

CALIFORNIA STATE MINING BUREAU.

1886

HENRY G. HANKS, STATE MINERALOGIST.

SIXTH ANNUAL REPORT

OF THE

STATE MINERALOGIST.

PART I.

FOR THE YEAR ENDING JUNE 1, 1886.



SACRAMENTO:

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1886.

SHEEP RANCH MINE.

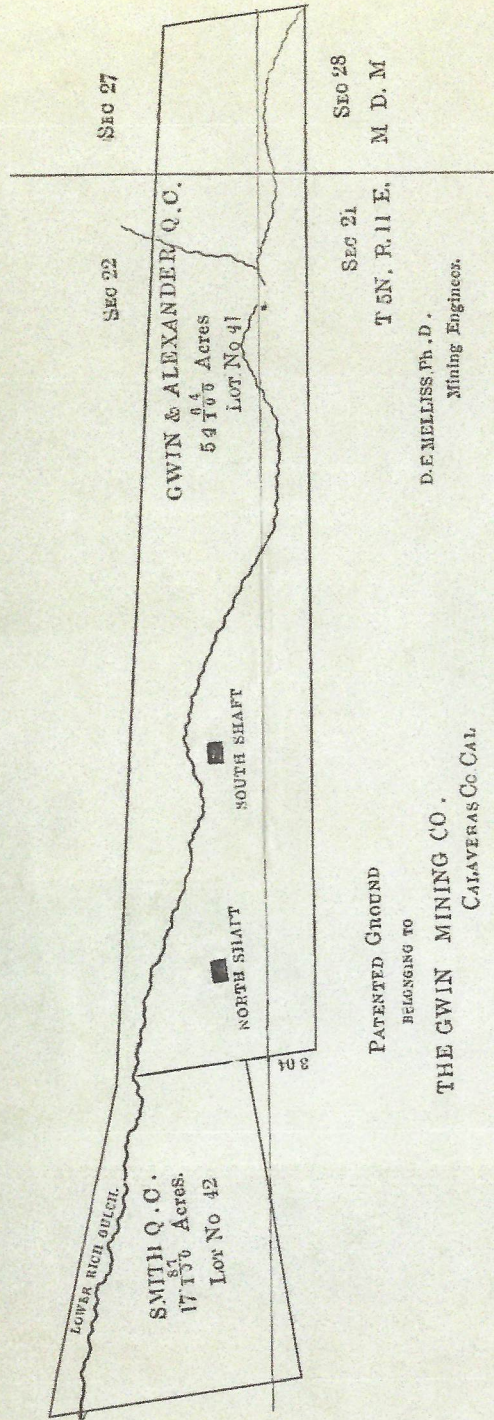
This, the principal mine in the Washington Mining District, is situated on San Antonio Creek, a tributary of the Calaveras River, at an altitude of 2,200 feet above sea level, in a slate formation. The claim is 1,600 feet in length by 200 in width; course of the vein northwesterly and southeasterly; dip easterly, and average width 12 inches. Hanging-wall is a grayish slate and foot-wall a hard black slate; the ore is a ribboned, free milling quartz. All the ore has been taken out down to the 800-foot level; the mill is at present crushing rock from the above and the 900-foot levels. During the year the shaft has been continued down 100 feet and 1,000 feet of levels have been run. The mill, wet crusher, 30 stamps, is run by steam power; each stamp weighs 800 pounds, falls 8 inches 85 times per minute, and crushes $2\frac{1}{4}$ tons of ore every 24 hours. Eighty per cent of the recovery is obtained from the batteries and 20 per cent is collected from the outside plates. The sulphurets are so low in value that it is not worth the while to save them. The apron plates having an inclination of 2 inches per foot, are 4 by 10 feet, and the sluice plates inclining $1\frac{1}{2}$ inches to the foot are 15 inches wide, with a total length of 100 feet.

Altitude, feet.....	2,200
Number of stamps.....	30
Weight of stamp, pounds.....	800
Drop of stamps, in inches.....	8
Drop of stamps, per minute.....	85
Duty of stamp in 24 hours, tons crushed.....	$2\frac{1}{4}$
Average width of vein, in feet.....	12
Depth of shaft, in feet.....	900
Length of ore-shoot, in feet.....	1,200
Size of screens, diagonal slot No.	9
Percentage saved of recovery in batteries.....	80
Percentage saved of recovery on plates.....	20
Cost of mining, per ton.....	\$3 00
Cost of milling, per ton.....	\$4 00
Number of men in mine.....	40
Number of men in mill.....	7
Brakemen, blacksmiths, teamsters, etc.....	18

THE GWIN MINE.

The following description is contributed by D. Ernest Melliss, Ph.D., Mining and Civil Engineer, as a record of deep mining on the gold belt of California:

The mine is situated in the Mokelumne Hill or Middle Bar Mining District, six miles north of Valley Springs, Calaveras County, at an altitude of 1,300 feet above the sea. The property comprises two United States patent claims, contiguous to each other, as shown in the accompanying map. These claims cover 4,989 feet, lineal, on the mother lode, with a total surface area of 69.61 acres. The mine was taken up by the late Senator, Wm. M. Gwin, in 1867; he purchased the Alexander Mine in 1872, and the Smith Mine in 1881; the property was incorporated under the name of the Gwin Mining Company.



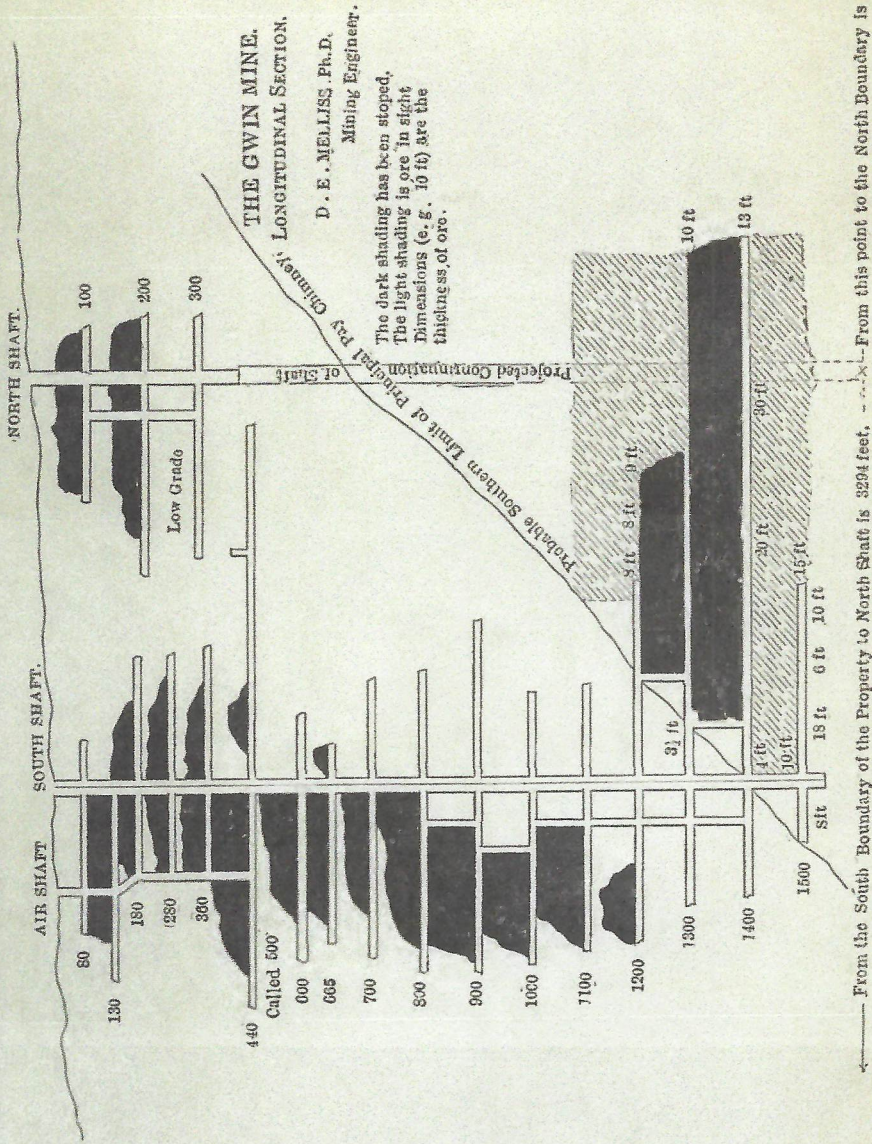
The country rock is slate; the vein strikes nearly due north, true meridian, and dips 75° to 80° to the east. The ore in the mine is white and banded quartz, carrying free gold and auriferous iron sulphurets, with occasional admixture of blende and galena. The average value in free gold is about \$8 per ton of ore, although, at times, exceedingly rich bunches of auriferous quartz have been found. The sulphurets are about one and one half per cent of the ore, and the value of the concentrations is about \$100 per ton. The retorted gold ranges in fineness from 850 to 875. The south shaft (see accompanying longitudinal section) has been sunk to a depth of 1,530 feet. It is an incline, and follows the foot-wall of the vein. Prior to 1877, considerable ore was taken out from the different levels above the 1,200. In April, 1877, the main ore chimney was struck, and it is on the character of this chimney, as developed by the workings in the 1,200, 1,300, 1,400, and 1,500 levels, that the value of the mine now depends.

The 1,200 level, which has been driven 370 feet to the north, strikes the pay chimney 160 feet from the shaft. No stoping of the north ore body has been done above this level. Of this level, 110 feet are in pay quartz, which is 3 feet thick at the commencement, and widens to 8 feet at the breast.

In the 1,300-foot level the chimney is struck 100 feet from the shaft; the level has been driven to a distance of 640 feet, of which 540 feet was in ore; at the breast it is 13 feet thick. The ground between the 1,300 and 1,400 levels has been taken out, as shown; the top of the stopes on the 1,200 line showing 8 to 9 feet of ore. At the 1,400 level the shoot crosses the shaft; the level has been driven 1,040 feet, all in pay ore; stoping has been done to the 1,300 level, as shown. The ore was 5 feet at the shaft, but in the length of the level widened once to 20 feet, again to 30 feet, and is 13 feet at the breast. The 1,500 level has been driven 100 feet to the south, and 370 feet to the north, all in pay ore. At the south breast the limit of the ore body in that direction has been reached; at that point it is 5 feet thick; at the north breast the ore is 15 feet thick, at the shaft 10 feet, and between that point and the north end it varies between 6 feet and 18 feet.

The mine has produced in all, over \$2,000,000 of gold. The exact amount cannot be ascertained. From partial records in possession of the owner, one is enabled to glean the following details in regard to the bullion product. It may be remarked incidentally that the mine was carried on always as a family concern, the money was distributed every month as fast as procured, and no surplus was ever allowed to accumulate. Prior to 1877 no care was taken to make or preserve any records. No records at all for the years from 1867 to 1871 existed, although 40 stamps were constantly running. From April, 1877, till September, 1881, the greater portion (but not all) of the gold produced was deposited in the Pacific Bank of San Francisco.

There are records of weekly shipments of bullion (with some intervals) extending over the period from April 7, 1871, to August, 1882. In none of these statements is the bullion from sulphurets included, except in one instance, a shipment on December 24, 1874, in amount \$11,565. The summary of these data is shown in the following table:



PARTIAL STATEMENT OF BULLION FROM GWIN MINE.

DATE.	Part of Mine.	Amount.
April, 1871, to June 23, 1872.....	400 level.	\$90,353 00
July 8, 1872, to December 26, 1872.....	500 level.	53,808 00
January 1, 1873, to October 5, 1873.....	600 level.	118,551 00
November 25, 1873, to February 15, 1874.....	700 level.	29,214 00
April 26, 1874, to August 30, 1874.....	800 level.	81,516 00
September 25, 1874, to April 8, 1875.....	900 level.	73,509 00
April 19, 1875, to June 24, 1876.....	1,000 level.	80,012 00
January 30, 1876, to March 26, 1877.....	1,100 level.	135,338 00
April 12, 1877, to October 1, 1879.....	1,300 and 1,400 level.	446,349 00
October 9, 1879, to September 23, 1881.....	Above the 900 level.	259,413 00
December 3, 1881, to August 4, 1882.....	Above the 900 level.	31,083 00
Total.....		\$1,399,146 00

The mill and hoisting works were old and entirely worn out. There were two quartz mills, one of 36 and one of 24 stamps. The stamps weighed only 500 pounds, dropping 75 times per minute. The mortars were old fashioned. The concentrators were concave buddles and sluice boxes. The 60 stamps did not have the crushing capacity of a modern 40-stamp mill. Furthermore, although there are no records relating to the subject, the character of work done in saving gold must have been very poor.

No steam is required for power either for mill or hoisting works. The Mokelumne Hill and Campo Seco Water Company's ditch passes above the mine, giving 300 feet head at the hoisting works delivered through a pipe 100 feet long. To pump and hoist from the 1,500 level, and run 60 stamps, required 180 miner's inches. The cost is about 16 cents per 24-hour inch.

Regarding the water in the mine, no difficulty was ever experienced in keeping it under control till the 1,400 was reached, with a 5-inch pump 30-inch stroke, running 8 strokes per minute. At the 1,500 a slightly increased amount was met with which the same pump could have controlled were it possible to increase the speed; this, however, could not be done, owing to the crooked condition of the shaft.

FINE GOLD MINE.

The mine is situated at an altitude of 3,000 feet above the level of the sea, in Railroad Flat Mining District, and is 1,500 feet in length by 600 feet wide. The course of the vein is north and south, dipping 70 degrees westerly, and averages 5 feet in width. The hanging and foot walls are slate, and the quartz is free milling, containing about 2 per cent of sulphurets, but not of sufficient value to pay for collecting and working. Developments on the property, beside the shaft 250 feet in depth, are three levels running north and south on the vein, from 400 feet to 600 feet in length, all of which were made during the year 1886. The machinery consists of water power, 10-stamp mill, hoisting works, and air compressor. The stamps weigh 750 pounds, drop 7 inches 100 times per minute, and crush 21 tons of ore per day. The apron plates are 4 by 4½ feet, and the sluice plates are 16 inches wide by a length of 100 feet to each battery. The saving of the yield is about equally divided between the batteries and plates.