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09/18/95

ARIZONA DEPARTMENT OF MINES AND MINERAL RESOURCES FILE DATA

PRIMARY NAME: MAID OF SUNSHINE

ALTERNATE NAMES:
LEADVILLE MINING COMPANY
CALUMET AND ARIZONA MINING CO.

COCHISE COUNTY MILS NUMBER: 791

LOCATION: TOWNSHIP 19 S RANGE 25 E SECTION 16 QUARTER SW
LATITUDE: N 31DEG 46MIN 30SEC LONGITUDE: W 109DEG 48MIN 36SEC
TOPO MAP NAME: PEARCE - 15 MIN

CURRENT STATUS: PAST PRODUCER

COMMODITY:
COPPER SULFIDE
SILVER
GOLD LODE
SPECIMENS AZURITE

BIBLIOGRAPHY:
ADMMR MAID OF SUNSHINE FILE
KEITH, STANTON B.,1973, INDEX TO MNG PROP IN COCHISE COUTNY, AZ BUR MINES BULL 187, P 83
WILSON, ELDRED D.,1927, GEOL & ORE DPSTS OF COURTLAND-GLEESON REGION, AZ BUR MINES BULL 123, P 56
ANTHONY, J.W, ET AL, 1977, MINEROLOGY OF AZ, UNIV OF AZ PRESS, P 48

ARIZONA DEPARTMENT OF MINES AND MINERAL RESOURCES

INFORMATION FROM MINE CARDS IN MUSEUM

ARIZONA

Cochise Co.

Maid of Sunshine Mine (F)

MM-9791 Cyanotrichite
MM L003 Cyanotrichite
MM M 709 Cyanotrichite
O 638 Chrysocolla

MILS # 791
O-AKA's
Maid of Sunshine (#2)

REPORT OF THE LEADVILLE GROUP OF MINES,
COURTLAND, ARIZONA,
MARCH, 1913.

****

LOCATION

The mining claims dealt with in this report are adjacent to the town of Courtland, Turquoise Mining District, Cochise County, Arizona, 36 miles northwest of the city of Douglas and 24 miles north of the city of Bisbee. They lie in a small group of low hills detached from but near to the extreme southeast end of the Dragoon Mountains.

AREA

The claims are divided into two groups with areas as follows:

Maid of Sunshine	Patented	18.11 acres	
King Solomon	"	20.66 "	38.77
Leadville	"		
Turquoise King	"		
Copper Bug	"		
Western Belle	"		
Northern Light	"		
Gray Mule	"		
Headlight	"		128.25
Winchester, surveyed for patent, area estimated		2.00	
West side, patent pending, area estimated		18.00	20.00
		Total acres	187.02

These claims, as well as the surrounding ones, are shown on the plan of the mining claims of the district and which plan accompanies this report.

TITLES

The titles to these properties are held by the Leadville Mining Company, an Arizona Corporation. Abstracts showing clear title to all but the last two mentioned claims have been presented to me.

HISTORY

The district gets its name from the Turquoise mines which were discovered on the west side of the camp about 30 years ago, and for the prospecting for which gem some of the claims of the district are still held.

An important body of commercial copper ore was discovered in the Humboldt claim about 1900, and the high price of copper late in 1905 and 1906 caused a great amount of activity in the camp.

Phelps Dodge & Co., the Calument & Arizona Mining Company and others did a large amount of prospecting. Some of the claims were held under bond at fabulous prices and the subsequent drop in the price of copper in 1907 is given as the reason for the relinquishment of nearly all the options held by them. The production of the Mary, Germania and Mamie mines since that time, as shown under head "Production" hardly give value to this reason.

GENERAL

The rock formations covered by the claims of the Leadville Mine Co. as well as those of the nearby producing mines, are five in number, three of these sedimentary and two igneous. The lowest member of the sedimentary group is a hard quartzite which is the rock which caps most of the highest hills of the district. Overlying the quartzite is a formation of thin shaly limestone. This limestone as well as the underlying quartzite have been identified by the U.S.G.S. as being of Cambrian Age. The other sedimentary rock of the district is a blue gray thick-bedded limestone of Carboniferous Age.

The igneous rocks of the district are both monzonite porphyries very similar lithologically and distinguishable mainly by the great amount of decomposition which the more acid of the two has undergone. This latter was probably intruded before the deposition of the Carboniferous limestone as the only contacts observed between the two were fault contacts. In the area studied the acid monzonite occurs only in the form of sills and laccoliths in the Cambrian limestone, one very persistent still about 25 feet thick lying between the quartzite and this limestone. The intrusion of this porphyry has had a very marked effect on the adjacent shaly limestone which has been largely changed to garnet and other contact minerals, accompanied by sulphides, chiefly pyrite, carrying small percentages of copper. Subsequent oxidation of the sulphides and the action of sulphuric acid this former on both limestone and porphyry has so altered these rocks in places that their original character can only be determined with difficulty.

The basic monzonite porphyry occurs in much larger bodies than the acid monzonite, usually in the form of stocks and dikes intruding all the above mentioned formations. It is of a darker color and coarser texture. It has had no decided metamorphic action on the limestone except in a few places where it occurs in a more silicic phase.

The district has been extensively faulted, both compression or overthrust faults and tension or normal faults occuring. The overthrust faults are perhaps economically the more important as long as their faulty dipping planes greater opportunity was afforded for the replacement of copper bearing solutions.

The ore deposits are of two types.

First: Pyritic impregnations in the shaly limestone near the contact with the porphyry.

Second: Oxidized deposits resulting from the replacement of shattered limestone by copper bearing solutions.

Both forms of occurence udoubtedly have their origin in the acid monzonite porphyry.

The first step in their formation was the introduction of sulphides into the limestone while these were undergoing contact metamorphic changes due to the intrusion of the porphyries. Local concentration of these sulphides, which are principally pyrite with a small percentage of chalcopyrite, may form commercial ore bodies of the first class. Some of the oxidized ore bodies of the camp are the result of the direct oxidation of these pyritic ore bodies in place, but the more important are probably due to the collecting agency of surface waters which in percolating through formations of metamorphosed limestone and porphyry carrying disseminated sulphides, have taken up copper sulphate in solution, transporting the same until some favorable medium for redeposition by replacement, such as the shattered limestone of the thrust fault breccia, is encountered.

THE MAID OF SUNSHINE MINE

The principal ore body lies along the plane of the Sunshine Fault, an overthrust fault by which Cambrina Quartzite and limestone have been thrust over, relatively younger, carboniferous limestone. The ore is a mixture of carbonates, silicates and oxides of copper irregularly distributed in a gangue of limonite and clayey residual matter resulting from the decomposition of the fault breccia. Smaller branches of the main body will often lead away from the fault and make along a bedding plane of the underlying limestone or along some minor fault wherever the limestone has been shattered.

The ore follows approximately the contour of the limestone footwall, between which and the unaltered hanging wall is a belt of oxidized residual material varying in thickness from a few feet to fifty feet or more. The ore itself varies from a rich streak of six inches to lenses of commercial ore forty to fifty feet thick.

The main ore body was first encountered about 100 feet down an incline shaft which was sunk approximately along the fault plane though not follwing the footwall closely. From this point ore was developed downward, but no further work was done along the footwall upward. It is probable that more ore will be found if this be done, for a number of shallow prospect pits sunk on the fault have shown good ore very near the surface. On the 122' level the orebody has been more fully developed than at any other plane in the mine and what little stoping has been done is from this level. The footwall is shown to be very uneven - partly due to original irregularity of the fault plane and partly to subsequent normal faulting.

The development on this level was probably done before the relation of the fault to the orebody was fully realized.

Drift 4xC along the footwall exposed some ore but no crosscut was driven towards drift 2xC which is still in the ore zone nearer to the hanging wall. Such a crosscut would probably have cut through the main orebody.

Ore was stoped on the Mary claim of the Great Western Copper

Company not far from the line on the continuation of the Sunshine fault. The Maid of Sunshine shaft cuts the fault plane about 26' below the 122' level going through a little ore but no exploration was done on the level NE of the shaft along the fault plane. The stope on this level cuts through about thirty feet of ore vertically, the body dipping nearly 30 degrees.

In drift 28xC, which lies in the ore body about 80 feet horizontally from the footwall a later fault has brought the footwall forward to intersect the drift.

The incline from the 122' to the 229' level, nearly horizontal in its upper part, begins in the footwall, and cuts through the ore and leached zone into the unaltered quartzite hanging wall. It then passes through a normal fault which has thrown the footwall back up to the level of the drift. As is shown in Section A - A the effect of the later faults has been to partially repeat the ore-body within the limits of the Maid of Sunshine Claim. The incline then follows the footwall rather closely along its changing dip until the 229' level is reached.

Drifts driven north from the sub-level incline along the footwall pass through a relatively barren zone. The richest part of the ore shoot devloped by the sub-level lies south of it. Another incline raise (21SR) from the 229' level and approximately parallel to the sub-level passes through a wide shoot of very rich ore. This incline follows the footwall, but a drift from it, (9SR) wanders around in the ore zone without effectively blocking it out.

On the 229' level drift 24xC runs through barren leached material about 75' from the footwall. In crosscut 35xC the footwall was again found with a narrow but high grade streak of ore along it. At the east end of this crosscut a raise developed commercial ore which seems to have made along a limestone bedding plane leading away from the fault plane.

The part of the Sunshine fault is in practically virgin ground as no other work has been done here either above or below the

229' level. Going west on this level the ore body which makes along the Germania fault is encountered in the drifts 34xC and 15xC. This fault is also a thrust fault with Carboniferous limestone in the footwall. It has been traced in a northwesterly direction nearly a mile from the Germainia mine. It dips northeast or in an opposite direction to the Sunshine fault. In the lower levels of the Germania Mine the orebody along this fault has been stoped up to the Maid of Sunshine line. Recently ore has been developed on this fault above the level of the Germania shaft collar.

Near the north end of drift 15xC on the 229' level is the only sulphide ore so far discovered in the Maid of Sunshine Mine. The body apparently belongs to the first classsof ore deposits of this camp, that is, pyritic impregnations in the Cambrian limestone, enriched by secondary chalcocite. Very little work has been done on it and there are no workings above or below it. It is a very promising prospect and should be explored further, although a small stope could be started on it at once.

The work on the 190' level was done wholly from the Mary shaft of the Great Western Copper Company. It lies entirely in the limestone footwall below the Sunshine fault, and was intended primarily for a working level in solid ground from which the orebody could be tapped by a system of raises. The orebody slopes from a height of 55' above the level at chute 15 to 18' above the level at chute 19. The probable fault shown on the map has not been cut on this level but has been cut on the sub-level above. Drift 191 extended turning to the left about 30 degrees would probably cut the Sunshine ore body on the near side of the probable fault and again some distance further on up the up-faulted far side. The Great Western Copper Company has stoped up to the line on the down-faulted portion.

The 275' level was undoubtedly intended for a working level by the former option holders. The drifts and crosscuts are all laid out in straight lines and right angles. The Germania and Sunshine faults approach within 75 feet of each other on this level, the zone between the two being entirely composed of decomposed fault mater-

ial. The only prospecting done on this level was about 100 feet of drifting in this zone. Some ore was developed but the work on the 229' level and the sub-level show that this portion of the fault plane was relatively barren.

One hundred and ninety feet below the 275' level is another level which was driven from the April Fool shaft of the Calumet and Arizona Mining Company. Unfortunately this level is now under water but its location was obtained from an old map. It was to have been the main working level through which the various members of the proposed consolidation scheme were to be worked, using the April Fool as a central shaft. Such information as could be obtained by questioning former workmen is to the effect that "sulphide" was struck in a drift going into the King Solomon claim and an "oxidized zone", probably decomposed fault breccia in one of the long crosscuts to the east. If the latter statement is true it would seem to show that the Germania fault is later than the Sunshine fault and consequently carries through. The character of the secondary faults and breaks tend to confirm this view, but this cannot be positively determined without an examination of the lower level. If on the other hand, the Sunshine fault is the later it will dip out of the Maid of Sunshine ground about 400' below the 275' level at the point through which the section is taken, and to successfully increasing depths as its strike is followed northerly.

RESUME OF GEOLOGY

The development work done by the option holders presents many puzzling features looked at from the view point of the operator. While ore has been encountered in many of the workings it has not been effectively blocked out. The best idea of the dimensions of the orebody may be obtained from the stoping operations in the Mary and Germania Mines, on that part of the Sunshine fault which dips into their ground. This also holds true for the Germania fault which dips from the Germania into the Maid of Sunshine ground. In both cases their stopes extend to the Maid of Sunshine line. The experience

in these mines has been that much new ore is developed in the process of stoping, and it is said that they haveas much ore in sight now as when production commenced.

The expense of keeping open workings in the ore zone was probably one of the main reasons for not more fully blocking out ore already discovered, and that there was ample warrant for this is shown by the badly caved condition of some of the workings, some altogether inaccessible, which have only been abandoned about three years. It is also apparent that the relation that the orebodies bore to the Sunshine and Germania faults was not understood, otherwise exploration could have been more efficiently directed and much aimless drifting avoided. In justice to the former management it should be said however, that subsequent work in the Mary and Germania mines has done much to clarify some of the obscure points in the structural relations of the faults.

During the boom days when the large companies held options on most of the promising claims of the district with the probable ultimate purpose of consolidtion, the camp was a hotbed of intrigue and manipulation, and it is frequently contended by persons on the ground that the character of the mine development was often influenced more by the status of some particular mining deal than by the actual conditions of the mine.

The conclusions arrived at as a result of the geological examinations are:

1. That the ore actually in sight is but a small part of what could have been developed by proper exploration.

2. That work up from the 122' level will probably show the continuation of the ore shoot far above that level.

3. That more work done along the Sunshine fault plane from all the levels will discover new ore shoots. This is especially to be recommended in the upper levels since a correspondingly greater portion of the fault plane lies in the Maid of Sunshine ground.

4. That drifts in the ore zone on the 275' level are ona portion of the fault plane which was comparatively barren on the upper levels and that if the south drift were extended 50 feet the rich ore shoot in 21SR would be found, while the same distance added to the north drift would reach the undeveloped shoot in 35xC on the 229' level.

5. That the sulphide orebody on the 229' level is a body distinct from either the Germania or Sunshine orebodies and will show some connection with the two sills of acid monzonite porphyry in the Cambrian limestone shown on the map.

6. That the extension of the Germania fault dips into the King Solomon Claim.

ORE IN SIGHT

The development of the ore in the Maid of Sunshine mine has been of such a nature as to preclude the possibility of making an accurate estimate of the tons of ore in sight, based on the generally accepted idea that ore in sight is ore blocked on four sides.

I estimate that there are fifty thousand tons of ore in sight carrying six per cent copper and that an additional fifty thousand tons should be considered probable ore carrying a similar amount of copper. It is quite probable however, that judiciously projected work will show a greater tonnage to be in the mine than that mentioned in the estimates.

ASSAYS

The assay results of all samples taken are shown on five assay sheets which accompany, and are a part of this report. The description of each sample is written against each assay number and correspondingly recorded on the assay plans of each level which also accompany this report.

COSTS

The freights rates per ton from Courtland to the smelters at Douglas and El Paso are respectively 45 cents and $1.55.

Coal f.o.b. cars at Courtland $7.20 per ton.

Fuel, oil f.o.b. cars at Courtland 4 cents per gallon.
Mining timber v.o.b. cars at Courtland $27. per thousand.
Water, as supplied by the Courtland Improvement Co., 75¢, per 1000 gallons when 100,000 gallons or more are used.
Labor, Hoisting enginners $4.50 per day for 8 hours.

Top men	3.50
Machine drill men	4.00
Hand drill men	3.75
Timbermen	4.00
Muckers $2.25 to	3.50
Trammers 2.25 to	3.50
Mexican Labor 2.00 -	3.00

TRANSPORTATION

The El Paso & Southwestern Railroad has a branch from Douglas, 36 miles, which crosses the Maid of Sunshine claim and ends on the claim Tin Horn. See plan of mining claims of the district and photographs, both of which accompany this report.

Distance by rail from Courtland to El Paso is 217 miles.

The Southern Pacific Railroad has a branch line from Cochise, through the mining camps of Pearce and Gleeson, which ends about two miles south of the Maid of Sunshine Mine. Daily trains are operated by both the lines mentioned.

PRODUCTION

That of the camp of Courtland has been as follows:

Great Western Copper Company:			
Humboldt Mine	- Estimated	$ 300,000.00	Gross
Mary and Mamie Mines,			
1909 455,219 lbs. Copper		59,096.53	"
1910 17,489 tons Ore		287,492.00	"
1911 20,702 " "		323,408.54	"
1912 33,112 " "		558,812.00	"
1913	Estimated	65,475.00	"
Forward		$1,594,284.07	
Calumet & Arizona Mining Co.			
1910 17,624 tons Ore		192,491.13	"
1912	Estimated	247,500.00	"
1913	"	110,025.00	"
Leadville Mining Company.			
1905 60 tons Ore		1,294.82	Net
1906 78 " "		1,593.82	"
1912 692 " "		10,205.22	Gross
	Total	$2,157,394.06	

When the word "estimated" is used the total tons produced, as based on the best information procurable and believed by the writer to be correct, has been multiplied by $15.00. The sixteen shipments made from the Maid of Sunshine mine had the following analysis, as

shown by the smelter returns:

Weight in lbs.	Percent Moisture.	Percent Copper	Ozs. Silver	Percent Iron	Percent Lime	Percent Silica	Percent Alumina
102080	12.5	6.16	Trace	2	2	50.2	15.5
88520	12.6	5.74	"	2	2.2	50.4	16.4
118980	18.5	6.15	"	1.6	Trace	48.0	20.4
99560	17.0	4.71	"	2.3	2	56.2	17.2
106960	18.0	5.44	"	1.8	Trace	52.4	17.3
130280	15.3	5.50	"	2.5	0	49.6	20.8
111900	17.1	5.70	"	2.6	2.1	52.2	17.2
101640	16.3	4.53	"	2.5	2.1	57.8	15.2
130600	14.1	5.28	"	2.5	Trace	54.4	15.5
99830	17.0	4.80	0	2.7	0	58.0	22.1
97080	16.5	5.7	0	2.4	0	58.2	17.0
87300	16.0	4.2	0	2.3	0	27.8	18.5
99360	16.5	5.98	0	2.5	0	55.8	18.5
94860	18.0	6.6	0	2.4	0	55.7	18.7
79580	14.0	4.31	0	2.7	0	47.2	23.1
99340	16.5	5.50	0	2.9	0	53.2	19.0

Report on the Leadville Group and such items as Equipment and Mining, not covered in this report will be complete by 28th inst.

Respectfully submitted,

(Signed) S.M.Greenidge.

Douglas, Arizona,
March 24, 1913.

GEOLOGY OF THE LEADVILLE GROUP

Douglas, Arizona.
March 28, 1913.

This group is developed by two main working shafts and a number of smaller prospect shafts. The greatest amount of work was done from shaft No. 1, located on the Copper Bug claim. It is about three hundred feet deep and has two main levels and some intermediate workings. But little could be learned of the character of this work as the shaft was allowed to fill with water when the property reverted to the Leadville Mining Company, and the present management had not had time to unwater it before this examination was made. No stoping was done by the former option holders. The dump which resulted from the exploration work was recently sold to the Pioneer Smelting Company, Sahuarito, Arizona, who shipped about two thousand tons of low grade copper-sulphide ore from it. Previous to the granting of the first options some work was done by the Leadville Mining Company in an incline shaft which was sunk on a bedding plane of the Cambrian limestone near the contact of one of the acid monzonite porphyry sills. Pyritic ore, somewhat oxidized and secondarily enriched, was found and a small amount of stoping was done about fifty feet below the surface. Samples 195 to 197 are taken from this stope and their locations are shown on the map of the Leadville Group which accompanies this report. This incline was continued to about 200 feet below the surface and about 100 feet of drifting was done from the bottom. This drift is said to be in good grade of sulphide ore. As the drift is under water it could not be sampled and the only record obtainable is a smelter liquidation on a car of ore which was taken out in development and which assayed 6.8% copper, 0.29 ounce Gold, 1.75 ounces Silver, 38.1% Sulphur, and 17.4 Insoluble.

Shaft No. 2 is the other working shaft and is now about 360 feet deep. On the first level a crosscut runs east in the basis monzonite. On the second level a crosscut cuts the contact of the basis monzonite and the Cambrian limestone, but has not yet cut an ore-bearing bed in the limestone.

Shaft No. 3 is a prospect shaft on the contact of Cambrian limestone and basic monzonite. A little work has been done from this shaft on two levels and commercial ore was found.

Samples 181 to 192 refer to this.

Shaft No. 4 is a prospect shaft in Cambrian limestone near the contact with an acid monzonite sill. Low grade ore was encountered apparently on the edge of a lense, but no work was done to prove this.

An open cut on the contact of basic monzonite and Cambrian limestone developed a good grade of oxidized copper ore which may be very cheaply mined. Samples 165 to 170 were taken in this open cut.

It may be said that the exploration done by the Great Western Copper Company during the last few years, on the claim Mamie, has given definite assurance of the existence of a body of commercial copper ore on the Leadville ground south of shaft No. 2. The great Western Copper Company began stoping operations some months ago along the line between the claims Mamie and Leadville and a very good grade of ore is still being produced from this place.

The ore bodies in this group of claims are clearly those of the first class, i.e. pyritic impregnations in Cambrian limestones. They are lenticular in shape and have no sharp boundaries being that portion of the bed where the pyrite is more thickly disseminated. From these concentrated portions the pyrite gradually thins out in all directions, the final limit to which a stope may be carried being directly dependent on the market value of copper at that time.

The pyrite owes its value as an ore of copper to finely distributed chalcopyrite, probably primary. Some of the stopes of the Mamie mine of the Great Western Copper Company are in this primary ore, but it is also true that some secondarily enriched copper ore is at present being mined in two of their stopes.

That the primary ores have been formed by the action of magmatic waters emanating from the intrusive acid monzonite sills on the beds of Cambrian limestone may be considered as fairly well established, but these beds have not shown equal susceptibility to replacement by

cupriferous pyrite. In order that future exploration be most economically conducted, the criteria for the recognition of the beds must be determined.

The geological conditions of the Leadville Mines are similar to those of the Mamie mines, i.e. Cambrian limestone with interplaced sills of acid monzonite porphyry. The surface showing of the Leadville is very much more favorable than that of the Mamie as the limestone is more heavily iron-stained, due to the decomposition of the sulphides. The Leadville has also been faulted and shattered more extensively than the Mamie, which affording channels for circulation surface waters produces a condition favorable to secondary enrichment processes.

In this connection attention should be called to the great turquoise overthrust fault shown on this map. This fault longitudinally cuts the formations in which it has been shown that primary ore is most likely to occur, and it is not improbable that along this fault plane replacement ores may be formed as in the case of the Sunshine and Germania faults. Some ore has been found in an incline shaft sunk on a bedding place of the limestone near the south end of the fault but the greater portion of the fault traced is covered by deep surface wash. A crosscut west from Shaft No. 1 to the fault place is recommended, since this will also cut several acid monzonite and Cambrian limestone contacts.

MINING

That heretofore done in the camp has been entirely by the square set system and although this is particularly applicable to the kind of rock mined the writer is nevertheless of the opinion that a modification of the caving system may be to some extent applied and a reduction of costs made thereby.

Stoping and all other costs necessary to the extraction and placing of ore on the cars should not exceed an average of $2.25 per ton.

Exploration work, above water level, should cost from $4.00 to $5.50 per foot and below water level an additional amount depending upon the amount of water encountered.

EQUIPMENT

At the Maid of Sunshine shaft this consists of a 9 H.P. gasoline host, a whim, and a new head frame. The shaft has been re-timbered to the 275' level and is in first class shape.

At shaft No. 1 of the Leadville group:

1 25 H.P. steam hoist
1 Station pump
3 Boilers and the pump need repairs.
1 30 H.P. Boiler
1 40 H.P. "

At shaft No. 2 of the Leadville group:

1 8½ x 10 Ottumwa Steam Hoist
1 Ingersoll Rand Compressor new 385 ft. x compounded and belt driven by
1 Russel 12x12 automatic governed steam engine.
1 140 H.P. fire tube boiler.
2 2½" Cochise air drills
1 Ingersoll Rand Stoper
3 Ingersoll Rand Sluggers
1 No. 7 Cameron Station Pump
1 Water bucket
1 Steel cage
4 Sinking buckets
9 Mine cars
1 Blacksmith shop, fully equipped
Necessary tools for the use of about sixty (60) men.

Respectfully submitted,

(Signed) S. M. Greenidge.

3/28/13.

REPORT ON LEADVILLE GROUP OF MINES
COURTLAND, ARIZONA.
December 22, 1917

* * * * * * * *

AREA

Since my report of March 1913, the area of the Maid of Sunshine group has been increased by the three claims, as follows:

FRACTION) SILVERTON)	Patented	11.429 acres
ROCK HILL	Unpatented	4 acres
Making a total acreage of		202,449 acres

These claims are included in the area colored as that of the Leadville Mining Company on the blueprint of the Courtland District.

TITLES

The titles to these additional claims are in the name of the Leadville Mining Company.

HISTORY

In May 1916, the Needles Mining and Smelting Company took a bond on the holdings of the Leadville Mining Company, making a payment of $10,000 and doing the development work shown as the difference between the blueprints which accompany this report and those which accompany my report of 1913.

The Needles Mining and Smelting Company did not exercise their option for purchase and ceased work in March 1917.

The Great Western Copper Company ceased operations of their mines, under their own direct management, shortly after my last report but have continued to produce from practically all their mines by leasing them.

The same may be said of the Calumet and Arizona Mining Company's operations in this camp. Some idea of the number of leasers in active operation in the North end of the camp may be gottan from the photos which accompany this report (See Plates 4 & 5). These leasers are still in very active operation in the camp and are producing approximately 40 cars of ore per month.

GEOLOGY THE MAID OF SUNSHINE

The development done by the last option holder does not furnish reason for any particular change in the geology of this orebody as written in my previous report. It is to be noted, however, that raise 253-R on the 122' level (See samples 1-2-3) reaches the Maid of Sunshine fault and shows the crevices in the shattered limestone to be filled with copper ore of a good commercial quality. Samples 1, 2, and 3 taken in this raise include the limestone which of course would not be shipped when the ore is being extracted commercially.

On the Fraction claim a shaft has been put down 100' near the railroad track. At 60' down a short drift has been run north, one east and one south. These drifts all show identically the same condition to exist on this claim, east of the Maid of Sunshine fault, as in raise 253-$ (See Samples 61 and 62).

A sufficient amount of work has not been done on this small shaft on the Fraction claim nor in the proper direction west, to show if ore in commercial quantity is to be expected at the point of contact between the basic monzonite porphyry and the carboniferous limestone on the east side of the former. See Geological Section. Drifts 90 Dr. and 95 Dr. are both caved and inaccessible for examination but a small amount of stoping has been done in drift 90 Dr. and several cars of good grade ore shipped therefrom.

The work done on the 175' level exposes the orebody on both the Maid of Sunshine fault and the Germania fault, and was apparently done to check the assay results in the 229' and sub-levels of my previous report. The reason for the peculiar branch-like work done on this level is not apparent to the writer.

The development work done by the last option holders has furnished contributing evidence showing the continuance of the Maid of Sunshine fault and Germania fault in a northwesterly direction, and has shown that the amount of ore estimated as being in sight in the former report was not only conservative but very low.

The operation of the leasers on the holdings of the Calumet and Arizona Company on the Germania claim has shown commercial ore of high grade to exist on the west slope of the quartzite outcrop shown in the Geological Section of the Maid of Sunshine Mine, and the development in this particular area should be carefully watched, measured and mapped. It may furnish information necessary for the proper exploration of the west side of the King Solomon and the Rock Hill claims, since a similar quartzite outcrop continues almost the entire length of these two claims. It may also be shown in this connection that the Silverton claim acquired by the Leadville Mining Company is also of great value for this if for no other reason.

The work done by the last option holders on the 378' level of the Maid of Sunshine claim is now under water and since maps showing the geological conditions there have not been obtainable, I am unable to state which of the faults, Germania or Maid of Sunshine carry through. The incline shaft shown on the maps near the west corner of the Maid of Sunshine claim is driven on a contact. The drift from this to the North east enteres the limestone. The drift south enters the basic monzonite porphyry and at point of contact ore shown by samples 63 and 64 is exposed. Indications of ore also occur in a number of places in the incline. Further exploration at this point is to be recommended. The existence of commercial ore at this point, taken in connection with the ore exposed along Germania fault to the Germania claim line leads one to believe that this ore body is very much larger than it was considerdd to be when the last report was made.

ORE IN SIGHT

From what additional work has been done since my last report, and which is now accessible, I estimate that 75,000 tons of ore containing six percent copper may be mined from the Maid of Sunshine orebody.

ASSAYS

The assay results from all the samples are shown on the sheets which accompany this report. The description of each sample is written against each assay and the assay number is recorded on the assay plan of each level. Each sample of less than 5' contains 10% of the barren material on each side of the ore. Samples 11, 12, 13, 14, 58, 59 and 60 are of sulphide ore.

COSTS

Freight rate from Courtland to the smelter at Douglas is cts. per ton on six percent copper ore. Coal at Courtland now costs $9.00 per ton, Timber $30.00 per thousand. Costs of labor has increased since my last report to as shown:

Hoisting engineers	$5.00
Top men	3.50
Machine drill men	5.00
Hand drill men	3.75
Timbermen	5.00
Muckers	3.50
Trammers	3.50
Mexican Labor	$2.50 to 3.50

Cost of production of ore from this mine and placing it on cars should not exceed $4.75 per ton when the average daily production is 200 tons.

WATER

The pumping plant, pipes and all equipment of the Courtland Water Company has been purchased by the Leadville Mining Company and consists of:

Two mining claims known as the Lulu and Homestake.

(1) (12) H.P. Weber gasoline Engine, belt connected to either one Deming 3 cylinder pump 4" diameter, 6" stroke, or one Mastodoos single Cylinder 5" x 20" pump.

(1) Weber gasoline gas engine, 11 H.P. belt connected to one three cylinder Deming pump.

19000' 4" water pipe, a number of meters and all other necessary equipment. (See Plate 3).

PRODUCTION

It has been found almost impossible to get at the exact production of the camp since my last report, but from information obtained the production has been much greater than that estimated in my last

report for the year 1913 and almost equal for the succeeding years. From the development done by the last option holders in the Maid of Sunshine claim, for a few leasers, and from the small amount of stoping done in drifts 90 Dr. and 15xC, sixty-eight carloads of ore have been shipped giving the following results:

Total tons	2830
Average per cent copper	6.6
Total net smelter returns	$53,961.28
Net value of ore per ton	$ 18.71

Respectfully submitted,

Signed - S. M. Greenidge.

Douglas, Arizona.

December 22, 1917.

LEADVILLE GROUP

At shaft No. 1 some additional work was done by the last option holders but as all the lower workings of this shaft and of shaft #2 are under water they could not be examined.

From shaft No. 2, a new level, 366' was run towards shafts No. 1 with the intention of connecting, by a raise 803 R, with the 291' level of shaft No. 1. This connection was not completed. A crosscut 715 N.E. is said to cross in its last 80', a heavily mineralized zone.

The 261' level from this same shaft No. 2 also is said to have passed through two well mineralized zones, probably at contacts of the acid monzonite prophyry and Cambrian limestone.

The 20 Drift east from this shaft is also said to have passed through a well mineralized zone, probably the same as that on which shaft No. 3 is located.

Several tons, probably a carload of good commercial grade sulphide ore was taken from the development work done from this shaft. This ore is now on the dump.

No work was done from shaft No. 2 in a southerly direction towards the strongly mineralized surface outcrops, and the existence of ore under which has been proved by the stopes up to the Leadville lines from the Mamie shaft of the Great Western Copper Company.

Leasers have shipped several cars of good grade carbonate ore from shaft No. 3 and adjoining open cuts.

A number of open cuts and shafts have been opened along this contact south and these show an almost continuous zone of mineralization 700' to the south line of this Company's holdings. From surface indications the area south and west of shaft No. 3 promises as great production of ore as that of any othr part of the camp.

EQUIPMENT

Since my last report the following equipment has been added:

At the Maid of Sunshine shaft.

1 - 60 H.P. Fire-tube boiler
1 - 30 H.P. " " "

1 - 8" x 10" Geared Hoist
1 - Bury Compressor, single stage supplying air drills.
1 - 5 H.P. Upright engine belt connected to 1 No. 6 Buffalo blower.
1 - Sinking pump 1½" steam 4" water end.
12 - Mine cars
4 - Sullivan air drills
6 - Leyner " "
2 - Jackhammer " "
1 - Drill Press
1 - Supply house well equipped with all necessary small repair parts.

The 9 H.P. gasoline hoist has been moved to Leadville 2 and the two boilers from Leadville 2 have been moved to Maid of Sunshine and used as a feedwater heater, - the other as an air receiver.

At Leadville No. 2 Shaft.

1 - H.P. Upright steam engine, belt connected to 1 No. 6 Buffalo blower.
1 - No. 7 Cameron Sinking pump.
1 - Worthington 7½ x 4½ x 10.

An assay has been completely equipped with pulp, analytical and button balances, chemical crusher, buckboard and small gasoline engine.

After the last option holders ceased operations the Leadville Mining Company expended $17,615.10 on the opening of caved drifts, re-timbering, purchasing of timber, etc., divided up as follows:

Labor in mine	$10,729.32
Freight on ore to smelter	457.80
Mine supplies, insurance etc.	6,427.98
	$17,615.10

(Signed) S. M. Greenidge.

Douglas, Arizona.
December 22, 1917.

No.	Percent			
		122' Level		
1	3.72	9.6'	Vertical	on W. side of R. 253
2	7.12	4.4'	"	in face of south drift at R.253.
3	4.36	2.6'	"	on east side of south drift 17½' from face.
		275' Level		
4	6.32	8.5	"	on N. Side in raise 53 R.
5	10.96	9.0	"	in raise in continuation, under sample 4.
6	9.40	5.0	"	in raise in continuation under sample 5.
7	10.16	6.7	"	on SE side in raise 53R under sample 6.
8	7.80	6.8	"	on S side in raise under sample 7.
9	17.84	5.8	"	on S side in raise under sample 8.
10	5.96	3.6	"	on SW side in raise under sample 9.
11	1.15	5.4	"	NW side of drift under 93R 40' from face.
12	1.52	5.5	"	NW & SE side of drift 30' from face.
13	2.32	5.9	"	NW side of drift 20' from face.
14	0.52	6.0	"	NW side of drift 10' from face. (The 4 preceding samples are of sulphide ore)
15	6.84	20.5	"	Horizontal along SE rib 350 xC.
16	4.04	15.	"	" " NW rib 350 xC.
17	2.32	1847		" " NE rib 350 xC.
18	9.60	9.4	"	in 23 R 6' above level in 350 xC.
		175' Level		
19	2.80	6.0	Vertical	opp. Sta. 216 in 20 Dr.
20	4.00	13.1	"	in 93R above roof of drift.
21	0.68	5.1	"	10' west of sample 19.
22	5.28	5.2	"	26.5' " " " 19 in S. side.
23	12.68	3.0	"	10' north" " 19.
24	3.20	6.6	"	10' " " " 19.
25	4.56	4.4	"	On E side & 6.3' vert. on W side. 22' north of sample 19.
26	2.48	5.2	"	30' north of sample 19.
27	14.40	3.8	"	on W and 3.2' vert. on E side, 40' N of 19.
28	21.78	3.2	"	on E side 50' N. of 19.
29	8.72	3.6	"	on S side & 2.4' on N side on 145xC.
30	6.28	2.5	"	opp. Sta. 210 on W. side.
31	5.08	2.4	"	E side 10' N of 30.
32	3.84	6.1	"	E side 98' N of 19.
33	7.28	5.6	"	W side opposite 32.
34	3.52	1.7	"	E side 106' N of 19.
35	5.2	2.	"	N side 180xC just below raise.
36	8.32	4.6	"	in 23 R.
37	2.92	3.	"	on N side 2.5' vert, on S. side drift W from 183 R.
38	4.00	4.9	"	on N side 2.7' vert. on S side 10' from face.
39	5.40	1.7	"	on N & 1.8' on S side top of 183 R.
40	3.60	1.3	"	& 2.4' as shown.
41	6.08	5.5	"	on E side.
42	5.92	5.7	"	on W side & 6.2' on E side.

Sample No.	Copper Percent		Description
		175' Level (Cont).	
43	8.06	6.4'	Vertical on W side.
44	3.72	2.5	" on E & W side under raise.
45	2.48	4.2	" on E & 3.8' on W. at 10' N of 44.
46	4.08	2.8	" on both sides at 20' N. of 44.
47	3.36	3.4	" on and 2.4' vert. on E at 30' N of 44.
48	4.92	5.2	" on W 40' N of 44.
49	3.68	6.1	" on S.
50	4.48	2.2	" " N & 4.2' of S.
51	6.12	2.0	" " S
52	6.48	6.8	" " N & 4.1' on S.
53	6.04	4.2	" " N side.
54	3.24	4.2	" " W & 2.5' on E.
55	3.78	1.2	" " W & 5.5' on E.
56	3.92	2.8	" " W.
57	3.68	2.7	" " each side.
58	2.72	1.7	" " east rib.
59	0.92	3.2	" " north rib.
60	0.76	3.0	" " " "
		PROSPECT SHAFT ON FRACTION CLAIM	
61	1.64	3.2'	Vertical on S side 4' from face of W. drift.
62	2.92	3.0	" " N side 4' from face of W. drift.
		INCLINE SHAFT NEAR WEST END-MAID OF SUNSHINE CLAIM	
63	4.76	3.8'	Horizontal on E rib 3' N from foot of incline.
64	7.02	6.8	" on W rib 10' N of foot of incline.