lies northwest of the present face of the Lower drift on the hanging-wall side of the fault. This is suggested only by the meagre exposure of a wedge-shaped body of ore on the hanging-wall side of the fault near the winze on the Fourth level.

It is probable that more ore can be developed beneath the small shoots exposed in the north end of the Third level. Drifting should be continued in this direction on the Lower level with adequate drilling or crosscutting into either wall at intervals of four hundred or five hundred feet.

Respectfully submitted,

M. H. Giddell

Butte, Mont.
Oct. 1920.

) COPY)

CAUTION

Read this form and all instructions carefully and fill in supplementary statement on back of return first. Totals in supplementary statement must agree with totals on face of return.

FORM 1081 (Revised January, 1918).—UNITED STATES INTERNAL REVENUE

CORPORATION INCOME TAX RETURN

(FOR ALL CORPORATIONS EXCEPT RAILROAD AND INSURANCE COMPANIES)

(Do not write in this space.) RECEIVED

Table with columns: LIST, Month, Page, Line. Includes 'Audited by' field.

Return of annual net income for the calendar year 1917. fiscal year ended Dec. 31, 1917

Name of corporation WALKER MINING COMPANY

Principal office Kearns Bldg., Salt Lake City, Utah

Kind of business carried on Mining & Milling Ore Date of organization Nov. 15, 1913

Table for items 1 and 2: Total amount of paid-up capital stock outstanding and Total amount of bonded or other interest-bearing indebtedness.

Main income and deduction table with columns for INCOME, DEDUCTIONS, and TAX. Includes items 3 through 16.

We, the undersigned, president and treasurer of the above-named company, whose return of net income is herein set forth, being severally duly sworn, each for himself, depose and say that the items entered in the foregoing report and in the supplementary statement and in any additional list or lists attached to or accompanying this return are, to his best knowledge and belief, true and correct in each and every particular.

Sworn to and subscribed before me this ... day of ..., 1917

(Signed) J. R. Walker President.

Seal of officer taking affidavit.

J. B. Whitehill Treasurer.

GENERAL INSTRUCTIONS.

Excess profits tax.—For the purpose of war excess profits tax, every corporation subject to income tax shall be deemed to be engaged in business, and all the trades and businesses in which it is engaged (whether continuously carried on or not) shall be treated as a single trade or business, and all its income from whatever source derived shall be deemed to be received from such trade or business. In the case of a trade or business having no invested capital or not more than a nominal capital, the excess profits tax is equivalent to 8 per cent of the net income in excess of \$3,000. This tax applies primarily to corporations engaged principally in rendering personal service in which the employment of capital is not necessary and the earnings of which are to be ascribed primarily to the activities of the owners. In the case of a trade or business having more than a nominal invested capital, the excess profits tax is equal to various percentages of the net income, depending on its ratio to the invested capital. Every corporation having a net income of over \$3,000 for the taxable year must make a return of invested capital and compute the amount of tax on Form 1103. For further instructions see Regulations No. 41, Relative to the War Excess Profits Tax. A copy can be obtained from any collector of internal revenue. Time of filing returns.—Returns made on the basis of a calendar year must be filed on or before March 1 with the collector of internal revenue of the district in which is located the principal place of business of the corporation; if made on the basis of a FISCAL YEAR, they must be filed within 90 days after the close of such year. *Fiscal year.—Corporations desiring to make returns of annual net income on the basis of a fiscal year other than the calendar year must, not less than 90 days prior to March 1 of the year in which the return would be due if made on the calendar year basis, file with the collector a notice in writing designating the last day of some month as the close of such fiscal year. A return for that portion of the calendar year ending with the date designated as the close of the fiscal year must be filed on or before the first day of March of the next calendar year, and the return for each full fiscal year thereafter must be filed within 90 days after the closing date of the fiscal year so established. Extension of time.—In the case of neglect to file the return within the prescribed time, the collector is authorized to grant an extension of the filing period not exceeding 90 days from the normal due date, provided such neglect was due to absence or sickness and provided an application for such extension is made in writing prior to the expiration of the period for which extension may be granted. In meritorious cases the Commissioner is authorized to grant such further extension as he may deem proper. Signatures and verification.—Returns must be signed and verified by two officers of the corporation, that is, by the president, vice president, or other principal officer, and the treasurer or other financial officer, and must be sworn to before an officer authorized to administer oaths, and the seal of the attesting officer, if he is required to have a seal, must be impressed on the return in the space provided for that purpose. Subsidiary companies.—The corporation making this return must attach hereto a list of all its subsidiary companies, if any, with the location of the principal place of business of each. Each subsidiary company must make a separate and distinct return. Foreign corporations.—Foreign corporations subject to the law are required to make returns to the collector of the district in which is located the principal place of business or agency through which is transacted the business in the United States, or if the corporation has no place of business or agency in the United States, including interest on bonds, notes, or other interest-bearing obligations of residents, corporate or otherwise, and including income derived from dividends on capital stock or from net earnings of resident corporations, joint-stock companies, or associations whose net income is taxable under this law. The deductions allowable are those losses and disbursements incident and necessary to the transaction of the business in this country, all as specifically set out in the Act. Foreign taxes are not deductible from the gross income arising and accruing to a foreign corporation from business done or capital invested in the United States. If a foreign corporation has no place of business or agency in the United States and no return is made, the tax on income from interest and dividends will be withheld at the source. Penalties.—Corporations refusing or neglecting to file returns within the time prescribed by law or rendering false or fraudulent returns shall be liable to a penalty of not exceeding \$10,000, and an additional tax of 50 per cent in case of neglect to file the return within the time prescribed by law, and 100 per cent in the case of a false or fraudulent return, shall be added to the assessment; provided, in case of delinquency, if the return is voluntarily filed without notice from the collector, and it is shown that delay in filing was due to reasonable cause and not to willful neglect, the 50 per cent additional tax will not be assessed. A statement of the cause of delay must be attached to each delayed return. Any officer of any corporation required by law to make, render, sign, or verify any return who makes any false or fraudulent return or statement with intent to defeat or evade the assessment required to be made shall be guilty of a misdemeanor, and shall be fined not exceeding \$2,000 or be imprisoned not exceeding one year, or both, at the discretion of the court, with the costs of prosecution.

SUPPLEMENTARY STATEMENT

The following information must be furnished, either on this sheet or on attached schedules, by every corporation, joint-stock company, or association. Without such information the return will not be accepted as complete. The items below relate to the correspondingly numbered items on the first page.

8. (c) FROM INTEREST.

Interest to be reported as income for the purpose of the income tax includes all interest received on bonds or securities owned by the corporation except interest on obligations of a State or political subdivision thereof or interest upon the obligations of the United States or its possessions.

8. (d) FROM DIVIDENDS RECEIVED.

Any distribution made or ordered to be made by a corporation out of its earnings or profits accrued since March 1, 1913, whether in cash or stock of the paying company, must be returned (under Item 3 (d) on front page of this form) by the receiving corporation as income of the year in which the distribution was made or ordered to be made and will be taxed at the rates prescribed by law for the years in which surplus or profits distributed were earned, viz., 1% on amounts received out of earnings of 1913 (subsequent to March 1, 1913), 1914, and 2% on amounts received from earnings of 1916 and 1917. A statement from the corporation paying the dividends included herein should be attached to this return, showing separately the amount of dividends paid out of earnings of each year; otherwise, they will be deemed to have been paid out of the earnings of 1917 and will be taxed 2%. The receiving corporation, in order that tax may be computed on dividends received in 1917 at the rates applicable to the years in which the profits were earned, must fill in the following form:

Dividends received in 1917 out of profits earned each year subsequent to March 1, 1913.					
1913	1914	1915	1916	1917	Total
\$	\$	\$	\$	\$	\$

8. (e) FROM OTHER SOURCES.

Income received from all sources not elsewhere specified should be itemized below:

Sales of Ore and Concentrates		261	225 30
Total			

4. (a) COST OF GOODS AND OTHER PROPERTY SOLD.

Report the cost of goods sold in the following form:

Merchandise bought for sale	\$	
Cost of manufacturing or otherwise producing goods (if separately shown on books). (Submit schedule showing principal items of cost).	\$	
Plus inventories at beginning of year	\$	
Total	\$	
Less inventories at end of year	\$	
Net cost of goods sold	\$	

Explanations

If the corporation makes inventories of merchandise or materials, explain the basis on which they are made, whether (a) at cost, or (b) at cost or market value, whichever is lower. If no inventories are made, make no entries referring to inventories, but report the total cost of goods purchased or produced during the year. If the cost of manufacturing or otherwise producing goods is not kept separate from general expenses in the corporation's accounts, include such cost in "Expenses, general," below.

Corporations dealing in real estate, and any corporation that has sold any of its capital assets during the taxable year, should report the cost of the property sold in the following form:

- Original cost of property \$
 - Market value March 1, 1913, if acquired before that date.
 - Cost of subsequent improvements, if any.
 - Depreciation and depletion to date of sale.
 - Net cost (item 1 or item 2 plus item 3 minus item 4).
- State how market value March 1, 1913, was determined.

Does such value include any good will? If so, how much? \$

4. (b) EXPENSES, GENERAL.

This item should include only the ordinary and necessary expenses paid within the year in the operation of the business and maintenance of the properties of the corporation, itemized as per schedule below. It must not include any expenditures reported under 4 (a), 5, 6, or 7.

Expenditures for incidental repairs which do not add to the value or appreciably prolong the life of property are deductible as expenses, but expenditures for new buildings, permanent improvements or betterments which increase the value of property, or for restoring or replacing property, are not deductible under this or any other item of the return. Such expenditures are properly chargeable to capital account, to be extinguished through annual depreciation charges.

Payments made to officers or employees, who are stockholders, in the guise of salaries or compensation, the amount of which is based upon the stockholdings of such officers or employees, are not deductible as a business expense.

Salaries of officers		4,100.00
Labor, wages, commissions, etc. (not included in "Cost of manufacturing or otherwise producing goods" under 4 (a)).		112,693.02
Rents, royalties, and other payments in lieu of rent		
Repairs, ordinary and incidental	Supplies & Exp. for	4,136.80
	Insurance	7,919.50
	Supplies & Expenses Hauling Ore & Concentrates	36,396.27
	General Expenses	3,065.45
	Supplies & Expenses Operating Mine & Mill:	74,804.95
Total expenses		243,115.99

If salaries were increased or extra compensation was paid to officers, state the amount, the reason therefor, and the basis on which computed.

5. (a) LOSSES.

Losses deductible under this item must be distinguished from depreciation or allowances for exhaustion, wear, and tear. The losses, not compensated by insurance or otherwise, must be absolute, complete, actually sustained during the year, and charged off on the books of the corporation.

Kind of property on which loss is claimed.	Cost of property.	Cause of loss.	Amount charged off within year.
\$	\$	\$	\$
Total	\$	\$	\$

When were the deducted losses ascertained to be such?

How were they so ascertained?

The cost of property lost should be determined as indicated in item 4 (a).

A bad debt offsetting income accrued since January 1, 1909, will not be allowed as a deduction unless the amount was reported as income for the year in which the debt was created.

State how the debts charged off (if any) were ascertained to be worthless.

If at any future time a debt charged off as worthless is collected the amount collected must be returned as income for the year in which received.

Unpaid debts are not deductible if made good by recovery of property sold or retention of property pledged.

5. (b) DEPRECIATION.

The amount deductible on account of depreciation is an amount charged off which fairly measures the loss during the year in the value of physical property by reason of exhaustion, wear, and tear. Such amount should be determined upon the basis of the cost of the property and the probable number of years constituting its life. Stocks, bonds, and like securities, as well as any other intangible assets, are not subject to exhaustion, wear, and tear within the meaning of the law. Hence any amount charged off as representing a shrinkage in the value of such assets is not deductible either as depreciation or as a loss.

Depreciation computed on total invoice value of merchandise in stock is not an allowable deduction by reason of damage or obsolescence of the merchandise is unsalable.

If a deduction is made on account of depreciation, the following statement must be filled in:

Kind of property.	Its cost.	Probable life after acquisition.	Amount of depreciation charged off.	
			This year.	Previous year.
Frame Building	Jan. 1, 1917			
Mine & Mill Machinery	118,111.74	10 years	11,811.17	None
Aerial Tram	118,111.74		11,811.17	
Total				

If building, state under "Kind of property" the material of which constructed.

5. (c) DEPLETION.

Depletion applies to the exhaustion of natural deposits, and contemplates a deduction to return to the corporation the capital invested, or in case of purchase prior to March 1, 1913, an amount sufficient to return to the corporation the fair market price or value of such deposits as of that date. An allowable deduction on account of depletion must not exceed the fair market value as of March 1, 1913, or the cost subsequent to that date, of the property mined and sold during the year, and will be determined in accordance with the rule set out in Articles 170 to 173, Regulations 33, Revised. The amount sought to be deducted on this account must be charged off on the books of the company.

Kind of property.	Its cost if acquired subsequent to March 1, 1913.	Fair market value as of March 1, 1913.	Amount of depletion charged off.	
			This year.	Previous year.
\$	\$	\$	\$	\$

* Coal, iron ore, copper, oil, or gas.
† State how fair market value as of March 1, 1913, was determined.

6. INTEREST PAID.

(a) The amount of interest deductible under (a) is the amount actually paid within the year on an amount of bonded or other indebtedness (except on indebtedness falling under 6 (b) or 6 (c) and indebtedness incurred for the purchase of obligations or securities the income from which is exempt from income tax) not in excess of the paid-up capital stock outstanding at the close of the year, or if there is no capital stock, the entire amount of capital (not including interest-bearing indebtedness) employed in the business, at the close of the year, plus, in each case, one-half of the interest-bearing indebtedness also then outstanding.

Capital employed in the business, as here used, contemplates the entire capital paid in by the members of the company, including so much of the accumulated surplus as is actually employed in the business, but does not include any borrowed capital or interest-bearing indebtedness.

(b) Interest paid (by banks) on deposits or on money received for investment and secured by interest-bearing certificates of indebtedness issued by a bank, banking association, or loan or trust company is deductible in the entire amount so paid.

(c) If the corporation's indebtedness, or any part thereof, is wholly secured by collateral which is the subject of sale or hypothecation in the corporation's ordinary business as a dealer in such property, the interest paid on an amount of such indebtedness not exceeding the actual value of the collateral may be deducted.

Describe all obligations on which interest is paid in the following form. Distinguish plainly collateral loans falling under 6 (c) and also obligations incurred for the purchase of securities, the income from which is exempt from income tax.

Kind of obligation.	Amount of principal.	Rate of interest.	Amount of interest paid.
Notes Payable	75,000.00	Jun. 30, 17	2,250.00
" "	96,055.59	8% 1 yr.	2,861.68
" "	9,500.00	8% 1 yr.	760.00
Total	180,555.59		5,871.68

7. (a) TAXES PAID.

Taxes, paid or accrued on the books of the corporation during the taxable year, are deductible with the following exceptions: Federal income and excess profits taxes (including taxes paid on the interest on its own obligations in pursuance of a covenant contained therein relieving the holder of liability for such taxes), foreign taxes on income derived from sources within the United States by foreign corporations, local taxes specially assessed against property on account of benefits derived from public improvements or betterments, and taxes upon the corporation's capital stock in the hands of the stockholders.

BASIS OF RETURN.

Is this return made on the basis of actual receipts and disbursements?

If not, describe fully what other basis or method was used in computing net income. **By deducting operating costs from the net proceeds from sales of ore and concentrates.**

Total net income of taxable year preceding that for which this return is made (less income tax paid thereon) \$ **NONE**

Amount of such income remaining undistributed six months after the close of that year

Amount of such income remaining undistributed twelve months after the close of that year

Total surplus and undivided profits at close of taxable year **NONE**

If sufficient space is not provided for the entry of any information required in the "Supplementary Statement," schedules in the form indicated, marked with the number of the item to be explained, should be attached to this form.

REPORT

of the

**Anaconda
Copper Mining Company**

For the Year Ended December 31st, 1918

Investments

During the year, your Company and its Subsidiaries added to their investments, expending the sum of \$8,883,627.65 on this account. The principal items, aside from advances made to the South American Companies, for which your Company has received, or is entitled to receive stock of such Companies, issued at par, are the following:

(a) Walker Mining Company—On October 1, 1918, the International Smelting Company exercised its option on 630,000 out of a total of 1,250,000 shares of the Walker Mining Company stock.

This property is located in Plumas County, California, approximately 22 miles by wagon road from Portola, a station on the Western Pacific Railroad.

The holdings of the Walker Mining Company consist of 38 patented lode claims and 2 placer claims, all forming a compact block of ground.

The exploration of the property to the depth of 346 feet has been accomplished by two shafts. Drifts from these shafts have opened up a body of ore approximately 800 feet in length averaging 16 feet in width, and a grade of about 4 per cent. copper. Recent developments by means of diamond drill holes indicate an additional length of vein approximating 900 feet. There is still a considerable amount of unexplored territory.

The following construction and development program is now in progress:

Increasing capacity of concentrator to 200 tons per day.

Installation of a new tailings dam.

Installation of an aerial tramway 8.2 miles in length to handle concentrates to and supplies from the railroad.

Driving a crosscut tunnel from the concentrator site a distance of 3,500 feet to strike the extension of the vein, then following the vein to the shaft, a distance of 1,200 feet. This tunnel will develop the property to a depth of approximately 800 feet.

Additional housing facilities for employees.

Additional plant equipment in the form of electric hoist and small shops.

(b) Arizona Oil Company—On account of the necessity for protecting the fuel oil supply upon which the operations of the International Smelting Company, at Miami, depend, it was deemed advisable to purchase, jointly with the Inspiration Consolidated Copper Company, a tract of 160 acres of oil-producing land in the Bakersfield District of California. A corporation, known as the Arizona Oil Company was formed, and

title to the property was conveyed to it. The Oil Company has an authorized capital of \$2,500,000, of which 16,320 shares, having a par value of \$100.00 each, have been issued. Your Company and the Inspiration Consolidated Copper Company each owns one-half of the issued stock. The net investment of your Company in this stock amounts to \$794,668.01. The transaction was consummated on May 21, 1918, since which date 329,622 barrels of oil were produced to December 31, 1918.

Finance

On December 31, 1918, the Directors of your Company authorized an issue of \$50,000,000 10-year secured gold bonds. \$25,000,000 of said bonds, designated as Series "A", bearing interest at the rate of 6 per cent., were issued on January 2, 1919. Full details of the transaction were embodied in a circular letter of the Chairman of the Board, addressed to the shareholders of the Company, under date of January 2, 1919, to which reference is made for your further information.

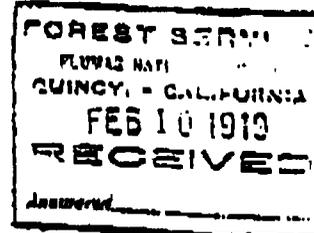
Financial Condition

Attached hereto you will find a consolidated balance sheet showing the financial condition of the Company, and its Subsidiary Corporations, at the close of business, December 31, 1918, and an income statement for the year, both certified to by Messrs. Pogson, Peloubet & Company, Certified Public Accountants.

JOHN D. RYAN,
Chairman of the Board.

New York, N. Y., May 5, 1919.

International Smelting Company



WM. WRAITH
GENERAL MANAGER

O. M. KUENS
ASSISTANT GENERAL MANAGER

SALT LAKE CITY, UTAH. Feb. 7, 1919.

Mr. D. R. Rogers,
Forest Supervisor,
Quincy, California.

My Dear Rogers:-

I spoke to you sometime ago relative to a right-of-way for tram road and aerial tram from the Walker Mine towards Spring Garden. Our attorneys are going to make application for this right-of-way through the regular channels, but as I told you then, I am hastening to send you a print now so that in case anyone attempted to interfere, you would know that we had applied for this right-of-way.

I trust that when the originals of these maps get to you that they will receive due consideration, and any further information that I can give you will be cheerfully granted.

The second map that I am enclosing is an application for tailings pond.

You will notice that this is at the bottom of Little Dolly Gulch, which is about three-quarters of a mile below the mill. Your corral cuts into the line between points 7 and 8, but you need not fear that we will put your corral under water for some years to come.

MAR. -18 '99 (THU) 15:10

LEGAL ALF 3568

TEL: 213 486 3969

P. 003

03/18/99 11:18 FAX 415 744 6478

DEPT. OF JUSTICE

0004/000

Mr. D. R. Rogers -2.

As you will be informed later, this tailings pond site is on certain placer locations which were taken up as placer locations with the avowed intention, as I understand it, to build a dam there to store water for the purpose of placering further down the creek. I trust that upon investigation of this ground you will be able to confirm my statements relative to it, which are in general that it is not commercial placer ground.

These maps are for your information only, and I am not now asking for either tramway right-of-way nor dam site. That will come in the regular form.

Very respectfully,

VAK:H
Enc.

WALKER MINING COMPANY

By *W. A. Newby*
Manager.

US 000205

Edwin W. Senior,
Lawyer

SUITE 329-330 JUDGE BUILDING
SALT LAKE CITY, UTAH

TELEPHONE WASATCH 2418

MINING LAW, INCORPORATIONS,
MINERAL PATENTS

February 19, 1919.

Mr. D. M. Rogers,
Forest Supervisor,
Quincy, California.

Dear Sir:

For your information, I herewith hand you copy of plats today forwarded to U. S. Land Office at Susanville, California, in connection with an application by Walker Mining Company for right of way for aerial tram line and for tailing reservoir.

Shall be pleased to furnish any further information within my reach that you may call for in the premises.

Encs.

Respectfully,

Dict.



Attorney for Walker Mining Co.

MIN 000011681

Copy sent District Ranger

Nail

February 25, 1919.

I
Uses, Plumas
Tramway,
Walker Mining Co.

Mr. V. A. Hart,
Manager, Walker Mining Company,
Portola, California,

Dear Mr. Hart:

Your letter of February 7, submitting the maps,
is received.

I can assure you that the Service will render all assistance possible in perfecting your permit for the tramway. The settling reservoir which you have indicated in Dolly Gulch at the head of Little Grizzly is a matter which shall have to be carefully gone into, since this area comprises a good many acres of our most valuable cattle feed. The only question here, of course, would be whether or not there is any other possible location which could be used instead of this one. However, this will be, of course, worked out in due time.

Very sincerely yours,

DNE:/W

Forest Supervisor.

MIN 000011680

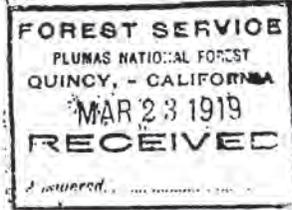
WALKER MINING COMPANY

PLUMAS COUNTY, CALIFORNIA

FREIGHT ADDRESS:
GULLING

POSTOFFICE AND EXPRESS:
PORTOLA

V. A. HART, MANAGER



March twenty-first,
Nineteen nineteen.

Mr. D. N. Rogers,
Forest Supervisor,
Quincy, California.

My dear Rogers:

Your letter of February 25th was received by me on my return from a trip to Old Mexico--hence the delay in answering same.

I note what you say relative to the area of proposed reservoir comprising many acres of good cattle feed. This area is considerably larger than we expect to use for many years to come, but while applying for a permit we thought it wise to stipulate sufficient area to take care of all our future requirements. The real area in use that would be at all adapted for feed will be very small as compared to the sketch or map showing same.

Yours truly,

WALKER MINING COMPANY,

By V. A. Hart
Manager.

VAH/F

WALKER MINING COMPANY

PLUMAS COUNTY, CALIFORNIA

V. A. HART, MANAGER

FREIGHT ADDRESS:
GULLING
POSTOFFICE AND EXPRESS:
PORTOLA

RECEIVED
QUINCY, CALIFORNIA
APR 5 1919

April 2nd, 1919.

Mr. D. N. Rogers, Forest Supervisor,
Plumas National Forest,
Quincy, California.

Dear Sir:

As stated to you in previous correspondence, we are making formal application to the Interior Department for easement for area in National Forest for the purpose of building a reservoir in which to settle our tailings.

Our attorneys in Washington advise that it is not absolutely necessary to obtain easement to land in question, but that it is customary to operate under a Special Permit issued by the Forest Service, similar, I judge, to that you are granting us for aerial tram line.

We wish to obtain from your department, if in your province to grant same, a Special Permit for the construction of a dam and the building of a reservoir on Little Grizzly Creek--just below Dolly Gulch, the location as shown by the map sent you.

We appreciate your point relative to grazing land and wish to state that we asked for the large area shown by the map, under the advice of our attorneys. This area is sufficient in size to last this property, under continuous operation, for at least fifty years.

We wish to erect a dam of approximately twenty feet in height--the water line being six feet lower. This will flood an area of about six to seven acres, and will provide ample storage capacity for some years to come. We will then have to increase the height of the dam and flood a larger area, depending, of course, on the scale of operations.

MIN 000011676

Mr. D. N. Rogers 4/2/19 Two

I presume that a permit of this sort would be in the nature of a lease at approximately so much per acre, but we will very gladly pay you for the full value of the ground, you to estimate same from a grazing or timber standpoint.

I trust that you will grant us all possible consideration in this matter and assuring you that we will gladly comply with such requirements as your department may specify, I am

Yours truly,

WALKER MINING COMPANY,

By *D. B. Hart*
Manager.

MIN 000011677

36

JRGE D. PARKINSON
ATTORNEY AT LAW
327-328 JUDGE BUILDING
SALT LAKE CITY, UTAH

May 3, 1919.

06713
06712

Hon. Clay Callman,
Commissioner of the General Land Office,
Washington, D. C.

11



S I R :

Attention of Mr. Dudley,
Chief of Division "2"

Referring to applications of the Walker Mining Company of this city for aerial tram-line right of way and impounding reservoir within the Plumas National Forest in California, which were filed in the United States Land Office at Susanville, California on February 19, 1919, and which were there given Serial Nos. 06713 and 06712 respectively:

On March 24th, 1919, the undersigned, acting as attorney for the applicant company, personally interviewed Mr. Dudley Chief of Division "2", General Land Office, concerning said applications, at which time it was arranged that action by the General Land Office on these cases would be deferred pending receipt of further advices from said applicant as to whether or not it is desired to have said applications acted upon at the present time.

I beg to state that, upon further consideration of the matter, ~~it is desired that these cases now be taken up and passed upon by the General Land Office at the earliest possible date.~~ If it is possible to give them special consideration, it will be greatly appreciated as the Walker Mining Company desires to commence construction at once and to diligently prosecute the same to completion prior to the inclement weather and deep snows that are encountered in the late Fall and early Winter months.

Very respectfully,

George D. Parkinson
Attorney for the Walker Mining Co.

gdp-op

P. S. By way of information, attention is respectfully invited to the fact that it is proposed to convey said tailings by water along a dry gulch to said reservoir and not by tram as was supposed by a member of Mr. Dudley's staff. It is also proposed to raise the impounding dam, from time to time, as the tailings so deposited fill up the original depression embraced in said reservoir application.

G.D.P.

36

JRGE D. PARKINSON
ATTORNEY AT LAW
327-328 JUDGE BUILDING
SALT LAKE CITY, UTAH

May 3, 1919.

Hon. Clay Tallman,
Commissioner of the General Land Office,
Washington, D. C.

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sdp-op

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J. D. Parkinson

35

PLY PLEASE REFER TO:

Susanville 06712-00713 "F" MN

1x R&R

DEPARTMENT OF THE INTERIOR

GENERAL LAND OFFICE

WASHINGTON

May 14 1919.

ADDRESS ONLY THE COMMISSIONER OF THE GENERAL LAND OFFICE

Walker Mining Company

Rejecting applications for right of way for reservoir and tram line.

Register and Receiver,

Susanville, California.

Sirs:

February 24, 1919, the Walker Mining Company filed in your office an application for a so-called reservoir covering parts of Secs. 7 and 18, T. 24 N., R. 12 E., and of Secs. 12 and 13, T. 24 N., R. 11 E., M.D.M., and another application for right of way for a tram line from a point in Sec. 8, T. 24 N., R. 12 E., to a point in Sec. 28, T. 24 N., R. 11 E., M.D.M. In the certificates on the maps filed in connection with these applications the Vice President of the Company refers to Section 4 of the Act of February 1, 1905 (33 Stat., 628) and states,

"That the reservoir herein described is desired for the main purpose of the storage of tailings produced by the milling and reduction of copper ores",

and that the

"proposed aerial tram line, herein described, is desired for the main purpose of transporting ore and concentrates produced from the mining and milling of copper ores and the transporting of supplies."

The land affected is within the Plumas

National Forest.

Section 4 of the said Act of February 1, 1905

reads as follows:

"That rights of way for the construction and maintenance of dams, reservoirs, water plants, ditches, flumes, pipes, tunnels, and canals, within and across the forest reserves of the United States, are hereby granted to citizens and corporations of the United States for municipal or mining purposes, and for the purposes of the milling and reduction of ores, during the period of their beneficial use, under such rules and regulations as may be prescribed by the Secretary of the Interior, and subject to the laws of the State or Territory in which said reserves are respectively situated.

It is obvious that this act authorizes rights of way within national forests which contemplate the use of water for certain purposes. There is nothing doubtful or ambiguous in the statute. Its language is clear and it is not for the Land Department to add anything to, nor take anything from it. A depression in the earth's surface may be a suitable place to deposit tailings, but such use does not warrant the hole in the

ground being called a reservoir, within the usual acceptation of the term. More assuredly is a tram line not within the scope and intent of the said act, even though it be used for "transporting ores and concentrates produced from the mining and milling of copper ores".

I have, therefore, to reject the said applications subject to the usual right of appeal. Should this decision become final, or be affirmed on appeal, the company could apply to the Forester, Department of Agriculture, for permits to use the right of way for the contemplated projects and the data filed in this office will be returned to it for such purpose, if desired.

There is inclosed a copy of this letter for service on the company. At the expiration of the time allowed for appeal make prompt report, transmitting evidence of service of notice on the company.

Very respectfully,

A handwritten signature in cursive script, appearing to read "W. C. Fuller".

Commissioner.

29
GEORGE D. PARKINSON,
ATTORNEY AT LAW
327-328 JUDGE BUILDING
SALT LAKE CITY, UTAH

Case

37640

Hotel Washington,
Washington, D. C.
June 19, 1919.

In re Application of Walker Mining
Company for reservoir right of way,
Serial Number, Susanville, 06713.

Hon. E. C. Finney,
Board of Appeals,
Department of the Interior,
Washington, D. C.

My dear Mr. Finney:

I beg to hand you herewith copy of Senate 1730,
introduced in the Senate on June 16th by Senator Smoot. I am
informed that this bill was forwarded to the Department of the
Interior for the report and recommendation of the Department,
on June 17th.

For your further information I beg to state that an
appeal from the decision of the Commissioner of the General Land
Office in the above-entitled matter has been filed in the General
Land Office and that the same has this day been formally trans-
mitted by the General Land Office to the Office of the Secretary.

I am taking the liberty of conveying the above information
to you in order that you might have both the bill and the appeal
before you at the same time for consideration.

Very respectfully,

Geo. D. Parkinson

gdp-op
(1 Enclosure)

US 000253

IN THE SENATE OF THE UNITED STATES.

JUNE 16, 1919.

Mr. STORR introduced the following bill; which was read twice and referred to the Committee on Public Lands.

A BILL

To amend an Act entitled "An Act providing for the transfer of forest reserves from the Department of the Interior to the Department of Agriculture," approved February 1, 1905.

1 *Be it enacted by the Senate and House of Representa-*
2 *tives of the United States of America in Congress assembled,*
3 That the Act entitled "An Act providing for the transfer
4 of forest reserves from the Department of the Interior to the
5 Department of Agriculture," approved February 1, 1905,
6 be, and the same is hereby, amended by inserting in sec-
7 tion 4, line 2, after the word "reservoirs," the words
8 "tailings reservoirs."

66TH CONGRESS, }
1st Session. } **S. 1730.**

A BILL

To amend an Act entitled "An Act providing for the transfer of forest reserves from the Department of the Interior to the Department of Agriculture," approved February 1, 1905.

By **MR. SMOOT.**

JUNE 16, 1919.—Read twice and referred to the Committee on Public Lands.

24

D 37640

DEPARTMENT OF THE INTERIOR
UNITED STATES LAND OFFICE

7/6/20/19

Susanville, Calif.

(Place)

June 19, 1919.

(Date)

7/6/16/19

In re: Susanville 06712-06713 "F" MN, 5-14-19.

Walker Mining Company.

Hon. Commr., G.L.O.,
Washington, D.C.

*Dept on appeal
7-1-19*

Dear Sir:

We transmit herewith evidence of service of
the above indicated letter, also copy of ap-
peal from said decision, and copy of appear-
ance in said matter by George D. Parkinson,
Judge Bldg., Salt Lake City, Utah.

The original of these papers are already on
file in your office.

Very respectfully yours,

JAN:MS

ENCL.

James A. Walker
REGISTER



25

copy

U. S. DEPT. OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

*June 18, 1919
3 PM*

BEFORE THE HONORABLE SECRETARY OF THE INTERIOR
Washington

Ex Parte,

WALKER MINING COMPANY

)
)
)
)

SUSANVILLE 06713

Appeal from the Honorable Commissioner
of the
General Land Office.

Comes now the Walker Mining Company, and appeals from the decision of the Honorable Commissioner of the General Land Office, rendered May 19, 1919. As grounds for said appeal the following error is alleged:

1.- In not holding that the storage of water, containing tailings in suspension, produced by the milling and reduction of copper ores, is such use of a reservoir site as is contemplated by Section 4 of the Act of Congress, approved February 1, 1905, (33 Stat. 628)

In this behalf, Your Honor's attention is respectfully invited to the following statement as to the use to which it is proposed to make of said reservoir site.

As a necessary part of the process of milling and reducing copper ores at the applicant's plant, the tailings produced will be transported through the natural channel of the Dolly Gulch creek bed to the "tailings storage reservoir," being carried in suspension in the creek water. The impounding of these tailings will require the construction of a dam, back of which there will always be more or less water. The purpose of this reservoir is to bring about a proper settlement of solid matter from the water, so that only clear water may pass on down the stream below the reservoir site.

Attention is also respectfully invited to the fact that in connection with the operation of its mill it is necessary for the company to provide a tailings pond for the impounding of its present and future mill tailings, as required by the California Debris and the State Fish and Game Commission.

It is a fact in this case that if the tailings in suspension were permitted to flow down the creek with the water, without being intercepted by the proposed reservoir, such tailings would prove a nuisance to others desiring to use the water.

It is respectfully contended therefore that such use is a "mining purpose" and a necessary part of the "milling and reduction of ores", within the meaning of Section 4 of said Act of February 1, 1905 (33 Stat. 628)

It is further respectfully submitted that a special use permit, issued by the Forest Service, as suggested in the Honorable Commissioner's decision, to use said reservoir site for the purpose in said application proposed, would not adequately protect the applicant in its use of said right of way, as it is possible for strangers to apply for and obtain the grant of a right of way by the Department of the Interior over this same reservoir site, for other objects specified in said Act, which grant, it is submitted, would be superior to and would take precedence over any use permit which can be given by the Forest Service.

The reservoir site applied for is the only reservoir site available for the purposes of the applicant. The applicant company has made and proposes to make large expenditures in the development of said milling and reduction plant and consequently is desirous of obtaining the best possible right to its use of said site, without the possibility of later being harrassed or intercepted by others.

Respectfully submitted,

Geo. W. Parkinson
Attorney for Applicant.
Hotel Washington,
Washington, D. C.

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copy I

U. S. DEPARTMENT OF THE INTERIOR
SUSANVILLE
JUN 18, 1919
3 PM

Hotel Washington,
Washington, D. C.
June 5, 1919.

Susanville 06713

Ex Parte
Walker Mining Company.

The Honorable Commissioner of the
General Land Office,
Washington, D. C.

S I R :

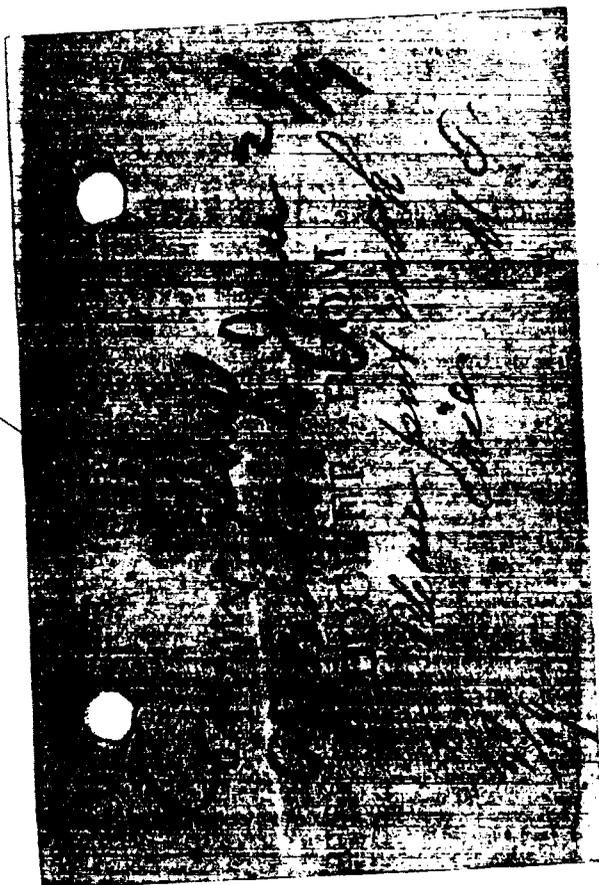
Please enter my appearance in the above-entitled action.

Very respectfully,

Geo. D. Harrison

gdp-op

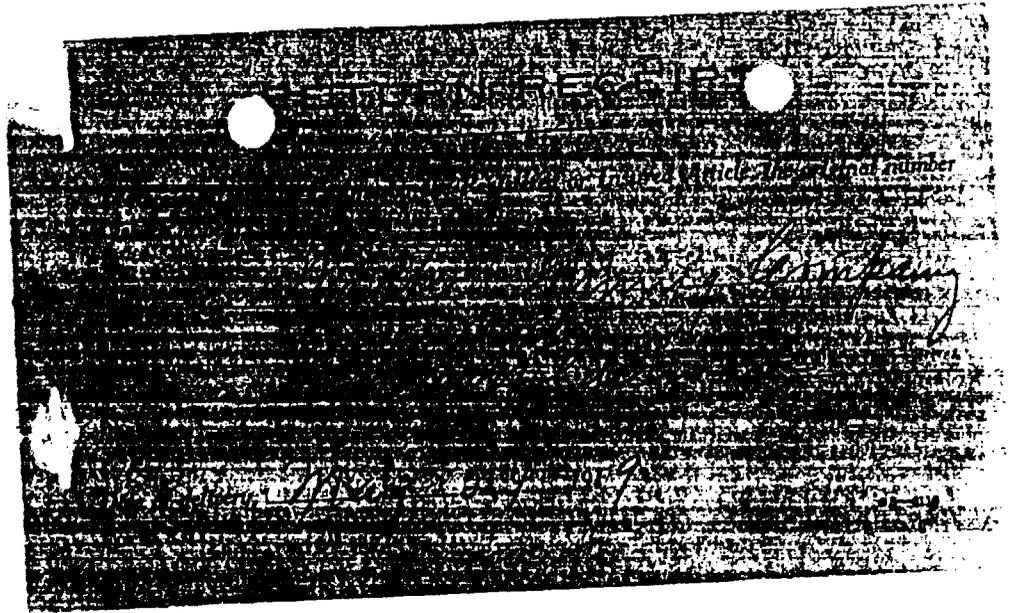
127



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US 000250

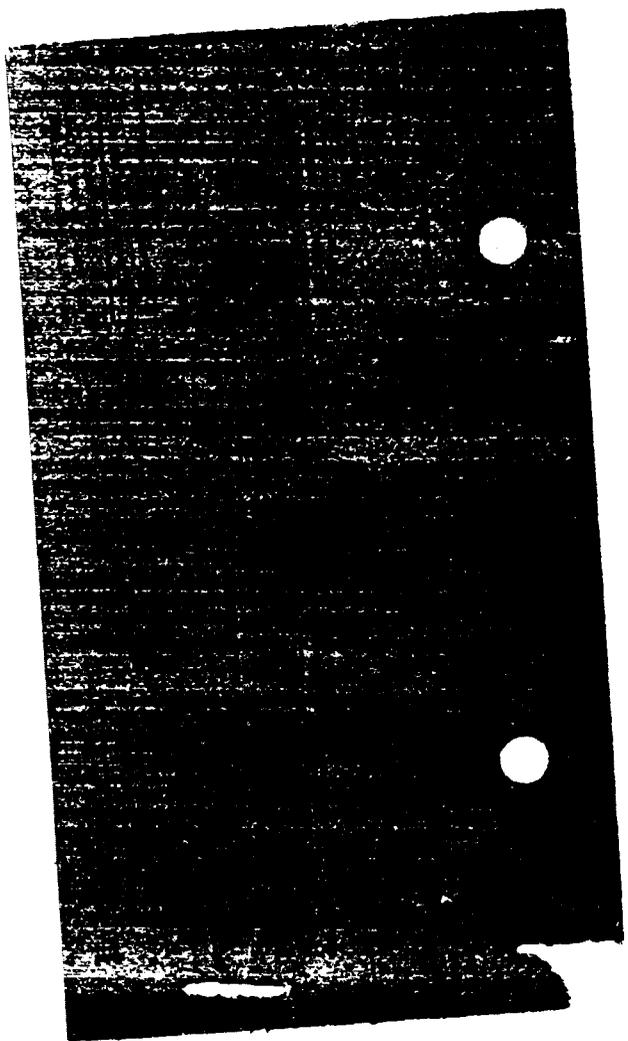
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06712 06713-2359

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US 000251



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US 000252

31

IN REPLY PLEASE REFER TO

Susanville 06713 "F" N
Incs.

DEPARTMENT OF THE INTERIOR
GENERAL LAND OFFICE

WASHINGTON

June 2/ 1919.

ADDRESS ONLY THE
COMMISSIONER OF THE GENERAL LAND OFFICE

Walker Mining Company : Transmitting copy of office
decision and appeal therefrom.

The Secretary
of the Interior.

Sir:

The Walker Mining Company has appealed from
a decision of this office addressed to the district
land officers at Susanville, California, rejecting
a certain application filed by it for a so-called reser-
voir site and right of way for a tram line. Copy of
said office decision and the appeal are herewith trans-
mitted for departmental consideration.

Very respectfully,



Commissioner.

IN REPLY PLEASE REFER TO

Susanville 06712-0411-17-18 Mr.

Incl.

DEPARTMENT OF THE INTERIOR

GENERAL LAND OFFICE

WASHINGTON July 1, 1919.

ADDRESS ONLY THE
COMMISSIONER OF THE GENERAL LAND OFFICE

Walker Mining Company ; Notice of action.

Mr. George D. Parkinson,
Attorney-at-law,
Care Hotel Washington,
Washington, D. C.

My dear sir:

As Attorney for the above named Company there is inclosed for your information, copy of office letter of this date, addressed to the district land officers at Susanville, California, which is self-explanatory.

The department having decided that Section 4 of the Act of February 1, 1905 (33 Stat., 628) is applicable for impounding tailings, the Company's application for such a Reservoir now pending before this office will proceed on its merits.

Very respectfully,

Commissioner.

86713

7-10-19

DEPARTMENT OF THE INTERIOR
GENERAL LAND OFFICE

WASHINGTON July , 1919.

ADDRESS ONLY THE
COMMISSIONER OF THE GENERAL LAND OFFICE

Walker Mining Company, : Transmitting map, etc.
: for report.

The Forester,
Department of Agriculture.

My dear Mr. Graves:

There is inclosed for your information copy of departmental decision of the 11th inst. reversing the decision of this office in the matter of the application filed by the Walker Mining Company, under the provisions of Section 4 of the Act of February 1, 1905 (33 Stat., 428) for easement for a Tailings Reservoir Site within the limits of the Plumas National Forest, Susanville, California land district.

The department having determined that the Act in question is applicable for Reservoirs for impounding tailings, the copy of the map filed in connection with said application is herewith inclosed for your considera-

PLEASE REFER TO Susanville 06712-16713 W* MF.

Incls.
1 x G.S.D.P.

DEPARTMENT OF THE INTERIOR
GENERAL LAND OFFICE

WASHINGTON July , 1919.

ADDRESS ONLY THE
COMMISSIONER OF THE GENERAL LAND OFFICE

Walker Mining Company, Promulgating depart-
mental decisions, etc.

Register and Receiver,
Susanville, California.

Sirs:

By office decision addressed to you May 14,
last, an application filed by the Walker Mining Company,
under the provisions of Section 4 of the Act of February
1, 1905 (33 Stat., 628) for easement, Tailings Reservoir
covering parts of Secs. 7 and 18, T. 24 N. R. 12 E., and
Secs. 12 and 13, T. 24 N. R. 11 E. M. D. M. and another
application filed under the provisions of said Act for
right of way for a Tram Line from a point in Sec. 8, T.
24 N., R. 12 E., to a point in Sec. 28, T. 24 N., R. 11
E., M. D. M. were rejected, subject to the usual right
of appeal, for the reasons therein set forth.

Superiorville 06712-16713 "PP" MN

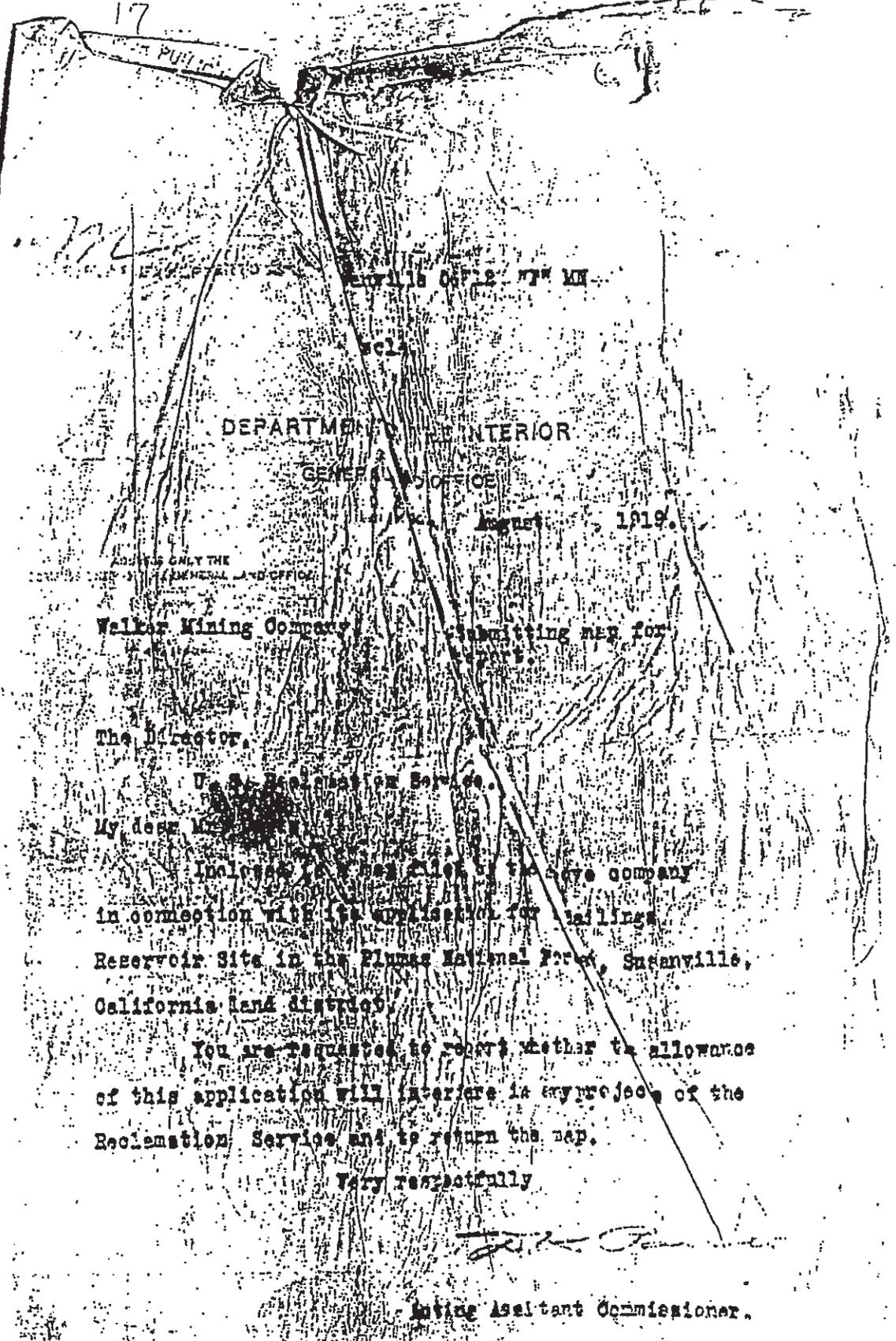
The Company's attorney, who at the time was in Washington, was duly notified of said decision and by letter dated June 19, 1919, you transmitted evidence of notice on the Company. The Company's attorney filed an appeal from said decision, so far as it rejected the Company's application for the Reservoir.

On the 11th inst., the Assistant Secretary of the Interior reversed the decision of this office, so far as it rejected the Reservoir application, and remanded the case for appropriate action. There is inclosed copy of said departmental decision for your file.

No appeal having been taken by the Company from said decision, so far as it rejected the application for the Tram Line, and the time for appeal having expired, the application for the Tram Line is now finally rejected; the map and field notes of survey filed in connection therewith are herewith inclosed, to be returned to the Company, and the Tram Line case is closed. Make appropriate notation on your records.

Very respectfully,

Commissioner.



Suzanyville Cal. 27th ME

DEPARTMENT OF INTERIOR
GENERAL LAND OFFICE

August 1919.

ADDRESS ONLY THE
GENERAL LAND OFFICE

Walker Mining Company submitting map for
report.

The Director,

U. S. Reclamation Service.

My dear Mr. Director,

Enclosed is a map filed by the above company
in connection with its application for a
Reservoir Site in the Plumas National Forest, Suzanyville,
California land district.

You are requested to report whether the allowance
of this application will interfere in any project of the
Reclamation Service and to return the map.

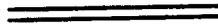
Very respectfully

Acting Assistant Commissioner.

REPORT

of the

Anaconda
Copper Mining Company



For the Year Ended December 31st, 1919

Investments

During the year your Company expended in adding to its investments the sum of \$9,894,170.39, substantially all of which was advanced to the South American Companies, and for which your Company is entitled to receive stock of those companies, issued at par.

(a) Walker Mining Company—The operations of the Walker Mining Company were continued in the year 1919 under difficulties, due to shortage of labor.

There were mined and milled 38,785.3 tons of ore, producing 5,982.5 tons of concentrates.

There were shipped to the International Smeltery, Tooele, Utah, 4,270 tons of concentrates containing 1,597,430 pounds of copper, 29,077.54 ounces of silver, and 677.754 ounces of gold.

Exploration work during year amounted to 1,819 feet.

The capacity of concentrator was increased to 200 tons per day.

The erection of a new tailings dam was completed.

The new aerial tramway to handle concentrates to and from the railroad was 87% completed.

The crosscut tunnel from the concentrator site to the extension of the vein is complete. The extension of this tunnel on the vein toward the shaft was commenced January 1, 1920.

Additional housing facilities are under construction.

(b) Arizona Oil Company—During the year this company produced 456,174 barrels of oil and paid \$8.50 per share in dividends, of which your Company received \$69,360.00.

(c) Anaconda Lead Products Company—After extensive experimentation for the purpose of determining the practicability of an electrolytic process for the production of white lead, and satisfactory results being obtained therefrom, the Anaconda Lead Products Company was formed and a plant erected at East Chicago, Indiana, adjacent to the plant of the International Lead Refining Company. This plant will be put in operation early in 1920, and will have a capacity of 20 tons of white lead per day.

(d) Copper Export Association, Inc.—Early in the year an Association was formed under the provisions of the Webb Act for the purpose of conducting the export business of a number of American copper producers. Working capital was supplied by the various members of the Association, in proportion to their production.

Financial Condition

Attached hereto you will find a consolidated balance sheet showing the financial condition of the Company, and its Subsidiary Corporations, at the close of business, December 31, 1919, and an income statement for the year, both certified to by Messrs. Pogson, Peloubet & Company, Certified Public Accountants.

New York, N. Y., May 5, 1920.

JOHN D. RYAN,
Chairman of the Board of Directors.

STIPULATIONS

(IRRIGATION, MUNICIPAL, MINING)

(Acts March 3, 1891; May 11, 1898; February 1, 1905)

Uses lumber
(Forest)

Walker Lumber Co.
(Name of applicant)

(Reservoir) Conduit 3-24-19
(Date of application)

WHEREAS, The reservoir right of way applied for by Walker Lumber
Company

(hereinafter called the Applicant) is within the lumber

National Forest, as shown by a certain tracing executed by C. G. ...

on January 15, 1919, and filed in the United

States Land Office at Unconville

State of California, on February 16, 1919; and

WHEREAS, The regulations of the United States Department of the Interior, concerning rights of way for railroads, reservoirs, canals, etc., provide that whenever such rights of way are located upon National Forests, the Applicant must enter into such stipulations and execute such bonds as the Secretary of Agriculture may require for the protection of the National Forests; and

WHEREAS, The Secretary of Agriculture requires, for the protection of said lumber National Forest that the Applicant shall enter into the stipulations hereinafter set forth;

NOW, THEREFORE, In consideration of the granting of the right of way applied for, the Applicant do hereby stipulate and agree, and do bind himself, his heirs, executors, administrators, and assigns, and each of them, jointly and severally (themselves, their heirs, executors, administrators, and assigns, and each of them, jointly and severally) (itself, its successors and assigns), as follows, to wit:

1. To pay to the National Bank of ... (United States Depository), or such depository or officer as may hereafter be designated by the United States, to be placed to the credit of the United States, in advance of cutting or construction, as required by the Supervisor of said National Forest, for all live and dead timber, standing and down, merchantable in the judgment of the Forest Supervisor, cut, damaged, killed or destroyed, on said right of way, title to which, at the time of said cutting, damaging, killing, or destroying, is in the United States, in accordance with the scale or estimate of the Forest officers, at a rate to be fixed by said Supervisor, which shall correspond to the prevailing stumpage rates charged on said Forest at the time said timber is cut, damaged, killed, or destroyed; and to dispose of all brush, refuse, or unused timber accumulating at such times upon such right of way in such manner as may be required by the Forest officers.
2. To pay to the United States Depository or officer as aforesaid, on demand, for all damage to said National Forest resulting from the breaking of, or the overflowing, leaking, or seepage of water from, the reservoir or ditch and for all damage to said National Forest caused by the negligence of the Applicant his (their) (its) employees, contractors, or employees of contractors.
3. To build new roads and trails, as required by the said Forest Supervisor, to replace any roads or trails destroyed by construction work or flooding upon said right of way, and to build and maintain suitable crossings as required by the Supervisor for all roads and trails which intersect the right of way.
4. To require his (their) (its) employees, contractors, and employees of contractors, both independently and at the request of the Forest officers, to do all reasonably within their power to prevent and suppress fires.

Some Features of the Geological Department of the Anaconda Copper Mining Company

By PAUL BILLINGSLEY

*The Anaconda Copper Mining Co., of Butte, has developed its geological department into an important branch of its organization. This has been the result of a number of factors, but perhaps the chief influences have been the character of the Butte orebodies and the methods of mining required for their development and extraction.

The Butte ores are contained in rather narrow veins in granite (quartz-monozite, to be exact). Widths range commonly from 2 to 20 ft. These veins are cut by at least six successive series of faults, the earlier of which also contain ore-shoots. Thus either in plan or in section the veins are broken and displaced at frequent intervals, the direction and amount of movement varying with each fault, but almost always being enough to throw the ore outside of the drift or raise. When it is considered that the high grade of the ore makes important the recovery of every fragment of vein, and also that many of these faulted fragments are too small to be hit by haphazard cross-cutting, the necessity for an understanding of the structure becomes apparent. From the mine operator's viewpoint it is essential to know promptly which way to turn a working; he is little interested in microscopic details of rock-alteration or theories concerning the source of mineral solutions.

ORGANIZATION. In 1900, an early date as mining geology goes, H. V. Winchell and D. W. Brunton organized a geological department for the Anaconda company, realizing that only the complete compilation of geologic data would solve the problem of fault-structure to the degree necessary for the proper aid to mining operations. The work thus begun has been greatly enlarged in scope and improved in detail under the direction of Reno H. Sales, chief geologist since 1906. F. A. Linforth, who in recent years has been in special control of the work in the Butte mines, has contributed many of the refinements of methods now in use. His paper presented at the Butte meeting of the A. I. M. E. in August 1913, gives an excellent outline of the work as conducted at that time. I follow his article in many points.

REQUIREMENTS OF MINING GEOLOGY. The geological department has thus from its formation kept for its prime objective the helping of the mine foremen and superintendents through a knowledge of the structure of the ground. Its members have realized that the geologist should be the servant of the man who is responsible for the work of the mine. As a result of 20 years of experi-

ment and progress, it has come to regard the following points as essential:

First, friendly co-operation and mutual respect between mine foremen and geologists. The geologist must be familiar with the foreman's plans in order to advise him intelligently, while the foreman must appreciate the value of geologic advice, and be prompt to seek it when in difficulty.

Second, prompt geologic examination of all new workings, in order that suggestions may be made without loss of time. Much useless work is thus prevented.

Third, accuracy in underground observation. Details of structure or of mineralization must be recorded exactly as they appear in the ground—big faults distinguished from minor slips; sequence of veins and faults at intersections properly interpreted; and important minerals, such as secondary chalcocite or primary chalcocite, observed and noted. To take notes properly frequently involves long study under very unfavorable conditions of air, water, ground, etc. Hazy or indefinite notes are only less useless than erroneous ones. If the geologist is not clear in his own mind as to which way the mineralization trends, or as to which of two faults is the intersected, and which the intersector, he should settle the point in the mine, with the evidence before him, and not use indefinite notes as a refuge.

Fourth, immediate platting of notes, and particularly of structural features, upon general geologic maps and sections, in order that the new evidence may be studied in its proper relation to that already accumulated. While I have just pointed out that decisions as to detailed structure must be made underground, it does not follow that general ideas can be correctly gained from that viewpoint. It is one of the most vital features of the work of the department that such general ideas are formulated only upon a study of all available details, each detail as accurate as it can be made by careful work with pick and compass. It is particularly important that one should not let his judgment underground be influenced by what he expects to find. Often a big fault does not come where it is expected; the reason will be discovered in due time.

Fifth, a smoothly-working system whereby conclusions reached by a study of geologic data are translated promptly into terms of mine operations.

METHODS. The means by which these fundamental ends are obtained have been described by Mr. Linforth, but may bear repetition here. Co-operation with foremen is a matter of state-of-mind. The geologist must be humble in spirit. Often the foreman knows more about

*A paper presented at the Western annual meeting of the Canadian Mining Institute in November 1919.

the geology of his mine than he can express in the geological language of professors. Generally he can teach the geologist much about mining methods. Experience would indicate that geologists who have used 'muck-sticks' in their past are apt to have a healthy state of mind in this respect.

Promptness has been secured by enlarging the force of geologists until each man can cover his territory in somewhat less than one month. Many foremen would like more frequent visits. Important faces are visited after each round. It has been found that while a geologist experienced in work at Butte can map correctly 25,000 ft. of workings per month, this gives too little time for the study of special problems in the mines, and does not permit enough trips with the foremen and bosses. At present I should judge that the members of the department cover about 6000 ft. of workings each per month.

Underground notes are taken on loose-leaf sheets on a scale suitable to the amount of detail desired, usually either 20 or 50 ft. to the inch. Colored pencils are used. Red represents vein mineralization, the ore being shown in darker color than the gangue. Blue is used for fault-gouge, light blue for slightly crushed rock, and heavy dark blue for strong clay selvage. With these conventions it is possible to make a drawing that absolutely reproduces the appearance of the face or back of a drift, showing to anyone familiar with the scheme the intensity of mineralization, amount of faulting, direction of drag, etc. The necessity of accurately reproducing the appearance of the ground is greater stimulus to careful observation. In this respect the Anaconda system is superior to others in which mere conventional symbols, such as red dots or crosses, mark the position of ore, or ruled lines of uniform width indicate faults. The fine distinctions which are perceptible underground should appear on the geological maps with equal clarity. Unimportant details such as joint-planes, etc., should be ignored.

In Butte, geological maps are based upon the co-ordinate system used by the mine-engineers. Sufficient sets of convenient size are made to cover the entire district in checker-board manner. The maps are on tracing-cloth, with a separate sheet for each level. In addition to the regular working-set on a scale of 50 ft. per inch, sets on scales of 100 and 200 ft. to the inch are maintained. Mine-foremen are provided with 100-ft. maps covering their own mines, and these are kept up to date by the department. It is of prime importance that the foremen should have for daily use a set of maps on which the geologic structure is shown. The expense entailed by the preparation and maintenance of these foremen's sets is more than repaid by the saving in underground work which results from their use. Cross-sections, generally on a 100-ft. scale, are made at sufficiently close intervals to cover all details of structure. In many parts of the district a cross-section every 100 ft. is essential. It has become axiomatic among members of the department that the preparation and study of these cross-

sections is one of the most fruitful methods of using the geologic data. It may be stated without reservation that even those most accustomed to using maps and thinking in terms of three dimensions seldom fail to profit by the use of cross-sections. Many an unexpected orebody has been found through their assistance. They are too seldom employed in general.

In order to transmit to the proper officers the geologic conclusions reached, a system of 'recommendation sheets' is employed. These sheets are made out by each geologist as he reaches his conclusions. They carry the following information: mine, level, description of recommended work, object of recommended work, approximate distance to be run, date of recommendation, result (to be filled in later). The recommendations of the subordinate geologists are submitted to Messrs. Sales or Linforth for approval, and if endorsed, are forwarded to the mine-foremen for execution. Duplicate copies are filed for the information or action of the general superintendent. It has been found desirable to keep each foreman supplied with a large number of recommendations for each working level, in order that he may carry out the suggested work at the time most convenient to his general operations. Recommendations requiring immediate action are appropriately marked.

CONCLUSIONS. This outline covers the routine work of the Anaconda Geological Department. I have purposely emphasized those features in which I believe it to excel—for instance, the close co-operation with the men in the mines, the accuracy and detail of the notes taken, and the concentration of attention upon the structure of the ground. Its excellence in these lines may be attributed both to the special problems of Butte geology and to the good leadership and direction which have solved them.

The problems which other mines present to the geologist are not always the same as those of Butte. In some districts mining operations depend less upon structure, and more upon such matters as the genesis of the ore and its association with certain rocks. But the correct interpretation of these points cannot be made without the preliminary work of thorough and detailed mapping of the veins, rocks, and faults. From this structural work alone can the succession of geologic events which have created and localized an orebody be worked out in the proper sequence, and upon this knowledge alone can underground prospecting and development be successfully conducted. With the recent great and justified expansion of the use of the microscope in geological study it is perhaps well that conditions in Butte have combined to prevent this from resulting in a neglect of overalls and pick as essential tools of the mining geologist.

JAPAN has forged ahead to leading position among the foreign countries using American copper, a total of 117,354,241 lb. having been exported there during the nine months ended March 31. This is all the more interesting when it is realized that not a single pound was sent to Japan in the corresponding period last year.