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ARIZONA DEPARTMENT OF MINES AND MINERAL RESOURCES AZMILS DATA

PRIMARY NAME: CONGRESS

ALTERNATE NAMES:

- CONGRESS MINE, PATENTED 878
- FRACTION, PATENTED 883
- NIAGARA
- NIAGRA
- GOLDEN KEY
- HERSKOWITZ PROPERTY
- QUEEN OF THE HILLS
- OHAHA
- PLANET MIER
- JAQUAYS
- B AND M
- PATENTED CLAIMS MS 2888 & 3523

YAVAPAI COUNTY MILS NUMBER: 440C

LOCATION: TOWNSHIP 10 N RANGE 6 W SECTION 23 QUARTER N2
 LATITUDE: N 34DEG 12MIN 05SEC LONGITUDE: W 112DEG 50MIN 54SEC
 TOPO MAP NAME: CONGRESS - 7.5 MIN

CURRENT STATUS: PAST PRODUCER

COMMODITY:

- GOLD
- SILVER
- COPPER SULFIDE
- FELDSPAR

BIBLIOGRAPHY:

- ADMMR CONGRESS MINE FILE
- ADMMR CONGRESS COLVO FILE
- ADMMR NIAGARA MINE & MILL FILE
- ADMMR GOLDEN KEY FILE
- REPORT OF THE GOVERNOR OF AZ 1899 P 54-56
- WILSON, E.D. ETAL. AZ LODE GOLM MINES AZBM
- METZGER, O.H. GOLD MINING & MILLING IN THE WICKENBURG AREA USBM IC 6991 1938 P 45

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REPTS THIS FILE

1.-	COLVOCOR ESSIES	8-30-48
2-	E.A. COL BURN	10-01-45
3.-		07-10-45
4.-	(RE, HERMONS)	11-18-44
5-	COLVOCOR ESSIES	12-19-44

S. THEODORE SMITH AND ASSOCIATES

Accident Control Consultants

610 SOUTH BROADWAY
LOS ANGELES 14, CALIFORNIA
TUCKER 6864

November 11, 1948

Mr. E. A. Colburn, Jr.
P. O. Box 153
Congress, Arizona

Dear Mr. Colburn:

We appreciate very much your detailed letter of October 27, together with the sketches, which give us a very clear idea of the whole layout.

At this writing I am unable to give you an idea of when I will be able to get away from here for a trip to look at the ranch, but can drop you a note later.

Sincerely yours,



(copy)

August 30, 1948

Messrs. Colburn, Byron Moyer, Richard Heilmann and Associates.

SUPPLEMENTARY REPORT ON CONGRESS MINE

Gentlemen:

Although my examinations of the Congress Mine in 1935, 1942, 1943 and 1944 were made first for the purpose of determining the advisability of treating the tailings and dumps and next with the idea of conducting a large scale operation for the treatment of tailings, dumps, mine fills and low grade ore in place;—the results as embodied in my long report of August 1943, to which I later made some additions, included much information which would be valuable in guiding a small operation treating only the higher grade ore. In this connection the following supplemental notes are submitted and in order to call particular attention to portions of my report which have a bearing on your present problems, I have side lined certain paragraphs in pencil and also made a number of notes on the margin of the copy with which I shall furnish you.

1. The remaining tailings will probably not pay to work, but it will be advisable to investigate the sub-soil where some samples which we took in 1943 showed material carrying \$18.00 per ton; but this may since have been removed.

2. As to the dumps while these will not average much over \$3.00 per ton, there are some portions which might be worth sorting over and perhaps screening since it is of record that on one occasion 147 tons were sorted from a dump and assayed \$18.55 per ton. Some of my samples from the dumps ran better than \$10.00 per ton but these were averaged with lower grade material.

3. From all sampling it appears that the mine fills down to the 1500 level will average at least \$5.00. Here again there are sections which are much richer than the average, but we purposely cast out high grade samples. Some idea of the probable value of each portion of the fill can generally be obtained by visual inspection after washing, as the presence of quartz and sulphides nearly always indicate gold values except in the Queen of the Hills where there is a lot of nearly barren quartz. Before actually preparing to mine any of this material, I suggest that some grab samples should be taken from the best looking sections as I obtained several samples which ran better than \$8.00 per ton particularly from the Congress vein near No. 2 shaft on the 925 ft. level.

4. The mine was unwatered in No. 2 shaft to the 1950' level in 1941 and Ramsden told me that he found some very good ore on the 1925' level in No. 3 shaft and extending up to the 1700'.

HIGH GRADE ORE

The existence of high grade ore remaining in the old Congress workings has been made the subject of persistent rumors many of which I believe to be unfounded or greatly exaggerated. However, as a matter of record, I think it proper to repeat some of these for what they may be worth.

Near to the surface, especially in the vicinity of the No. 1 shaft there still remain small sections of pillars and sills of high grade ore some of which has been gouged out by leasers during recent years and shipped to the Hayden Smelter after the Congress Corporation shut down their mill. This ore was difficult and expensive to mine and probably had an average value in the order of \$20.00 per ton but was hand sorted until the shipping product becomes much richer. Profits to the miners seem to have been small since the work was intermittent and had been practically discontinued during the latter part of 1944. The tonnage of such ore now remaining in this section of the mine must be small and cannot be considered in any estimate although it is quite likely that after regular mining and milling operations are resumed, new leasers may furnish a few hundred tons or more per annum.

Frank Stone of Prescott who did some leasing on the mine claims to have climbed up 90' in an inclined raise from the 600' to the 700' level east of No. 2 shaft and there to have found and sampled a cross vein with a width of 18" to 2' that carried up to 4.00 Oz. of gold. This story was related by Herscowitch who apparently does not know just where the raise is located and in any event it is probably now inaccessible except after some preparatory work.

Regarding the Queen of the Hills workings, Stanton could give little information since most of this work was done after he was no longer manager of the mine, but it is of record that leasers operated here with some profit during the 1930s and that the mine workings are much more extensive than shown on the map and at one point a winze had been sunk to a depth of 1750'. Samples taken in some of the pillars ran better than \$10.00 per ton and several reliable men stated that a substantial tonnage of similar grade of ore remained in the sections of the vein which they had examined prior to 1940.

It is my opinion that a comparatively small amount of cleaning up would permit the examination of much of these workings which are now inaccessible and I suggest that special attention should be paid to the QUEEN of the Hills which seems to have been much less thoroughly prospected than other portions of the property and which probably contains the faulted extension of the Congress Vein.

LOWER GRADE ORE

As to the lower grade of ore remaining in various portions of the workings, I can add nothing to the previous statements and those in my report except to mention that Snow confirmed the findings of Calburn, Price and Ramsden to the effect that many samples out in the vein between the old stopes would run from \$7.00 to over \$10.00 per ton and some of my samples carried over \$9.00 although all high grade material was purposely avoided.

Stanton and others who were familiar with the old mine mentioned the fact that there had been left in the upper levels of the Niagara vein ore which assayed just a shade below the old limit of 0.35 oz. per ton and which could be reached for sampling from the #5 shaft if a little cleaning up was done in the shafts and drifts. While no accurate estimate of this ore was made, the tonnage was represented as being quite substantial and some portions of it would carry better than 0.40 oz. per ton.

METALLURGY

In further reference to the treatment of the higher grade

ore to be produced from small scale operations (about 50 tons per day) it seems that this might best be started through the use of flotation with shipment of concentrates to a smelter. These concentrates and even the flotation tailings could later be cyanided (with or without roasting if the extra recovery would make this worthwhile.

I have a record of gravity concentrates shipped by the Congress Company to the Humboldt Smelter in 1906 which carried 7 to 8 oz. in gold and 13 oz. in silver, and I believe that a high recovery of values could be obtained on most of the ore by modern flotation alone whereas the installation of cyanide equipment would involve much extra expense and the operation of a small cyanide plant is comparatively costly.

CONCLUSION

To sum up the situation I would call your attention to the estimate of ore reserves given on page 104 of my long report and especially the possible ore amounting to 200,000 tons with an average gross value of \$11.00 per ton. Neither the quantity nor grade of this material can be made the subject of an engineering estimate based upon mathematical data but it is based largely on conversations and correspondence with competent engineers who were familiar with the old workings of the mine and it has been checked to some extent by my own findings and those of other engineers who assisted me or were associated in our investigations.

Of course all cost estimates in the long report must now be substantially revised upward and without attempting to go into detail I have figured that the cost of developing, sorting and mining ore will be in the order of \$6.25 per ton in place of \$5.00 and milling, etc. will cost about \$1.75 making a total operating expense of \$8.00 and leaving a profit of \$2.00 per ton on this class of material if an average recovery of \$10.00 can be obtained.

The total expected profit from the operation, after deducting the repayment of capital which must be invested, may not seem to make the venture particularly attractive, but one must bear in mind the chance (and I think it is a very good one) of finding and mining considerable ore of a much higher grade some of which may well run to a value of \$20.00 as produced in the old operations and considering that all mining is at best a speculative venture, I feel that there is a strong probability that the initial investment will be repaid and a reasonable expectation that a very substantial profit may be earned either because of the development of higher grade ore or because of the anticipated increase in the price of gold. Moreover it should be noted that all of the samples listed in the report were purposely taken without sorting while such sorting, at a comparatively small expense, would have raised the grade of those taken from ore in place and also from portions of the job from 15% to 30%.

In carrying on a small operation you will doubtless find it advisable to apply both selective mining and sorting and may thus be able to bring the average value of mill heads to perhaps \$13.00 per ton which would be most desirable.

FIRST PROCEDURE

The condition of the workings which I visited and sampled some five years ago has doubtless changed somewhat for the worse and before mining and milling is actually started, it will be essential to have made accessible a sufficient number of faces of pay ore or gob to permit the desired daily production.

In order to be reasonably sure of producing 50 tons of pay ore or gob I feel that first of all, and before making any large purchases of equipment, it would be your best policy to employ a competent young engineer with a small crew of miners who could work under the direction of Mr. Colburn, clearing out the drifts or stopes where pay is known or believed to exist and re-sampling these ore shoots or sections of the gob with proper sorting followed by preparation for actual extraction of the pay ore.

By following this program you should be able to avoid the mistake of going to more than a trivial expense in preparing to develop and mine ore shoots which are not sufficiently rich to pay the working costs.

CAPITAL EXPENDITURES

I have refigured the capital expenditure which will probably be involved in this undertaking and assuming that you can purchase the present power plant for \$12,500.00 and obtain good second hand machinery for your other principal items of equipment, I think that the \$80,000.00 which you propose to provide should be sufficient provided you do not attempt to cyanide either the concentrates or tailings from the flotation plant. Should such cyanide treatment prove to be necessary or advisable, I believe that you should arrange to have available an additional \$10,000.00 or preferably \$20,000.00 which last figure would raise your total capital investment to \$100,000.00 and serve to provide a certain amount of working capital which is often of great importance.

My conclusions are again made on the assumption that there will not be any further advances in the cost of labor or other commodities resulting in serious inflation with a decrease in the value of our currency which would make present estimates entirely worthless as long as the value of gold is fixed at \$35.00 per ounce.

Yours very truly,

GMC:IM

(signed) G. M. Colvocoresses.

WICKENBURG ORE MARKET

ASSAY CERTIFICATE

JOHN C. HERR, Assayer

Wickenburg, Arizona, Feb. 21 1919

Congress Metals

Congress Ariz.

Samp No.	Owner's Mark on Sample	GOLD		SILVER		Percent of Cp'r. Lead	Total Value Per Ton
		Ozs. Ton	Val. Ton	Ozs. Ton	Val. Ton		
	Bullion Bar # 30	209 Fine		737 Fine			
	11 3/4# = 170 Troy Oz						
	11# of Bullion = 160 Troy Oz						
	160 x 209 = 33 oz Au = \$ 1155						
	160 x 737 = 118 " Ag = 106						
							1261
	Au 248 oz x 201 fine = 52 " = 1850						
	Ag 248 x 731 " = 183 " = 168						

Gold at \$.....Per Oz.

Copper at Smelter Settlement

John C. Herr 1919
ASSAYER

WICKENBURG ORE MARKET

ASSAY CERTIFICATE

JOHN C. HERR, Assayer

Wickenburg, Arizona, Sept. 28th 1919

Dave Du Bois.

Congress, Ariz.

Samp No.	Owner's Mark on Sample	GOLD		SILVER		Percent of Cp'r. Lead	Total Value Per Ton
		Ozs. Ton	Val. Ton	Ozs. Ton	Val. Ton		
	Queen # 1	0.52	\$ 16.74	0.40	---		\$ 16.74
	" # 2	0.44	\$ 14.16	0.50	\$ 0.45		\$ 14.61
	M-Drift #3	0.32	\$ 10.30	0.50	\$ 0.45		\$ 10.75
	Sample # 4	0.76	\$ 24.47	2.60	\$ 2.34		\$ 26.81
	Charges \$6.00						
	By Geoglein.						

Gold at \$ 32.20 Per Oz.

Copper at Smelter Settlement

John C. Herr
ASSAYER

171.30
11 3/4
1454
16034

100
209
3200
33440
33
760
105
44220
105
737
1155
117920
118
462

at 35/oz.
at 32.20/oz
Average 14223 @ 35 = 49271

Shoshone, Calif.
Dec. 30, 1947

E. A. Colburn, Jr.,
P. O. Box 153,
Congress, Arizona.
Dear Sir:

I received your letter of Dec. 1st, and thought I would visit you before Christmas.

I made a trip to Yuma last week but did not have the time to come over to the Congress Mine. It may be about the end of February before I find time to come over.

Yours truly,

Mark C. Cadwallader

Happy New Year.
I'll show up as soon as I can

**SCHEDULE NO. R-2
RESIDENCE SERVICE**

Availability:

This rate available in territory outside of the Cities of Prescott, Flagstaff, Winslow and environs to residence customers taking service thru a single meter for lighting, appliances, refrigerators, ranges, water heaters, and single phase motors for residence use not to exceed three (3) horsepower total capacity.

Character of Service:

Alternating Current, sixty (60) cycle, single phase, 120 volt 2-wire and 120/240 volt 3-wire.

Contract Term and Billing:

Standard contracts are for periods of One (1) Year with monthly payments for service taken.

Rate Table:

		Net
First	13 kilowatt hours or less per month	\$1.00
Next	42 kilowatt hours per month	@ 7c per KWH
All over	55 kilowatt hours per month	@ 2½c per KWH

Plus the applicable proportionate part of any additional taxes or governmental impositions which are assessed after the effective date of this rate on the basis of the gross revenue of the Company and/or the price or revenue from the electric energy or service sold and/or the volume of energy generated or purchased for sale and/or sold hereunder.

Minimum Monthly Charge:

Lighting, appliance and small power service	\$1.00
Additional charge for electric range and/or water heater	\$1.00

Plus \$1.50 Net per KW of capacity of water heaters in excess of 3 kilowatts and of ranges in excess of 12 kilowatts.

Payment Terms:

Bills are due upon presentation and, if not paid twenty (20) days after date of presentation, become delinquent.

Special Provision:

Water heaters in excess of three (3) kilowatts of rated capacity, where installed in connection with an electric range, shall be connected by a double throw approved safety switch so that the range and water heater cannot be used simultaneously. All wiring from meter to range and/or water heater shall be in conduit or approved armored cable continuous with no splices or outlet boxes from meter to range and/or water heater.

Rules and Regulations:

The general rules and regulations set forth in this tariff shall govern where applicable the supply of service under this rate.

The Congress Mine
Yavapai County, Arizona.

Oct. 1, 1945.

The Congress mine was opened in the early 1880's and produced a total of nearly \$8,000,000.00 up to 1910 when all work was stopped underground and never again started. This production was with gold selling at \$20.00 per ounce, whereas it is now selling for \$35.00 per ounce.

The Congress Mine was the best money maker of any gold property in that part of Arizona, and is still far ahead in point of gold production of any nearby mine. It has been idle for 35 years while other properties have been working. Surrounding mines such as the Alverado, Octave Yarnell and others have made money for their owners, but the Congress still overtops them all.

In fact, in its early history it was the direct cause for the building of the railroad extending from Ashfork through Prescott and on past the mine to Phoenix. This railrao is now owned by the Santa Fe. Prior to this time the ore was hauled about 100 miles to rach the railrodd for shipment to smelters.

The real reason for the suspension of operations on the Congress Mine in 1910 was the fact that the Congress at that time was owned by a company with large holdings in other mines in Arizona. These properties were largely unproductive and were requiring the investment of considerable funds to keep them going. A large part of this capital was drawn from the production of the Congress Mine and production was pushed to the fullest extent, development was neglected and in fact the mine was gutted. In 1919 the time came when income of the group was not equal to the expenditures so that all properties were closed and among them the Congress.

Since 1910 no serious work has been attempted underground and in 1920 the entire mining and milling plant was sold and removed, thus leaving no equipment on the property except some houses and the water supply system from Martinez Creek. Naturally the small leaser, who usually follows large company operations, was unable get into the mine to clean it up and further develop it, because of this lack of mining equipment. Therefore the underground workings remain pretty much as they were in 1910 except for the rottin of timbers and the consequent caving of openings which makes access to part of the mine difficult and some of it impossible.

Therefore, we have a mine idle since 1910 and not worked out at that time. In those days gold sold at \$20 per ounce, now it sells at \$35 per ounce. Then the cyanide process was in its infancy, now it is well advanced and other accessory processes have been developed which make possible very much improved recoveries and greatly lowered costs. Then the mine was worked by hand drilling and the muck hoisted by steam power, now we have access to highly mechanized methods of ore breaking and ore handling. Then it was necessary to maintain a high grade mill head with consequent high costs per ton mined, now we are able to treat much lower grades of ores and our mining expense is consequently much less per ton mined.

In consequence of this condition we are able to mine and mill at a profit ore of so low a grade that the operators before 1910 would have classed it as waste. Therefore, they left it in place in the mine to say nothing of the large amounts of ore then minable at a profit which they overlooked.

There have been several attempts to make money from the large mine dumps and from the mill tailing dumps, but these have largely failed because of lack of capital, of knowledge and of equipment. However, the last attempt was a success until closed down by conditions incident to the war in 1942. If by any chance it had survived the labor shortage in the summer of 1942 it would have been closed down by the goldmine closing order of October in that same year. A 300 ton per day cyanide plant was built at a cost in excess of \$200,000.00 and successfully operated on tailing and mine dump ores. If the war had not intervened the RFC loan would have been paid off in the latter part of 1942 or early 1943. In 1941 an operating profit of \$50,000.00 was had. The plant was closed because labor was not available to operate it. It had been a profitable operation and was rapidly paying off the debt, and it can be made to operate at a profit again.

This plant is still on the property and is in excellent condition.

According to statements by Mr. Rockwood, the receiver before the RFC foreclosed their loan, and who was in charge of the property during most of the mill operation, says that there ample tonnage still on the dumps to pay the RFC loan and a good profit as well. This is figured from his estimates of tonnage remaining and his profits based on actual mill operation.

The RFC bought in the property for their debt of about \$93,000.00 of which \$78,000 is principal and the balance interest.

I have recently transmitted an offer of \$25,000 from a Denver machinery firm to the RFC, for the entire property. I also have a tentative offer of \$35,000 for the mill machinery alone from a reliable Phoenix machinery and sales company. It is my opinion that by private sale a little more money could be obtained for the machinery now on the property. Perhaps \$40,000. These bids fix the value of the plant, as used machinery deals rarely ever pay more than 10% of the first cost. Of course, this is exceptional used machinery and would naturally bring more money than some.

Naturally, the machinery as constituted in a plant is worth more than it would be to remove it from the property as used stuff.

It might be possible to sell off the two Diesel generating sets and bring in power from the lines of the Northern Arizona Power Company about 3 miles away and thus realize quite a sum of money and still leave the mill in good operating condition.

There are several ways in which this property might be handled, and among them are the following:

1. Retain the present mill.
2. Sell off the mill as used machinery.

The first would require the greatest primary investment in that the cost of the purchase could not be recovered at once, but must await upon the profits of the operation.

However, as a mill would eventually be necessary, although perhaps of a smaller size, it might be the best investment in the long run. The mill could be operated on dump ore until the mine could be put in shape for production. In this case the profits from the mill would be put back into the cleaning up and further development of the mine until production started therefrom. This scheme has the advantage of a mill of good size and consequent low operating cost per ton of ore passed through it. The mill being a cyanide plant has the advantage of a very small marketing cost as compared with mills concentrating the ore and having a high marketing expense in the transportation and sale of the product. However, this advantage is partly nullified by the higher cost per ton in the cyanide plant than in a concentration mill.

The second scheme offers the best chance for the mine operation at the smallest possible expense. The sale of the mill equipment and buildings should offset the down payment to the RFC and leave the mine without cost, except possibly a small royalty to cover the balance, if any, still due the RFC on the purchase of the property. It might also be possible to sell the dumps or the mill and the dumps together for a price sufficient to pay out original purchase price. I have had a nibble along this line quite recently. A small initial investment would be needed to open up the high grade shipping ore and get into production thereon. Monies derived from the sale of this product could be used to further open up the mine to such a degree that money could be borrowed to build a milling plant of possibly 100 tons capacity. There is also the possibility that a very modern cyanide plant can be obtained in which to treat this ore. The owners might treat the ore for us or be willing to sell or rent the mill which is only about 5 miles away. The property has a good record for mining and milling costs and mill recoveries on an ore of much greater hardness and exceptional difficulties of treatment, but the mine is virtually worked out with respect to a good grade of ore. Mining and milling costs were less than \$4000 per ton on a 100 ton basis. The Congress ore is much more readily mined and milled than the ore from this property and the costs would be proportionately less.

If the property can be bought from the RFC on a reasonable basis the sale of the mill would pay off the purchase price leaving the mine free, but in case the RFC insists on a higher figure arrangements possibly could be made to turn over to them the proceeds from the sale of the mill to them as a down payment and allow the balance to be paid out of a small royalty on the ore shipped or milled. In any case the mine and mill are worth much more than the face of the loan, especially if they can be had on the basis above referred to, but the proposition must be carefully worked with due regard for the knowledge of the ore deposits which I have been able to gather over a period of years and which is not obtainable elsewhere. An engineer going through the workings and unacquainted with conditions in many parts of the mine difficult of access or caved or flooded since I examined them would not be able to see too much ore in sight, and would naturally turn to the ore on the dumps to estimate the value of the property. This is exactly what has happened time and again, and is one of the reasons for the property being available at this time, and for the opportunity to make a big mine of this now idle property. A small expense fund of from \$5,000 up would reach the high grade ore and put us into production thereon.

Congress Mine #4

Now is the time to get into gold mining before everyone else gets the same idea. Gold is always good in times of labor unrest and depression. It is now predicted that within six months there will be 8,000,000 unemployed, and if this is true labor can be had for gold mining at pre-war levels of pay. Even now there is great interest in gold mining in Arizona and the West generally, and this will grow with the easing of labor.

On a milling basis of 300 tons per day the dumps should return a profit of 50¢ per ton. With \$7.00 ore from the fills and other low grade ore sources underground the mill should show a net profit of from \$2.00 to \$2.50 per ton of ore milled. The high grade shipping ore would not pass through the mill but would be shipped directly to the smelter and should net from \$20. to \$30 per ton on a basis of a gross value of \$35 to \$50 per ton.

Milling on a 100 ton basis the \$7 ore would net from \$1.75 to \$2 per ton. Without the present 300 ton mill it would not be possible to make a profit from the dump ores unless some method of preliminary concentration were developed. This does not seem to be an impossible feat and tests should be conducted along this line.

It appears, therefore, that the Congress offers a fine opportunity to recreate a great mine for a comparatively small investment. In the accompanying reports I have covered the situation thoroughly as regards conditions of the workings, ore shoots, gold values, etc. Maps of the old workings are available and arrangements for a personal explanation of all matters may be arranged.

Very truly,

E. A. Colburn, Jr.

Congress Mine and Mill.

July 10, 1946.

Subsequent to the reports relative to the Congress Mine the property was sold, early in 1936, and was later equipped with a 300 ton mill to treat the ore and tailing dumps. This mill is now on the property. The old mill referred to in the reports was dismantled and sold. This new plant, together with other necessary expenditures and a loan from the RFC cost a total of over \$200,000.00.

In order that the reader may get a good idea of the mine and mill I am giving below extracts from my letters to other people who were interested in obtaining the mine, or mine and mill. Where the letters are from others to me I am making note of that fact. Due to trouble in the owning company stockholders, a receivership was asked for by the RFC and a large part of the time the mill was run it was under this receivership. Mr. Rockwood was the receiver and he could not grant leases for a period of over 90 days upon the underground workings due to orders of the court, and this was the reason that I took no lease on the mine, as the length of time would not be sufficient to recover the investment necessary to reach the ore.

December 12, 1940. Your letter received, and I will tell you what little I know about the Congress affairs. Sherman made the original examination on the dumps and Lydell evidently promoted the deal. The man who gave them the money for the original purchase and additional funds, I understand, to make up the amount of his investment to \$80,000. or more was this Mr. Holmes from Pittsburg, Pa. Evidently he has had no prior experience in mining, but is now living at Date Creek, for the winter, I suppose. He bought a place there, ostensibly for water for the Congress Mill, and has since built additions to the house so that he has quite a nice place. A friend of mine who knows Holmes well told me that Sherman and Lydell each got 15% out of the deal, and evidently the management went along with the minority interest, for Lydell has been in the saddle all the time. As far as I know Sherman has not been on the job at any time. Just what the causes are for their failure to meet the RFC loan specifications I do not know, but from experience with the ore I am inclined to believe that the lack of management is largely responsible together with small tonnage capacity and probably undergrinding. The RFC contract specified that they were to work only on the mine and mill dump so that no underground mining could be accomplished; However, they have been treating some custom ore. The other attempts to get a profit from the mill tailing were both foredoomed to failure. Strange and McGuire did not grind the heads at all, and tried to put too much tonnage through the plant. My tests indicate that in order to get a reasonable recovery it was necessary to grind to 150 mesh. This would not require much expense as the tailing is already fairly fine, but there are many sand particles which have attached values that must be freed. You will remember that I was on the job for about 15 days of the other run made by the Illinois Mining Co. Their trouble was poor assay control, over tonnage for the size of the plant causing lack of wash to get the dissolved values out of the slime and undergrinding with also a lack of agitator capacity. The plant was run for a short period after I left there and the man in charge later reported to me that he could make a good recovery at 150 tons per day when he was

grinding fine and using the data I worked out, but that over that tonnage he could not wash out the soluble gold. After you looked the Congress over I was up there for a period of three months, making a total of eight months altogether. We did no work on the Congress vein, but did open up the No 5 shaft on the Niagara vein which lies to the south of the Congress vein, is more steeply inclined and is opened 2000 ft. deep on the vein. No. 5 shaft is the main working opening on the vein although No. 4 which is 1200 ft. deep and No. 6 1800 ft in depth are both on this vein. The collar of No. 5 was caved, but we managed to crawl down through between big rocks and get into the workings below. The hanging wall had caved down to the 300 and disclosed quite a body of \$20 ore, in fact three superimposed layers, about three feet thick each of sulphide ore, length undetermined but well over 100 ft. A leaser caught up the collar temporarily, but in such a manner that it caved in worse than ever, after I left there. Samples of fills at three different points in this shaft down to 300 gave me \$14 per ton. The leaser I referred to crawled down below the cave at 300 and investigated the ground below. He told me that there was all kinds of the same ore as showed in the cave above as far down as he went. Ore from this vein is wider, has more sulphide content and is a little lower in grade than the ore from the Congress vein. If my memory is correct the Niagara ore went about \$10 as against Congress \$13 old price. I think that the prospects of making quite a mine out of the Niagara vein are very bright, but on account of the caves mentioned one can't see much. On the ??? level of No. 2 shaft on the Congress vein a body of ore has been tapped. This is a high grade vein which will average better than \$50.00 per ton and is about two feet in width. The opening has ore in both lateral faces and is now 75 ft. long. While making a geophysical survey on the surface directly over the extension upward of this ore body we found very fine indications. According to that we could expect this ore to extend a distance of at least 500 ft. There are other numerous places on the property where good pay ore can be had, but I wouldn't be foolish enough to say that enough ore was in sight to start the present mill without the dumps and fills. I do say, however, that with a little fixing up and development that a very substantial tonnage would be flowing to the mill from the mine. The above information is confidential and no one knows about the most of it but myself. I was there for quite a while and had the opportunity to work it out. I understand that the present operators are just shoveling up the mine dumps and crushing and milling it, and if that is the case it is no wonder that they are not making money. It should be screened and sorted to make a good grade mill ore. It has been my opinion that the Congress is the best gold mine in the state and I still believe that it is, but there will have to be some money invested in it before profits can be had.

February 15, 1941. Yesterday I went to Congress to see if I could find out anything new. It is reported that Holmes came down some time last fall, probably prior to Oct. 1, to change managements from Mr. Lydell to Mr. Gemmill, who was on the Yarnell while I was looking it over for you. It is reported that the RFC would not allow a change of management. Lydell told me himself that the receivership was not caused by any lack of money, but by trouble with stockholders. I saw Lydell personally and I couldn't pump much information out of him. Approached him on the basis for getting a lease underground. He is purchasing ore on a very peculiar basis and poor sampling machine but seems to be getting quite a little ore at that. He is willing to lease for a period of 90 days only.

He wouldn't give me any information as to what was to happen in the future even if he did know, which I doubt. He would like to have someone take over portions of the mine and furnish mill ore from the fills underground. Says he could take about 150 tons per day now, as that is the tonnage he is getting from the dumps which with a like tonnage from the tailing makes up his mill head. I told him that it would cost quite a bit to rig up to produce that amount from the mine and that a leaser would have to have a great deal more time than 90 days, and he agreed on that point. They seem to have a very nice plant as far as I could see from the office. On the rock coming from the dump they are not sorting to any extent. All I saw was a man perched on the tailboard of a truck which was packed up to the conveyor picking out rock and throwing it into the truck. There may have been other sorting, but I didn't see it.

February 26, 1941. There is an old yunnel going into the hill at the Oldest No. 5 shaft and there is ore to start on in the floor of this tunnel that will run \$20. Then farther along is a winze with a vein in it that will run \$125 for four inches with a total width of perhaps 18". This will make ore and will prospect the territory beyond the fault which I hope will disclose a virgin mine. If I can get the No. 5 I can get started breaking ore in under a weeks time after I get the word. If I have to take the No. 2 shaft it will probably take about three weeks, as I would have to get a larger hoist on the job lay 600 ft. of track and water and air line and do some cleaning up of a drift.

March 5, 1941. There have been several leases granted on the mine since the mill started operations, and I believe that one or two are in operation at this time. All of these were on or near surface as few of the local men have machinery that they could use, and as you know there is no machinery of any kind on the shafts. The mine is now operated under a receivership by the RFC so that the receiver must know of all such matters as leases on the mine. Evidently some of the leases have been running for several times the 90 days. The quantity of ore exposed in No. 5 is quite large. I don't suppose that one could get in to see it now as the collar of the shaft is caved. I saw this ore when I was there with Reed and a leaser opened the then caved collar and we were able to go down to the third level. The hanging wass had caved for a considerable distance showing 10 ft of good ore which had been left standing. This is west of No. 5 and I do not know whether it extends into the workings of the old shafts but it is pointing in that direction. It is my idea that the original operators overlooked more ore in these workings than they did in the Congress, and left perhaps more than they took out, because of the character of the ore shoots in the Niagara. There is a junction of veins which does not show on the maps, at or near No. 5 and this may be the cause of parallel ore shoots along the vein.

November 26, 1941. It appears, from a talk with Mr. Rockwood receiver for the Congress Mine, that he is not allowed to give longer than a three months lease upon any of the ground belonging to the company for the reason that the court has so ruled and will make no exceptions. It is not a matter that the RFC can alter. It is further apparent that the receivership will terminate in about a years time due to the paying off of the indebtedness. He also told me that they had paid off \$50,000 in the past 12 months, so that is a pretty good recommendation. D

Congress Mine and Mill #4

Don't see how they did it, but I don't think he would lie to me. He also told me that he was going to put a plant on No 3 shaft and get a track down to the water. They have had it pumped down to below the 1700 level, but that was through No 2 shaft. He says that the 17th level is clear from #3 to #2 shaft.

September 25, 1942. (The Congress mill was shut down in July 1942 on account of not being able to get men to run the plant. They resorted to every expedient to get and keep men, but the wages on the coast in war plants was so much above prevailing wages that all men were syphoned out of this country)

My trip was primarily in regard to the mill we sold to a fellow who is operating on some dumps of the old Congress, off Congress ground, on the west side.. The dump was from the Niagara vein and came out of shaft No. 6. He has been hindered by power trouble but has run quite a little ore and determined that a fairly good tailing can be had by flotation. He obtains about .02 or .03 oz. tailing and a high grade concentrate of about 6 oz. If his samples and assaying is reliable he is doing a very good job on that ore. I never ran any tests by flotation on Congress ore so I have no check on his results. The Congress just prior to the closing bought some new trucks, belteing and a Caterpillar engine of 185 HP. One of the leasers who was originally on the property in another location has been working for some time on the Niagara vein on surface west of No 4 shaft and has shipped some very rich ore since the mill closed it is said that he has produced about \$20,000 from this place alone. The man to whom we sold the ball mill is working the dump by merely running it over a two inch grizzly and direct into the mill. Can't be crushing finer than 40 mesh. I certainly wish that I had the mill and the Congress underground workings. It would do for a pilot operation, but of course, would be of no use for the duration except to get things in shape in a small way, as men are not available for any sort of an operation

(The gold mine closing order came in October 1942 so ther has been no activity on gold since that time)

May 10, 1943. I arranged to meet Mr. Rae at Congress last Friday and went through the whole plant with him. I was very agreeably surprised at the quality and quantity of equipment in the mill. I had no idea that the plant was as well equipped and supplied. The big Worthington Diesel engine is a fine one and has been well taken care of. It is equipped with all accrssories and with a generator direct connected, speed 400 R.P.M. In the same building is a Caterpillar Diesel of 150HP connected by V drive to a 62½ K.V.A. generator which is used as a standby and to run the pump over on Martinez Creek. This is a new job, while the Worthington was new when installed. I walked all over the plant but did not make a list of all equipment and supplies as that would take days. The ball mill looks as if it were new when installed it is a Stearns-Roger 5 ft. by 10 Ft. mill in excellent condition and driven by a 100 H.P. slip ring motor. Voltage of large generator and all large motors is 2300. This ball mill, according to Rae, ran for months at a time at 300 tons per day of dump ore which would be the equivalent of mine run ore. Grinding was at 80 mesh. This shows that it will handle 300 tons per day to about the required mesh of mine ore.

In closed circuit with the ball mill is a large Dorr Duplex classifier of late make, Type FX I believe. All machines in the mill are direct driven by individual motors, some of them being gear motors. There are five big thickeners and three very large agitators. Latter with steel tanks and all with Dorr mechanisms. Merrill-Crow precipitation with two filter presses and two oil fired cleanup furnaces. I think that three of the five thickeners have steel tanks. Thickeners have diaphragm pumps, I noticed three of them on primary thickener, so there must be a like capacity on the others. Most of the motors have been removed and stored in the warehouse, and there are certainly a lot of them, all sizes. There are also many supplies stored here. The assay office is well equipped for heavy work and has quite a store of chemicals etc. Most of the residences and houses have been fixed up and modernized. Two or more new ones have been built, one especially nice with four rooms, bath, etc. The office building has been rebuilt and now has two very large rooms, heater etc. The pipe line over the hill to Martinez Creek and the pump at that point have been replaced and the pump electrified. Out in the mill yard is a lot of machinery some of it practically new such as a small Kennedy-Van Saun secondary crusher. There is a complete extra set of Manganese liners for the ball mill besides the ones now in the mill. Of course, there is a lot of pipe and miscellaneous materials in the plant which will not show in the inventory. As I have written you before the secondary crusher has been sold. All conveyors, feeders etc. are in place except for the conveyor belts, I guess they went with the crusher. The primary crusher is 14 by 24 as nearly as I could measure the jaw opening with it a couple of feet below the platform. There is also a big magnetic pulley that protected the secondary crusher. All in all there is a lot of nearly new good stuff there, and in fine condition.

Sept 30, 1943. Mr. Rockwood informs me that there are 120,000 tons of \$2.85 tailing left. Of course there is more tonnage than this, but he figures that some of it is low grade sand that can be left. He also says that about one half of No. 5 dump is left, this will run \$5.00 per ton. I have forgotten the exact tonnage he assigned here. Then there is a big tonnage in No 2. dump which his samples say will go better than \$2.75 per ton. I would say that there are about 200,000 tons in this dump alone. So you see that there is a very sizable operation right in the dumps without thought for the mine itself. The mill being at hand and cheaply purchasable it looks like a very good thing indeed. During the time of the receivership operation they paid back one half of the loan or \$70,000. which shows that a profit is possible even on this low grade material. If manpower were available they would still be in operation. I have written you before that the mill is in good condition and fairly well adapted for the ore it was intended to treat. It was improved very considerably after it was built, and many improvements made which added to the economy of operation, etc. All of these improvements were paid for out of the operating revenues. The only thing against the mill from a money making viewpoint is the fact that the plant was not originally provided with enough settling capacity and for this reason only about one half the capacity can be used for tailing, the balance of the ore must come from the dumps and from underground supplies. The old stopes could be pulled for a large amount of this tonnage. after the tailing dumps and a small amount of the fills were cleaned up, then it would be the proper time to determine whether or not to cut down the tonnage and change the flow sheet. That, of course, would also depend on the amount and character of the development work, and the

Smaller
C O N G R E S S

NOTE RE HERNON'S EXAMINATION AND SAMPLING

Mill Tailings:--

Pipe samples did not check with trial lot of 16 tons which was good, but it appears that Congress Co. took the greater part of the White tails which are richer than the red tails and the gray tails seem to average between the two.

W. J. G. & J.
 Hernon has so far accepted my estimate of 150,000 tons remaining but figures the average assay at only 0.045 oz. = \$1.575 of which Crabtree thinks that 70% (\$1.10) could be recovered and they estimate the cost of reclaiming @ 25¢ per ton and of milling @ 75¢ so that the margin of profit would be only \$0.10 per ton and it might not pay to treat them at all. (NOTE. No allowance was made for any content or recovery of silver).

Dumps:--

Sampling is still in progress. So far #1 averages 0.10 oz.

2 = 0.07 oz.

#3 is very low grade

#5 about 0.08

#4, #6 & Queen, --no samples yet taken.

Hernon again accepts my tonnage estimates but if we now discard the 90,000 tons in #3 it appears to him that the 160,000 tons in the other dumps will average 0.081 = \$2.835 and allowing for an 80% recovery this would represent \$2.27 per ton (again excluding the small silver values). Here the cost of reclaiming and sorting is tentatively figured at 27¢ and milling (including crushing and grinding) at \$1.00 leaving a profit of \$1.00 per ton = \$160,000 for all the dumps. *plus perhaps 20,000 representing*

the junk value of the plant

Thus if only the dumps should be treated in the present plant (after same had been reconditioned) there would be a net return of

\$160,000 plus plant salvage

say 20,000 making total

net income \$180,000 from which must be deducted the purchase

price of the property ----- \$95,000

Additional expense for limited water supply --- 15,000

Reconditioning mill and equipment ----- 30,000

Total \$140,000

leaving \$40,000 which could be spent without loss for investigation of mine and exploration and development of new ore bodies at Congress and Sullivan properties or elsewhere in the district.

Recoveries of values are based on the last mill records which for a period of 38 months showed a recovery of 68.64% from tailings and dumps treated jointly and recent mill tests at Sahaurita which have given better results but more tests of the dump ore are to be made.

Mine Fills (Gob):--

The underground investigations have so far been limited to the Congress Vein from #2 Shaft and have proved disappointing. The few samples taken from the vein showed very low grade ore while the samples from the gob have averaged 0.13 oz (\$4.55) and samples of the hanging wall diorite average a little over 0.05 oz. (say \$1.80) and Hernon thinks that it will be impossible to mine the fills without bringing down an equal tonnage of the diorite up to the fault and true-hanging wall of granite which would mean that the mixed material would have a value of only \$3.15 per ton and he and his co-workers including Stone figure that the cost of mining and hoisting this material would be at least \$4.00 per ton to which must be added the transportation and milling, say \$1.25 making a total cost of \$5.25 to recover \$2.50 (80%) which involves a net loss of \$2.75 per ton.

The presence of numerous stulls set every 20' or so throughout the stopes make the mining difficult and expensive and he thinks that #2 Shaft would have to be enlarged to permit hoisting any substantial tonnage as they would have to haul on nearly every level and an even greater expense would be required to drive those thru to #3 Shaft.

X- Hernon does not think that it would be possible to examine the ore possibilities of the lower levels unless one could mine out the gob with profit and therefore it now looks to him and to Fowler and to the other officials of the Eagle-Picher Co. as it if is not going to be possible to carry out this work or determine the existence of pay ore in the mine.

On basis of present data I must agree with this conclusion and therefore the only hope of persuading the Eagle-Picher Co. to exercise their option and carry out the original program seems to lie in devising some method by which the fills, or at least a substantial portion of them can be mined at a cost of less than \$2.00 per ton for fills alone or less than \$1.00 per ton if diorite must be taken with them. No standard method of mining either by hand or thru the use of ~~shishers~~^{shishers} or scrappers could possibly be carried out at anything like these figures and the only possible alternative would seem to lie in hydraulicing or flushing down the fills which plan is discussed below.



HYDRAULIC MINING

General Conditions:--

(a) The dip of the Congress Vein is on the average ^{about 27°} ~~over 25°~~ so that small rocks or even large boulders will roll rapidly downward when the support is removed and water pressure exerted to form a steady flow. No doubt some large boulders will hang up and remain in the stopes but they should carry less than the average value in gold while high grade fines should be washed down the foot wall (V report p.18 - 20)

The average width of the ^{there is not less than 4' in the foot wall} stopes is about ~~4'~~ and the width of the hanging wall diorite up to the fault is 5 to 15' and soon after the gob is washed out some of this will doubtless come down and be washed down along with the gob but it would seem to be a safe bet that the recovered material would be at least 75% gob and not more than 25% diorite on which assumption it would have a value of nearly ^{3.86} ~~\$4.00~~ per ton or more if the gold ~~is~~ in the bed rock were sufficient to act as a sweetener. On this basis the ^{assumed value of 3.00} recovered value (80%) should be ^{less than the original} ~~\$3.20~~ or say ~~\$3.00~~ for safety.

(b) The collar of #2 Shaft has an elevation of 3400' (about) while the high point on the Martinez pipe line (where a storage tank or reservoir would be located) has an elevation of 3606', so that there would be a fall of 200' to the collar of the shaft which would increase as work proceeded at the lower levels, and provide ample pressure for moving all but the largest material.

(c) It is recognized that this procedure will require the use of a great deal of water and using a ^{2"} ~~3"~~ monitor under such a pressure will mean a stream of about ~~1000~~ gals. per minute.

⁹⁹⁵ (while) a $1\frac{3}{8}$ nozzle
would deliver 524 gal. p. m. - 4 -

However, it is proposed to use only the total quantity of water per day which will be needed in the mill and on the assumption that 250,000 gals. per day may be used for the treatment of 1,000 tons for mill feed the monitor could work underground for about 4 hrs. each day giving the shift an equal amount of time for preparatory work, clean-up, etc. while a second shift would probably be required to operate a mechanical loader, tram and hoist the washed down gob.

Since the monitor is to be used for the purpose of the mill, it is suggested that the monitor should be operated on a shift basis.

To supply this water a tank or reservoir of not less than 300,000 gals. capacity should be built on the saddle along the pipe line from the Martinez Well and this could be filled each day by operating the pump at the Date Creek Canyon and the auxiliary pump at Martinez Well at the rate of about 260 gals. per minute for a total period of 20 hrs. each day or at a higher rate for a shorter period of time. The extra 50,000 gals. per day would be required for the camp.

The Date Creek water supply will be ample for this purpose and the pumps would be run by electric power which may be supplied (as per correspondence with the U. S. Reclamation Service) at a price of about .7¢ per kw. hr.

Actually this program would not require any more pumping from Date Creek or Martinez Well than has been contemplated for the ordinary operation of the mill, etc. and the only extra power and pumping would result from the need of pumping this water out of the mine which could be done at the rate of 300 g. per min. for a period of 14 hrs. each day and as long as the work was carried on above the present water level (@ 1000' on the incline) the vertical lift to the collar of the shaft would be 450' or say 500' to the present tank at #1 Shaft. This means pumping against a head of (500 x .4335) 217# pressure or say 250# allowing for friction.

By arranging to wash gob and pump water at different periods the same pipe line (probably 6" pipe) with proper arrangement of valves could be extended down the #2 shaft to the water level and used to supply the monitor and for pumping the water out of the mine. Figuring that the cost of pumping from anywhere above the 1000' level should not exceed 5¢ per 1000 gal. the cost of getting this water out of the mine would be about \$12.50 per day excluding labor involved.

To operate the 2 monitors which might be used above and below the fill which was being mined 4 men would be needed on one shift underground plus a hoistman. On each of the other two shifts and while pumping was in progress there would probably be 5 men loading and tramping and one hoistman so that the total crew might probably be

(? Some men might run to the monitor. Changed

- 14 men underground n 12
- 3 hoistmen
- 2 foremen
- 1 mechanic
- 1 roustabout or nipper

Expense of pumps

Total 21 at daily wage of about \$180.00

To which add pumping as above and allow for hoisting power and all timber, supplies repairs, etc. 12.50

57.50

Total mining cost per day \$250.00

The tonnage which will be produced by this method cannot be determined by anything short of practical experiment but based on hydraulic mining which I have done elsewhere and attempting to evaluate all of the local conditions it certainly seems as if this should be a minimum of 250 tons with good chances that this figure might be substantially exceeded with the employment of some additional loaders and trammers.

Cost of 1.00, 2.00, 3.00, 4.00, 5.00, 6.00, 7.00, 8.00, 9.00, 10.00
75-25 | 3.61 | 2.89

Assuming a production of 250 tons at a cost of \$1.00 per ton with value and treatment costs as above estimated ^{at 1.20} the profit per ton would vary from ~~\$1.00~~ ^{0.35} -- if the proportion of diorite to gob should prove to be 1 to 1, - up to ~~\$2.64~~ ^{2.35} if none of the diorite had to be mined. Since it seems obvious that the proportion of diorite would be much smaller than if the gob were pulled by hand or by slushers, ~~and~~ a fair guess of the average value of the mixture would seem to be around \$3.75 representing a recoverable value of \$3.00 and a profit of ~~\$2.00~~ ^{0.60} per ton. ✓

(d) As to the investment of capital beyond what would be required for the treatment of the tailings and dumps the following expenses may be noted.

*1.73 p p
 8" = 2.02"*

Check all figures & units

Interference

- (1) 300,000 gal. reservoir at Martinez Saddle to be built of rough concrete at cost of perhaps \$5,000.00
- (2) Heavy 6" pipe from collar of #2 Shaft to 1000' level to be purchased and installed for about *also price of removal* \$2,000.00
- (3) Two ^{3, 2" w 1.3"} monitors or giants similar to those used in hydraulic mining to be purchased & installed with valves, etc. for . . . \$1,000.00
- (4) One moveable ^{Electric} loader for underground ore cars \$3,000.00
- (5) Electric driven centrifugal pump and motor, 300 gal. capacity . . . \$2,000.00
- (6) Electric driven hoist with cable & skips \$3,000.00
- (7) Ore cars, small tools, etc. \$3,000.00
- (8) Repairs to shaft, laying track, etc. and hoist house and ore bin \$5,000.00

1000

?

Total \$25,000.00

Thus if 100,000 tons of fills could be mined from #2 Shaft above the 1000ft. level the capital charge against this ore would be 25¢ per ton while much of the expense would not have to be duplicated in order to mine the gob from the other portions of the property.

An objection to the above program may be made by reason of the fact that the production of gob would be limited to perhaps 250 tons per day whereas it is hoped to erect a mill for the treatment of 1000 tons of material and since it now appears probable that neither the remaining tailings nor the #3 dump contain sufficient values to justify their treatment the only other "pay ore" that can be sent to the mill is represented by the 160,000 tons of rock in the other dumps which would be exhausted in about 7 months if reclaimed and treated at the rate of 750 tons per day.

Under such conditions it may seem advisable to modify the original and design the mill to treat only 500 tons per day of which the pay dumps would furnish one half for a period of 21 months. In any event the mining of the gob, -should this method prove successful, -need not be limited to #2 Shaft for obviously the water from the high tank could be returned from the mine to the reservoir and used over and over again before it was sent to the mill and run to waste with the mill-tailings. For example, the water first used in #2 shaft could be pumped back to the reservoir and then run down to another hydraulic mining unit located in #5 shaft and after being again pumped back to the reservoir it could be used in a similar manner in #3 shaft and from there sent directly to the mill.

Thus a total of 3 mining units might be installed and the production of gob increased to perhaps as much as 750 tons per day. The extra

capital investment should be roughly proportional to the increased tonnage but any attempt to operate the 3 units simultaneously might involve some complications due to the quicker lowering of the underground water level and the water if used more than twice might become too foul or ^{too heavily} loaded with sand to be used in the mill without some filtering.

From a practical standpoint I do not think that it would be advisable to plan to treat more than a maximum of ²⁵⁰ 500 tons of gob per day and it will thus probably seem advisable to start with a 500 ton milling plant, -making provision to increase this later if it should appear that the production of new ore (including the ore from the Sullivan Mine or other properties) would furnish sufficient additional mill feed.

[This would mean less water for the mill & require the use of extra water for mining the gob or running the same water]
For hoisting 250 tons per day the present size of #2 shaft with a single hoisting track should be sufficiently large and there would not appear to be any need of enlarging this shaft as proposed by Herson nor of making any new connections by drifts to the #3 Shaft which ^{could} be used later for hoisting the gob in its vicinity ^{and} probably would never need to be used unless there was a find of depth #5 Shaft (after being cleaned out and repaired around the collar) should serve to hoist all ore from the Niagara Vein while the small tonnage of gobs in the Queen of the Hills workings and in the eastern section of the Congress around #1 Shaft can be neglected for the time being and permanently, unless new ore bodies are found in those sections of the mine.

(e) Mechanics of the Hydraulic Mining of the Gob

As a prerequisite to such an operation every care must be taken to prevent any rock movement in or immediately around the #2 Shaft or

250
750000
150000

in sections where the permanent pipe lines and haulage tracks will be installed. ^{Probably} The mining should start as near to the top of the gob as possible and should gradually work downward. Also each section to be mined should be first attacked as far as possible away from the shaft ^{as possible} and the monitors should retreat on each level. Two monitors would be required, one below and one above, or near to the top of the bank that is to be mined and at the outset a sufficiently large opening should be cleaned out on the haulage drift to permit one or more days run of gob to be run down and mucked out from the ^{floor} flow of the drift by a mechanical loader which would shovel into regular ore cars that should be run out and dumped into skips in the shaft. (If any large tonnage is to be taken out on any one level, an ore pocket might be provided as at Tumco but this would involve considerable expense in cutting out a drift into the hanging wall and making a pocket so that the saving in handling the ore would not be likely to pay for the cost).

For mining operations the stope areas would have to be divided in blocks which should be as large as possible but will be limited in size by the physical conditions.

As a starter I will assume that the first block might be located ^{west} east of #2 Shaft ^{also} on the ¹⁰⁰⁰ 250' level where the filled stope seems to have a length of ^{me} about 400' and to extend upwards on the incline for perhaps ²⁵⁰ 200' so that this "bank" might contain about ³ 20,000 tons of gob assuming a width of 5'.

The pocket for the gob might be cleaned out for a length of 50' and to a height of 20' thus providing storage for some 250 tons of washed down material and plank or steel loading sheets would be laid down for

a floor on which the loader would work while a track for the ore cars should be run from this point back to the shaft.

Access to this block of ground should also be obtained ^{from #3 shaft} on the ~~250'~~ level (McKinley tunnel) where the ~~upper monitor~~ ^{upper monitor} would be placed.

^{at 1850' level}
The lower monitor on the ~~450'~~ ^{250'} level would first be put to work and would bring down enough gob to fill the loading pocket, the top of which should be protected by heavy stulls so that the roof would not cave down while the washed gob was being run down to the pocket.

The water would run down thru the gob in the lower level stopes and in so far as possible should be kept away from the shaft which must first of all be secured against caving and large pillars of gob would have to be left in place on both sides of it.

After the first days washing had been cleaned up from the ^{flow} ~~flow~~ of the ore pocket ~~and~~ a similar procedure would be repeated to wash out the next cut from the gob and then or later the upper monitor would be put to work to help in washing down the gob and to clean out the material which would hang up on the footwall of the stopes.

Without doubt some of the hanging wall diorite ^{or granite} would come down while this operation was in progress, but most of it should remain until after the bulk of the gob ~~was~~ ^{had} been washed down ^{of crushed and} and the larger fragments should hang up on the foot wall and could be left untouched.

After the block of gob had been mined it is to be expected that all of the hanging wall diorite and perhaps some of the granite would fall into the stopes but this caved material should not run down into the lower workings nor cave thru into the ore pocket so that it should later be possible ^{to} use this haulage level for access to the stope fields

from #1 Shaft which are said to be the richest in the mine and should be taken out if it is possible to do so.

Lower down in the mine the washing operations would have to be conducted on both sides of the shaft but it will ^{probably} be desirable to first clean out all the available fills on the east side and when the deeper fills on the west side are tackled work can also be carried on from the #3 shaft.

In some ways it might seem advisable to start near the bottom of any one set of stopes and work upwards especially where the ore shoot has pitched in the vein and this alternative should be given careful study.

For data look up Loftus file and also write to Herbert Paine for suggestions after sketch has been prepared.

Talk project over with Pullen, ~~and~~ Mills, ~~and~~ Fields, ~~and~~ Peach and D'Arcy at Jerome and later with Morton and others. *Riley, Sims, West*

Fuzzy
It will be in order to consider the condition of the mine after the washing out of the gob has been completed and in all probability this will be pretty terrible.

The #2 Shaft must be well protected and should not be affected down to the 1700' level below which it will probably not pay to attempt to mine the gob. The haulage levels, or at least one or two of them can be kept open if this is worth the expense and thus they would serve to give access to the eastern end of the ore shoots and such of the drifts along the cross fault as might still be open and thus it might be possible to reach and mine any ore that might be left in that section of the vein.

The balance of the drifts and old stopes will all be caved in completely and filled with diorite and granite from the hanging wall.

Below the 1700' level no change would have been affected and the possibilities of finding new ore in that area would be the same as at present but the great bulk of the fills lie above the 1700' level and it might not pay to attempt to wash out any of the gob below that point unless some pay ore were found in the vein which does not seem probable. Perhaps as much as 300,000 tons of gob and hanging wall diorite could be mined from above the 1700' level and of this as much as 200,000 from above the 100' level, and all these stopes might be divided into blocks or banks about 250' in height. The old stulls and other timbers in the stopes would probably be largely washed down along with the gob and could either be used to help support the haulage levels and ore pockets or stacked up out of the way in the drifts or in the completely worked out stopes.

As to the fine material which would run down suspended in the water it is evident that this would form sand and gravel banks in various sections of the mine below the area that was being washed and some of this might become inaccessible but the greater part could probably be collected by the loader or by hand-shovelling from the lower levels especially the 1700' level on which the shaft appears to bottom and from the sump below that level. Some of it might run down along the einze which on the map appears to extend from the 1700 to the 2525' level at which the winze is bottomed and any attempt to reclaim material from below that point, -or perhaps from anywhere below the 1700' level would involve the heavy expense of reconditioning the #3 Shaft, -but that need not be considered at the outset of the operation nor until long after its success or failure would have been completely demonstrated

December 19th, 1944

PRELIMINARY REPORT ON GOB IN THE CONGRESS MINE
AND SUGGESTED METHOD OF MINING

Mr. Grover J. Duff, General Manager
Eagle-Ficher Mining & Smelting Company
P. O. Box 1268
Tucson, Arizona

Dear Mr. Duff:

The preliminary information respecting the gob or fills in this mine was set forth in my report of August 25th, 1943. Most of the data had been given me by Mr. W. F. Staunton from whose letters on this subject I quoted at length on pages 19 and 20 while on pages 55 - 58 I commented on the grade and recovery of this material which I thought might amount altogether to some 700,000 tons with an average value of about \$5.00 per ton. I believed that Staunton was correct in assuming that a large percentage of this material could be reclaimed by slushers or scrapers with the use of occasional stulls to support the weak hanging wall of diorite and therefore estimated that the mining cost would not exceed \$2.00 per ton.

From data obtained by your engineers up to the middle of November it appeared that the gob in the upper workings from the #2 Shaft on the Congress vein had an average value of \$4.55 per ton although there is a chance that the fines lying along the footwall might sweeten this up to an average of around \$5.00 as previously estimated.

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Re: Congress Mine
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This gob, -which was originally mined from the hanging wall of the vein, -consists of fragments of low grade quartz and diorite rock, and while there are a few pieces that are a foot or more in diameter, the bulk of the material is sized from 4" to 10" and a substantial percentage is represented by fines or small chips that will pass through a 1" screen.

The diorite dike forming the hanging wall of the stopes had been found to have an average value of only about \$1.80 per ton and a thickness of from 5 to 15 feet lying below the fault gouge and the true hanging wall of granite. Much of this diorite slab is so loose and so badly cracked that it seems highly probable that reclaiming the gob by any ordinary mining methods would either require a great deal of timbering to support the roof or otherwise at least an equal tonnage of this diorite would fall down and have to be mined thus diluting the production which would then become an average value of \$3.17 of which only 80% or \$2.54 would be recoverable.

Moreover, these and other conditions recently developed have led your engineers to estimate that the cost of mining the gob will not be less than \$4.00 per ton should it be mined by hand or by the use of slushers or scrapers. It therefore appears obvious that either the gob must be left in the mine and entirely eliminated as an asset or that some materially cheaper method of mining must be devised which also if possible should result in leaving in place, -at least until the bulk of the gob has been removed, -the great percentage of the diorite dike.

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Re: Congress Mine
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It is my present opinion that a solution and probably the only feasible solution of this problem may be found in applying a modified form of hydraulic mining and thus attacking the loose gob in sections by means of "giants" or monitors which could throw streams of water under high pressure from protected locations and wash down the gob to points in the drifts where it could be loaded into mine cars by power shovels and thence trammed to the shaft. I have had considerable experience with this type of mining in the placer deposits of California and have often visualized its use underground when special conditions made it applicable.

Without attempting to cover the details of ~~this procedure~~, which I have already worked out to a considerable extent. I will mention the more important advantages of this procedure as I visualize it at present.

(1) The average slope of the Congress Vein (27°) would permit well directed jets of water to wash down along the foot wall of the stopes all but the largest fragments in the fill, while such of the old stulls and timbers as did not remain in place which could be utilized for protection in the workings or stacked up in the drifts and cross-cuts.

(2) The footwall of the stopes would be washed clean and the rich fines, which Stanton mentions as having been broken during the original mining and often left behind in the gob, should be nearly or completely recovered.

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(3) While some of the diorite hanging wall rock would doubtless fall while this mining was in progress and the smaller fragments would have to be trammed and hoisted yet by working in comparatively small sections or cuts and retreating as rapidly as possible I think that the percentage of such material could be kept much lower than would be possible by standard practice and believe that the run of mine muck would not contain more than 25% more diorite than it does at present and therefore should have an average value of say \$3.75 per ton of which \$3.00 would be recoverable in the mill.

(4) Only the quantity of water actually required for milling need be used for the hydraulic mining and when reasonably cheap electric power is available this could be pumped up to the surface for a power cost of not more than 5¢ per 1000 gals. Thus the total expense of pumping 200,000 gals. per day would not exceed \$15.00 to \$20.00 with allowance for labor, repairs, etc. This water ^{which} would carry up the fine sand and much of the very fine gold in suspension could then be used for milling purposes with no detriment to that operation.

(5) Cleaning out and properly timbering one level in every 250' for use as a haulage way and ore pocket and working back in short sections from the far end of the filled stope nearly all of the gob in each of these sections could be successively washed down to the floor of the ore pockets and then loaded by a power shovel into the ore cars.

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(6) The duty of the water, i. e., the tonnage that could be washed down per miner's inch or per 1000 gals. is something that I cannot pretend to estimate at present, but after the technique of the operation has been standardized thru practice I am of the opinion that by the use of two small giants,--one placed above and one below the section to be attacked,--a flow of 200,000 gallons passing thru the giants with a head of 200 ft. or less should serve to wash down to the ore pockets at least 200 tons of gob in from 4 to 6 hours leaving the balance of each day for loading and hoisting the ore, shifting the giants and preparing for the next cut. This should be accomplished without the necessity of enlarging or laying a double track in #2 Shaft which has a width of 5.5' and a height of 6.5' inside the timbers.

The same pipe line (probably 6" diameter) which carried the fresh water to the giants during the washing period should also serve for pumping back the water from the lower levels of the mine to the surface tanks from which it would go directly to the mill.

(7) The actual mining, loading and hoisting of the ore, preparation of the ore pockets, etc., i.e. all of the underground operations, would require a minimum of labor and in my judgment the total costs of such procedure, after the initial preparations had been completed should not exceed \$1.00 per ton of gob. The subsequent sorting, crushing, grinding and milling would probably add about \$1.20 making the total costs \$2.20 per ton.

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(8) The capital expenditure required to permit the application of this method down to the 1000' level of #2 Shaft, would consist in cleaning out and repairing the shaft, laying track, pipe lines for air and water and electric power line; installing a hoist, pump and compressor and preparing the first two levels (say the 750' and the 1000' levels) for haulage and for the use of the giants or monitors of which $\frac{2}{3}$ should be purchased and installed as well as one power shovel, ore cars, etc.

There would be no expense for water supply beyond that which would be required in any event for mill water, but it would be advantageous to build a fairly large reservoir at the top of the saddle over which the pipe line passes from the Martinez Well, this being 800' above the collar of #2 Shaft.

A rough estimate of the above capital expenditure is \$40,000 which would represent 20¢ per ton of reclaimed gob if, as seems highly probable, as much as 200,000 tons of that material could be reclaimed from the stopes adjacent to #2 and #1 Shafts down to the 1000' level. Thus it would appear that by this means and method upwards of 200,000 tons of gob (including such diorite as would be washed down from the hanging wall) could be recovered and treated for a total cost including mining, milling and repayment of special capital investment of \$2.40 per ton with a net profit of 60¢ per ton or \$120,000 for this particular area.

Obviously a similar procedure could be repeated for other sections of the mine with a lower capital expenditure per ton of gob and I think it quite possible that altogether as much as 500,000 tons of gob (mixed

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with some diorite) might be mined and milled with a total profit in the order of \$300,000 or more.

Unless steps were very promptly taken to catch up the levels or sections of the stopes after the fill has been mined it is quite certain that all of the mined area will cave completely and become wholly inaccessible but this would be of no importance unless pay ore had been found in the unmined sections of the veins.

However, while the hydraulic mining is in progress it should be possible to get at many sections of the vein which are still in place and whenever any of these are found to contain sufficient values to justify regular mining the necessary timbering could be provided and the pay ore mined and brought down to the nearest haulage level.

Since first considering this somewhat novel method of procedure I visited the mine on December 1st and tried to visualize on the ground the details of its application to the job around the #2 Shaft and I have since discussed the program in a general way with several experienced engineers some of whom are familiar with hydraulic mining and with conditions at Congress. All of these men have so far expressed a favorable opinion, more or less qualified in respect to local conditions.

It is my expectation to again visit the mine as soon as I learn that your Mr. Stone will be back on the sampling job and to fully discuss with him all phases of the project which meantime I trust will receive your careful consideration and such comment as you may think in order.

Mr. Grover J. Duff
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I have been much disturbed by the unfavorable results obtained from the investigation of the gob mining problem to date and needless to say that I am extremely anxious to assist in solving this problem if it is possible to do so since I recognize the probability that this may be the factor on which your Company's final valuation of the Congress Mine is likely to depend. I should have previously brought my ideas to your attention and followed them up more actively during the past month except for the fact that some other work which could not be postponed has kept me almost constantly occupied.

Data obtained by your engineers up to November 18th seemed to make it probable that the remaining mill tailings may not pay to reclaim and mill and that the #3 Dump is worthless so that the only surface material of value may be limited to the other dumps containing about 160,000 tons with a recoverable value of around \$2.27 per ton. From reclaiming and treating these dumps with costs of \$1.27 per ton an operating profit of about \$160,000 may be anticipated after having made a capital expenditure of some \$140,000 for purchase of the property, reconditioning and enlarging the mill, providing additional equipment and requisite water supply.

To this narrow margin of profit would be added the resale value of the plant and equipment which should be at least \$20,000, also all net returns obtained from reclaiming and treating the gob in the mine and any pay ore that may be found in the old workings or in other portions of the property.

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In my opinion the principal value of this venture still depends upon the discovery of new ore in the Congress and Sullivan and New Congress Claims. These last should, I think, be tested by drilling as soon as possible.

Because of its yet untested possibilities and the probable value of the gob in the mine I still consider that,--subject to the results of the further investigation,--this enterprise has substantial speculative merit even though, in view of recent developments, it may probably seem prudent to first resume the operation on the basis of treating not more than 400 tons of combined dump ore and reclaimed gob per day. There would still be the expectation that work could be conducted on a larger scale as soon as the practice of mining the gob has been well established or in case pay ore had been developed in any of the property on which you now hold an option.

Yours very truly,

Jme

GMC/b