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Item

ENGINEERING REPORTS AND TECHNICAL MINING MAPS OF PROPERTIES OF

GREAT AMERICAN MINING CORPORATION

Located In

DIAMOND DISTRICT, EUREKA
EUREKA COUNTY, NEVADA

Boulder City, Nevada

June 15, 1952

Great American Mining Corporation
421 Atlas Building
Salt Lake City, Utah

Dear Sirs:

In accordance with your request, I have examined the property of the Great American Mining Corporation in the Diamond Mining District, Eureka County, Nevada, and herewith submit my report:

Summary and Conclusions

A well-defined system of mineralization extending north and south, traceable for approximately five miles, occuring in well-defined veins replacing limestone and showing excellent surface values.

A record of production of over 5,000 tons since May, 1947 (which netted lessees approximately $7 per ton) from one claim only.

A possible historical record of another 6,000 tons from this same claim, in early days.

From faces of ore left exposed (not blocked out) and a study of the mine map, there could be 60,000 to 100,000 tons of good grade mill ore still available in this claim in unmined areas readily available from and by extending present workings as shown on map.

I therefore conclude that you will be well justified in continuing a development plan both above and below the main tunnel level, and I believe that with the capital expenditure of $15,000 in buildings and equipment, plus a $4500 a month development program, inside of six months you can have enough good grade mill ore blocked out to successfully operate a 50-ton per day mill for at least five years.

In my opinion, your program should include finances for a 50-ton per day mill, and a reliable firm should be employed at once to work out flow sheet and design. The cost of such a mill should not exceed $60,000, and another $7500 should be provided for necessary water requirements for mine, mill, and domestic purposes.

I would not recommend shipping any ore direct to smelters at present metal prices, although there are several faces of ore that would be of direct shipping quality with lead 14% or better.

It is recommended that at least 60% of the work be carried on in known ore of mill grade to produce a stock pile of mill ore and block out a five year supply, and 40% should be carried on in general development to assure a long time operation; I believe this development work will open up additional ore which will be of shipping value under proper market conditions.

If this plan is put into effect, the property is well managed, the mill ore grade is maintained at not less than 8% lead and 5.5 oz. of silver to the ton, and the lead price is not less than 10¢ per pound, the property should show a net profit of at least $100,000 per year or $0.025 per share on the 4,000,000 shares of capital stock, or should show a return of 10¢ per share yearly on 1,000,000 shares of issued stock from this one claim.

Location of Property

The property is located on the west slope of the Diamond Range, some 19 miles north of the town of Eureka, the county seat of Eureka County, Nevada.

Claims and Titles

The property consists of seven unpatented claims in the phillipsburg group held under a lease and bond from Cyril Drumm. The main workings are on the Lincoln claim of this group. The Francis Group of five claims joins on the south, the North Star group of four claims joins the Phillipsburg on the north, the Juniper group of 12 claims joins the North Star, and the Potosi group of seven full claims and two fractions joins the Juniper group. All of the claims are unpatented and, outside of the Phillipsburg group, are all owned by the Corporation (see List and map attached).

Water

The Phillipsburg group lease indicates a water right from the Diamond Mountains that is be ng checked and perfected, and the Corporation has two fillings for underground water that should furnish an ample supply for a maximum of a 300-ton mill, mine and domestic purposes.

Geology and Ore Occurrence

The formation prevailing throughout the group is silicified limestone with a probable thickness of several hundred feet, lying at the base of the Diamond Range.

The main vein, called the Phillips vein, has a strike about north and south and is traceable for more than five miles on the surface, with dips ranging 34° to 57° to the west and widths ranging from 8" to 18', averaging 2 1/2' in rich streaks and probably 8' or more in the ore of mill grade. The ore bodies replace the limestone and approximately 700' along the vein has been partially stoped above the main tunnel level and the vein has been opened up along the dip some 116' below the tunnel level. There is also several hundred feet of development on the Francis group to the south and a few hundred feet on the North Star group, all of the work showing ore in place. There are other veins paralleling the Phillips vein but not enough work has been done as yet to estimate their possibilities.

Topography

The surface of the ground lies a few hundred feet above the valley floor at an average elevation of from 6,000 to 6,500 feet with a fairly gentle slope to the west. It supports a fair growth of sage and scattering clumps of Juniper and Pinion Pine. All of the claims are readily accessible by fair roads and the main road to the Lincoln mine is maintained by the County.

Transportation

A good haulage road connects the mine with the main Eureka - Palisade highway. The haul to Palisade is about 90 miles and the road is open the year around. The Southern Pacific and Western Pacific Railroad are at Palisade and give direct connections to the smelters at both San Francisco and Salt Lake City. The average cost from mine to railroad, for haulage, is $5 per ton.

History

From available information, the first mineral discovery was made in the District in June, 1864, by one Phillips. Some ore was hauled to Austin in 1866, after which the District was practically abandoned until about 1873 when a small furnace was built at the Champion min. This was not successful and, later, a second furnace was built on the Lincoln claim of the Phillipsburg property. There is no record of this production, but from the extent of the old workings and ore values the District did not produce more than $50,000.

Since the early days there have been small amounts of ore produced from various small mines in the District prior to 1947, but no records are available.

Shipments

Since May, 1947, the property has produced approximately 6,000 tons

of ore, all from the Lincoln claim in the Phillipsburg group, and some small shipments have been made from the old slag dump on this same claim. A tabulation is attached showing the tonnage and values. This ore was produced prior to the acquisition of the property by the Great American Mining Corporation. A small amount of ore has been shipped by the Corporation. However, the attached settlement sheets show, in general, the average character of the shipping ore with gross values of from a low of $31.60 to a high of $41.05 per ton.

Development

The main development work is on the Lincoln claim of the Phillipsburg group and consists of a main haulage tunnel at right angle to the vein some 300' long, about 700' of drifting along the vein and some 600' along the vein has been partially stoped and the vein has been followed some 116' along the dip below the tunnel level (see map for detail). There has been approximately 1,000' of work done on the Francis group and a few hundred feet on the North Star group, both exposing the vein in several places on the Juniper and Potosi groups.

Sampling

The attached map shows series of samples from 1947 to 1950 taken by Lowell Thompson, former lessee, now mine superintendent, George H. Ryan, chief engineer, and myself. The sample map speaks for itself and requires no detailed explanation. The samples do show, however, several working faces of good ore, and while only face samples, and the ore is not blocked out, they do indicate good possibilities for a large tonnage of excellent mill grade ore, and, with lead at 14¢ or better, good shipping ore. Random surface samples on the north end of the Potosi group four miles north of the Phillipsburg show 27.4 oz. silver with 2.3% lead, and on the North Star claim, where the tunnel cuts the vein, and drifting opens up the vein for some 200 feet, showing widths from 8" to 36", samples show 17 ozs. silver and 10% lead per ton.

The sample taken to show average mill ore at about section B-B with a width of 1 foot, sent to the Bureau of Mines at Reno, Nevada, show 0.0025 oz. gold, 5.5 oz. silver, 8% lead and 0.9% zinc per ton.

The long holes drilled and sampled by Thompson and assayed by the Combined Metals Company, are as follows (all shown on map):

H-1, 100' level winze No. 1 South, near face of south drift, hole into hanging wall at approximately right angle to dip, first 9 ft. silicious vein filling, then 7 ft. of ore to lime hanging wall, assaying 2.68 oz. silver, 6.2% lead, 0.8% zinc.

H-2, 30 ft. hole same location, upper in vein 0.38 oz. silver, 0.9% lead, 0.8% zinc.

H-3, on main level about 40' south of winze No. 2 south, first 5' in lime, then 12' in ore to caliche, 9.36 oz. silver, 10.8% lead, 9.8% zinc.

H-4, near bottom of winze No. 2 South, at right angle to vein in hanging wall 23' assaying 6.14 oz. silver, 6.5% lead, 2.4% zinc.

H-5, same location as H-4, right angle to dip, northwest 25' 10.2 oz. silver, 9.2% lead, 0.8% zinc.

H-6, same location as 5, bears southwesterly 24', 5.9 oz. silver, 5.5% lead, 0.8% zinc.

H-7, same location as 6, five 6' holes fanned out into vein at right angles to dip, 6.2 oz. silver, 5.5% lead, 0.8% zinc.

Sample No. 8, first three ft. or H-4, 13.94 oz. silver, 8% lead, 0.8% zinc.

With lead 14¢ or better 3-5-8 would be shipping grade, and all except H-2 are mill grade ore.

Ore Possibilities

While, for all practical purposes, there is no ore actually blocked out and measurable, there is every indication from the exposed faces of as good or better than 8% lead and 5.5 oz. of silver to the ton which leads to the expectation that within six months work on known ore there could be from 60,000 to 100,000 tons of mill ore blocked out and a month's run of mill ore stockpiled. This same development could possibly block out as much as 30,000 tons of ore of much higher grade. This assumption is based on ore occurrence in one-half of the remaining virgin ground above the 116' level of the Lincoln claim only.

Equipment

The property is inadequately equipped for any real development or mining program. This has handicapped the operations to date. There is a small 105 cu. ft. compressor, two or three stopers, two jackhammers, tugger and slusher, cars and rails, and other meagre equipment. There are rather poor accommodations for five or six men. To properly equip the property with adequate power-tools, remodel the buildings and shelter equipment, together with a small laboratory, will require $15,000, although it might be done at a minimum of $10,000, if good second hand material can be secured.

Labor, Power, Fuel, Timber, etc.

Good labor is readily available at standard wages; no electric power is available, power must be gasoline or distillate. Some timber for stulls, etc., can be secured locally; lumber is expensive, although some is available from disbanded Army bases and other sources within a 250-mile radius.

Prospects of Property

This report so far has concentrated on the Phillipsburg group, as that is where the development work has been done, and does not even speculate what may be the possibilities at depth when one would get into the sulphide zone.

The Francis group warrants careful development, and this is true also of the North Star and the other claims to the north. From surface indications and meagre work already done, there are several possibilities that might prove even more attractive then the Lincoln claim.

Take this property as a unit and, considering the mineralization that shows for more than five miles through the property, it is not unreasonable to expect that, with proper development, it can be made into a real producer. There is no reason to believe that the mineralization and ore bodies would not continue down into the sulphide zone below the water level. With proper development of the indicated ore bodies, I am of the opinion that sufficient mill ore could be developed to guarantee the operation of a 300-ton per day mill for a period of many years.

Tests on Character and Extractable Value

In a report made for the Diamond District from a 100 lb. sample of average mill ore from the Lincoln claim, assay returns showing 5.5 oz. of silver and 8% lead, recovery by gravity concentration and flotation indicate recovery of 87.7% of the lead and 47.9% of the silver. The indicated ratio of concentration was about 10 to 1. The resultant concentrate contained 61% lead, 25.27 oz. of silver to the ton. The report further indicates that no great difficulty should be encountered in handling ore of this character.

The report continues in stating that a 90% recovery of lead and a 50% recovery of silver could be expected from a straight flotation treatment of this type of ore. This should show a net smelter return of approximately $130 per ton of concentrate.

Operating and Development Costs

Capital Investment

Lease and bond	$ 50,000
Buildings and equipment	15,000
Mill	60,000
Water development	7,500
Total	$ 132,500

Mine Operation	Per Month		
Working Foreman	$ 350		
5 Men at $280	1,400		
Cook	250		
Supplies and Equipment	1,500		
Miscellaneous	500	$4,000	
Mill Operation			
Working Foreman	$ 350		
Assayer	350		
7 Men at $280	1,960		
Supplies	750	$3,410	
Office and Management	680	680	
		$8,090	
Six Months at $8,090			$ 48,540
Total			$ 181,040

Markets

Selby, California, and Salt Lake City, Utah.

Estimated Returns

With a 50-ton mill in operation, with lead not less than 10¢ and silver at 90¢ per oz., and maintaining an ore averaging 8% lead and 5.5 oz. silver, the property should show a yearly net return of approximately $100,000, or

$0.025 per share on the entire 4,000,000 shares of capital stock or $0.10 per share on 1,000,000 issued shares if that much is to be issued. A very slight increase in the price of lead, or ore of higher grade, would show a greatly increased revenue for same operating costs. The $100,000, in my estimation, is the minimum expectancy, and would pay out the $181,040 in less than two years' time.

Recommendations

(1) Properly equip the property..

(2) Develop and block out known ore.

(3) Develop underground water now filed on with State Engineer's Office.

(4) Have flow sheet worked out and mill designed by competent mill firm.

(5) Build 50-ton mill.

(6) When mill is in operation, start development work: (a) Francis Group; (b) North Star Group; (c) Assessment work on other groups that will lead to development of vein.

ARCHIE D. RYAN
Land and Mining Consultant

Enclosures

Acknowledgements

Mr. A. C. Johnson, Mr. J. B. Zadra and staff, Bureau of Mines, Reno, Nevada.
Information Circular, #1.C.7022, Bureau of Mines, Washington D.C.
Mr. George H. Ryan, Mining Engineer, Salt Lake City, Utah.
Mr. Lowell Thompson, Eureka, Nevada.

Room 206
10 West Second Street
Reno, Nevada

May 9, 1956

NEVADA BASE METALS COMPANY
140 North Virginia Street
Reno, Nevada

ATT: Mr. J. V. Gargan

Gentlemen:

Pursuant to your request, I have examined the Phillipsburg, North Star and Champion mines of the Nevada Base Metals Company in the Diamond Mining District, Eureka County, Nevada. The last two mines were examined only because they are located close to the Phillipsburg and might well serve to add more evidence to the broad geologic picture. A report of my findings is submitted herewith.

PHILLIPSBURG MINE

Summary and Recommendation

The mine workings on the Phillipsburg mining property consist of a 300' cross-cut haulage adit driven East from the portal through erosion detritus and limestone and cutting the North-South striking Phillipsburg vein 220' along its dip from where it outcrops on the mountain side to the East. From this point of intersection the vein was drifted North 380' and South 370'. This drift served as haulage way for stoping operations both above and below this level beginning in the '70's and continueing, with several periods of inactivity intervening, until 1949. Mined out stopes containing some pillars of ore, standing well and quite accessible, along with good sample and assay records of some of the production periods (See Sample Map, Phillipsburg Mine by G. H. Ryan, 1947, attached) indicate a production from this mine in the order of 10,000 tons of ore averaging 4' in thickness and assaying 7.7 oz. selver and 11.0% lead. This average was derived by weighting the assay results shown on the above mentioned map according to the thickness samples and finally reducing the average values by 25% to insure conservatism.

4 qinzes were sunk from the adit level. The South-2 winze was sunk in mill-grade ore 60° on the dip below this level. Samples cut in this area at the adit level, along with several long hole drill samples from the lower portion of this winze, indicate 5,000 tons of partially blocked out ore ranging in thickness from 5' to 23' and assaying 6 oz. silver and 7% lead and 5,000 tons of probable ore of the same grade. (See Ryan map attached for details on 1950 long hole drilling and assays). A composite sample from the several dumps at the adit portal indicates an available 3,000 to 4,000 tons of mill-grade ore. There are 2,000 to 3,000 tons of gob in the underground workings which may well prove worth adding to the mill-grade category.

All geologic evidence in the workings of the Phillipsburg and the surface area adjacent indicate a replacement in limestone type of lode deposit along and intimately controlled by fractured and crushed zones in bedding plane fault blocks. 190' North from the point where the entrance adit cuts the vein an irregular 40' crosscut into the hanging wall fault block discloses evidence of the source of the mineralizing solutions of this lode. At some 20' from the haulage drift a low temperature, finegrained, quartz-porphyry has intruded the limestone member in the form of a sill. The limited penetration of the intrusive zone by the crosscut makes an exact measurement impossible; but the many large and small pieces of broken limestone included in the margin of the intrusive indicate a thickness of several tens of feet. Another segment of this intrusive is disclosed 110' further North along the vein drift, adding additional weight to the assumption of the lode's origin being the intrusive. It is significant that at this point the vein shows very minor deposition of values and is only several inches thick, indicating solutions too close to source and too hot to deposit out values.

The geologic evidence found and a study of the Ryan assay map strongly support two significant conclusions regarding the mineralization found in this mine:

(1) This lode is mesothermal in origin, being formed at comparatively low temperature by ascending thermal waters originating from the intruding quartz-porphyry. The low assays from the Northern quarter of the North vein drift along with the significantly higher assays directly above this area where the vein outcrops on the surface, 240' up the dip, further indicate the source of the mineralization solutions was probably the quartz-porphyry. From the points of contact of the intrusive with the crushed zones along the fault surfaces of the displaced limestone blocks the solutions fanned out up the dip and both North and South along the strike of these crushed zones forming the Phillipsburg lode. The large stoped out portion of the vein above the South drift followed by the current exposure of over 20' of good grade ore in the South-2 winze area indicate that a major solution channel continued down and to the South-West.

(2.) Oxidizing meteoric waters followed substantially this South-West channel from the surface down through the lode, leaching out most of the zinc and part of the silver values, carrying them down to permanent water table where a significant zone of secondary enrichment can logically be.

General Geology

The Diamond range of mountains forms the main structural element of the region. It is composed on its Western slopes of up-tilted Cambrian, Silurian and Devonian sedimentary members, the salient strata of which, in the Phillipsburg mine area, consist of 150' thick quartzite underlain by successive horizons of limestone and dolomite. There is evidence of several Tertiary eruptives in the region but locally the only exposure occurs in the North drift of the adit level of the Phillipsburg mine. It occurs as a dike or sill and is presumed to conform to the generally 45° West dipping Phillipsburg lode and the partially silicified limestone members forming the lode's foot and hanging walls. Evidence indicates that this quartz-porphyry intrusive was the source of the mineralization along the lode.

The genesis of the Phillipsburg lode seems intimately connected with the period of mountain building which characterizes the Cordilleran region of successive ranges of mountains and valleys, as particularly exemplified by the topography of Nevada. During this period normal faulting occurred; and in the case of the Diamond range most of these faults occurred along bedding plane lines of weakness. These fault block breccia zones then became ready channels for the rising, mineral bearing thermal solutions emanating from the intrusives. They later acted as lines of weakness along which meteoric oxidizing waters leached out some of the lode's values carrying them down to permanent water table.

Some minor faulting was noted in the workings; but, with one exception 30' South of South-2 winze the displacements along these faults are not over a couple of feet. At the location of the exception noted the lode appears to be cut off by a fault and displaced several tens of feet to the West. Previous operators failed to crosscut far enough to the West to disclose the exact location of the lode in this South block. Surface reconnaisance shows ample evidence that the lode continues to the South for another 360'. This conclusion is supported by the presence of much vein float all the way from the large vein exposure on the side hill 200' N rth of the line of the entrance adit to a small prospect tunnel 320' South of the major fault area mentioned above. This fault underlies a shallow canyon on the surface and may well reflect the origin of the canyon. The limited work below the adit level forces the conclusion that the economics of the period rather than the geology of the ground caused the previous operators to discontinue exploration at depth.

Similar lodes in Ruby Hill at Eureka were mined to the 1200' level producing many millions of dollars in lead and silver before exhaustion.

Potential Ore

During the period of examination the writer cut sufficient samples to verify the work done by A. D. Ryan and reported upon by him in 1952. These sample locations have been superimposed on the G. H. Ryan sample map attached hereto. A tabulation of the samples is attached as Appendix "A".

As mentioned in the Summary and Recommendation, there are 13,000 tons of partially blocked out and probably ore. Considering the many tons of good grade mill ore in the area of the surface stope on the North-West portion of the lode and the potential ore on the projection of the mineralization along the lode to the South below present workings, it is felt that a reasonable estimate of potential mill-grade ore would total in the order of 50,000 tons, the net value of which, at current prices of lead and zinc plus or minus 2¢, will be in the range of $6.00 to $10.00 per ton. As an extension of this same Phillipsburg lode is exposed 2,000' to the South in the Frances mine and the North extension was examined and sampled by the Writer 1500' to the North in the North Star mine, it is felt that further exploration will disclose large extensions of the known ore zones in the Phillipsburg mine. A large composite sample from approximately 80 tons of ore on the North Star dump assayed 7 oz. Silver, 7.8% lead and 2.1% zinc. The writer also examined the Champion mine 2000' South-East of the Phillipsburg. It proved too limited in mineable widths of ore to be of more than geologic interest at the present time.

Metallurgy

The U.S. Bureau of Mines tested the extractability of a composite sample representing the major silver-lead mines in the Diamond Mining District and reported their findings as "Report of Investigations 4762", January 1951. A summary of their findings is that a 90% recovery of lead and a 50% recovery of silver can be expected from straight flotation treatment of the Diamond District type of oxidized silver-lead ore.

Conclusion

The recommended diamond drilling program, as illustrated on map No. 2, beginning with drill hole No. 1 and progressing on to No. 6, as disclosures in previous holes warrant, should quickly and inexpensively enlarge the potential ore body on this property. In the event that hole No. 5 in Set-up No. 2 shows strong indications of persisting values, it is recommended that an additional series of 3 holes be drilled from Set-up No. 3 where indicated on the map.

Considering the low cost of the recommended exploration, approximately 2,000' of drilling at not over $6.00 per foot, the excellent chances of disclosing a large body of mill-grade ore by initiating such exploration and the strong possibility of secondary enrichment at permanent water table, it is considered that the Phillipsburg mine is a property of high merit and should develop into a steady producer.

(Signed) Otis A. Kittle
Registered Professional
Mining Engineer, State
of Nevada, No. 415

P. O. Box 415, Boulder City, Nevada
November 28, 1949

Mr. Otto Mehr,
Salt Lake City, Utah

Dear Mr. Mehr:

Referring to the Proposed Corporation to be organized on the west slope of the mountains facing Diamond Valley in the Diamond Mining District, Eureka County, Nevada.

This Corporation will own and control thirty seven or more lode mining claims, extending north along the mountain facing Diamond Valley, from the Francis group on the south to the Steel Galena on the north, a distance of over five miles.

There are two (perhaps more) very distinct and strong veins, that extend north and south through the property, the veins vary in width from a few inches to more than eighteen feet, and occur as a replacement in limestone, the lime is very friendly to mineral deposition. There has been development work done and ore mined from the Francis, Lincoln, North Star group of claims and also the Steel Galena, and also good surface showings are found on many of the claims owned by the Corporation, this is especially true of the claims north of the North Star group.

The entire property is served by fairly good roads. It is located about eighteen miles north of Eureka, Nevada at an elevation of approximately 6300 feet. There are probably surface water rights that are a part and attached to the Lincoln Mine, but this is of small concern as there is ample underground water for all mining, milling and domestic purposed that is readily available.

The principle production has been from the Lincoln claim, where the two parallel veins have been cross-cut by a fine haulage tunnel and the veins have been opened up along the strike for about 700 feet, the veins are strong and persistent, extending north and south with dips to the west of 37 to 56 degrees, these workings according to available information produced considerable tonnage in the early days and in the past three years have a recorded production of more than 6000 tons. There have been more than 350 tons shipped this year and these shipments have averaged over $20. per ton net, after all charges such as hauling, freight, royalties and smelter charges have been paid. While not actually blocked

out, it is reasonable to assume from samples taken, and working faces exposed that there should be at least 30,000 tons of shipping ore that can be readily developed that will average a net return of approximately $20 if the price of lead stays at not less than 12 cents. In the work that has been done on this one claim there has in addition to the shipping ore mined, a large amount of lower grade mill ore developed, and again while not actually blocked out, in my opinion, I believe that a very safe estimate would place the mill ore readily available at 60,000 tons. This mill ore will run from 4 to 7 ounces of silver and 5 to 9% lead. I believe that the first objective should be to have a proper flow sheet worked out so that a good fifty ton mill could be built to handle this low grade ore.

When you realize that the whole record of production is from some seven hundred feet along the vein on this one claim, and that you have as good a surface showing at many places along your five miles of ownership as there is on this one claim, I think you can readily see that the property has great possibilities to make a real mine that should last and with proper handling show an excellent return on the investment.

Sincerely,

Archie Ryan
Mining Engr.

REPORT ON LINCOLN GROUP

OF MINING CLAIMS OF THE

GREAT AMERICAN MINING CORPORATION

by

EDWARD W. BROOKS

REPORT ON LINCOLN GROUP
OF MINING CLAIMS OF THE
GREAT AMERICAN MINING CORPORATION
by Edward W. Brooks

Mr. H. A. Culloden
Pasadena, California

I submit herein the following report, based upon my visit to your mining property, the Lincoln Group, near Eureka, Nevada.

The property referred to comprises two more or less full mining claims, and covers a single connected area approximately 40 acres in extent. They are known respectively as the Lincoln and Harold, and have a record of substantial past production and great future possibilities.

They have a common endline and trend northerly and southerly along the westerly base of the Diamond range of mountains. They are situated in the Diamond Mining District, Eureka County, Nevada, about 18 miles northerly from the famous early day mining camp of Eureka, from which place the property is reached over an excellent road, crossing a nearly level valley.

THE PHYSICAL SURROUNDINGS

The two claims cover a section of approximately forty acres in extent, stretching along a moderately steep hillside across which the drainage has scored several small gulches leading into the valley below.

Originally well timbered with pine and other conifers, only a small secondary growth now remains on the property. Back and above, on the higher reaches of the range, however, there appears to be an abundance of good timber which is suitable for mining and other purposes, and which can be had at the cost of cutting and transportation.

Water sufficient for all requirements can be had, and piped from springs reaching the camp by gravity.

The climate is excellent, and permits of continuous operation.

GEOLOGY

The geology of the region comprises a thick series of sediments broken and intruded in many places by Tertiary eruptives, among which surface flows are prominent. The sedimentary series is domently Paleozoic in geologic time, and contains Cambrian, Silurian, and Devonian members. The series is made up of quartzites, shales, and limestones of the several periods named. Mineralization is confined chiefly to the limestone members along contacts with other rocks, or within and along fractures and zones of shearing and faulting in the limestones. The genesis of the ores in generally assigned to ascending waters carrying the metallic compounds in solution, such waters being set in circulation by contact with some one or another heated mass of intrusive igneous rock.

The Diamond range, at the westerly base of which the Lincoln Group lies, consists predominantly of thick series of lime stones, shales, and quartzites elevated by crystal warping, accompanied by faulting, and subsequently modified to its present configuration by erosive agencies.

In that portion of the range examined by the writer, evidences of eruptive activity were not seen, and no dikes or other bodies of igneous rock were to be seen in the vicinity of the Lincoln Group. The character of the mineralization, however, is such as to suggest their presence, probably at some point below the surface, or buried under the valley detritus immediately below the camp. That such intrusive body exists somewhere in close proximity to the property, or at a depth within it, seems necessary to the writer to account for the strength of the mineralization shown, and the intense silification of the limestone evidenced in many places.

THE LINCOLN LODE

Striking almost due north and south through the full lengths of the Lincoln and Harold claims is a faulted and sheared zone in hard, gray limestone. The dip is to the west at about 35 degrees, taken at the surface. This steepens to perhaps 50 degrees at a depth of about 250 feet below the outcrop, measured in the plane of the lode, and changed dip occurs quite abruptly, suggesting the possibility that a complete reversal in dip may occur at some depth below. This would be in conformity with similar reversals of the dip noted quite generally in this locality, where sufficient development has been made. Such changes in dip are favorable for the localization of large bodies of ore, and this seems to have proved true in several mines in the region hereabout.

One wall of the Lincoln vein, or more properly, lode, namely the

footwall, preserves considerable regularity. In the hanging wall side, the mineralization chambers out extensively, and wall is accordingly irregular and ragged.

Along the lode, the limestone has been completely silidified for several feet out from the lode in many places. Within the mineralized portion, quartz of at least two periods of generation occurs in roughly banded form. These are separated by bands carrying irony oxides, principally limonite, with lead carbonate - Cerussite - and occasional bunches of galena carrying silver, and with occasional stains of copper carbonates. The lead carbonates occur in both the hard and "sandy" form. No zinc or other interfering elements are to be seen, though these may possibly come in below water level, when that horizon has been reached.

The ore occurs most prominently on the footwall, but frequently chambers up into the hanging wall extensively, such chambers having yielded large quantities of ore in the past. The black stains of pyrolusite, the dioxide of Manganese, are abundant and are favorable as an indication of strength of the mineralizing agencies.

The Lincoln Lode presents, ideally, all the essential features of chamber deposits of silver-lead ores, characteristic of such occurrences in limestone throughout the world.

DEVELOPMENT

On the Lincoln claim, a tunnel driven into the hill at approximately right angles to the lode, intercepts it at 200 feet in from the portal. From the point of interception by the tunnel, the lode has been opened along a drift extending each way approximately 400 feet distant, or about an equal distance north and south of the point where the tunnel encounters the lode. From this level, the vein or lode has been worked out pretty well in one place to the surface, a distance measured on the dip of approximately 250 feet above the tunnel level. The widths stoped vary from about three feet to as much as twelve or fifteen feet. In this way, the property has yielded a large amount of ore, perhaps several thousand tons, during the period of its activity.

There are four winzes sunk below the drift at the tunnel-level, the deepest of which measures 116 feet on the dip. The ore is found to extend to the bottom of these winzes, but no ore was taken from them, except that taken out in sinking, as everything had to be raised by windlass operated by hand, which was too slow and expensive a method of mining.

In the floor of the drifts, both north and south of the point where the tunnel enters the lode, the ore remains untouched under the old stopes, or nearly so. From the level of the drifts, therefore, the lode remains virgin and awaits the hand of the miner.

No systematic sampling has been made of the ore left standing. Samples taken at random have yielded a wide range of results from low-grade, non-commercial lode matter to values running into high figures, in both lead and silver.

In the following of the lode, south from the line of the tunnel, a fault was encountered at about 350 feet in, and the lode and its contained ore has been displaced. The amount of this horizontal shift cannot be large, and, as the lode is easily traceable on the surface beyond this point, it should be again picked up by a little cross-cutting along the fault, the south side ore extension of the lode beyond the fault having probably been shifted a little to the west.

All of the ore thus far opened is essentially of the type known as "oxidized." And only scattered bunches of galena were found, together with some galena disseminated through and enclosed within solid quartz, which makes up part of the lode-filling. All workings are bone-dry.

The level of the tunnel referred to in the foregoing is about two hundred feet vertical above the valley floor. At what depth in sinking water my be expected is a matter of conjecture, but there seems evidence warranting the belief that water-level would be reached at a depth of not more than 300 feet below the present tunnel level, measured vertically.

The almost complete oxidation of the Lincoln lode shown in development above the water level, together with the character of the alteration observable in the lode-filling, as regards change from primary to secondary minerals due to this oxidation, and subsequent leaching of the mass, makes it reasonable to expect a zone of silver enrichment at or below the standing water-level. It is evident that the primary ores first formed in the lode were sulphides, galena predominating, and accompanying silver sulphides.

Subsequent oxidation in the presence of line carbonates would result in sulphates of the metals. The sulphates in turn would, in the case of the lead sulphate, react with the calcium carbonate of the limestone to form lead carbonates which, being relatively insoluble, would remain more or less in situ, while the silver sulphate not forming carbonate of silver, would, being soluble, leach to ground-water level and become available for enrichment of the primary sulphides at and below

that point. Only a part of the silver would thus be removed from the oxidated zone; some would remain entangled in the lead carbonates remainging behind in the course of leaching. Nor would all of the lead become converted to the carbonate from; some of it would remain as Carussite, the carbonate of lead, is seen to be accompanied with some Anglesite, which is lead sulphate. Both these minerals carry some silver.

In view of the conditions explained above, the writer believes that, when the permanent water-level has been reached, a zone of enriched ores will be found, and that usch enriched ores will constitute the most important ores in the Lincoln lode. The writher further believes, on the exidence afforded, that the promise of an important zone of enrichment justifies the sinking of a vertical shaft, so placed as to intercept the lode on its dip at a vertical depth of 30 feet below the tunnel level.

In addition to the ores to be expected below the water-level, there remains, undoubtedly, a large and commercially important tonnage of oxidated carbonate ores, extending from the tunnel level down to the water-level, in what is essentially a virgin section of the lode. As the Lincoln and Harold claims contain 3000 feet in length of this lode, the foundation for a very promising and important mining undertaking is afforded.

PAST PRODUCTION

Owing to the time which has elapsed since the Lincoln Group was operated for production, the records have become scattered, and the total amount realized from the ores that have been mined from it cannot be given. By piecing together various farily well authenticated records, there seems to have been something like $75,000 or more taken out gross.

FUTURE OPERATIONS

The showing that has been made above the tunnel level is such as to warrant extensive development below the tunnel level, for reasons given herein. This, in the writers opinion, should be directed towards opening the lode at the level below the level of the standing ground-water by perpendicular shaft. The writer believes that a vertical depth of 300 feet of sinking would accomplish this, and prove up, and made available a tonnage of commercial ore sufficient to supply a sustained production of 100 tons per day, or more, of direct smelting and milling ores. The richer ores encountered would be sent directly to the smelterm while the larger quantities of lower grade ores could be treated by concentration on the ground, and the product shipped to the nearest market, of which there are several.

Accompanying the ores that have been taken from above the tunnel level, there remains an important tonnage of lower grade, which could not be handled with the facilities employed at the time the work was done, but which would readily yield to concentration and afford a substantial profit under suitable method of treatment. As this low grade material is free from all interfering elements, such as zinc and arsenic in appreciable amount, it would offer no difficulties which would be unfavorable to the easy recovery of the values contained in it. There is also no evidence that the ores encountered below the water level will be found difficult of treatment. On the contrary, there is good reason to believe that they will prove quite docile in this respect.

RECOMMENDATIONS

It is recommended that a shaft be sunk to intercept the lode on its dip at sufficient depth to open the sulphide zone below the permanent water level. It is believed that 300 feet of sinking will accomplish this.

For this purpose, since pumping will be necessary below water level, it would be advisable to employ electricity. Fuel considerations make it seem advisable to employ a heavy oil, or Diesel-type engine for primary power in generating the required electricity.

When the shaft has been sunk below water level, and the vein opened, drifting should be carried forward on the lode, and the ores should be systematically blocked out and sampled. When sufficient ore has been assured to support a production of at least 100 tons per day, over a period of six months to one year, and the character of the ores determined with regard to the proper method of treatment, a mill should then be built. When this has been completed, the mine is ready for production. Development should continue, so the ore reserves can be kept well in advance of mill requirements. The writer believes that the program outlined above can be sustained by the showing that will be made during the progress of the work.

The matter of details incident to this program is left to the operating engineer in charge of it at the time.

SOME ORE RECORDS

An idea of the character and value of the ores which have been taken from this property during past years is given below, being taken from certain smelter settlements sheets and assayers' certificates:

Shelby Smelting & Lead Company: (Shipments)

Weight	Silver oz.	Lead %	Silica %	Iron %	Zinc %
2280 lbs.	64.68	53.80	24.20	1.20	
2230 lbs.	62.28	58.50	10.00	4.00	
5700 lbs.	84.45	30.00	42.00	3.40	
2000 lbs.	26.22	42.70	24.00	7.80	
5700 lbs.	74.74	30.00	42.00	3.40	
12100 lbs.	37.80	42.30	20.80	6.30	4.90

Eureka Consolidated Mining Company:

Weight	Silver oz.	Lead %
6935 lbs.	35.20	41.00
10453 lbs.	23.00	20.00
7483 lbs.	54.00	28.00
6700 lbs.	52.55	49.50
12100 lbs.	23.00	26.00

Reno Reduction Company:

Weight	Silver oz.	Lead %
9019 lbs.	29.30	48.20

Many shipments of ore and concentrates were made, the records of which have been lost. From time to time, the property has been worked by leasers in a small way, who mined and shipped only the high grade ores which could be had with very little, if any, development expense. They merely gouged out the richer, scattered bunches of ore, and then quit, without attempting to open more.

CONCLUSION

In consideration of the length of the lode within the property, 3000 feet lineally, the very strong character of the mineralization evidenced, the fact that it possesses a record of substantial profitable production, all taken from above the tunnel level to the surface, a depth of only about 250 feet,

measured on the dip of the lode, the evidence of distinct ore-chambers of large size, and the assured continuation of the ore in full strength and values in the unexplored territory below the tunnel level, I regard the Lincoln Group as an exceptionally promising property for the development of an important silver-lead producer.

Respectfully submitted,

/s/ Edward W. Brooks
Mining Geologist and Engineer

SUPPLEMENTAL REPORT

The following is supplemental to my report on the Lincoln Group near Eureka, Nevada.

On the whole, there is very little that can be changed or added, as no development of consequence has been undertaken on the property since it was written, and the situation remains essentially as it was then. Some little additional information was, however, secured, the character and significance of which is here described.

At the time the report was written, the writer mentioned therein the surprising fact that, apparently, no porphyry was showing in the vicinity of the property, though the nature of the ores and the character of the mineralization made it seem certain that porphyry of some sort existed close to the vein, and was possibly concealed at some depth, not having broken through to the surface. On the occasion of my recent visit, this porphyry was discovered in the workings underground. Closely resembling the blocky limestone in which the vein occurs, it was not distinquished or observed on the occasion of the previous visit. It is evidently a gongue, reaching upward from a larger surface. It is of the acidic type, and may probably be tentatively classed as so-called quartz-porphyry. The presence of the porphyry, now made certain adds strength to the prospect of opening sizeable chambers of ore below the present tunnel level, more especially at and below the ground water level, since it is there that redeposition of minerals, leached from the oxidized zone above, may be expected. There can be little doubt but that porphyry intrusive into the limestone here is to be considered the genetic source of the mineralization, by reason of the active underground circulation set up by it. To this porphyry, especially the deeper and larger mass from which the occurence shown in the mine workings is merely an off-shoot, can be attributed the original source of the metals taken into solution in the underground waters.

A further contribution to the geology at the Lincoln Group was obtained when the writer was permitted to read the very complete report of Arnold Hague of the U. S. Geologicall Survey, dating back to the directorship of Major Powell. This is now out of print, and its copies are extremely rare and difficult to obtain. In referring to the limestones of the Diamond Range, Hague assigns them to the upper and lower coal measures; i.c., the Upper and Low-Carboniferous divisions overlying the Cambrian and Devonian series. Hague also identifies the very extensive and widespread "Weber Conglomerate, which forms a conspicuous marker horizon at Leadville in Colorado." This confirms the writer in his previous identification of the formation in the Diamond Range as closely analogous to that in the

famous silver-lead camp in Colorado. This being true, we certainly have in the Lincoln Group, and vicinity, the requisite geological formation in which to anticipate ore deposits of importance. This, taken with the showing that has already been made in the way of superficial production, the apparent strength of the mineralization, and the relatively small depth on the vein that has been mined, together with the essentially unexplored region below the present tunnel level into which the ore is known to extend, makes the Lincoln Group a most inviting piece of development as it stands today.

In the former report, the writer advocated the sinking of a vertical shaft to a depth of 300 feet, to cut the vein at or close to the water level, and to drive sufficient laterals as will fully test out its character at the depth. Since this shaft would have to be sunk in hard limestone for most of its depth, and away from the vein, no exploration of that portion of the vein passed in diking would be possible, until the bottom was reached. The cost per foot of this work would be greater than that required to follow down on the vein itself, although the depth measured in the plane of the vein to reach water level would be greater than that measured in a vertical shaft. In weighing these factors, the writer inclines to favor the plan of following down on the vein itself, as a plan being both cheaper and affording opportunity to examine the character of the vein all the way down, with the possibility of opening important chambers of good ore.

June 15, 1938

J. J. BEBSON
MINING GEOLOGIST
DOOLY BUILDING
SALT LAKE CITY, UTAH

July 25, 1950

Mr. Otto Mehr
Vice Presidentt and General Manager
Great American Mining Corporation
1104 First Security Bank Building
Salt Lake City, Utah

Dear Mr, Mehr:

At your request I have examined the Phillipsburg Mine and the adjoining Francis and North Star groups of mining claims, under option to or owned by your company. This examination was not made with the understanding that it would be a study of the area in great detail or with the view of covering the more distant part of the holdings, but its primary objective was to review and check the more important showings of silver-lead mineralization in the Phillipsburg and adjoining properties.

The venture appears more difficult than I had expected for the following principal reasons:

1. In the Phillipsburg Mine the better grade ore in the vein north of the main adit tunnel appears to be almost completely stoped out except for narrow widths (8"to20") and in general the walls of the vein are unmineralized limestone. Thus any attempt to mine this area further is likely to result in high mining costs if mined in narrow widths or much dilution if mined as milling ore in greater widths. The latter is likely to reduce the grade to a noncommercial product.

Below this are in the No. 1 winze and short levels to the north the irony vein material is up to 3 feet in thickness but appears low grade. The latter is also indicated by the fact that only two or three small stopes have been undertaken and my sample of the muck from the raise on the 116 level north of the No. 1 incline winze gave the following assay returns:

GOLD. . .01 Ozs. per ton
SILVER. .1.10 Ozs. per ton
LEAD. . .2.7 % per ton

From the above it is concluded that present mineralized exposures north of the adit tunnel and incline offer little encouragement for any substantial tonnage ofshipping or mining ore above the 116 foot level.

2. In the Phillipsburg Mine south of the adit and No. 1 Incline Winze the vein is usually from 2 to 5 feet in thickness, sometimes composed of irony or silicious vein material and often a footwall and hanging wall strand separated by waste. Apparently the vein has increased in thickness above the level as the open stope shows 5 to 7 feet between foot and hanging walls. Also more thin seams of galena and lead carbonate are in evidence in the pillar and boundaries of the stope than on the main tunnel level. (The outline of the stoped area is shown on the accompanying map).

Toward the southern end of the drift the main fissure is intersected by an east-west cross-fissure and the No. 2 Winze has been sunk about 60 feet deep just south of the intersection. In the immediate vicinity of of the intersection the main vein shows a thickness in excess of 20 feet. Also above the level the size of the stope is impressive. However, from the standpoint of ore reserves it is apparent from the map that most of the mineable ore has been removed.

Below the level the exposed part of the vein is large but too low grade to make milling ore according to assay returns on my own samples. See "B" samples shown in green on accompanying map.

The above condition is not favorable but recent drill hole samples gave the following more favorable returns:

			Ozs.		%
H4	23 feet	Silver	6.14	Lead	6.5
H5	25 feet		10.20		9.2
H6	24 feet		5.9		5.5

It is hoped that these sampled represent an average improved grade of mineralization.

Also drill holes sample H3 on the level south of No. 2 Winze is indicated on the map to have given the following result:

H3	12 feet	Silver	9.36	Lead	10.8

It was not practical for me to resample the drill holes but in view of the fact that they show almost continuous mineralization I recommend that they be checked by running a short crosscut across the vein and then by taking channel samples. This - because drill hole sludge samples often give results too high or too low and channel sampling will be more accurate.

Apparently mineralization similar to that in the drill hole samples from the bottom of No. 2 Winze was found in a drill hole sample through the vein near the surface of the south drift from the No. 1 Winze on the 116 foot level. I recommend that this sample also be checked by running a crosscut and channel sampling. As a matter of practical operation it may be more satisfactory to drive the 116 foot level by cross cutting into the present hanging wall and then running southerly in the vein under the No. 2 Winze. I consider this work as most important because the results will probably determine to what extent the vein should be further explored.

3. As to the possibilities for milling ore in the property or the immediate vicinity the following observations have been made:

a. At the Francis workings south of the Phillipsburg the ore streak is 6 inches to 1 foot thick in the shallow surface exposures. A 7 inch cut sample of the average material in the high grade streak was channel sampled and gave the following:

B-2 7 inch width Gold 0.01 Oz.; Silver 8.0 Lead 16.7%

The ore in this vein is too narrow to break even as milling ore. A tunnel was run to intersect this vein at greater depth but encountered a vein carrying little or no ore; either the vein was barren or the tunnel was not run far enough to cut the vein exposed at the surface. A survey should be run to help determine this matter. At present there us no supply of mill ore in these workings and the future must depend on further exploration.

b. At the North Star workings a small stope was examined. A 15 inch channel was cut across the vein. This sample gave assay returns as follows:

B-3 15 inch width Gold 0.005 oz.; Silver Tr.; Lead 7.6%

About 100 feet lower in elevation than the surface stope a 140 ft. cross-cut tunnel was driven to connect with the vein. When the vein was encountered drifts were driven about 100 feet to the north and 100 feet to the south along a 6 inch vein. For a few feet near the north face the vein widened to

about 3 feet and it was further prospected by raising on this showing.

Considering the low assay of the above sample the narrow width of the vein and its general appearance it is evident that this vein will not furnish mill ore from the present workings. Unless improved conditions are found at greater depth this showing will not contribute to the future of the venture.

c. As to milling ore possibilities in the Pittsburg Mine - this has already been discussed, but in summarizing, the condition appears to be that there is very little first class milling ore that can be developed in the present workings without extending them along the main vein and particularly at greater depth. In addition to stoping widths the ore found must be higher in grade than my present samples indicate, or the price of lead higher, to quality for milling ore.

4. In order to determine the qualifications for milling ore the possible grade of ore, milling extraction and cost, smelter returns on concentrates, and mining cost, must all be considered.

In as much as most of the ore shipped from the Phillipsburg Mine in recent years came from the stope above the main tunnel in 1947 and 1948 and was shipped without sorting, the following production returns show the average grade and give an idea of ore that may be considered as milling grade in the future.

WEIGHTING AVERAGE AND RETURNS FROM ORE SHIPPED TO SMELTERS.

Year	Tons	Silver. Ozs. per ton	Lead %	Net Value per ton $	Lead Avg. Price per pound in ¢
1947	3191	5.42	6.19	9.27	14.67
1948	1481	4.63	7.9	8.44	18.04

1 - The above "net value" is after deducting royalty, hauling and freight and smelting charges totaling $5.12 in 1947 and $11.98 in 1948.

With the present price of lead at 12 cents per pound the average return on the 1947 production is estimated at between $6. and $6.50 per ton. In view of the fact that none of the above costs include mining, exploration and development, it is apparent that neither the production of 1947 or 1948

could be shipped direct to the smelter at the present price of lead or even with a considerable improvement unless freight and smelting charges are reduced.

As to the possible return that might be secured from milling over 100 tons per day, a reasonable estimate based on present metal prices is as follows:

(a) Assume a grade comparable with the 1948 productions=

or Lead 8%	Silver 4.63 ozs. per ton		
or Lead 160 lbs.	Silver 4.63 ozs. per ton		
or Gross Value	Lead 160 x 12¢		$19.20
	Silver 4.63 x 90¢		4.17
or Total gross value per ton lead and silver			$23.37

Gold is 0.0025 according to Bureau of Mines
It will be included in concentrate at 0.02 ozs. per ton of concentrate.

(b) Assume an extraction of 80% of the lead which is more likely than 90% estimate of the Bureau of Mines as this is an oxidized ore.

(c) Assume an extraction of 50% of the silver. The value computation them becomes:

Lead 160 lbs. x 80% = 128 lbs. in mill concentrate
Silver 4.63 x 50% = 2.31 ozs. in mill concentrate

Milling: Ratio of concentration 10 tons ore - 1 ton concentrate
10 x 128 = 1280 lbs. lead in one ton concentrate or 64% lead
10 x 2.31 = 23.1 ozs. silver

Smelter returns:

Lead	1280 lbs. x 85% - 1088 lbs. x (12-1.25¢) =		$ 116.96
Silver	23.1 ozs. x 95% - 21.945 x	90¢ =	19.75
Gold	0.02 ozs. x 100% -0.02 x	31.82 =	.64
	Total groass value per ton----		$137.35
	Smelting charge base----------		8.00
Pay for 10¢ per unit over 30% or 50% - 30% = 20%			2.00
			$ 6.00

It is then assumed that lime and iron will balance silica so no further deduction on this --

Payment for concentrate $ 131.35

Additional Charges:

Hauling $ 10.00 (because of high value) 10.00

Total after smelting and hauling charges $ 121.35

Or net smelter return per ton of ore:

121.35 ÷ 10 = $ 12.14
Cost of milling is estimated at $3.00 per ton or
$12.14 minus $3.00 = $9.14

As to mining costs, the actual figures on the overall cost in a western mine similar to the one under consideration was $7.00 per ton in the first half of 1942 with an average daily production of 200 tons.

Increased costs since 1942 would add another dollar to this cost making the present estimated cost $8.00 per ton. This record was made in a distirict where labor, electric power, and railroad and other facilities were available. Thus in the Diamone district neat Eureka, Nevada, where neither electric power not railroad transportation are immediately available and a restricted labor market exists, the mining costs are likely to be a minimum of $9.00 per ton on a 200 ton daily production basis.

During the World War II period mining costs above $12.00 per ton at small properties were not uncommong and such costs can be expected in the present case if a 50 ton per day operation is undertaken.

The conclusions after consideration of the above is that:

(a) A 50 ton mill operation will not result in a profit to stockholders.

(b) It is probable that with a 100 ton daily production ming costs would total at least $10.00 per ton which would result in a loss of around $1.00 per ton with a 12 cent lead price and present mining conditions.

(c) A 200 ton daily operation is likely to result in only a small profit unless the price of lead advances. Thus a 250 ton operation would be more desirable.

In view of the above, if a successful venture is to come from the development of this property, it will require higher grade ore or higher metal prices, and in either case a generous supply of ore. An indication as the values can be determined by crosscutting the vein at the locations where long hole drilling was done or by driving on the 116 Level under the No. 2 winze and on to the south. Also the development of ore sufficient to justify a 250 ton mill should not be less than 150,000 tons of blocked ore. Even at best this will require a long and expensive perios of development and exploration.

The principal geologic reason for recommending further work on this property is that the main vein is approximately parallel to and within a few feet of a major (Basin Range) fault. The latter has sone indications of being pre-mineral, thus it is a strong structure which extends north south along the Diamond Range for miles. It is still to be determined whether the gauge in this fault forms a barrier to mineralization and mineralizing solutions and causes more intense mineralization in the limestones where intersected by cross-fissures or whether it will form favorable conditions for ore at depth. At the No. 2 winze mineralization makes up to this large fault. In the main crosscut, which traverses the fault breccia for 200 feet, the main vein is separatedfrom the fault by about 20 feet of unreplaced limestone. On the 116 level apparently a minor vein is followed from the No. 1 winze for 110 feet showing only irregular small bunches of irony mineralization and nothing is seen of the main mineralization except possibly the footwall quartz near the face where the long hole drill is reported to have passed through 7 feet of ore assaying 2.68 ozs. silver and 6.2% lead. The most southerly ore exposure (indicated by Sample H3 40 feet south of No. 2 winze) indicates 12 feet of ore assaying 9.36 ozs. silver and 10.8% lead. This location is also close to the major fault breccia and it certainly offers inducement to further exploration.

In conclusion I recommend that before a final decision is made as to the extent of future exploration of the property that the most favorable "long drill" holes be checked by crosscuts or raises. Also that the 116 foot level be extended for at least 150 feet to the south to determine the continuity and grade of the mineralization between the present face and below the No. 2 winze. If the results indicate improvement in values with depth it should make major financing feasable with the public or with government assistance if the present war emergency assistance if the present war emergency grows more serious.

Should a substantial amount of shipping grade ore be encountered as often happens with increased depth, many of the above difficulties will be reduced.

Also at greater depth the oxidized ore should be replaced by sulphide and this will improve the mill recovery. With these possibilities in mind the further exploration of the property as above indicated is fully justified.

Respectfully submitted,

J. J. BEESON, MINING GEOLOGIST

(Signed) J. J. Beeson

CORONADO COPPER AND ZINC COMPANY
209 TABOR BUILDING
WALLACE, IDAHO

December 14, 1954

Mr. Blair W. Stewart, Vice President
Coronado Copper and Zinc Company
1206 Pacific Mutual Building
Los Angeles 14, California

Dear Blair:

I spent December 2nd and 3rd in Eureka, Nevada, inspecting the property of the Great American Mining Corporation, located in the Diamond Range some twenty miles north of Eureka.

The Ryan report and file of correspondence, which you mailed to me to be used as a guide, is enclosed, herewith. Geologic features, which Spellmeyer and you wished investigated, were foremost in mind.

-Conclusions-

The Great American Mining Corporation's property is situated at the base of the western slope of the Diamond Range. The strata, possibly paleozoic in age in the vicinity of the mine property, consists of limestones and quartzites, which, for the most part, are rather gently west-dipping. There were no features which indicated regional thrusting along the western front of this range at the lower elevations, however localized visible steeper dips and bedding trend distortions to the east of the Great American property and at higher elevations might be constructed as suggesting localized thrusts.

The mineral occurrences that have been prospected on the Lincoln claim occur in silicified dolomitic limestones. Mineralization appears to be localized in tension breaks between northeasterly-trending fault structure that dip to the northeast at rather flat angles. The mineralization shows some replacement features as well as vein filling characteristics. The silicification appears to be persistent along all of the mineralized zones. There is no evidence of contact metamorphic minerals on the surface examined or in any of the underground workings inspected.

The mineral zone explored by the Phillipsburg Mine can be traced along its outcrop a distance between 1200 and 1500 feet. To the north, which consists with the northern limit of the Phillipsburg Mine workings, it disappears beneath alluvium; to the south,

it appears to terminate against massive quartzites. At an elevation of qpproximate - ly 6150 feet, this zone was explored in the Phillipsburg Mine for a length of about 750 feet. Moderate grade, oxidized, silver-lead ore was produced from about 600 feet of the total length of 750 feet explored. To the south, there remains approxi- mately an equivalent length of unprospected, potential mineral zone. Mineraliza- tion within the length prospected occurs over widths ranging from 1 to 25 feet, the greatest widths being found in the zones of intersecting fractures.

In the Ryan Report data, it was suggested that the water table might be expected at a depth of about 300 feet lower than the Phillipsburg Mine adit. If exploration at the elevation of the water table is considered attractive, such could be accomplished by surface drilling. The dip of the mineralized zone and the slope of the ground sur- face are favorable for such work. It is questionable as to the depth of the alluvium on the hillslope where holes might be located for favorable intercepts. The Phillips- burg adit was driven through about 240 feet of alluvial material before encountering bedrock. The Eureka Corporation, Ltd., used rotary drills to explore their Ruby Hill properties. These drills are not in use, at the present time, and are situated at the Eureka Corporation's plant. If drilling were to be undertaken on this property, it might be wise to consider the rental and use of one of the Eureka Corporations drills. At depths beneath the water table, this area is very apt to possess features similar to those encountered by the Eureka Corporation in their Ruby Hill activities, particularly, the possibility of large volumes of water inflow.

The magnitude and grade of ore production, thus far derived from the property and, at present, in sight, are not attractive; however, the geologic features do suggest the possibility of more extensive occurrences.

While on the property, I, also, inspected the workings of the North Star Mine, situated about 4000 feet north of the Phillipsburg Mine. The workings, here, consist of a shallow winze sunk on a mineralized outcropping and a short cross- cut with drifting there from at an elevation about 100 feet below the outcrop. A few hundred feet of drifting was done along a narrow, vein-like, mineralized structure that varied from a few inches to approximately 36 inches in width and dipped to the west about 40 degrees. This mineralized structure, also, occurred in silicified dolomite limestone.

Considerable of the ground surface between the North Star and the Phillipsburg Mines was traversed, and there was no evidence that the Phillipsburg mineralized zone

extends to the North Star. It is quite likely that additional mineralized areas occur along the lower elevations of the western front of this range, but they are apt to be localized by fault pattern, such as is indicated in the Phillipsburg Mine.

Respectfully Yours,

(Signed) S. K. Garrett

Mining Geologist and Engineer

SKG:m
Encl.

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF MINES
Hydrometallurgical & Ore Dressing Branch
Box D, University Station
Reno, Nevada

Project RE-0-2.36 Oxidized Lead-Silver Ore from Diamond District
Eureka, Nevada

The sample received consisted of lumps and fines of a highly altered siliceous rock containing much earthy red hemtite, and some granular black hematite. Lead was present chiefly as the carbonate mineral cerussite. No zinc mineral was identified. No silver mineral was identified. There were no sulfide minerals present. Examination with the binocular microscope showed the lead carbonate occuring in seams and disseminated in the hematite. Crushing to minus 10-mesh size was necessary to achieve a degree of liberation sufficient for preliminary gravity concentration. Analysis showed:

Pb. . (Lead) . . . 8.0 percent	
Zn. . . . . 0.9 percent	Au. . . (Gold) . . 0.0025 Oz/T
Total sulfur. . . 0.254 percent	Ag. . . (Silver) . . 5.5 Oz/T

A preliminary gravity concentration test was made on a portion of ore crushed to minus 10-mesh, and sized by wet screening to several products, this procedure approximating plant treatment by hydraulic classification and table concentration. The sized products were separated into sink and float portions, using acetylene tetrabromide, a heavy liquid with 2.9 specific gravity. The sink products corresponded to the table tailings which could be obtained by tabling. The float products similarly corresponded to the table tailings which might be produced in plant operation.

This experiment indicated that about 80 percent of the lead could be recovered in concentrates containing 22.5 percent lead in about 30 percent of the original weight, or approximately a 3 to 1 ratio of concentration. The average silver content was 8.8 ounces per ton, representing 45.8 percent recovery of silver. The sand tailings averaged 0.7 percent lead, and 3.9 ounces silver per ton.

The minus 200-mesh portion of the ore was panned, and the concentrates thus obtained were included with the float products. However, the slimes amounted to about 10 percent of the original ore, and contained somewhat more values than the heads, representing nearly 12 percent of the original values.

It seems apparent that by preliminary gravity concentration of ore crushed to minus 10-mesh. classified into several sand portions and slimes, and concentrated by tabling, it would be possible to discard from 50 to 60 percent of the original ore without losing an excessive amount of lead in the sand tailings. It should also be possible to obtain some considerable portion of the table concentrates as a final product of sufficiently high grade for shipment. The remaining portions of the table concentrates could be ground to minus 100-mesh for flotation along with the thickened slime tailings.

A flotation test was made on a portion of the sample ground to minus 100-mesh. The ore was quite friable and easily ground. The ground pulp had a natural pH of about 6.0 slightly acid.

Since the results of the sink-and-float test had indicated that the silver content of the ore was not closely associated with the lead, flotation was commenced with the addition of a 0.04 pound Z-6 and 0.05 pound cresylic acid, to recover silver minerals before conditioning with sodium sulfide which is a depressant of silver minerals. Little effect was noted, but some recovery of silver was indicated.

The pulp was then conditioned for 3 minutes with 1.0 pound sodium sulfide, and, then with 0.25 pound copper sulfate per ton of ore, 0.10 pound Z-6 and 0.05 pound Aerofloat 25 were added and produced a satisfactory froth, and lead carbonate being well sulfidized and nearly as bright as galena.

More lead was floated by repeating this treatment, using the same amounts of regents. A third treatment stage produced more concentrates but only half the amounts of reagents were required. The flotation concentrates were combined and not cleaned. They contained 44.7 percent lead, 2.2 percent zinc, and 20.0 ounces silver per ton, in 14.7 percent of the original weight, representing 93.8 percent recovery of the lead, and 54 percent recovery of the silver. The flotation tailings contained 0.7 percent lead, 0.7 percent zinc, and 2.9 ounces silver per ton. Apparently, the silver was disseminated in the gangue minerals and did not respond to treatment by flotation much better than by gravity concentration.

In a subsequent series of similar flotation tests, enough concentrates were accumuated for a two-stage cleaning treatment. In the second cleaning stage, 1.0 pound per ton of sodium silicate was addied, but no other reagents were required. This treatment resulted in producing concentrates containing 61.0 percent lead, 0.4 percent zinc, and 25.28 ounces silver per ton, representing recoveries of 87.7 percent of the lead, and 47.9 percent of the silver in the ore in 10.1 percent of the original weight, about 10 to 1 ratio of concentration/

Based on the results of these flotation tests, it may be expected that 90 percent of the lead and 50 percent of the silver could be recovered by straight flotation treatment of the type of ore represented by the sample tested.

Since only about half the silver content of the sample was recovered by either gravity concentration or flotation, and the flotation tailings carried about 3.0 ounces silver per ton, the extraction of the silver by cyanidation was investigated. A test was made on a portion of head sample ground to minus 100-mesh. The pulp was diluted to a ratio of 3 parts of water to 1 of solids. Lime and cyanide were added and the pulp agitated for 72 hours. The resultant extractions of silver was 60.0 percent. Consumption of lime was 17 pounds per ton of ore, and cyanide 0.8 pound per ton of ore. The residue contained 2.1 ounces silver per ton.

Subsequent cyanidation tests were made, using washed flotation tailings assaying 3.0 ounces silver per ton. In one test lime was used for alkalinity and in another caustic soda was used. The extractions after 72 hours agitation were identical. The cyanide residues each contained 2.10 ounces silver per ton, this being the same as in the residue when the heads was cyanaded. These data indicated extractions of about 30 percent of the silver in the cyanide feed, or additional extraction of 14 percent of the total silver in the ore. Combined extractions of silver by flotation and cyanidation of the flotation tailings was thus about 69 percent.

The consumption of reagents in the latter tests was 5.8 pounds lime in one case, and 2.5 pounds of caustic soda in the other, with 0.8 pound of cyanide per ton of feed in both. The lower consumptions of alkaline reagents were not doubt due to the fact that the cyanide feed (flotation tailings) was washed before cyanidation, corresponding to thickening in plant operation before dilution with barren retun solution.

Apparently, the additional recovery of silver by cyaniding either the heads or flotation tailings would not be economical, as the value recovered would be only about 73 cents per ton of ore which would not cover the cost of cyanidation.

Conclusions

If a sufficient tonnage of ore is to be treated, it appears that gravity concentration, followed by flotation of re-ground table concentrates and slime tailings, might be the most economical method of treatment for this ore.

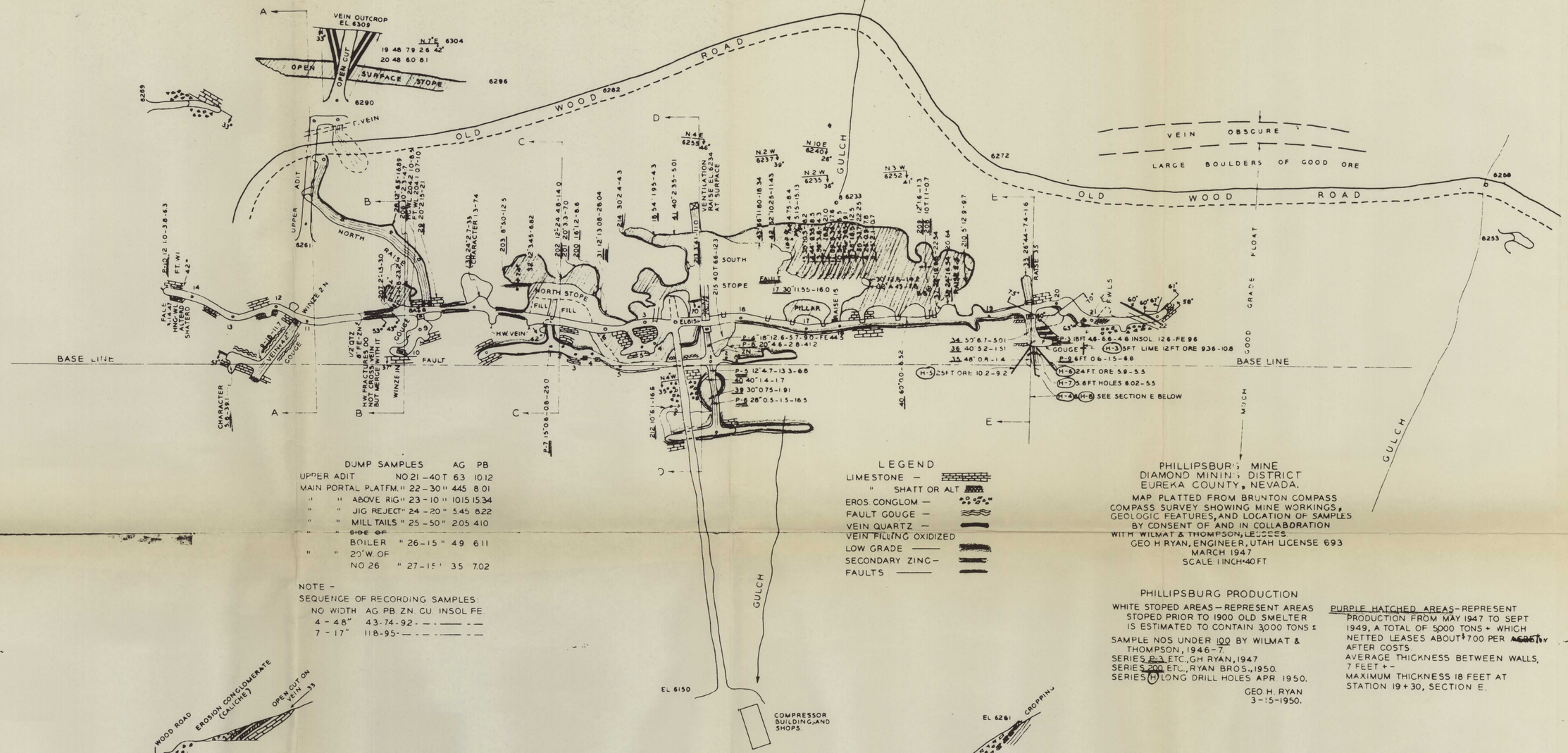
But, if less than 300 tons of ore per day are to be concentrated, it is probable that grinding the entire one to minus 100-mesh for flotation will be the simplest and

most satisfactory treatment method. The ore is not hard to grind, and the lead content sulfidizes readily, giving high recovery and good grade concentrates.

A tabulation of the gravity concentration data is attached.

GRAVITY CONCENTRATION (SINK AND FLOAT)

Product Size-Mesh	Weight percent	Percent Pb	Percent Zn	Oz/T Ag	Distribution, Percent Pb	Distribution, Percent Zn	Distribution, Percent Ag
-10 +48 sink	12.7	18.8	2.0	9.66	29.6	26.0	21.4
-48 +100 sink	5.2	29.1	2.3	8.06	18.7	12.5	7.4
-100 +200 sink	3.6	33.7	2.0	10.00	15.0	7.3	6.3
-200 Pan Conc't.	8.2	19.2	1.3	7.46	19.6	11.5	10.7
Total concentrate	29.7	22.5	1.85	8.80	82.9	57.3	45.8
-10 +48 float	46.4	0.8	0.4	3.92	4.6	19.8	31.7
-48 +100 float	8.6	0.2	0.8	4.63	0.2	9.4	6.9
-100 +200 float	4.4	0.3	0.5	4.86	0.1	2.1	3.7
-200 slimes	10.9	9.1	1.0	6.81	12.2	11.4	11.9
Total tailings	70.3	2.0	0.6	4.49	17.1	42.7	54.2
Composite	100.0	8.1	1.0	5.8	100.0	100.0	100.0



DUMP SAMPLES		AG	PB
UPPER ADIT	NO 21-40 T	6.3	10.12
MAIN PORTAL PLATFM.	" 22-30 "	4.45	8.01
" " ABOVE RIG	" 23-10 "	10.15	15.34
" " JIG REJECT	" 24-20 "	5.45	8.22
" " MILL TAILS	" 25-50 "	2.05	4.10
" ~~SIDE OF~~ BOILER	" 26-15 "	4.9	6.11
" " 20' W. OF NO 26	" 27-15 "	3.5	7.02

NOTE -
SEQUENCE OF RECORDING SAMPLES:
NO WIDTH AG PB ZN CU INSOL FE
4 - 4.8" 43-74-92- - - —— - —
7 - 17" 118-95- - - - - —— - —

LEGEND
LIMESTONE —
" SHATT OR ALT
EROS CONGLOM —
FAULT GOUGE —
VEIN QUARTZ —
VEIN FILLING OXIDIZED
LOW GRADE ——
SECONDARY ZINC —
FAULTS ——

PHILLIPSBURG MINE
DIAMOND MINING DISTRICT
EUREKA COUNTY, NEVADA.

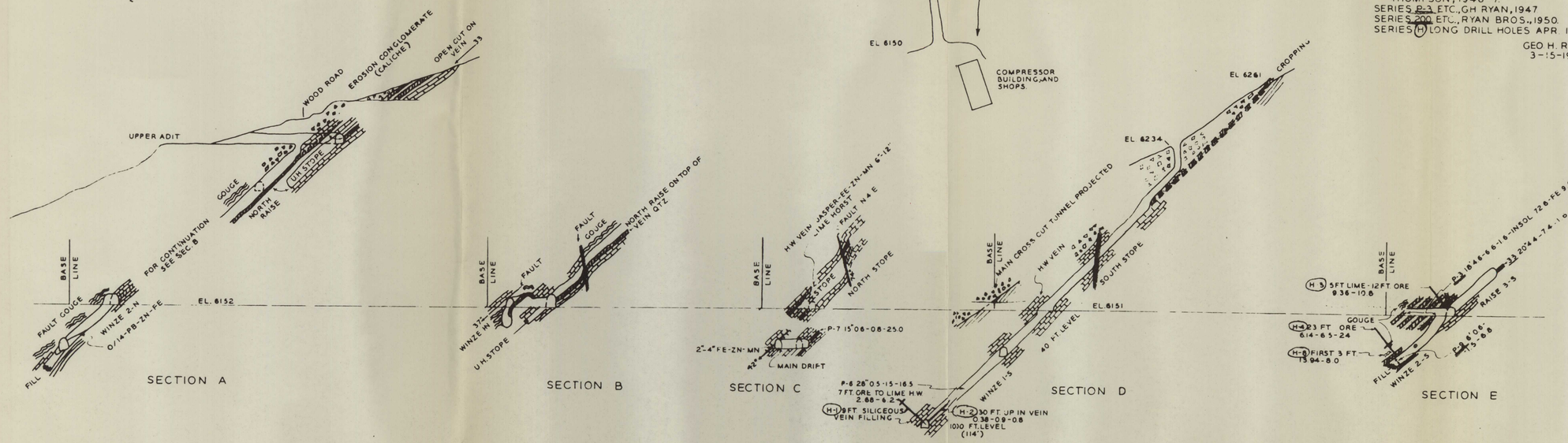
MAP PLATTED FROM BRUNTON COMPASS COMPASS SURVEY SHOWING MINE WORKINGS, GEOLOGIC FEATURES, AND LOCATION OF SAMPLES
BY CONSENT OF AND IN COLLABORATION WITH WILMAT & THOMPSON, LESSEES
GEO H RYAN, ENGINEER, UTAH LICENSE 693
MARCH 1947
SCALE 1 INCH = 40 FT

PHILLIPSBURG PRODUCTION

WHITE STOPED AREAS — REPRESENT AREAS STOPED PRIOR TO 1900 OLD SMELTER IS ESTIMATED TO CONTAIN 3,000 TONS ±

SAMPLE NOS UNDER 100 BY WILMAT & THOMPSON, 1946-7.
SERIES P-1 ETC., GH RYAN, 1947
SERIES 200 ETC., RYAN BROS., 1950.
SERIES (H) LONG DRILL HOLES APR 1950.
GEO. H. RYAN
3-15-1950.

PURPLE HATCHED AREAS - REPRESENT PRODUCTION FROM MAY 1947 TO SEPT 1949, A TOTAL OF 5,000 TONS + WHICH NETTED LEASES ABOUT $700 PER ~~ACRE~~ TON AFTER COSTS.
AVERAGE THICKNESS BETWEEN WALLS, 7 FEET + -
MAXIMUM THICKNESS 18 FEET AT STATION 19+30, SECTION E.



COMPRESSOR BUILDING AND SHOPS.

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Item