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ITEM
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(Nevada)

Nye County

17 mi. E of Tonopah

Au Ag

HANNAH PINE

PIATORO CORPORATION
SUITE 1
4344 E. INDIAN SCHOOL RD.
PHOENIX, ARIZONA

"THE HANNAPAH MINE."

Nye County - - - - Nevada.

Celia O. Browne(} Owners.
F. E. Browne, (}

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The "Hannapah Mine" is situated 17 miles east of Tonopah, as shown upon Print 1 hereto attached. The property is composed of eight lode mining claims, forming a compact, contiguous group, designated by the U. S. Surveyor General as Survey No. 2105 and containing an area of 142.81 acres, for which a U. S. Patent Deed was issued November 19, 1904.

Also find attached Print 11, showing the claims and the strike of the "Hannapah-Silver Glance" vein which extends along the lode line of three claims, while the extralateral rights are fully protected by the other five locations.

The work first started upon the property the latter part of 1902 and continued intermittently until the panic of 1907, during which time 2512 feet of development work was performed, as shown upon Schedule A and Print 111 hereto attached.

There is a plant of machinery (see Schedule B attached) that could be placed in working condition at slight expense. The buildings, which were of light board and tent construction, were destroyed by fire (see letter Frank E. Work hereto attached, Aug. 2, 1907) but the heat generated was not great enough to injure the machinery, as it was afterwards run and found to be in good working order.

The mine is filled with water below the 165 foot point of the Vertical Shaft, and the pumping records kept of the flow at the 300 Foot Level indicate a maximum of 120 gallons per minute. This is a favorable condition, as it is about what is required for mining, milling and domestic

purposes.

J. E. Spurr, in U. S. Geological Survey Bulletin No. 213, at page 87 states:

"The rocks of the district are volcanic, bearing a general resemblance to those at Tonopah. The veins also, of which two or three were observed, are of the same general character as the Tonopah veins, although so far they have not been shown to have anything like the strength of the better class of veins in the older camp."

The development at Hannapah is very slight as compared with Tonopah, and the favorable earlier andesite has not been prospected at all: when this is done it is possible the size of the veins will be more equal.

It will also be recalled that the Tonopah veins stand out in the history of mining as being phenomenal, both for richness and size.

Upon October 1st, 1905, the manager of the property estimated the ore reserves to be 5000 tons of 16 ounce silver ore. (Letter F. B. Work Oct. 1, 1905 attached). As the property was in operation for two years subsequent to that date the reserves were greatly increased, as no ore had been stoped and considerable new drifting performed.

It will be noted from the foregoing that the development has been quite extensive and the geological features favorable. The Hannapah-Silver Glance vein strikes N. 70°W. and dips about 57° to the north. It can be traced upon the surface for approximately 10,000 feet. On the Silver Glance property, to the northwest of the Hannapah Mine, it has produced considerable ore in times past.

Other vein characteristics are interesting from a mineralogical standpoint. The great distance that the vein is traceable upon the surface leads one to believe it will likewise go to great depths: this hypothesis is further supported by the minerals occurring in the sulphide form. The distance between the most northerly and southerly points, where ore is known to exist in the underground workings of the Hannapah,

is about 500 feet, and the various shoots of ore are connected by a well defined iron sulphide streak, generally showing Ruby silver.

The most promising section of the vein appears to be that portion lying north of the Incline shaft and extending east to the Vertical Shaft.

Upon the 150 foot level of the Incline, in a drift to the south east and in that portion of the mine above the water level, an ore shoot about 25 feet long, with an average width of about 20 inches has been exposed. The silver content is about 40 ounces per ton, with some gold. The interesting feature in connection with this ore exposure is the occurrence of quartz in the form of nodules ranging in size from a fraction of an inch to 20 inches in diameter: these rounded particles of quartz are at times exceedingly high grade, some running 400 ounces silver to the ton. The silver occurs in the form of pyrargyrite (ruby silver). See letter A. Mathez Aug. 12, 1906, and report of D. H. Walker Sept. 5, 1911, No. 3, also Prints III and IV.

This same ore shoot is again encountered upon the 250 foot level of the Incline Shaft (identical with the 190 foot level of the Vertical Shaft). Here it has lengthened to about 100 feet and is from one to four feet wide. The same occurrence of quartz nodules is noticeable as in the level above, also the occurrence of Ruby silver. See report of D. H. Walker, Nos. 5-6-7 and Prints III and IV.

The most extensive and probably the most important ore shoot thus far discovered in the mine is the one disclosed upon the 190 foot level of the Vertical Shaft and adjacent thereto: it is from 75 to 100 feet long, while the width ranges from six to thirty inches. It is exceedingly high grade in places, assays as high as 276 oz. silver and .35 oz. gold, having been obtained. This same shoot is again exposed upon the 300 foot level of the Vertical Shaft: the length and width

remain about the same, but if anything the values are somewhat better, a two inch streak returning 609 ozs. silver and .27 ozs. Gold. See letters F. B. Work Oct. 2 to Dec. 26th, 1904 letter G. C. Ripley June 3rd, 1906, D. H. Walker report Sept. 5th, 1911 No. 9, No. 10 and No. 11.

From the foregoing, it will be observed that at present writing there are two places in the mine where profitable ore can be extracted and shipped: one is upon the 150 foot level of the Incline Shaft and one is at the point where the vein crosses the Vertical Shaft and is again encountered slightly to the north thereof upon the 190 foot level.

It will be noticed from Print V that the vein has not been prospected in the Earlier Andesite, but that all the workings are in the capping rock.

Several other ore shoots were discovered upon the different levels of the mine and all are connected by small stringers from one to three inches wide, of iron sulphides, showing Ruby silver.

At the time the mine closed in 1907, the manager was expecting daily to encounter the ore shoot, lying north of the Incline, upon the 300 foot level of the Vertical Shaft. It will be noted from the foregoing description that this particular ore shoot is composed mostly of nodules of quartz and therefore takes the appearance of a loose conglomerate. It is a water bearing fissure, as the conglomerate is not closely concreted, and the last round of shots fired upon the 300 foot level undoubtedly broke into the ore shoot, as the following morning it was found that such a large flow of water had been released that it was impossible to enter the workings. This condition, taken in connection with the low price of silver and the panic of 1907, discouraged the owners and closed down the mine.

It is the general consensus of opinion among the older mining men of Tonopah, who were familiar with the

Hannapah Mine at the time it was in operation, that there is the making of a wonderful producer, if the vein is developed in the earlier andesite.

The workings have not been extended to sufficient depth to demonstrate the value of the property. The surface formation within the lines of the group has not been classified, except by Mr. Spurr and in a very broad way, but it is known to be one of the light colored Tertiary lava flows. It is similiar to those at Tonopah and is undoubtedly rhyolite. The underlying rock has been definitely recognized as earlier andesite and is similiar in every respect to the lode andesite of Tonopah in which the productive veins occur. It is a light pink color such as was found in the Mizpah mine at about the 200 foot horizon of the vein.

The vertical shaft has passed through the rhyolite and the station at the three hundred foot level is excavated in the earlier andesite. The cross cut to the vein passes out of the andesite and re-enters the rhyolite as shown on Print V. It therefore follows that the vein has not been prospected at all in the favorable formation.

The mineralized boulders in the ore shoots and the secondary sulphides should be traced downward until their source and mode of occurrence is definitely determined. It is evident that the vein in the earlier andesite, after being formed and enriched, and the surface rhyolite had capped it, was crushed and reopened, and in this movement caused a new fissure to extend through the capping rock to the surface. There is little doubt but that the silver found in the vein of the overlying rock was first derived from ascending mineral bearing solutions which had passed through the primary ore breaking down and transporting a portion of the original silver sulphides. Further crushing of the vein material afforded quartz fragments, which were later rounded into boulder form through erosion and the action of hot ascending waters.

This is a logical solution of the manner in which the

nodules of quartz containing secondary silver sulphides could be found in the surface formation, and offers an excellent argument for greater depth.

There is some room for doubt regarding the manner of deposition of the secondary silver sulphide, pyrargyrite: where this particular form of silver is best exposed upon the 300 foot level, it is associated with iron pyrite and is frozen to the hanging wall. At this point the workings are about 135 feet below the ground water level and it is not at all likely the silver was carried and deposited by descending waters, but on the contrary was deposited through some other agency not clear in the present state of development.

See letter F. B. Work, June 2 - 18, 1907.
" report D. H. Walker Sep. 5, 1911 No. 10.

The lowest level of the mine should have been driven a few feet below its present horizon in the upper part of the earlier andesite, in place of the lower part of the capping rhyolite.

The contact between the rhyolite and the earlier andesite is marked by about thirty-five feet of decomposed material, dipping northerly at an angle of 21° . Below it the andesite is firm and little altered. The decomposed rock at the point of contact is probably not due to faulting, but indicates that the earlier andesite was at one time the surface and was covered by the later flow. The contact is so flat that little faulting would be expected. See letter C. C. Ripley Aug. 7 - 15, 1906, also Print V

Upon pages 20 and 21 hereof, a comparison of the Hannapan district with other districts of the same geological conditions has been made.

Attached hereto will be found extracts from the correspondence of Frank B. Work, C. C. Ripley and D. H. Walker, who were the men in charge of the work at various times. The numbers found upon the maps refer to like numbers in the report of D. H. Walker, dated September 5, 1911.

In the correspondence, I have copied both the

favorable and unfavorable statements. It will be noticed that considerable stress is laid upon the water problem. The manager of the mine was justified in constantly making excuses for the lack of headway, but the men who were financing the enterprise were really the ones at fault, as, with full knowledge of the situation, they were expecting the manager to keep the mine dry with a No. 7 Cameron pump, whereas a No. 9 was the size required.

The accuracy of the statements regarding the amount of water the No. 7 was lifting is also subject to question. The normal capacity of a No. 7 is 100 gallons per minute, equal to 144,000 gallons per 24 hours: the maximum capacity is 125 gallons per minute, equal to 180,000 gallons per 24 hours. With the steam line uncovered, from the boiler to the pump, and the loss in friction due to a small water column, I seriously doubt if over 100 gallons per minute were being pumped at any time.

It will be noticed from the foregoing statements and the attached correspondence, that the Earlier Andesite is firm and hard. It therefore follows that the water problem in sinking another two hundred feet will not be serious. There is no question but that the water either comes from the contact between the two porphyries or from the loose boulder ore shoots. In the sinking operations necessary to reach the five hundred foot point, the water from the 300 foot level could be controlled by a station pump, and there is little doubt but that a No. 5 Cameron could easily handle the water entering the shaft during the sinking operations. A station pump should then be installed at the 500 foot level, as a large flow of water will undoubtedly be released when the vein is encountered.

For the purpose of developing the vein in the Earlier Andesite, three points of attack are offered from the present workings. They are as follows:

1. The first and most feasible proposition would be

the sinking of the Vertical Shaft, as all the machinery is installed at this point. Furthermore, the location of the contact between the two porphyries is positively known and developed in these workings, and the vein has been proven to be strong and persistent upon the three hundred foot level: it is therefore advisable to concentrate the work in this shaft and sink an additional 200 feet. Then upon the 400 foot level, run a cross cut to the vein, of an estimated length of 155 feet, and upon the 500 foot level another cross cut of an estimated length of 220 feet, and from these cross cuts perform such drifting as is deemed necessary. This involves at least 575 feet of new work, at an estimated cost as follows:

1.	Rebuilding camp, placing machinery in working order, purchasing a No. 9 Cameron Sinker, pipe, telescopic joints, fittings, valve bucket, tools implements, etc. - - - - -	\$5000.00
2.	Repairing shaft and pumping 375,000 gallons of water from present workings with an inflow of 100 Gal. P.M.	3000.00
3.	Sinking Vertical Shaft, keeping it vertical and plumb, and of the same size as the part thereof already constructed, that is 4'x8" in the clear, timbered with 8"x8" square set timbers, lagged where necessary 200 feet @ \$40. per foot - - - - -	8000.00
4.	Upon 400 ft. level Excavating station and driving 155 feet of cross cut to vein - - - - -	2000.00
5.	Upon 500 ft. level Excavating station and driving 220 ft. of cross cut to vein - - - - -	3000.00
6.	Miscellaneous work such as drifting raising, etc. - - - - -	4000.00
	Total - - - - -	<u>\$25000.00</u>

If the development discloses a vein of profitable ore and it is decided to further develop the mine, then of course, items 1, 2 and 3 will be distributed pro rata over all future work.

11. The second form of attack is by changing the angle of dip of the Incline from 69° to 50° and sinking an additional 400 feet, at which depth the shaft will intersect

the vein. At the point of intersection the vein will have been cut at the same horizon as by the 500 ft. level of the Vertical Shaft. In order to develop the vein at the 400 ft. point, a 20 ft. cross cut will be necessary.

This plan is not considered advisable, as the cost will be approximately the same as the work from the Vertical Shaft, with the further great disadvantage of not being so well posted regarding the geology.

III. A third and impracticable method of development would be the sinking of the Incline upon its present dip of 69° and then cross cut to the vein.

These three methods of development are more clearly set forth upon Print VII, hereto attached.

EXTRACTS FROM LETTERS AND REPORTS OF THE FORMER
EMPLOYEES OF THE HANNAPAH MINE.

Letter,
Frank B. Work,
April 24th, 1904.

Note:-
Incline 250 ft.
Level.

"The past week we have advanced our drift 16 feet. We still have a good hanging wall and on our right solid porphyry highly mineralized with an occasional ruby silver stain."

"There is only about an inch of quartz on the wall now. The vein is turning a little and is now running directly east. We have passed through the water and are now in dry ground."

Letter,
Frank B. Work,
May 1st, 1904.

Note:-
Incline 250 ft.
Level.

"The past week we have extended our drift 20 feet making a total of 65 feet for the month of April. We still have a good hanging wall and Ruby silver showed the past week in a streak of quartz and iron about a foot from the hanging. We caught the signs of a cross vein the other day and it looks as though it is coming in from the N. E."

Letter,
Frank B. Work,
June 26th, 1904.

"I had to pay \$4.00 per cord for the wood. I will begin hauling this week. We burn about 20 cords per month."

Letter,
Frank B. Work,
July 10th, 1904.
Note:-
Incline 250 ft.
Level.

"Our quartz has changed from the foot wall to the hanging wall and is about a foot thick now. The average sample was \$5.00 and the picked \$22.80. To the right of the quartz there is a foot of porphyry and next to that a talc streak and then ten inches of quartz that carries \$1.00 gold but no silver, and the right of that is a kind of quartz porphyry seamed with iron. On the whole I think it is improving nicely."

Assay certificate shows:-

Gold	.07 ounces.
Silver	38.2 "

Letter,
Frank B. Work,
July 16th, 1904.
Note:-
Incline 250 ft.
Level.

"Since the first of the month we have extended our N. E. drift 23 feet. The ore vein is about the same (10 inches) but for the last three days we have gotten more Ruby and Brittle silver than any time since the boulder shoots. Our ground is tightening up and the ore is going back to the foot wall!"

Report,
Frank B. Work,
August 1st, 1904.
Note:
Incline 250 ft.
Level.

"During July we have done 32 feet of work. The drift N. E. has been extended 30 feet and the cross cut south 22 feet. The drift shows 10 inches of good quartz and in the cross cut a foot of good looking quartz 15 feet from the main fissure."

Letter,
Frank B. Work,
August 9th, 1904.
Note:-
Incline 250 ft.
Level.

"During the week, our cross cut was extended 14 feet and the face shows several stringers of iron and quartz."

Report,
Frank B. Work,
Sept. 1st, 1904.
Note:-
Incline 250 ft.
Level as it approaches the Vertical Shaft.

"During August we ran 26 ft. of cross cut and extended the main drift 26 feet or 52 feet of work during the month. We are getting considerable quartz in the face of our main drift and have some Ruby silver in sight every day. The quartz is on the south side of the drift and we are gradually working into it and hope there will be a good body of it."

Letter,
Frank B. Work,
Sept. 21st, 1904.

"The face of our drift is about 2/3rds quartz full of iron sulphides and is gradually getting harder. The quartz has been continuous longer than any time yet and I hope for better things soon."

Letter,
Frank B. Work,

Sept. 21st, 1904.

"Work done upon Hannapah mine to date:

Incline shaft--	250 feet.	
Drift, 80ft. lev	15	"
Drifts and		
cross cuts	150 ft.	
level, -----	377	"
Cross cut	200	
ft. level----	44	"
250 ft. Lev.-	1168	"
Surface work-	100	"
Winze, 150 ft.		
level-----	6	"
Sump 8' deep,		
25 ft. long		
upon 250' Lev.		
of Incline---	25	"
Total -----	1985	feet.

Letter,
Frank B. Work,
Oct. 2nd, 1904.
D. H. Walker No. 9,
G. C. Ripley L.6/3/06.

NOTE:-

Incline 250 ft.
Level,
190 ft. Vertical
Shaft.

"We ran into a little ore the other day in the upper left hand corner of the drift. We cant tell yet how important the strike is as it will take us several days to gradually turn our drift north and catch it with the bottom of the drift. I had a hole drilled into it 2 1/2 feet and had the drillings assayed and got:

Gold	.04 ounces
Silver	22.8 "

also took a big sample of about ten pounds across about 14 inches where the shot potted back and got:

Gold	.20 ounces
Silver	116 ounces

It is coming in the porphyry and ground up stuff of the fault fissure, so don't believe it is our real ore shoot, but believe it indicates nearness to the thing we have hunted so long. I sent you some samples of our strike of the 29th by express, to give you an idea of the material the values are in. I didn't assay a picked sample but am satisfied can pick one that will run about 800 ounces silver.

Report,
Frank B. Work,
October 2nd, 1904.

"During the month of September we extended our drift east 40 feet. The smallest number of feet we have ever made during one month. The ground was somewhat harder and our ground caved somewhat and held us back. On the 29th of September we broke into values in the upper left hand corner of our drift, etc. (See preceding letter October 2nd, 1904.)

Letter,
Frank B. Work,
October 24th, 1904.

"Our strike is holding out, about

Note:
D. H. Walker No. 9.
Letter G. C. Rip-
ley, June 3, 1906.
Vertical Shaft,
190 Ft. Level.

eight inches of good looking quartz showing Ruby silver. I have an assay in, and if I get the certificate before I go out to the mine, I will enclose it in this. I took it from the face about 8 inches of the best. We struck a big flow of water Friday noon and we are now pumping 25,000 gallons per day. Believe this ore will lead us to the main body." Assay result follows:

Gold - - - - - .16 ounces
Silver - - - - - 124.4 "

Report,
Frank B. Work,
November 30, 1904.

Note:
D. H. Walker No. 9.
Letter, G. C. Rip-
ley June 3, 1906.
Vertical Shaft,
190 Ft. Level.

"During the month of November the drift has been extended east 40 feet. In that distance, we have had good ore on the hanging wall and part of it on the foot wall. At present our vein is so large we can only follow the hanging wall on which is an ore streak six inches at the widest place assaying:

Gold - - - - - .22 Ounces
Silver - - - - - 180. "

Our ore has been continuous for 75 feet and the values are increasing."

Letter,
Frank B. Work,
December 26, 1904.
Note:
Vertical Shaft,
190 Foot Level.

"We are at a very interesting place in the vein just now - considerable quartz in the face and Ruby showing several places. We are not on either wall. The vein is very wide and to keep our drift straight we left the hanging but expect to catch one wall this week."

Report,
Frank B. Work,
Jan. 2, 1905.
Note:
190 Ft. Level.
Fault No. 2.

"The drift has been extended east 33 feet, during the month of December four sets of timbers were installed. We had some Ruby silver showing until four or five days ago when we struck a talc streak followed by ground up material crossing us at right angles. Expect to strike our wall and usual conditions within a week."

Report,
Frank B. Work,
February 1, 1905.
Note:
190 Foot Level,
Vertical Shaft.

"Our east drift has been extended 33 feet. Everything is moving nicely now and the last shift caught the water in the face and another shift will doubtless take us into our hanging wall."

Report,
Frank B. Work,
March 1, 1905.
Note:
Fault No. 2.
Last report from
190 Ft. Level.

"During February we have extended the east drift 43 feet. We have been running between the walls but not on either on account of the wide vein. The last two shifts we have gotten considerable porphyry mixed with talc and quartz and the indications are favorable to striking the foot wall soon"

Note: From March 1, 1905 to October 1, 1905, the new Vertical Shaft was being sunk. It reached the 190 foot level, identical with the 250 foot level of the Incline on about the latter date.

Letter,
Frank B. Work,
October 1, 1905.

Note:
Report,
D. H. Walker,
Sept. 5, 1911,
No. 9.

The term "Lode
Porphyry" is taken
to mean the "Ear-
lier Andesite"

"When we reached the level of the old workings (250 foot level of the Incline, 190 foot level of Vertical Shaft) and ran a cross cut to the old drift we found the ledge cut was our old one dipping at a greater angle. I had an assay made from the sulphide streak on the hanging that went:

Gold - - - - - .35 ounces
Silver - - - - - 276. "

The whole vein of three feet at this point would probably average:

Gold - - - - - .07 ounces
Silver - - - - - 34. "

a good grade of milling ore.

"I would estimate the milling ore blocked out in the mine to be 5000 tons of an average value of:

Gold - - - - - .04 ounces
Silver - - - - - 16. "

"Our double compartment shaft is timbered for a cage only to the level of the old workings (190 feet) and consequently no new ground has been opened, but every foot now takes us into new territory and I believe 50 feet more will take us into the lode porphyry (earlier andesite) in place and may mean a mine for us without going deeper. The \$10,000.00 will take us 150 feet deeper and cross cut our formation to the vein where we are confident of finding everything in place and our ore bodies larger. The ore now in sight will not justify the erection of a concentrating mill. A number of mining men have visited Hannapah during the summer and all are struck by the similarity to Tonopah and the general opinion is that with depth we will have a mine."

Letter,
Frank B. Work,
November 4, 1905.

"We have been breaking ground for about one week now and have added 15 feet to the depth of the Vertical Shaft. It is now 206 feet deep and the work is progressing as rapidly as can be expected with the present equipment. The shaft is making about one gallon of water per minute."

Letter,
Frank B. Work,
November 14, 1905.

"We are now 235 feet deep in the Vertical Shaft and are making good headway. The porphyry is changing rapidly, getting lighter in color with some pink showing, very full of iron sulphides. The water is the same about 1 G.P.M. We expect the hoist on the 17th and will be glad to discard the whim."

Letter,
Frank B. Work,
January 2, 1906.

"Our shaft is now 266 feet deep and going down at the rate of three feet a day. The formation is changing and is now mostly highly mineralized pink porphyry and looks very encouraging to me."

Letter,
Frank B. Work,
January 5, 1906.

"When I got back to the mine the other eve, I found it flooded with a big flow of water and the boys oiling up the sinking pump. Our water seems to come in the contact of the two porphyries."

Letter,
Frank B. Work,
January 20, 1906.

"Our new shaft is now 292 feet deep and we have 75,000 gallons of water per day, all our pumps can handle. We are in solid pink porphyry in the bottom, and if we can go ten feet deeper, our station will be in solid rock.

"One mile west of Hannapah they have been sacking ore and have just made a shipment of 17½ tons which ran \$200.00 per ton. The strike is on the extension of our vein

Letter,
Frank B. Work,
March 19, 1906.

Note:
300 Ft. Level.

"We are having trouble with another flow of water. Our cross cut was in 30 feet when we struck it. It comes from the direction of the vein and is going down slowly. We worked in the cross cut yesterday the first time in six days. We are pumping about 170,000 gallons of water per day."

Letter,
Frank B. Work,
April 17, 1906.

Note:
Report,
D. H. Walker,
Sept. 5, 1911 No.
10. -- 300 Ft. Lev.

"We struck our hanging wall 86 feet from the shaft. The last 12 or 15 feet was the worst broken up mess we ever struck in the mine - ground up porphyry. We turned west along the hanging wall and the first round of shots showed some good ore and the second round was even better than the first and everything points to our getting a fine ore body. I had an assay made to-day from a two inch streak that seems to be in place on the hanging wall and it went:

Gold - - - - .27 ounces.

Silver - - - - 609.4 "

and I believe ten feet further will make us smile."

Letter,
Frank B. Work,
May 1, 1906.

Note:
300 Ft. Level.

"If we get the water out in a week, I should have something to report soon. The last time I saw the face we had about six inches of shipping ore."

Letter,
Frank B. Work
May 9, 1906.

"The Silver Glance people on our west are busy sacking and shipping ore. Mr. Brock of the Tonopah Mining Company bought 60,000 shares of Silver Glance stock the other day. A strike 2½ miles east of us is causing a good deal of talk.

Letter,
Frank B. Work,
May 19, 1906.

"We are gaining on the water faster the last three days and hope to be breaking ground within a week. There is still 20 feet of water in the shaft and we are gaining three feet a day.

Letter,
Frank B. Work,
May 31, 1906.

"We expect to have the water out by to-morrow. I haven't heard from Ripley but suppose he will be here in a day or two."

Letter,
G. C. Ripley,
June 1, 1906.

"I have been with Mr. Work most of the day and we have talked the Hannapah proposition over. The great cry of both Mr. Work and his foreman is "better equipment". Mr. Work has faith in the mine and alluded with particular zeal to the \$400.00 streak which is now under water."

Letter,
G. C. Ripley,
June 3, 1906.

Note:
See report,
D. H. Walker,
Sept. 5, 1911,
No. 9.

Letters,
F. B. Work,
Nov. 30, 1904, to
October 1, 1905.

Note:
6" streak is men-
tioned in letter
F. B. Work,
April 17, 1905.

"Now in regard to the indications of pay ore. Naturally, I have had no assays, but in the old workings it is very plain to be seen that as the vein is followed down it takes more definite shape and the values are found high in places. On the 190 foot level of the new shaft, there is a good streak of ore, in boulder form, extending some 75 to 100 feet. In any of these boulders Ruby silver can be seen. Now I have had very little chance to study this formation, but it certainly looks to me that we will find our shipping ore at greater depth. The solid formation must be prospected if we even expect to make a mine here, for one can go almost anywhere in the present workings, even in the country rock, and find mineral and good values too. I hope the ore shoot upon the 300 will develop into something good and show that we can go deeper. I will write more definitely in regard to the six inch streak you mentioned when I can get in there, which I hope will be this week sometime."

Letter,
G. C. Ripley,
June 15, 1906.

"I am in receipt of a letter informing me of the purchase and shipment of one 85 HP boiler and a five drill air compressor."

Letter,
G. C. Ripley,
June 29, 1906.

"At the present rate of flow it is very evident that the No. 7 Cameron now operating cannot handle the water satisfactorily, and work be carried on at the same time. Therefore if we have to buy a pump, it must be a larger one of the same type, or a pump of another make which can handle a greater volume of water."

Letter,
G. C. Ripley,
July 25, 1906.

"The machinery arrived at the mine July 10th, was unloaded the 11th, boiler placed in position and foundation started the 12th. Setting was completed the 21st and stack raised the 22nd, and the connections with steam line and so forth are now being made. Water is 12 feet above the 300 foot level."

Letter,
G. C. Ripley,
Aug. 2, 1906.

"The new boiler works very satisfactorily and requires about one half as much wood as the old Economic. Uses about $3\frac{1}{2}$ cords of wood per day."

Letter,
G. C. Ripley,
August 7th, 1906.

"The water has been out of the mine since the morning of August 5th, and I have been "mucking" since then with two shifts. I find the caved material has come from the contact of the early andesite or pink porphyry and the overlying mass of broken material. Quite a hole has been made by this cave and a steady stream of water is coming down, sometimes carrying with it mud and rocks, showing that the ground is still in a very unsafe condition overhead."

Note:
300 Ft. Level.

Letter,
G. C. Ripley,
August 9, 1906.

"I have timbered and bulkheaded the caved cross cut and have started to drive straight ahead in the solid formation."

Letter,
Auguste Mathez,
August 12, 1906.

"I had the pleasure of meeting Mr. Ripley. We both agreed that there was little use of my visiting the Hannapah, since the cross cut had not reached the vein. (300 ft. Level)

"From what Mr. Ripley tells me of the boulders in the vein, it must be the channel of an old geyser. The geysers of the Yellowstone are to-day throwing up these rounded pebbles, called "geyser eggs" only they are not mineralized with valuable ores."

"The lower levels of the Combination Line in Goldfield shows the same characteristic geyser filling of pebbles. *

"I don't see much else to do than to follow down and find the source if possible of this conglomerate. It may be in the form of a pipe, neck or vein."

Letter,
G. C. Ripley,
August 15, 1906.

Note:
300 Ft. Level.

"Earlier Andesite"

"Breast of new cross cut 59 feet from shaft, in good solid ground. Water under good control and being handled by the No. 7 alone. I use the No. 5 in emergencies. Hope to cut vein early next week. If the vein continues east in this solid formation, I have every reason to believe that it will be in place, that is, I believe the cross cut is in the "earlier andesite" and below the cap rock in which the vein matter was so much disturbed and broken."

Letter,
G. C. Ripley,
August 23, 1906.

"The new cross cut has been driven 20 feet making a total of 79 feet from the shaft to breast. The ground is still firm and extremely hard in places."

Letter,
G. C. Ripley,
August 28, 1906.

Note:
300 Ft. Level.
cross cut from
shaft, north.

"Since last report the cross cut has been driven 11 feet, making a total distance of 90 feet from shaft to breast. The formation is more broken than it was, is still hard and firm and does not break well. According to the reports I have had, the vein was encountered about 89 feet from the shaft in the old cross cut. In that case, if the vein continues regularly on the strike it had in that place, I ought to encounter it in the next few days. However, owing to the more broken ground the vein may have been displaced further north. I will therefore start a drift west from my present cross cut to catch the old drift, where the six inch streak is reported to be, if I do not cut the vein within the next five or ten feet. At the same time I will drive the cross cut north to cut the vein wherever it may be, and if I do find it I will drift east from there. The water is giving us comparatively little trouble now and the boilers are working very smoothly."

Letter,
G. C. Ripley,
Sept. 2, 1906.

Note:
300 Ft. Level.

"Breast of cross cut 105 feet from shaft, The breast was in what is in all probability the foot wall of the vein. We have passed through the characteristic talc streak which has always been present in the vein material, and the porphyry is showing signs of mineralization, containing a good deal of finely divided iron sulphide."

Letter,
G. C. Ripley,
Sept. 12, 1906.

"The west drift is in a distance of 21 feet from the cross cut, still in firm ground with little water."

Telegram,
G. C. Ripley,
Sept. 17, 1906.

"Big flow water broke through face of west drift. Workings closed. Still pumping."

Letter,
G. C. Ripley,
Sept. 17, 1906.

Note:
300 Ft. Level.

"The night shift of Friday broke through into the soft vein matter in the face of the west drift at a distance of approximately 27 feet from the new cross cut. The shots evidently broke a hole through into the water course or reservoir which was encountered last April, for a great deal of water was struck. The water gradually gained on the No. 7 Cameron until there was ten feet of water above the 300 foot station. Here we held it for one day when it began to gain slowly and there is now 13 feet of water above the station. I figure the No. 7 is throwing approximately 170,000 gallons per 24 hours. A No. 9 Cameron will hold the water easily, but will require a four inch pipe column. I have about 50 pounds of the ore which was taken out of the \$400.00 streak by Frank B. Work. Every piece is extremely rich and shows a great deal of Ruby silver. It has surprised me that Mr. Work did not save what he has encountered throughout the old and new workings. It will cost a considerable amount to develop it, but it seems a pity to give up when water is the only thing to keep us from making a mine here. I believe the ore is in the ground, but deeper, in any quantity."

Letter,
G. C. Ripley,
Sept. 22, 1906.

"The water has raised to 30 feet above the 300 foot level. A new No. 9 Cameron is our only hope."

Letter,
G. C. Ripley,
October 4, 1906.

"Mine entirely closed down, watchman in charge. The Silver Glance property have struck water in their 100 foot shaft. They are planning to drift at this level."

Letter,
G. C. Ripley,
October 13, 1906.

"Judging from the rate the water gained on the No. 7 pump, I am satisfied that a No. 9 can handle the present flow. Our boiler can easily supply the necessary power."

Agreement,
Frank B. Work,
March 26, 1907.

"In consideration of my being made manager of the Hannapah mine, I hereby agree that for the sum of \$7500.00 I will pump the water out of the present 300 foot Vertical Shaft and make said shaft safe and in good shape to work in with bucket and cross head, also I agree to put the cross cut to the vein and the drift in the vein to the point where I quit on the last of May 1906, in good workable order."

Letter,
Frank B. Work,
June 2, 1907.

"I will do all I can to push the drift and hope to catch the ore shoot soon. We are getting bunches along the hanging wall showing good

values and I hope to have something good to report soon. The water has decreased, so we are holding it easily with one boiler, using from 2½ to 3 cords of wood per day."

Letter,
Frank B. Work,
June 18, 1907.

Note:
300 Ft. Level.

"The first 16 days of this month we advanced the drift on the vein 64 feet, or an average of four feet per day. We are following the hanging wall and the foot is not in sight. Along the hanging we get bunches of ore showing Ruby silver where the water breaks through and the wall is plastered with iron and looks like reaching ore in larger quantities soon."

Letter,
Frank B. Work,
June 25, 1907.

Note:
300 Ft. Level.

"On account of bad air we were compelled to put an air line down the shaft and into the face of the drift. We put an inch and a half line in and run the compressor a half hour after shooting. Our drift is perfectly dry and the gas hangs in the dry muck. On account of work on the air line an advance of 12 feet only was made the past week, making 76 feet in all for the month. I don't expect to strike the shoot until we break into water again. It is still well mineralized and showing some values."

Letter,
Frank B. Work,
August 2, 1907.

Note:
300 Ft. Level.

"During July we only advanced our drift 7½ feet. We were unfortunate enough to lose our boiler house, gallows frame and blacksmith shop by fire on the evening of July 2, 1907. At this writing we have a new gallows frame, our machinery is repaired, twelve sets of timbers were put in the drift and we are breaking ground in the face of the drift 223 feet from the shaft. Some good quartz came into the roof of our drift about eight feet from the face the last of June. It now comes down one half the face of the drift and is about two feet wide. I believe we are getting into the ore shoot we passed through on the 190 foot level. The way it is coming in shows a dip west in the vein of 30° or about the same dip of the shoots in the Tonopah Mine."

Letter,
Frank B. Work,
August 27, 1907.

Note:
300 Ft. Level.

"I haven't put a building over the machinery but if we run longer we will have to do so as the cold nights make it hard to keep steam and wastes wood. On the 24th, I took an assay across two feet of the vein to see what it would average, it ran:

Gold----- .16 ounces.

Silver-----30. "

Since then the vein has pinched until the walls are within six inches of each other and we are getting quite a flow of water. I am looking for a big change in the next few feet and consider the water a good sign. We have extended the drift 96 feet this month and expect to go 15 feet further by September 1st, 1907. Hope you will get matters in shape to keep going 60 days longer as we are making such good time and should prove the property to be O.K. soon."

Letter,

Frank B. Work,
Sept. 14, 1907.

Sept. 1907 was
last month mine
worked.

" I made a survey of our underground workings the other day, from the 300 foot level of the New Shaft and find we have only 60 feet to run to be in line with the cross cut from the bottom of the old Incline Shaft. The formation in our drift is changing rapidly for the better, is getting much harder and less broken up and is very encouraging."

Letter,
D. H. Walker,
Sept. 5, 1911.

"Silver Glance lies about N. 70° W. of Hannapah, a distance of about one mile, and there is no doubt of it being the same vein, it being exposed practically the entire distance. There was never any work done along the Hannapah vein in the new formation found in the bottom of the shaft, as the cross cut to the north went out of the new formation some distance before encountering the vein."

See Print V.

Report,
D. H. Walker,
Sept. 5, 1911.

Note: The numbers refer to points on the maps accompanying this report.

No. 1. Some good ore but in small stringers. Was found while excavating for a blacksmith shop. The vein is covered from this point eastward.

No. 2. Numerous shallow shafts sunk on the vein showing 20" to 30" of ore averaging \$15.00 to \$18.00. Vein is traceable to west line of Hannapah property.

No. 3. The Incline entered the foot wall and the vein was therefore to the east while sinking. In cross cut found good ore where it first encountered the vein. Some boulders 18" to 20" in diameter assayed as high as 400 ounces silver. I think this drift is the only part of the mine that is accessible to-day. This shoot was from 20 to 25 feet long, the average width about 20 inches and the probable average value 40 ounces silver or better.

No. 4. Plenty of quartz but not showing any value higher than eight to ten ounces silver, about 3½ feet wide. Numerous bunches of quartz between 3 and 4 carrying small values.

No. 5. Bunches of quartz, apparently solid 15" to 30" wide showing Ruby silver.

No. 6. Another bunch of quartz similar to No. 5 but not so solid. The shoots are all connected by small stringers of iron sulphide ore showing Ruby silver, averaging anywhere from 1" to 3" wide and the greater part of the time on the foot wall.

No. 7. The first ore found after passing through fault No. 1, some fair ore was found before entering the fault. Broken up as usual, average width 15" to 20" and carrying about 25 to 30 ounces silver.

No. 8. Mr. Work and I sampled this shoot about 10 to 20 feet in length, average width 20 inches, assayed 65 ounces silver, .2 ounces gold.

No. 9. Some great specimens of Ruby silver ore were taken from this place, but the shoot was small and I can't recall taking any average assays. Good ore was found in the new shaft while sinking at a depth of 160 feet, the shoot was about three inches wide.

No. 10. The ore encountered upon this level (the 300) was all frozen to the hanging wall. But there were no ore indications east of Fault No. 2. Samples taken from the hanging wall showed as high as 600 ounces silver and 1 oz. gold, it was anywhere from $\frac{1}{2}$ " to 6" in thickness. About 60 feet west from the cross cut it was free from the hanging wall.

No. 11. Is a continuance of the ore found on this level but very badly broken up.

The talc throughout this mine on the foot wall will average 12 inches wide and in some places 36 inches; it is always thoroughly impregnated with minute boulders of quartz.

The New Vertical Shaft encountered about 40 feet of broken up country rock before entering the andesite.

ARGUMENT IN FAVOR OF GREATER DEPTH AT HANNAPAH.

It will be observed from the data herewith presented, that the form of silver most frequently found in the vein is the secondary sulphide pyrargyrite (Ruby silver). It will also be observed that the approximate ratio of silver to gold is 600 ounces to one, or upon a value basis of the metals 96% silver and 4% gold.

The greatly predominating value in silver is undoubtedly occasioned by the original silver sulphides not being as stable as the gold, and when the primary vein was opened the second time, the ascending circulating waters carried away a portion of the silver but left the gold, which is less migratory, behind.

Other deposits formed in the Tertiary andesites and rhyolites and analogous to Hannapah are the following:

Tonopah production to date	\$198,989,729.00
Constock " " 1902	\$370,000,000.00
Pachuca " "	\$146,000,000.00

The percentage of silver and gold, based upon the value of the two metals, is as follows:

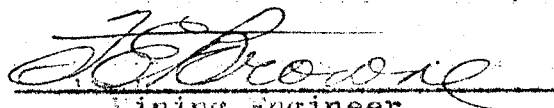
Tonopah	72% silver	28% gold
Comstock	57% "	42% "
Pachuca	75% "	25% "
Hannapah	96% "	4% "

In the mind of the writer the above statements lend weight to the theory that the vein found in the "surface porphyry" is enriched by metals carried from the vein in the "earlier andesite" and deposited in the secondary vein above. When the primary vein is reached, both the gold and silver values will undoubtedly increase and the percentage of value of the two metals will ultimately settle at about the same average as at Tonopah, Comstock and Pachuca.

Briefly stated it is highly advisable to prospect the vein in the "earlier andesite" and ascertain with certainty the source of the high grade quartz boulders and the Ruby silver.

The data herewith presented is taken from the reports and correspondence of the men who operated the mine. The maps are made from the office records, patent deed, and what other information was available. The writer has never examined the property.

Respectfully submitted,


Mining Engineer.

Dated at:
Los Angeles, California.
January 22nd, 1918.

SCHEDULE "A"

The following is the development work performed
upon the HANNAPAH mine.

Shafts:

Vertical Shaft, 4 feet by 8½ feet in the clear, timbered with square sets, guides, etc - - - - -	300 feet.
Incline Shaft, 69° dip, follows vein part of depth- - - - -	250 "
Total footage of shafts- - - -	550 Feet.

Drifts:

Incline, 80 foot level - - - -	14 feet.
Incline, 150 foot level - - - -	262 "
Incline, 250 foot level, identical with 190 foot level of Vertical Shaft - - - - -	708 "
Vertical Shaft, 300 foot level-	250 "
Total footage of drifts	1,234 Feet

Cross cuts:

Incline, 150 foot level - - - -	95 feet.
Incline, 200 " " - - - -	43 "
Incline, 250 " " identical with 190 foot level of Vertical Shaft - - - - -	373 "
Vertical Shaft, 300 foot level -	117 "
Total footage of cross cuts	628 Feet

Surface Cuts:

Shallow shafts, trenches, cuts, etc. upon surface, about - - -	100 feet 100 Feet
Total Development - - - - -	2,512 Feet

TITLE DATA

Notice of Location. Located: June 24, 1902.
RATTLER. Recorded: September 19, 1902, @ 8.10 AM.
Book: "G" of Mining Locations.
Page: 29, Nye County Nevada Records.
Locators: M. E. Graham
E. P. Graham
J. J. Clark
Lode Line: 750 feet westerly, 750 feet easterly.

Notice of Location. Located: June 24, 1902
BIRDS EYE. Recorded: September 19, 1902, @ 8.20 AM.
Book: "G" of Mining Locations.
Page: 30 Nye County Nevada Records.
Locators: M. E. Graham.
E. P. Graham.
J. J. Clark.
Lode Line: 750 feet Easterly & 750 feet westerly.

Notice of Location. Located: July 11, 1902.
HANNAPAH. Recorded: August 6, 1902 @ 3 PM.
Book: "D"
Page: 41, Tonopah Mining Records.
Recorded: August, 19, 1902, @ 9 AM.
Book: "F" of Mining Locations.
Page: 404, Nye County Nevada Records.
Locators: M. E. Graham 1/4
E. P. Graham 1/4
Frank B. Work 1/2
Lode Line: 1150 feet easterly, 350 feet westerly.

Notice of Location. Located: July 11, 1902.
WYBE. Recorded: August 6, 1902 @ 3.10 PM. : Lode Line:
Book: "D" : 700' easterly
Page: 40 Tonopah Mining Records. : 800' westerly
Recorded: August 19, 1902, @ 9.30 AM.
Book: "F" of Mining Locations.
Pages: 406-407 Nye County Nevada Records.
Locators: M. E. Graham 1/4 E. P. Graham 1/4
: Frank B. Work 1/2

Notice of Location. Located: July 25, 1902.
SANDWICH. Recorded: October 20, 1902, @ 8 AM.
Book: "G" of Mining Locations.
Pages: 242-243 Nye County Records.
Locators: E. P. Graham.
- M. E. Graham.
Lode Line: 500 feet westerly, 1000 feet easterly.

Notice of Location. Located: October 9, 1902.
COMSTOCK. Recorded: December 16, 1902 @ 9 AM.
Book: "H" of Mining Locations.
Page: 68 Nye County Nevada Records.
Locator: A. J. Bettles.
Lode Line: 500 feet westerly, 1000 feet easterly.

Notice of Location. Located: October 31, 1902.
BETTLES. Recorded: January 27, 1903. @ 9 AM.
Book: "H" of Mining Locations.
Page: 229 Nye County Nevada Records.
Locator: A. J. Bettles.
Lode Line: 1000 feet westerly, 500 feet easterly.

Notice of Location.
JOHNSON.

Located: November 1, 1902.
Recorded: January 27, 1903, @ 9.⁰⁰AM.
Book: "H" of Mining Locations.
Page: 230, Nye County Nevada Records.
Locator: A. J. Bettles.
Lode Line: 250 feet westerly, 1250 feet easterly.

Deed:
M. E. Graham
E. P. Graham
To:
A. J. Bettles.

Date: August 28, 1902.
Recorded: November 14, 1902 @ 8.10 AM.
Book: "P" of Mining Deeds.
Page: 556 Nye County Nevada Records.
Convey and Quit Claim:
Hannapah claim $\frac{1}{2}$ interest.
Maybe " $\frac{1}{2}$ "

Deed:
M. E. Graham
Edward P. Graham.
John J. Clark.
To:
Alfred J. Bettles.

Date: October 30, 1902.
Recorded: November 14, 1902, @ 8.20 AM.
Book: "P" of Mining Deeds.
Page: 558 Nye County Nevada Records.
Quit Claim:
Birds Eye claim.
Rattler "

Deed:
E. P. Graham,
M. E. Graham,
To:
A. J. Bettles.

Date: November 3, 1902.
Recorded: November 14, 1902, @ 8.30 AM.
Book: "P" of Deeds.
Page: 561-563 Nye County Nevada Records.
Quit Claim:
Sandwich claim.

Deed:
A. J. Bettles,
To:
The Hannapah Mining
and Smelting Co.

Date: February 21, 1903.
Recorded: February 26, 1903, @ 3.32 PM.
Book: "Q" of Deeds.
Pages: 195-6-7 Nye County Nevada Records.
Quit Claim:
Bettles claim.
Johnson "
Comstock "

Deed:
Alfred J. Bettles,
Frank E. Work,
To:
The Hannapah Mining
and Smelting Co.

Date: November 7, 1902.
Recorded: November 14, 1902.
Book: "P" of Deeds.
Page: 551 Nye County Nevada Records.
Quit Claim:
Hannapah claim.
Maybe "
Birds Eye "
Rattler "
Sandwich "

INCORPORATION.

The Hannapah Mining and Smelting Company was incorporated under the laws of Utah, November 4, 1902. Capital stock 1,000,000 shares of a par value of \$1.00 per share.

The Utah charter was revoked the first Monday in April 1911 for failure to pay the state taxes.

United States
Patent Deed.

To:
The Hannapah Mining
and Smelting Company.

U. S. Survey
No2105.

Dated at the City of Washington November 19, 1904

Recorded: December 18, 1906 @ 10 AM.

Book: 8 of Deeds.

Page: 523 Nye County Nevada Records.

Conveys: Johnson lode mining claim.

Hannapah	"	"	"
May Be	"	"	"
Birdseye	"	"	"
Rattler	"	"	"
Sandwich	"	"	"
Comstock	"	"	"
Bettles	"	"	"

Mortgage Deed of
Trust.

The Hannapah Mining
and Smelting Co.

To:
Utah Savings and
Trust Co.

Date: December 1, 1906.

Recorded: December 18, 1906 @ 10 AM.

Book: "E" of Mortgages.

Page: 145 Nye County Nevada Records.

Recites:

"-----WHEREAS, in the exercise of the powers in that behalf possessed by it, and pursuant to resolutions adopted at the regular annual meeting of its stockholders held on the 5th day of November, 1906; and also in pursuance of a resolution adopted by its Board of Directors at a meeting regularly and duly called and held for that purpose, The Company has resolved to make, execute and dispose of its obligations in the form of bonds to the extent of \$250,000.00 consisting of 500 of such bonds"-----

Bonds dated December 1, 1906.

Payable December 1, 1911.

Interest: 7%.

THEREFORE -----"The Company has granted, bargained, sold, conveyed, assigned, released, transferred and set over, and by these presents doth grant, bargain, sell, convey, assign, release, transfer and set over unto the Utah Savings and Trust Company, etc -----

The Johnson, Hannapah, May Be, Birdseye, Rattler, Sandwich, Comstock and Bettles lode mining claims.

Note: Under the foregoing Deed of Trust, 73 bonds were issued amounting to \$36,500.00. The bond holders never instituted foreclosure proceedings.

Deed.

Frank F. Mannix
County Treasurer,
of Nye County, Nevada

To:
Celia O. Browne.

Dated: August 29, 1913.

Recorded: September 25, 1913.

Book: 30 of Deeds.

Page: 408 Nye County Nevada Records.

Consideration: \$120.68

Recites:

"--- does by these presents grant, bargain, sell and convey, etc"

Survey No. 2105, Johnson, Hannapah, Maybe, Birdseye, Rattler, Sandwich, Comstock, Bettles, and improvements

August 29, 1918.

The "Statute of Limitations" in Nevada is five years, therefore upon August 29, 1918 the courts were closed to anyone trying to set up an adverse title.

In Tonopah, where the mineralization was undoubtedly contemporaneous with Hannapah, the veins in the earlier andesite and before the rhyolites and dacites were erupted had predominating silver values. In the rhyolites and dacites which were subsequently erupted, veins are to be found, but the predominating values are gold.

In the case of the Hannapah mine, the greatly predominating silver values lend weight to the hypothesis of silver transportation from a primary vein in andesite, enriched with original silver sulphides. The developed portion of the Hannapah Mine exposes the vein in rhyolite, and the silver values greatly predominate, while the gold values are insignificant.

It is frequently advisable not only to study an ore deposit by itself, but also to compare it with others. The study of other analgous districts will often present information which, in a property of limited development, will not be considered important. The richest silver vein in the world is the Real del Monte, near Pachuca, Mexico. The production is in the neighborhood of \$1,000,000,000.00. The most productive formations are the tertiary andesites and ruby silver was found extensively in the vein. Basalts are found capping rhyolites, which in turn cover andesites and secondary veins are not at all uncommon.

Bulletin No. 315, pp. 36, 1907, by W. H. Emmons.
Granite-Bi-Metallic Mine.

"More than one-half of the silver is in the form of dark ruby silver, pyrargyrite, there is also considerable light ruby, proussite."

Tuscarora Mining District, Nevada.
10th Census. Vol. XLIII, pp. 34, by C. F. Becker.

Mineral Deposits, By Waldemar Lindgren.
Pages 810, 813, 829, 831, 832.

"Genesis of the Ores at Tonopah, Nevada" by Edson S. Bastin and Francis B. Laney,
Professional Paper No. 104, pages 11, 12, 15.

"GENESIS- In the preceeding pages attention has been called
"to the strong evidence connecting the class of deposits here
"discussed with igneous action and pointing to ascending hot waters
"as the agents of deposition. The best proof that the ores were
"not formed by ordinary circulation of surface waters is the
"fact that deposition has not proceeded uniformly, but that the
"vein-forming epochs were of brief duration and followed closely
"after each considerable eruption. Evidence of this relation is
"available from many important districts. At Tonopah the
"principal mineralization followed the eruption of the earlier
"andesite and the veins are truncated by the flow of the later
"andesite and the later rhyolite. At Jarbridge, Nevada, the veins
"are contained in the early rhyolite, while the later rhyolite is
"barren. At Waihi, New Zealand, the rich veins are sharply
"truncated by erosion and capped by a rhyolite of later age.

"The occurrence of these deposits in lavas really counts for
"but little; there are vast areas of lava flows absolutely barren
"of mineral deposits. On the other hand, several of the Hungarian
"authors have pointed out the fact that the veins are confined
"mainly to the vicinity of volcanic necks or centers of eruption.
"Exactly the same conclusions have been reached in the United
"States. This feature serves to connect the veins formed near
"the surface with those of greater depths. The deposits in the
"surface lavas are, then simply the tops of veins the roots of
"which are to be found in the intrusive masses of the depths.
"No matter whence all the water or part of the water came, the
"deposition of the substance of the veins- their valuable content-
"appears to be a phenomenon connected with intrusive-activity
"and not merely dependent upon the heat furnished by the lava
"flows to circulating surface waters. The metals, as well as the
"sulphur, carbondioxide, and fluorine, were^{yn} all probability
"derived from intrusive underlying masses."

EXTRACTS FROM UNITED STATES GEOLOGICAL
SURVEY PUBLICATIONS.

Mining Districts of
Western United States
Bulletin 507.
Pg 222.

No. 137.
Hannapah. Au., Ag.
20 Miles east Tonopah, T. & G. RR.
Tertiary volcanics.
Veins.

Ore Deposits of Tonopah
and neighboring districts
Nevada. J. E. Spurr.
Bulletin 213, 1903.
Page 87.

The rocks of the district are
volcanic, bearing a general resemblance
to those at Tonopah. The veins also, of
which two or three were observed, are of
the same general character as the Tono-
pah veins, although so far they have not
been shown to have anything like the
strength of the better class of veins
in the older camp,

Mineral Resources.
1908.
Part 1.
Page 499.

In Hannapah District the Silver
Glance was the only shipper.

Mineral Resources,
1909.
Part. 1.
Page 420.

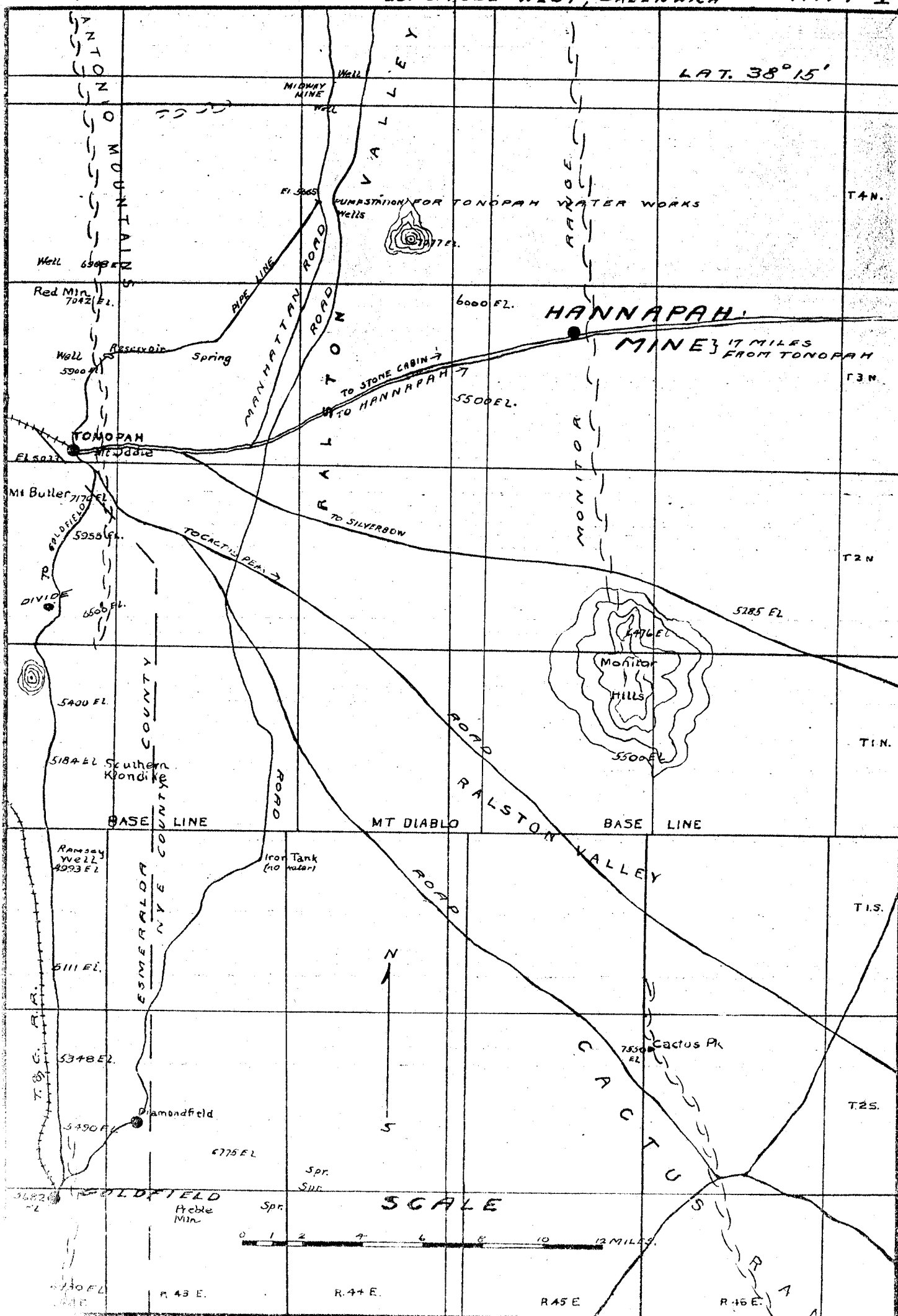
The Silver Glance mine in the
Hannapah section was worked by lessees
who shipped silver ore carrying small
gold values to Tonopah mills and to
smelters.

Mineral Resources.
1914.
Part 1,
Page 699.

A small production of silver ore
was reported shipped from one property
in the district.

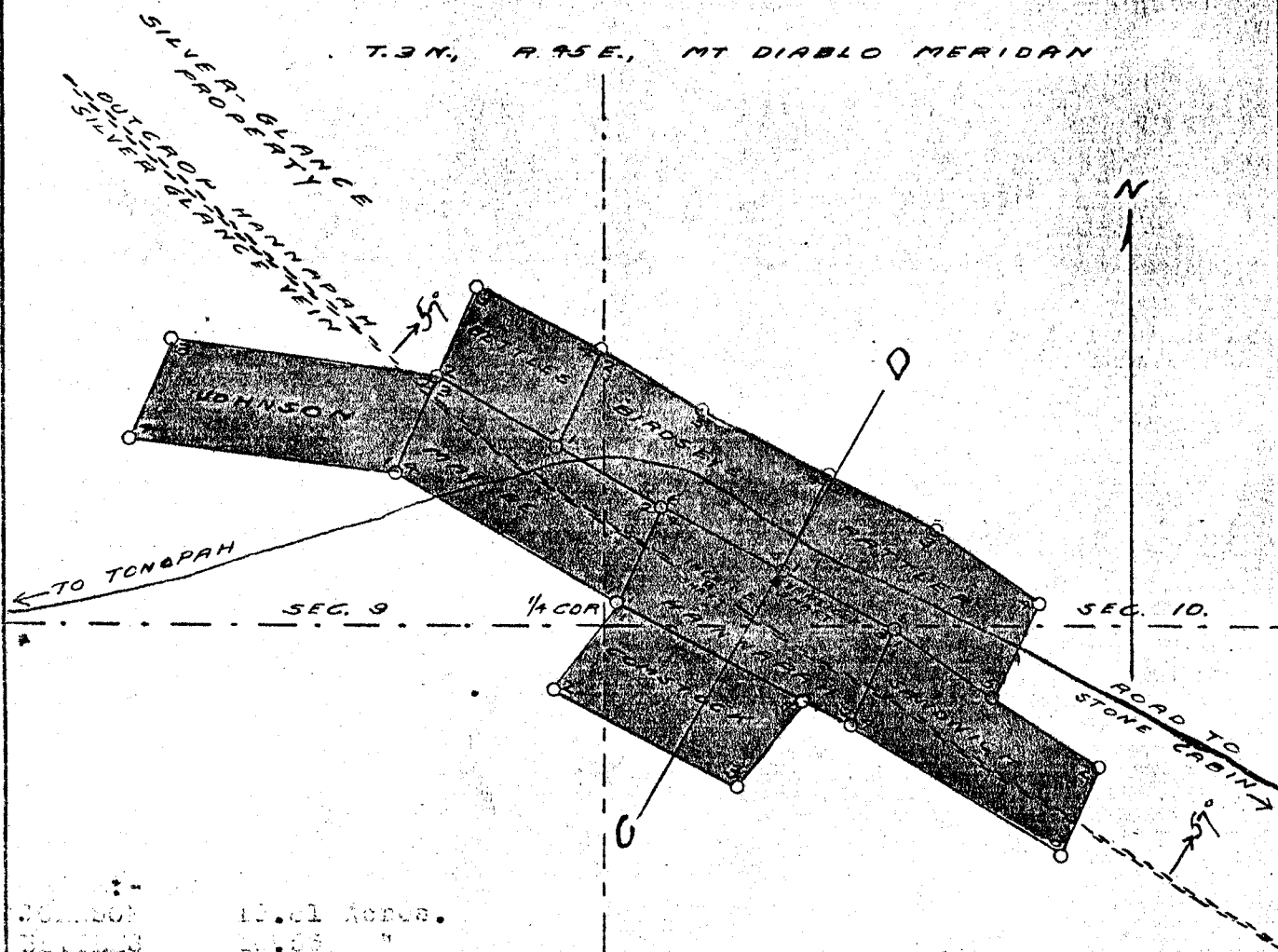
117° LONGITUDE WEST, GREENWICH PRINT I

LAT. 38° 15'



PRINT II

T. 3 N., R. 95 E., MT. DIABLO MERIDIAN



JOHNSON	19.61	Acres.
BIRD	19.61	"
JOHNSON	19.57	"
BIRD	19.54	"
JOHNSON	20.13	"
BIRD	19.56	"
JOHNSON	19.51	"
BIRD	17.60	"
Total	112.61	"

SCALE 1 INCH = 1000 FEET

MAP SHOWING PROPERTY OF

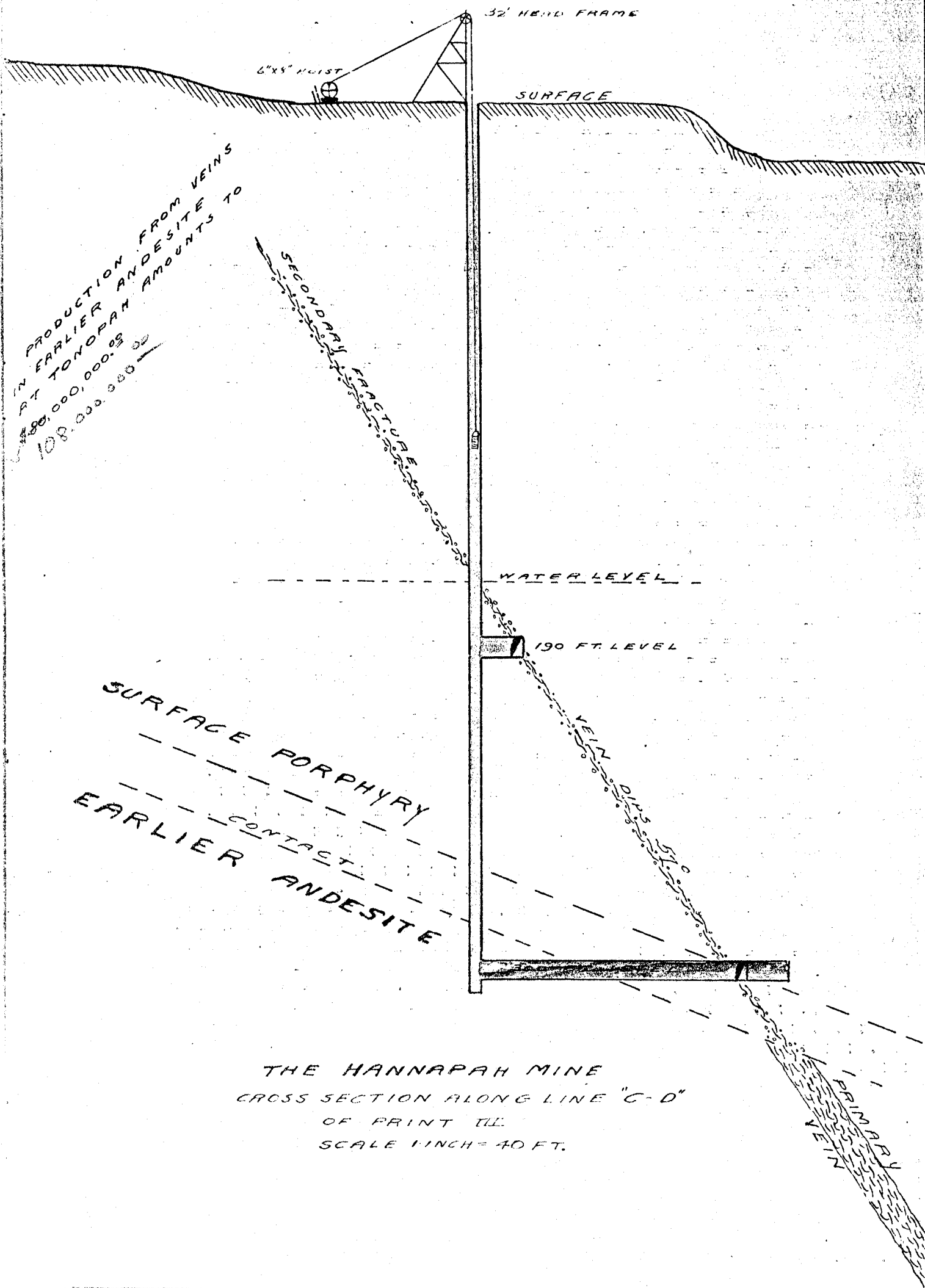
FREDERICK F. FORTNE

LOCATED AS

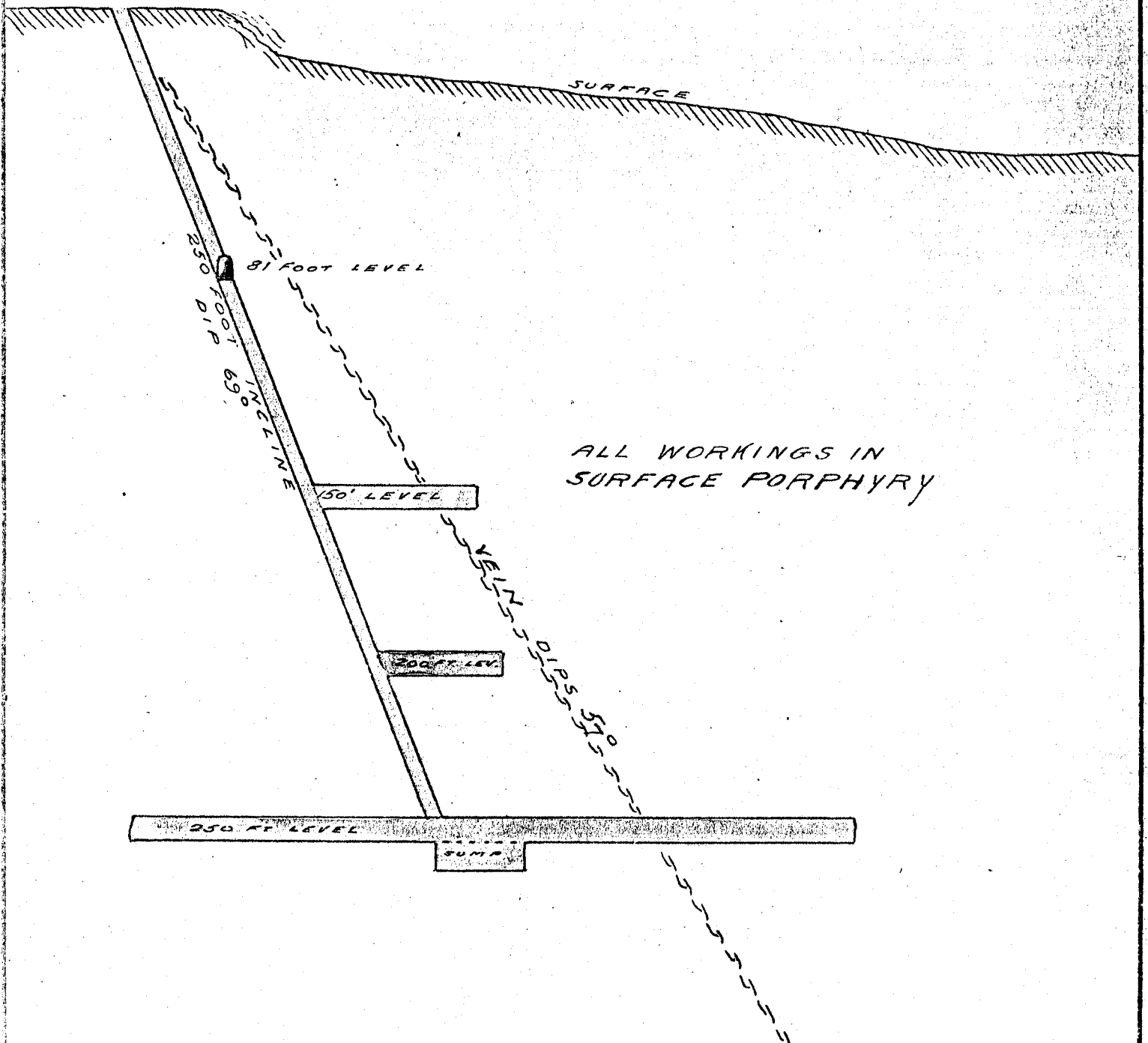
"NEW HAVEN" ETC.

U. S. Survey No. 1175
By Henry, Nevada.

PRINT V



PRINT VI



THE HANNAPAH MINE
CROSS SECTION ALONG LINE "E-F" PRINT III
SCALE 1 INCH = 90 FEET

COLLAR EL. 6594.5

ABOVE SEA LEVEL

INCLINE 69°

250 FT LEVEL

VEIN DIPS 57°

NEW SINKING PROPOSED 405 FT

525 FT LEVEL

20' LONG

EL 6000 FT. INTERSECT VEIN AT 655 FEET

NEW WORK
SINKING AT 50° 405 FT.
525' LEV. CROSS-CUT 20 "

TOTAL 425 "

PRESENT WORKINGS

--- PROPOSED ---

SCALE 1 INCH = 100 FT.

COLLAR

6500 FEET

INCLINE 69°

250 FT LEVEL

NEW SINKING 335 FT

475 FT LEVEL

115' LONG

ELEVATION 6000 FT. 585 FT. LEVEL

NEW WORK
SINKING AT 69° 335 FT.
475' LEV. CROSS-CUT 115 "

585' " " 140 "

TOTAL 390 "

COLLAR

190 FT LEVEL

SURFACE PORPHYRY

300 FT LEVEL

190' LONG

400 FT LEVEL

155' LONG

400 FT LEVEL

220' LONG

500 FT LEVEL

200' LONG

500 FT LEVEL

200' LONG

500 FT LEVEL

200' LONG

500 FT LEVEL

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500 FT LEVEL

200' LONG

500 FT LEVEL

200' LONG

500 FT LEVEL

NEW WORK
SINKING, VERTICAL 200 FT
400 FT. LEV. CROSS-CUT 155 "

200 " "

TOTAL 355 "