History of the Golden Anchor Mine, Idaho County, Idaho

Victoria E. Mitchell

Staff Report 00-11
June 2000

Idaho Geological Survey
Morrill Hall, Third Floor
University of Idaho
Moscow, Idaho 83844-3014

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Staff reports present timely information for public distribution. This publication may not conform to the agency's standards.

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INTRODUCTORY NOTE

This report was prepared under a cooperative agreement with the U.S. Bureau of Land Management (BLM), Idaho State Office, as part of a project to identify and describe inactive and abandoned mines in the state of Idaho. Work on this project included preparing detailed histories of selected mines on BLM-administered lands in Idaho. The information in this report is from a number of published and unpublished sources in the Idaho Geological Survey's mineral property files. Where not otherwise noted, most of the mine production data is drawn from the U.S. Geological Survey's (USGS) annual volumes on *Mineral Resources of the United States* (1882-1923) and the equivalent volumes produced by the U.S. Bureau of Mines (USBM) (*Mineral Resources of the United States,* 1924-1931, and *Minerals Yearbook*, 1932 to present). Information on underground workings and mine equipment is generally from the annual reports of the Idaho Inspector of Mines (IMIR), published from 1899 to 1979. After 1974, the Mine Inspector's office was known as the Mine Safety Bureau, a section of the Idaho Department of Labor and Industrial Services. Detailed accounts of mine operations are, for the most part, drawn from annual reports made by the companies to the State Inspector of Mines; these reports were required by law and the information contained in them formed the basis of the Mine Inspector's annual reports. Reports of recent developments are taken from the Idaho Geological Survey's (IGS) annual reports on the developments in mining and minerals in Idaho (from 1984 to present) or from similar reports produced by the Survey's predecessor, the Idaho Bureau of Mines and Geology (IBMG) from 1975 to 1984. Other published sources are referenced in the text. A complete bibliography is included at the end of the report. Where direct quotations are taken from source materials, the original spelling and grammar are preserved even in cases where they do not conform to currently accepted usage.

History of the Golden Anchor Mine, Idaho County, Idaho

Victoria E. Mitchell[1]

The Golden Anchor Mine is in the Marshall Lake mining district in southern Idaho County (Figure 1). It is at an elevation of 6,800 feet, in Bear Creek in the NE¼ sec. 20, T. 24 N., R. 5 E. (Figure 2). The area is about 45 miles by road from McCall and 13 miles north of Burgdorf.

The mine is in a schist, quartzite, and gneiss roof pendant in the Idaho batholith (May, 1984). Five veins have been worked in the mine (Figure 3). The Golden Anchor vein is the most extensively developed in the district. The workings extend from above the 200-west level to below the 1000 level (Murray, 1984). The vein strikes about N. 50° E. and dips about 50° to the southeast, although there are many local variations in both strike and dip. The ore-bearing parts of the vein averaged about 2 feet in width, but could vary from 8 to 36 inches within short distances. The vein is cut by a series of faults with strikes of N. 30°-60° E. and dips of 30°-70° NW. (Lorain and Davis, 1938). Reports differ on the relationship of gold content to the width of the vein, the character of the wall rock, and the relationship of mineralization to the faults (May, 1984). Lorain and Davis (1938) described the faults as having formed before the rocks were mineralized; other workers (cited in May, 1984) stated that the faults formed after the veins. The ore in the upper levels was strongly oxidized, and the vein was stained in many places with cerargyrite, malachite, and ferrous sulfate. In the lower levels, the ore minerals were tetrahedrite, galena, sphalerite, molybdenite, and pyrite with free gold (Lorain and Davis, 1938).

[1]Idaho Geological Survey, Main Office at Moscow, University of Idaho, Moscow.

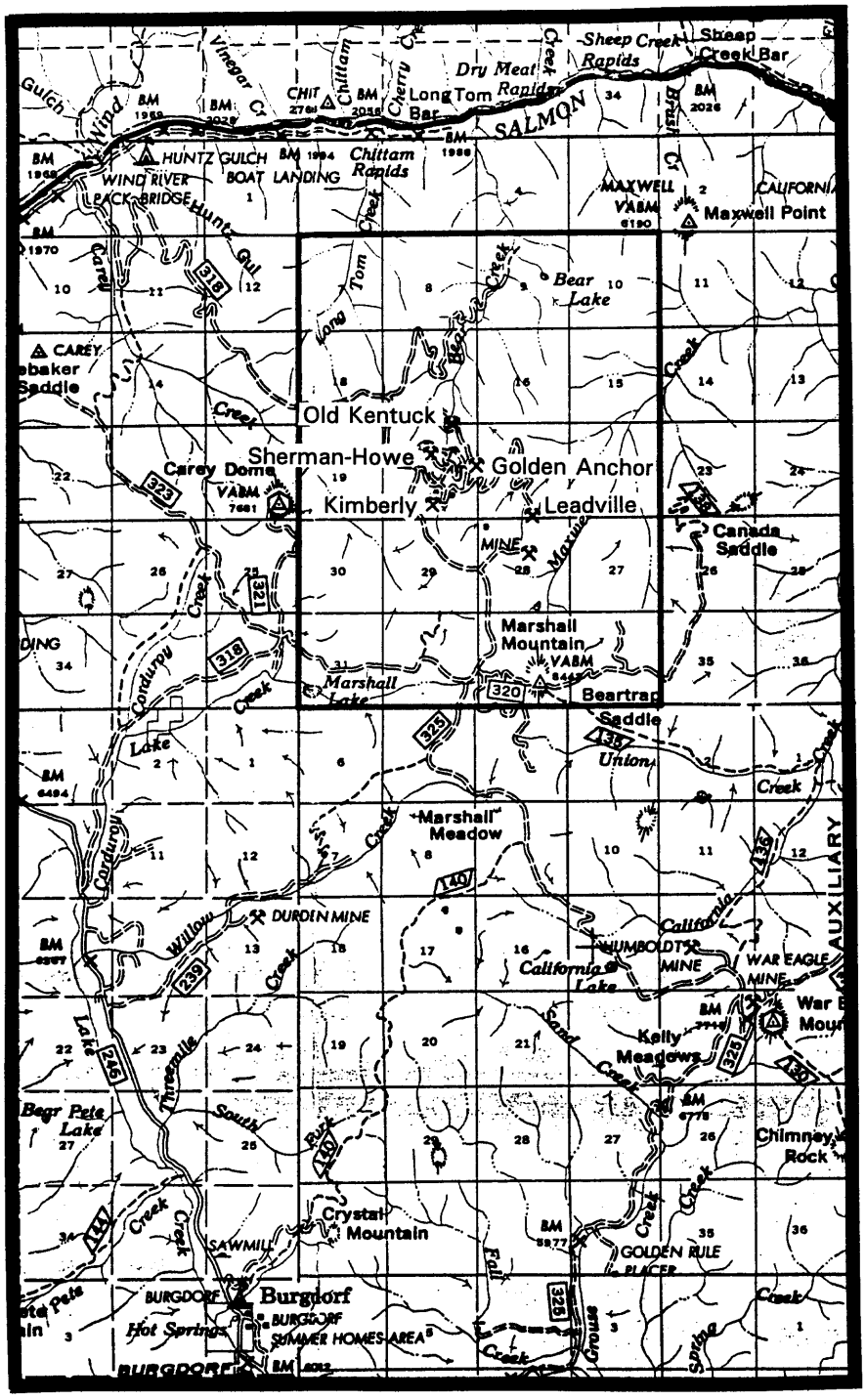

Figure 1. Marshall Mountain area and vicinity, southern Idaho County, Idaho (U.S. Forest Service, 1966, Payette National Forest planimetric map, scale 1 inch = 2 miles).

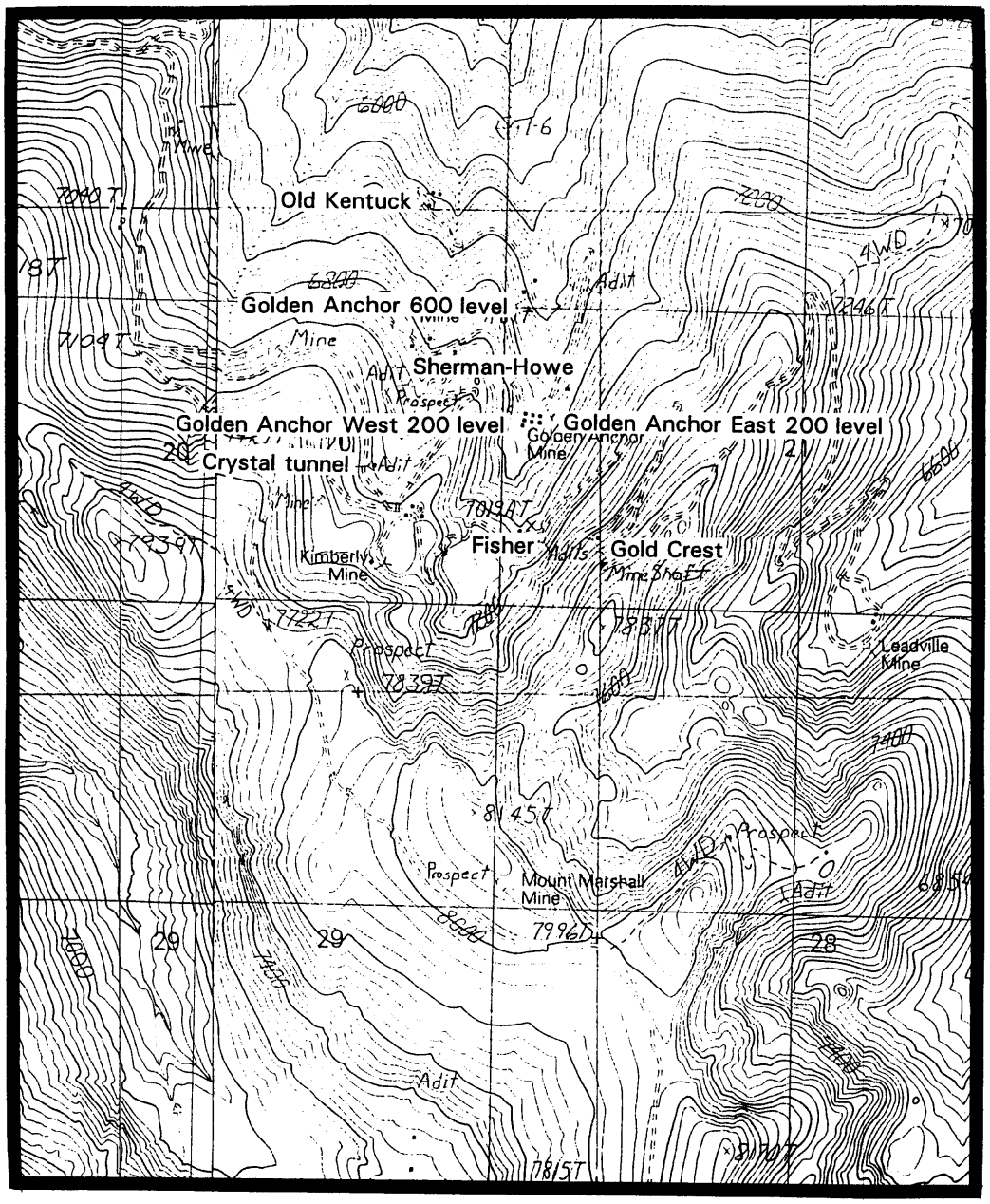

Figure 2. Topographic map of the Golden Anchor Mine and vicinity (U.S. Geological Survey Johnson Butte and Carey Dome 7.5-minute topographic maps).

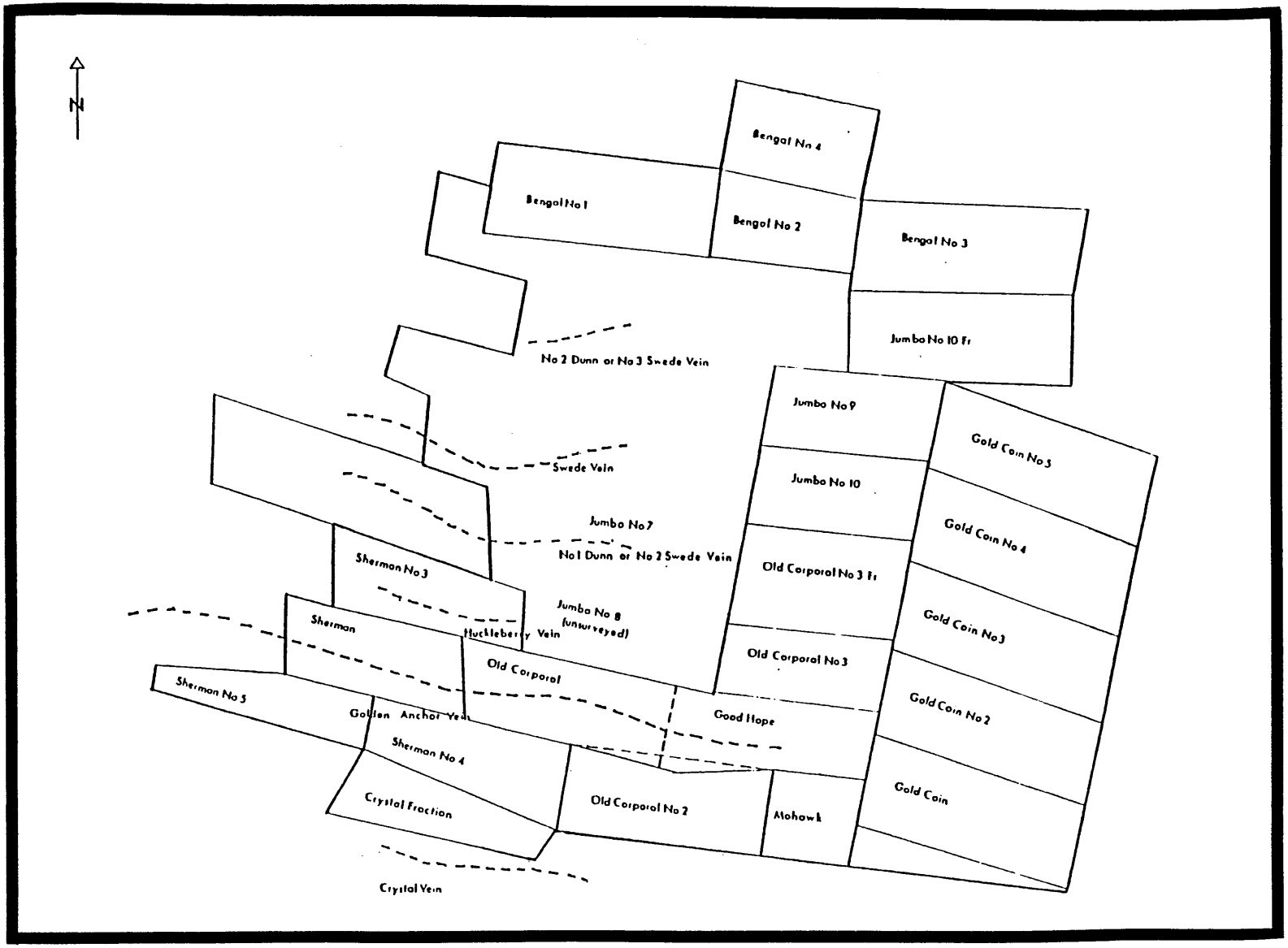

Figure 3. Vein systems and claim boundaries at the Golden Anchor Mine (Murray, 1984, Figure 5).

The other veins that have been worked on the property are the Huckleberry, the Swede, the Swede No. 2 (or Dunn No. 1), and the Swede No. 3 (or Dunn No. 2; Figure 4). The Huckleberry vein has only been exposed for a short distance on either side of its intersection with the 600 level crosscut. The Swede vein is similar to the Golden Anchor vein but narrower. It has been explored by several tunnels, including the workings on the adjacent Old Kentuck property. The Swede Nos. 2 and 3 veins look much like the Golden Anchor vein, but they do not contain much high grade ore (Murray, 1984).

The first two claims of what would become the Golden Anchor Mine were staked on June 7, 1902, by John C. Fox and Phoenix R. Briggs. (Table 1 lists individuals and companies operating at the mine.) The men named their claims the Sherman and the Old Corporal. (Figure 5 shows a plat of the claims in the Bengal Group of the Golden Anchor Mine.) Fox and Briggs also staked four other claims on the ridge south of Marshall Mountain, but these were never extensively developed (Murray, 1979). About the Fox and Briggs Group, the 1906 IMIR (p. 78) said: "Situated near the summit of Mount Marshall, this property carries a well defined vein of eighteen inches to three feet wide that can be traced at the surface for considerable distance and carries the characteristic high grade ore of the district."

In 1907, Fox, Briggs, and Charles Waldum completed 70 feet of tunnels on the Sherman and Old Corporal claims. One shot was said to have exposed ore valued at $300. The three men also staked additional claims south of Marshall Mountain, but sold them the following year. Limited development was continued on the property on 1908 and 1909, but recession and low metal prices slowed development in the district from 1907 to 1910 (Murray, 1979).

The 1911 IMIR (p. 73-74) described the property:

> The Fox and Briggs showing is one of the more recent discoveries of the district, and carry a vein of opaque white glassy quartz from one to four feet wide in walls of glassy quartz formation. This vein has been opened by an adit tunnel 60 feet long and shows a continuous ore shoot of the size mentioned that is said to average $30 per ton in gold. It has a slightly baser look than the Kimberly and probably contains some antimonial material. Its limited amount of development, however, has produced some remarkably rich specimens of coarse wire gold ore assaying up to 4,000 ounces gold per ton in selected samples.

On September 15, 1915, H.S. Briggs (a relative of Phoenix Briggs) sold an undivided one-half interest in the Sherman to Leif T. Holte for $10,000. At the same time, Holte obtained an option to work the other claims in the group. He immediately began developing the mine and adding to the camp (Murray, 1979). According to the 1916 IMIR (p. 38):

> The Marshall lake district, in Idaho county, which I have annually advertised as a likely source of gold mining profits for the last ten years, has demonstrated the virtue of this prediction during the past season as a result of the intelligent activities of Mr. L. D. Holt, an experienced Alaska operator. Mr. Holt took an option on one of the promising veins of that district about a year ago; demonstrated the permanency of the deposit with 500 feet of adit tunnel drifting work; built a wagon road connection to

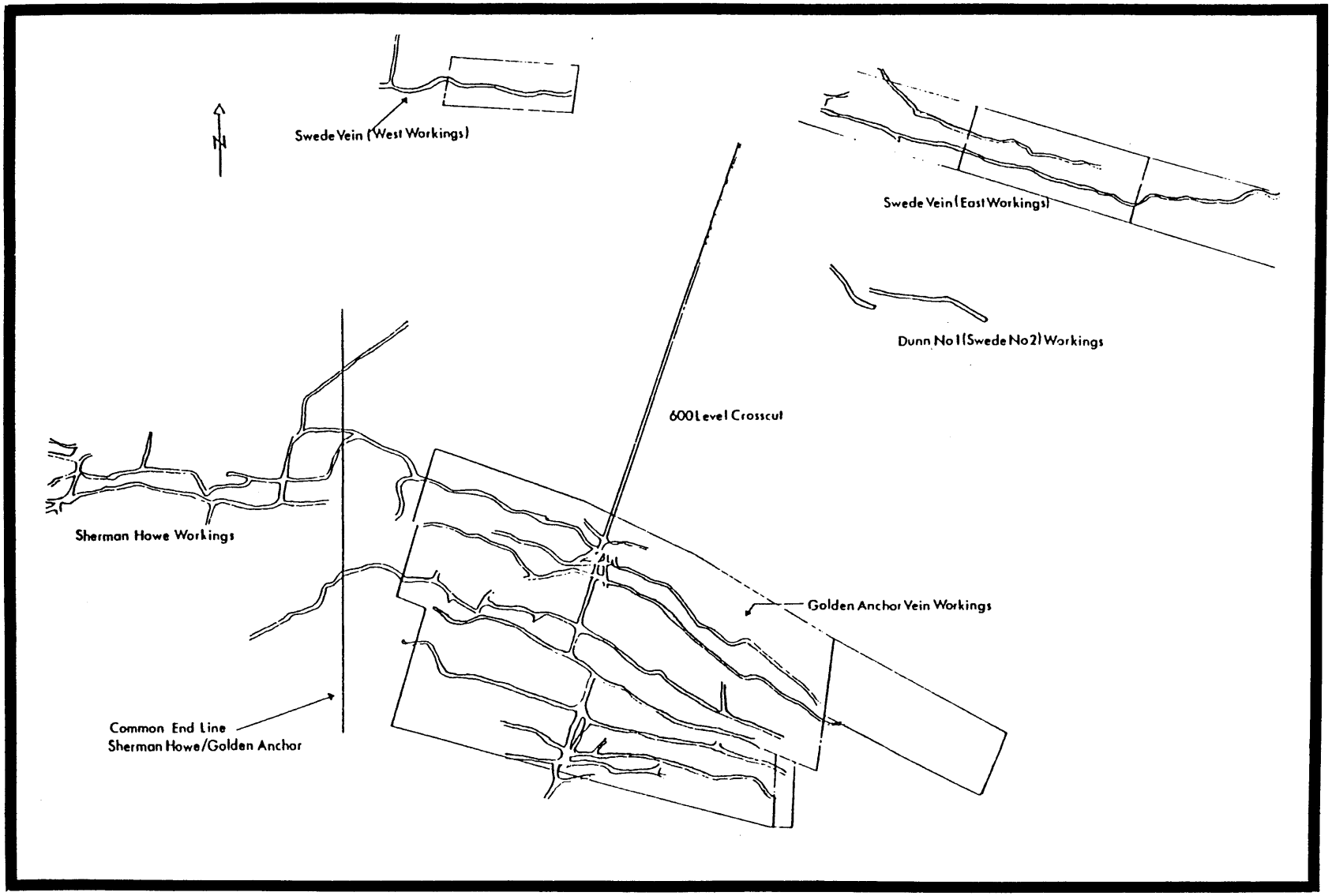

Figure 4. Plan of underground workings at the Golden Anchor Mine, separated by vein (Murray, 1984, Figure 2).

Table 1. Companies and individuals operating at the Golden Anchor Mine.

Company Name	Officer	Date Incorporated	Charter Forfeited	Year(s) at Mine
John C. Fox and Phoenix R. Briggs	—	—	—	1902-1916
Leif T. Holte	—	—	—	1916-1920
Holte Mining Co.	Leif T. Holte, President-Manager	Jan. 12, 1920	Nov. 30, 1932	1920-1928
Golden Anchor Mining Co.	J.A. Czizek, President	April 14, 1928	1946	1928-1945
United Verde Extension Mining Co. of Arizona	[1]	1902	[1]	1930-1938
George Kingsdon	—	—	—	1938-1939
Harland F. Beardslee	—	—	—	1939-1945(?)
Anchor Mines, Inc.	C.W. Turner, President-Manager	Feb. 27, 1945; reinstated Mar. 5, 1956	Nov. 30, 1953; changed name Mar. 23, 1956	1945-1956
Midwestern Oil & Gas Corp.	Frank Martin, Jr., Manager	name changed from Anchor Mines: Mar. 23, 1956	1960	1956-1960
Gold Ore Mining Co.	[1]	[1]	[1]	1963-1968
Bagdad Chase	[1]	[1]	[1]	1968-[2]
Ernest W. Sawyer (lessee)	—	—	—	early 1970s
Gold Cache, Inc.	[1]	[1]	[1]	1983-1984
Gold Resources, Inc.	[1]	[1]	[1]	1983-1984
Strata Mining and Exploration, Inc.	Rod Johnson, owner	[1]	active	1993-[3]

[1]Information not available in Idaho Geological Survey's files.
[2]Owner of record in 1984.
[3]The last available information is for 1993.

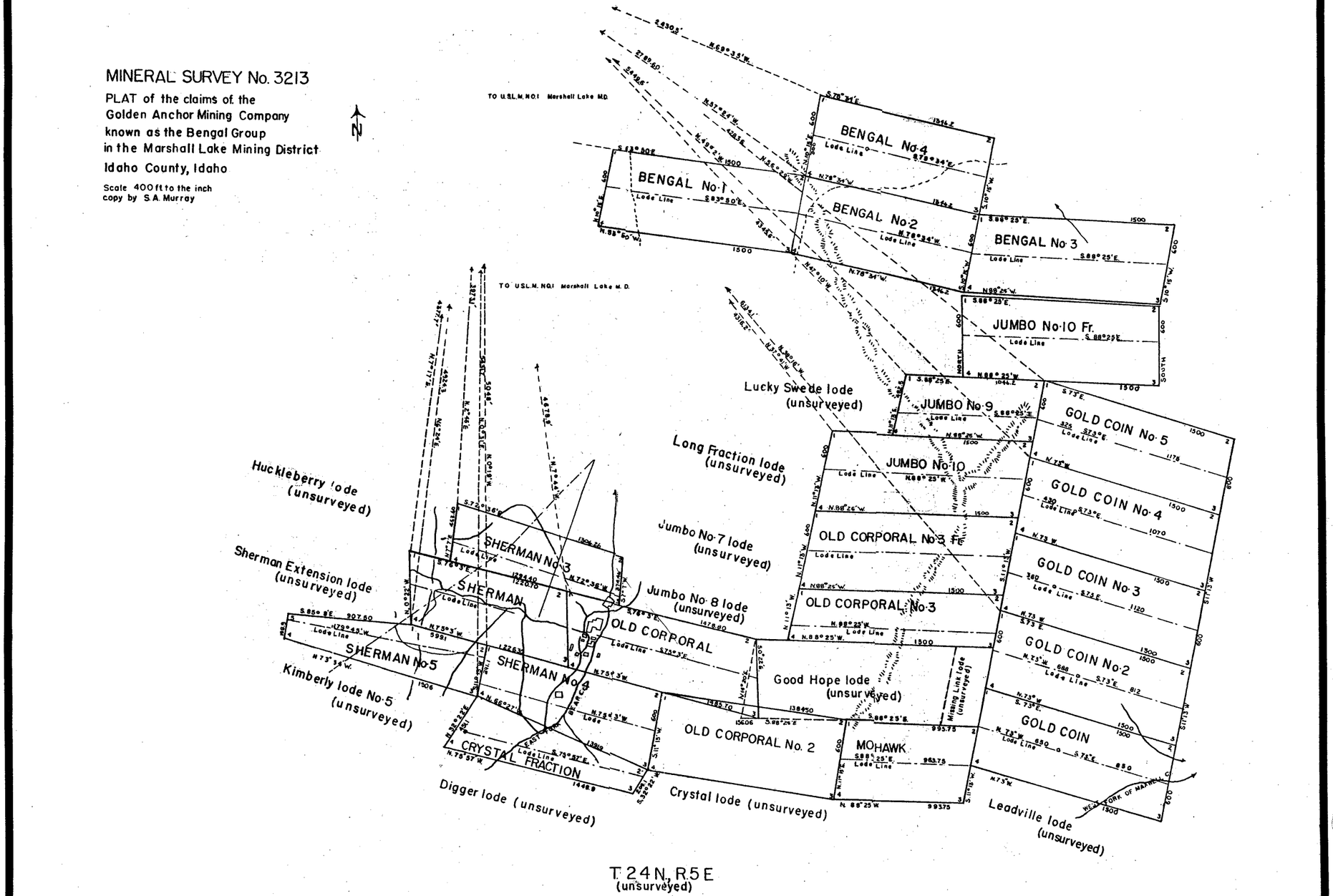

Figure 5. Plat of Mineral Survey No. 3213, showing the claims in the Bengal Group of the Golden Anchor Mine (Murray, 1984, Map 2).

the property; built a sawmill to cut his own lumber and a quartz mill of twenty-five tons daily capacity, which, in a month's operation subsequent to starting the mill, produced enough gold bullion to pay for the mine and the entire cost of equipment and maintained an ore reserve in the mine estimated at a quarter of a million dollars in value.

This remarkable deposit of rich gold ore was formerly known as the Fox & Briggs Mine. I am reliably informed that its ores give an average value of $50 per ton in free gold on the plates with an additional recovery of twenty to thirty dollars per ton on the tables, affording a concentrate that will run several hundred dollars per ton in gold.

In October, Holte purchased the remaining half interest in the Sherman claim and a one-half interest in the Old Corporal claim from John C. Fox for $25,000 (Murray, 1979). The mill was put into operation on October 15, and about 2,000 tons of high-grade ore was treated by amalgamation during the rest of the year (USBM). According to Murray (1979), Holte installed a Lane Chilean steam-driven mill with a capacity of 50 tons per day (tpd). Holte also staked additional claims in both 1915 and 1916. Supplies and equipment transported to the mine before snow closed the roads included $2,500 worth of meat to feed the miners during the winter (Murray, 1979).

The Holte Mine was the most productive gold mine in Idaho in 1917. Several thousand tons of ore were treated in the 30-ton[2] amalgamation plant equipped with the Lane mill and Deister tables. In October, the mine shipped bullion valued at $24,000, which was said to be a month's clean-up. Holte began construction of a cyanide plant late in the year. According to the 1917 IMIR (p. 92-93):

The most productive gold lode mine in Idaho during the past year was a new enterprise at the Marshall Lake District in Idaho County, operated under the management of E. M. Holt, covering a vertical fissure vein of gold-bearing quartz in siliceous wall rocks. This vein has been developed through two adit tunnels with a total length of 1,000 feet, a face depth of 250 feet disclosing a succession of rich ore shoots 60 to 250 feet long with stoping ground from 6 inches to 10 feet wide, with the interesting condition of finding some of the best values in the widest swells.

The property is equipped with a 25-ton mill and very substantial camp building accommodations. The ore is said to average $35.00 per ton in free gold with quite an additional value in rich concentrates. The concentrates, consisting of blended mixtures of pyrite, zinc, lead and copper sulphide. The concentrates produced are said to run several hundred dollars per ton in gold, and the output for the year of this small plant is said to have totalled fully a quarter of a million dollars[3] in gold. The enterprise has been handled in an intelligent, practical manner and the owners are to be congratulated on its selection and management.

A letter sent to John C. Fox in early 1917[4] stated that the mine had produced $76,000 of ore in the past three months. During the most recent month (to the date of the letter),

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[2]The size of the mill was variously reported as 25 tpd, 30 tpd, 35 tpd, and 50 tpd. The discrepancies are believed to reflect inaccuracies in reporting rather than changes in equipment.

[3]Murray (1979) gives the 1917 production as "in excess of $50,000," which seems an understatement given that she values the October 1917 output at $24,000 and gives a value in excess of $31,000 for ore that was probably produced in January 1917 (although it could also have been produced at the end of 1916). Murray (1984) gives substantially higher production for 1917 (see Table 3).

[4]The contents of the letter were reported in an article in the *Idaho County Free Press* on February 8, 1917.

$31,000 of gold was recovered from clean-up of the plates, and several thousand dollars was received from concentrates. During the year, Holte also located twelve more claims or fractional claims, but only one of these was eventually incorporated into the Bengal (Holte) Group (Figure 5) with the Sherman and Old Corporal claims (Murray, 1979).

Between November 1, 1916, and July 1, 1917, the Holte Mine produced 4,800 tons of ore with a gross value of $96,000. Operating expenses for the same period were $72,000, leaving a net profit of $24,000. The mine employed sixty men during the eight-month period (Murray, 1979).

Production from the mine in 1918 was much less than in 1917, but it was still one of the five gold mines in the state that produced over $35,000 of ore. Murray (1979) described the 1918 activities at the mines as follows (p. 40-41):

> The cut in production resulted in a reduction of the crew to twelve men in August. During the year the chutes and stopes were cleaned out; the track, piping, electrical wiring and pumps were removed from the lower levels of the mine. Two men continued to work the first week in August at the bottom of the shaft where there was four feet of high grade ore. This work was undertaken in an attempt to determine the extent of the deposit. While sinking the shaft the miners lost the ledge. A crosscut run from the shaft picked up the vein again, exposing ore as rich as that in the upper levels. The Holte property was inoperative throughout the winter of 1918, although contracts were let for work on the main level as miners attempted to locate another shoot.

The mine produced a small amount of ore in 1919, although development work continued. The 50-tpd cyanide plant was put into operation (Figure 6) and processed several hundred tons of old tailings. The Idaho Mine Inspector noted that mineral production in the state was slightly more than half of what it had been the previous year. The reason for the reduction was low metal prices and economic readjustments following World War I. The 1919 IMIR (p. 116) described the year's work at the mine:

> At the Marshall Lake district, 40 miles northeast of McCall, the Holt Mine was further developed by a shaft sunk from the 200-foot level to a depth of 50 feet in the main ore shoot that is reported to show a vein in this new opening three to five feet wide carrying over $100 per ton in gold. This property has recently been substantially financed by Caldwell capitalists for its further development. It is equipped with a 25-ton daily capacity mill and has made a production in the past three years of about $300,000 from notably rich milling ore values said to average all through its stoping area above the 200-foot level, $50 per ton in gold. The new work proves the continued persistency of the values in the vein on its downward course and, judging from strong lineal extent of the vein, great confidence is expressed in its continued maintenance of these high values as the work progresses to further depth.

In addition to the money obtained from the "Caldwell capitalists," Holte also sold Lyman Woolfolk and his wife an undivided one-fourth interest in the mine for an undisclosed amount of money. The following year, Woolfolk exchanged all rights in the claims in return for 999,993 shares of stock (out of a total of 1 million) in the Holte Mining Company (Murray, 1979).

The Holte Mining Company was incorporated on January 12, 1920. The property of the new company consisted of ten unpatented claims, including the Sherman and the Old

Figure 6. Cyanide tanks used by the Holte Mining Company (Murray, 1979, p. 38).

Corporal. Development work continued during the year. (Table 2 shows development work done at the mine.) In addition, several more claims were staked in the area (Murray, 1979).

The mine was idle for most of 1921, but gold bullion from previous operations was shipped early in the year. The company noted that it had problems with water on the lower levels and that it had been unable to raise enough money to drive a new tunnel beneath the current workings to eliminate pumping and hoisting.

In 1922, the mine was inactive due to financial problems and disagreements among the owners. The mine had approximately 2,683 feet of workings, including three tunnels, one shaft, and one raise. The No. 2 tunnel was 1,200 feet long, and the No. 1 and No. 3 tunnels were each 400 feet. The vertical shaft was 150 feet deep. During the latter part of the year, Holte and partners E.E. Carter and Frank Hanchett obtained a lease and option on the adjacent Walker-Wilcox Group (which later became part of the Sherman Howe Mine). The men had a right-of-way agreement on the west 200 tunnel of the Holte Mine, through which they mined the Walker-Wilcox property. They also leased the surface plant and mill of the Holte Mine to process their ore. Twenty men were employed on this project.

Holte's partners forfeited their bond in July 1923, leaving Holte in control of the Walker-Wilcox lease. In the fall, Holte discovered high-grade gold ore on the Sherman Extension claim (part of the Walker-Wilcox Group). After the discovery, supplies were brought in so the work could continue throughout the winter (Murray, 1979). The ore was treated by amalgamation.

The Walker-Wilcox lease was active for the first part of 1924, but operations were discontinued after the first of April. In that period, rich free-milling gold ore was produced from the Sherman Extension, and several lots of bullion were sold to the Boise Assay Office.

The Holte Mine was active for about thirty days during 1925, and the mill was operated for a few days. In 1926, the company performed its necessary annual labor, most of which entailed doing 200 feet of development work. Depressed economic conditions halted work on a crosscut being driven to drain the lower levels of the mine. Two prominent companies examined the property; both were said to be favorably impressed, but neither became involved with the mine (Murray, 1979). In 1927, the company extended their main tunnel 40 feet and repaired the roads and the camp.

Despite reported total production of $258,000 from the mine, financial problems finally defeated the Holte Mining Company in 1928. On April 10, Holte sold the company's twenty-two claims, complete camp, assay office, sawmill, cyanide plant, and 50-tpd mill to Jay A. Czizek[5] of Boise for $1 and "other good and valuable consideration" (Murray, 1979). The Golden Anchor Mining Co. was incorporated on April 14, with Czizek as president. Czizek sold the mine to the new corporation for $494,000. The major

[5]Czizek was the Idaho Inspector of Mines in 1899 and 1900.

Table 2. Development work, number of men employed, and operating companies at the Golden Anchor Mine, by year.

Year	No. of Men employed	Tunnels (feet)	Sinking (feet)	Cross-cutting (feet)	Drifting (feet)	Raising (feet)	Operator
1920	12	—	104	45[1]	—	—	Holte Mining Co.
1921	8	640[2]	105[3]	535[1]	—	—	Holte Mining Co.
1923	10	500[4]	—	—	—	—	Holte Mining Co.
1924	[5]	500[4]	—	—	—	—	Holte Mining Co.
1925	[5]	200	—	—	—	—	Holte Mining Co.
1926	3	190	—	—	—	—	Holte Mining Co.
1927	3	40	—	—	—	—	Holte Mining Co.
1928	6	400	—	—	—	—	Golden Anchor Mining Co.
1929	6	800	—	—	—	—	Golden Anchor Mining Co.
1930[6]	8	1,400	—	1,000	350	—	Golden Anchor Mining Co.
1931	6	600	—	—	—	100	Golden Anchor Mining Co.
1933	15	—	—	82	674	406	Golden Anchor Mining Co.
1934	13.8	—	—	79	784	14	Golden Anchor Mining Co.
1935	1[7]	—	—	25	335	—	Golden Anchor Mining Co.
1936	30	—	—	—	493	—	Golden Anchor Mining Co.
1936	41	—	—	—	2,310[8]	—	Golden Anchor Mining Co.
1937	40	544[9]	203	188	977	1,020	Golden Anchor Mining Co.
1938	50	1,095[9]	—	125	2,371	1,007	Golden Anchor Mining Co.
1939	54	4,598[2]	—	—	—	—	Golden Anchor Mining Co.
1941	55	—	—	132	1,822	321	Golden Anchor Mining Co.
1946	4	—	—	—	460[10]	—	Anchor Mines, Inc.
1947	4	—	—	—	460[10]	—	Anchor Mines, Inc.
1948	2	—	—	—	460[10]	—	Anchor Mines, Inc.
1949	2	—	—	—	460[10]	—	Anchor Mines, Inc.

[1]Number given is a combined figure for crosscutting and drifting.
[2]Number given is for total development during the year.
[3]Number given is a combined figure for sinking and raising.
[4]This work was probably done on the Sherman Extension claim.
[5]Number of men employed was not given.

(Table 2, continued.)

[6]Development figures listed here almost equal total workings in the mine (3,800 feet). The 1,400 feet of tunnel work may represent a total for the year"s development, with the crosscutting and drifting reflecting a more specific breakdown of the type of work done. The USBM reported about 1,000 feet of development work was done during the year.

[7]This work was probably done by lessees.

[8]Number given is a combined figure for drifting and raising.

[9]This work was described as "Miscellaneous" by the company.

[10]In 1948 and 1949, the company described the work done as "general underground rehabilitation." It is probably that the work done in 1946 and 1947 should also be described in this way rather than as actual development.

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stockholders in the Golden Anchor Mining Co. were Czizek and his wife, who together owned 112,565 shares of stock, and Leif Holte, who owned 33,000 shares (Murray, 1979). The new company installed a small hydroelectric plant at the mine and began driving a long crosscut to intersect the Holte vein at a "substantial" depth below the workings. The list of equipment at the mine when Golden Anchor took over the operation included a 12-horsepower St. Paul hoist, a 10"x10"x10" Laidlow Deim [Dunn?] Gordon & Co. compressor, three jackhammers (various manufacturers), two stopers, three ore cars, a complete sawmill, and a blacksmith shop. Mill equipment included Cyanide-Trent agitator solution tanks, engines, and pumps, one 10" Lane Chilean mill, one Sampson crusher, a Deister slimer and concentrator, three boilers, two vertical engines, and one dynamo.

Golden Anchor continued working on the lower tunnel in 1929. By the end of the year, the tunnel was 1,200 feet long. Although the IMIR continued to list the Golden Anchor's Chilean mill as part of the mine's equipment, 1929 is the last year that the company listed a mill on its reports to the Mine Inspector. What happened to the mill is unknown. In October, the twenty-two claims held by the company were surveyed for patent; six were eventually patented (Murray, 1979).

Development work continued at the mine in 1930. The company did about 1,000 feet of drifting and crosscutting. In February, the lower tunnel intersected high-grade ore approximately 300 feet below the bottom of the upper workings. Drifts were driven along the vein, and a 200-foot raise was put in to intersect the ore. This was considered to be one of the most important discoveries in the state for the year. Despite this, operations were suspended in October, apparently because of poor weather and a shortage of capital (Murray, 1979). The mine was under option by the United Verde Extension Mining Co. of Arizona for at least part of the year.

In 1931, the company continued to develop the ore discovered the previous year. The raise was extended 150 feet, connecting it with the No. 2 tunnel of the old

workings. In addition, 800 feet of drifting was done on the vein from the No. 3 tunnel. However, the company was in financial difficulties due to the cost of this work, and Czizek made a trip to the East in the fall to seek additional funds (Murray, 1979).

By early 1932, the company needed money to pay off a series of judgments and liens. The stockholders donated half of their shares back to the company. United Verde Extension (U.V.X.) purchased these 75,000 shares for $1 each. This gave U.V.X. a controlling interest in the company (Murray, 1979). In March, development work resumed. Most of this consisted of running drifts from the lower tunnel and raising on the ore discovered in the drifts. This was the largest development program in Idaho County during the year and greatly increased the reserves at the Golden Anchor. The power plant, mine buildings, and mill of the Sherman Howe Mining Company were leased. The power plant was used to supplement the Golden Anchor's hydroelectric plant. A substantial tonnage of ore was run through the mill to determine the best processing method.

The Golden Anchor operated during the early part of 1933, but was forced to close on July 1 when the lease expired on the Sherman Howe mill. In April, high-grade ore was discovered when a vein that had been displaced by faulting was relocated on the 600 level, 2,600 feet from the mouth of the tunnel. The ore carried $20 per ton of gold (Murray, 1979). A small amount of ore that was cleaned up from former operations was sent to a smelter.

The Sherman Howe Mining Company leased the Golden Anchor in 1934 and had a crew at the mine all year. Ore from the Golden Anchor was processed in the Sherman Howe mill. U.V.X. purchased an additional 150,000 shares of Golden Anchor stock for $9,000, for a total of 225,000 shares, or 56 percent of the company's stock (Murray, 1979). In September, Sherman Howe began construction of a mill adjacent to the portal of the 600 level. Equipment included a 50-tpd Allis Chalmers ball mill (Murray, 1979).

Installation of the ball mill was completed in late August 1935 (Figure 7). Equipment for an amalgamation and flotation plant was purchased and brought to the mine. During the year, 1,590 ounces of gold and 5,231 ounces of silver were recovered. This gave the company a gross income of $58,569 from bullion and concentrates and a net profit of $12,280. On September 1, 1935, the estimated life of the mine was five years (Murray, 1979). The company did 360 feet of development during the year.

Production from the Marshall Lake district increased from $64,247 of ore in 1935 to $261,345 in 1936 as a result of a large increase in output from the Golden Anchor. The company built a 50-ton amalgamation and flotation plant[6] during the summer of 1936. The mine was the largest gold producer in the county and ranked second in the state in gold production for 1936. The mine produced 7,558 ounces of gold and 20,303 ounces of silver from 8,166 tons of ore. Gross income from bullion and concentrates was $278,435,

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[6]Despite this, the IMIR continued to describe the Golden Anchor's mill as "a 50-ton steam driven Lane Chilean mill and cyanide plant" until 1942, when the Golden Anchor Mining Co. listing was dropped from the IMIRs for the duration of World War II.

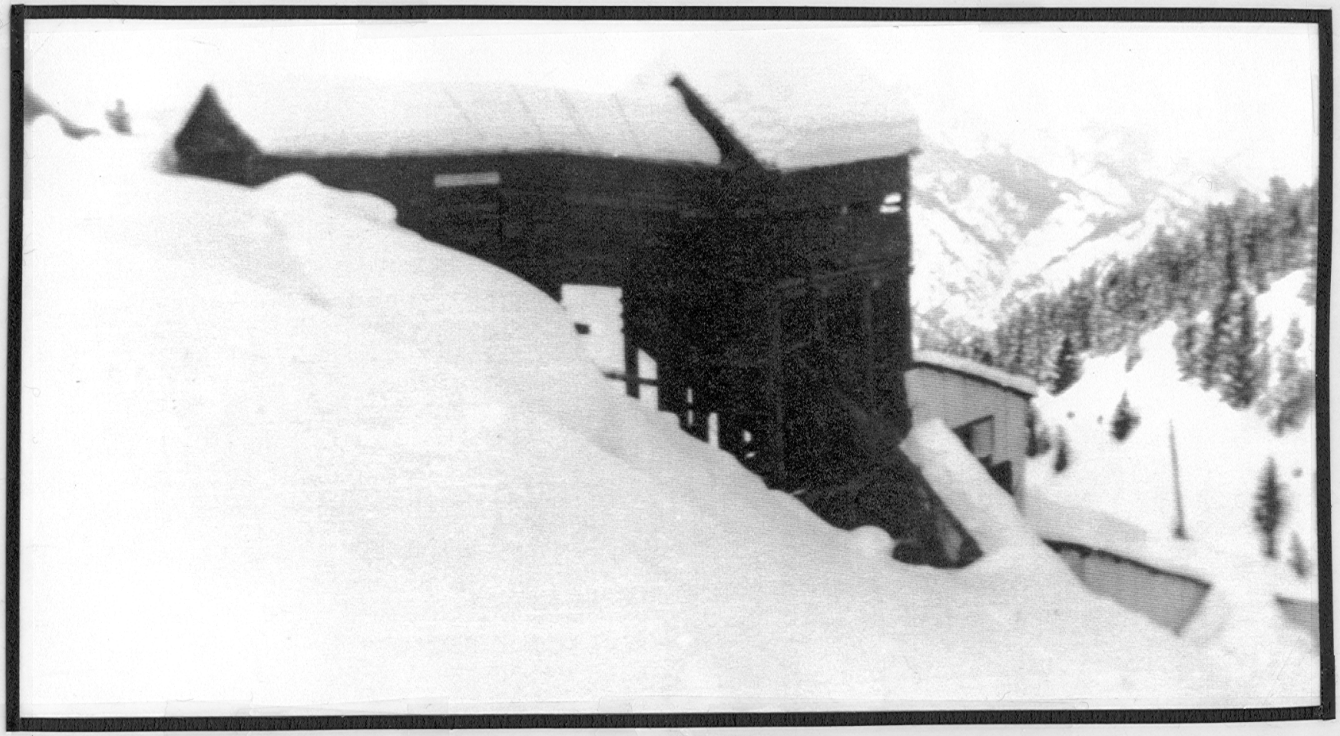

Figure 7. Winter at the Golden Anchor Mine, showing the ball mill and associated buildings covered with snow (Murray, 1979, p. 69).

with a net profit of $90,002 (Murray, 1979). A new road was built to the mine by the Civilian Conservation Corps (CCC). Although never used, an airstrip was built several miles above the mine camp to provide winter transportation for the area (Murray, 1979). The company did 493 feet of development during the year.

Most of the output from the district in 1937 was gold ore from the Golden Anchor. The mine and mill operated the entire year. The mine was again the largest producer of gold in the county, although its output was smaller than in 1936. The mill processed 9,547 tons of ore, which yielded 6,283 ounces of gold and 19,394 ounces of silver. Gross income was $233,635, and the net profit was $51,512. Stockholders received dividends totaling $141,514 (Murray, 1979). The U.S. Bureau of Mines conducted a study of the Golden Anchor operation in 1937 (Lorain and Davis, 1938); the text of the report was repeated in a later discussion of mining in Idaho County (Lorain, 1938). At that time, the main workings were reached through a 1,600-foot adit on the 600 level. From that level, the mine had 2,400 feet of drifts in Golden Anchor ground and an additional several hundred feet of drifts in the adjoining Sherman-Howe property (Figure 8). Four other levels of varying lengths were located between the 600 level and the surface. During 1937, a two-compartment vertical shaft was sunk about 200 feet below the 600 level (Lorain and Davis, 1938). In mid-1937, the mine had about 10,984 feet of workings. This included 150 feet of winzes, 1,234 feet of raises, and 9,600 feet of tunnels, crosscuts, and drifts. (The company report from which the latter data was taken appears to have been filed with the Idaho Mine Inspector before the shaft was started.) The operation of the Golden Anchor mill was described as follows (Lorain and Davis, 1938, p. 7-8):

> Ore is treated in a 50-ton amalgamation-flotation mill operated two shifts a day. The flow sheet is shown in figure 5 [Figure 9].
>
> Ore from the mine is received in a 50-ton ore bin covered with an 8-inch grizzly on which oversize is broken by hand. Two hand-operated gates control the flow of ore from the coarse-ore bin onto a grizzly with a 3/4-inch space between the bars. The oversize is crushed in an 8- by 24-inch Allis-Chalmers-Blake type jaw crusher run at 230 rotations per minute, set for 1/2-inch discharge. Crushed ore and grizzly undersize fall into a 50-ton fine-ore bin.
>
> From the fine-ore bin the ore is fed by a 15-inch by 6-foot Denver belt ore feeder traveling at 18 inches per minute to a 4-1/2- by 5-foot open discharge ball mill loaded with forged-steel balls of 3-inch maximum size. The ball mill is lined with wave-type liners and is operated at 32 rotations per minute, through a Texrope drive. It is operated in closed circuit with a 12- by 18-inch Denver mineral jig and an Akins classifier. The jig pulsates at 300 strokes per minute and the classifier rotates at 5-1/2 rotations per minute. A jig bed 2 inches deep, composed of 3/8-inch ball bearings, has been found much more satisfactory than the shot bed originally used. About 15 pounds of jig hutch is drawn on each shift, and the jig concentrate is run over a half-size Wilfley table, which produces a tail, middling, and concentrate; the middling is accumulated and run over the table again and the tails from the two runs are returned to the classifier. Concentrates from both runs and middling from the second run are amalgamated in the amalgam barrel.
>
> Classifier overflow passes over three 11-inch by 12-foot tables arranged in parallel and covered with rubber matting; tables slope 1-1/4 inches per foot. Concentrates are removed from the matting every two days and amalgamated in the amalgam barrel with the jig concentrates.
>
> The amalgam barrel is operated when sufficient concentrates have been accumulated, usually about twice a month. The concentrates are ground for 6 hours with mercury, lye, and about a dozen 4-inch steel balls. The amalgam is retorted, and the rejects, which assay about 14 ounces of gold to the ton, are shipped to the smelter.

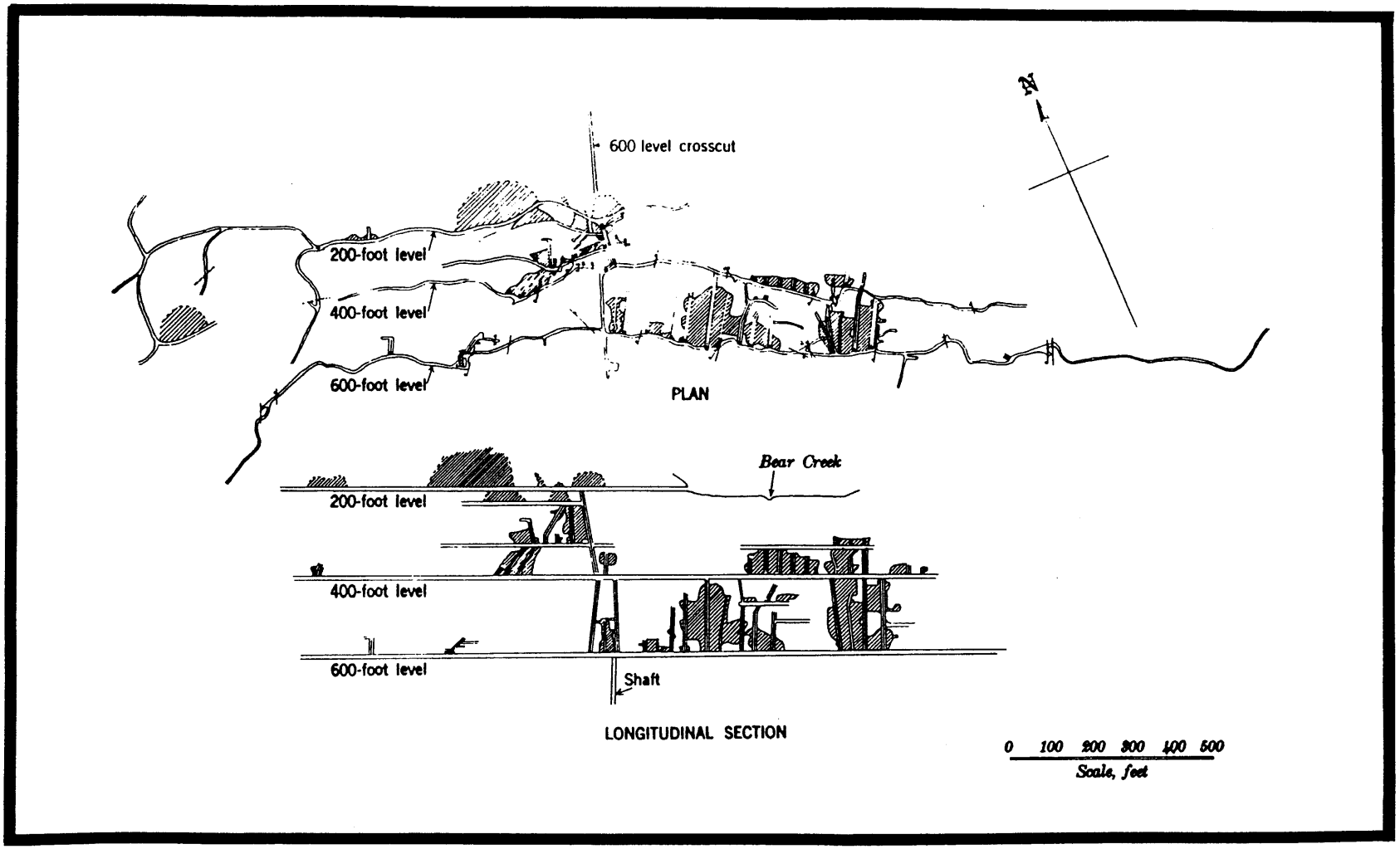

Figure 8. Underground workings at the Golden Anchor Mine in 1937 (Lorain and Buford, 1938, Figure 1).

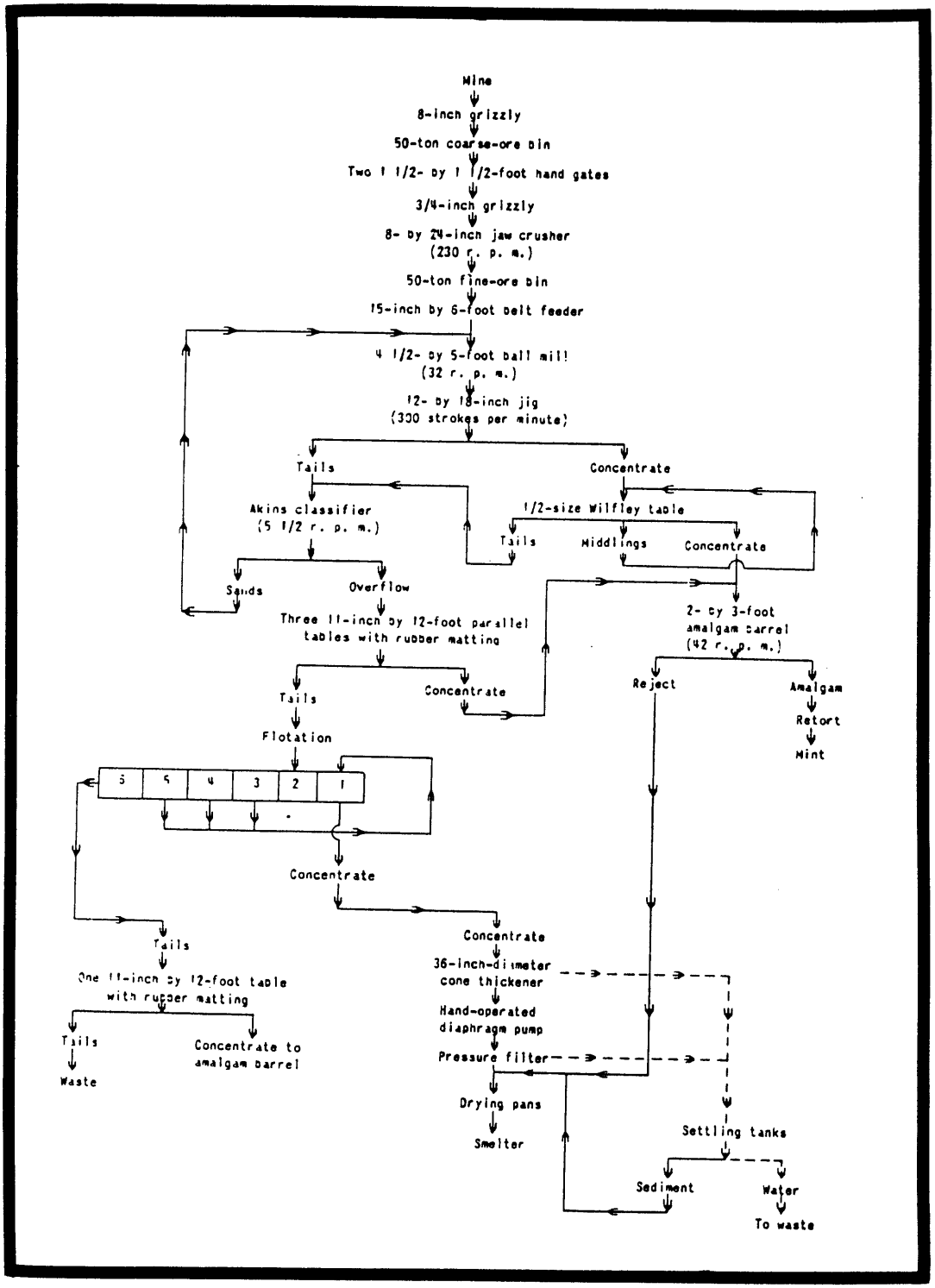

Figure 9. Flow sheet for the Golden Anchor mill (Lorain and Davis, 1938, Figure 5).

Tails from the blanket tables are fed to the second cell of a 6-cell, 15-inch, Denver sub-A flotation machine; this cell is used as a conditioner only. The pulp then goes to the last four cells in series; the concentrates from these cells are returned to the first cell for cleaning. Reagents are added to the feed to the conditioner cell by a Denver reagent feeder in the quantities shown in the table under the section on Metallurgical Data[7]. Soda ash was formerly used but was definitely found to depress gold; consequently, its use was discontinued; the present flotation circuit is virtually neutral.

Flotation concentrates from the first cell are thickened in a 36-inch diameter cone, from which the pulp is discharged by a hand-operated diaphragm pump and filtered in a pressure filter of a local design and construction. The filter consists essentially of a round iron box 18 inches in diameter and 18 inches high, in the bottom of which is a spirally grooved plate covered with filter cloth. The box is nearly filled with concentrate, air pressure is applied, and the moisture is forced out through the spiral grooves. The filtered concentrate contains 10 percent moisture; it is then dried more thoroughly in pans and sacked for shipment in lined sacks of 100 pounds capacity with cemented ends.

The sacked concentrates are trucked 17 miles to Burgdorf in 3-ton loads; they are then reloaded in 10-ton trucks and hauled the remaining 550 miles to the smelter at Garfield, Utah. The total cost of trucking from the mine to the smelter is $26 per ton of concentrates.

The mill was never run at full capacity during the seven years it was in operation (Murray, 1984).

The Golden Anchor was the largest producer of lode gold in the state in 1938, although its output was less than in the previous year. The company treated 10,432 tons of ore in its plant. Gross income from the metals in this ore was $216,450 and the company's net profit was $52,422. The cost of production was $28.18 per ounce of gold (Murray, 1979). A new Eimco electric hoist was installed during the year, and the company did 2,932 feet of development work.

Output from the mine increased substantially in 1939, and the mine produced 16,301 tons of gold ore, which was treated in the company's mill. Gross income from the sale of bullion and concentrates was $384,988, and the company's net profit was $198,237. Production costs averaged $18.43 per ounce of gold (Murray, 1979). The company did 4,598 feet of development work and installed a new diesel power plant during the year. In addition, a new bunkhouse, with accommodations for thirty men, and a schoolhouse were built during the summer and fall (Murray, 1979).

The mine produced 15,459 tons of ore in 1940, but the gold output was 24 percent less than in 1939. It was the sixth largest gold producer in the state. The mine acquired its own post office on September 27, 1940. It was named Czizek after the first president of the Golden Anchor Mining Co., and it operated until June 2, 1942 (Murray, 1979).

In 1941, the Golden Anchor was still the largest producer in the district, but production declined to 13,367 tons of ore. The mine employed 55 men, and 2,275 feet of development work was done during the year. There were about 21,368 feet of workings, which consisted of 1,325 feet of shafts, 950 feet of raises, and 19,093 feet of tunnels, crosscuts, and drifts. Workings were on nine different levels (the 200, 245, 300, 400, 600,

[7]The reagents added per ton of ore were: Aerofloat No. 25, 0.298 pounds; Xanthate Z-3, 0.224 pounds; and pine oil, 0.099 pounds.

700, 800, 900, and 1000). A 250-foot vertical shaft extended from the 600 to the 800 level, and a 450-foot inclined winze connected the 600 and the 1000 levels. The mine had three entrances. The west 200-level adit (the original Holte adit) connected with the Sherman Howe workings. The east 200-level adit provided access to the Golden Anchor vein in the northeast part of the workings. The 1,600-foot adit on the 600 level was the main haulage adit and helped drain the upper workings (May, 1984).

The Golden Anchor was closed permanently on April 30, 1940. In the first four months of the year, the mine produced 2,827 tons of ore, which yielded 1,498 ounces of gold and 4,482 ounces of silver. In October, War Production Board Limitation Order L-208 closed all "nonessential" (gold) mines for the duration of World War II. The workings below the 600 level flooded during this closure (May, 1984).

The Golden Anchor Mining Company sold its ball mill during World War II (Murray, 1979). Anchor Mines, Inc., purchased the assets of the Golden Anchor Mining Company in 1945. Anchor did some work at the mine between 1946 and 1948. Most of this probably consisted of rehabilitating the tunnels. Two men worked to retimber sections of the 200 and 600 levels in 1947 (Murray, 1979). The company was trying to obtain financing to support a development and operating program; however, nothing came of this. There was a watchman at the property and only the minimum amount of work necessary to retain title to the unpatented claims was done.

A study for Anchor Mines in 1946 indicated that the mine had 46,603 tons of indicated reserves with an average grade of 0.59 ounce per ton of gold in the Golden Anchor vein and 8,662 tons of indicated reserves in the Swede vein. Of the reserves in the Golden Anchor vein, 31,500 tons was above the 600 level, and the remainder was in the flooded 800, 900, and 1000 levels. The reserve calculations did not include any estimates of the silver content of the ore, nor were any estimates made of the probable reserves in undeveloped sections of the veins to the east at depth (Murray, 1984).

A geologic survey was conducted during the summer of 1952 to assess the scheelite potential of the mine. Anchor apparently sold most of the equipment in the mid-1950s.

In 1963, Gold Ore Mining Company purchased the claims from the major stockholder of Anchor Mines (and, presumably, of its successor, Midwestern Oil & Gas Corp.) Gold Ore transferred their interest to Bagdad Chase in 1968. Some preliminary exploration was done on the property in the early 1970s, when the mine was leased by Ernest W. Sawyer, a geologist from California (Murray, 1979).

By 1980, the east 200 adit was caved and the west 200 adit was only partially open. The 600 level adit was also partially open, with the mine rail intact and a heavy flow of water coming from the portal (Figure 10). Several of the buildings were still intact (Figure 11), and some were being used for storage (May, 1984).

In 1983, Gold Cache, Inc., leased the Golden Anchor from Bagdad Chase. Gold Cache was also leasing the adjacent Kimberly Mine. In August, Gold Resources, Inc., entered a 50-50 joint venture with Gold Cache to evaluate both properties. Gold Resources planned to process old tailings left from earlier mining operations and to

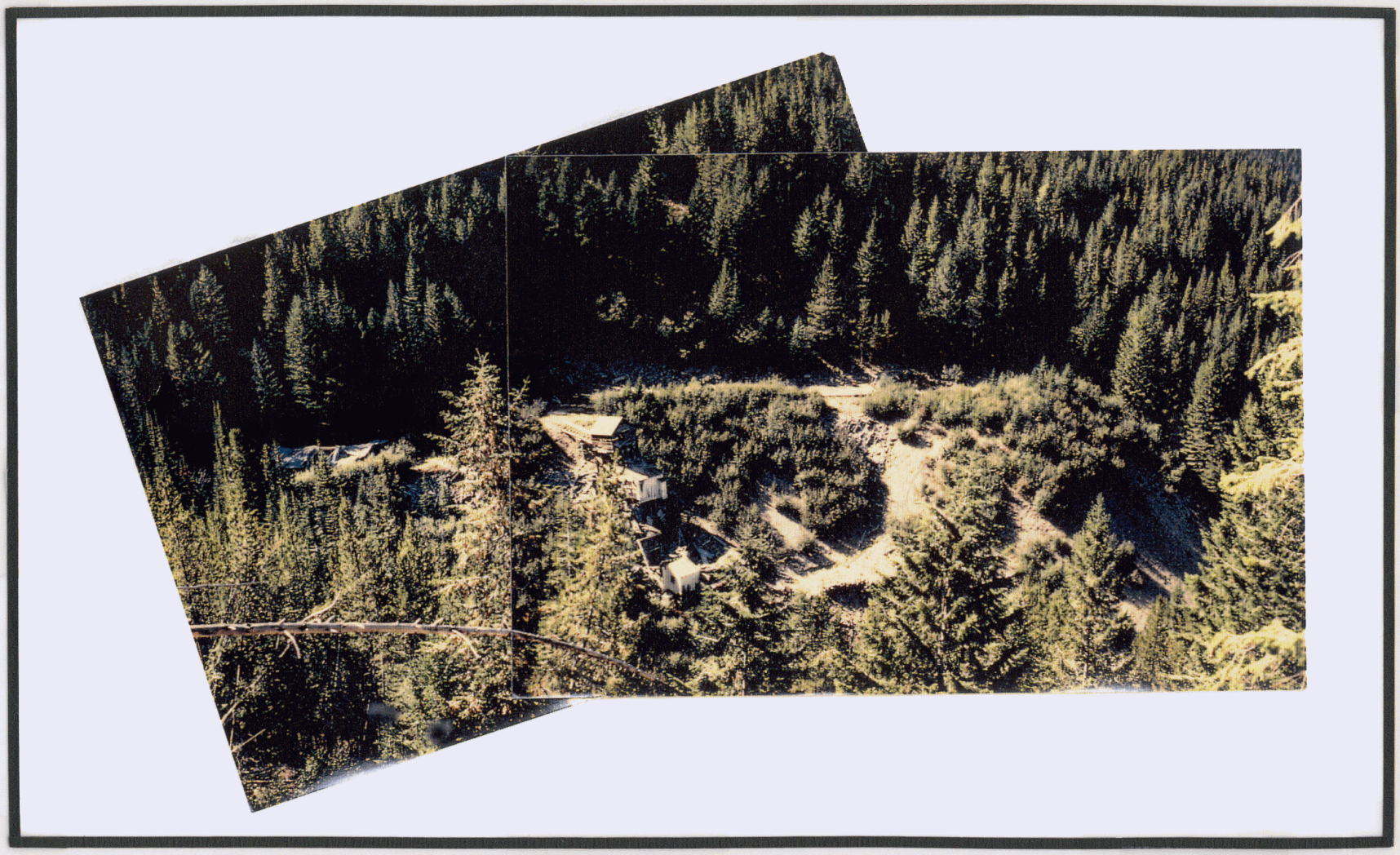

Figure 10. Overview of the 600 level of the Golden Anchor Mine (c. 1984), showing dump and mill buildings (Murray, 1984, p. 40).

Figure 11. Camp buildings at the Golden Anchor Mine (c. 1984; Murray, 1984, page 13, top).

explore for ore above the 200 level in the Golden Anchor. A heap-leach operation was reportedly planned for 1984.

Gold Resources started exploration at the Golden Anchor Mine in 1984 and planned to process tailings from both the Golden Anchor and the Kimberly during the year. In addition, a drilling program was scheduled to locate the Golden Anchor and Swede veins at the Golden Anchor. According to company spokesmen, the mine was believed to have substantial reserves.

In 1993, Strata Mining and Exploration, Inc., a privately held company, did exploration work at the Golden Anchor and other mines in the Marshall Lake district. Geophysics and remote sensing were used to extend the gold veins and trace offset segments. A 100-tpd gravity mill was constructed. The results were encouraging, and the company planned more work for the next year. (Figures 12 and 13 show the mine in 1994).

Between 1916 and 1942, the Golden Anchor produced 94,085 tons of ore and processed 568 tons of old tailings. This material yielded 60,197 ounces of gold, 178,216 ounces of silver, 9,789 pounds of copper, and 20,573 pounds of lead. Total value of these metals, at the time of their production, was $1,984,667 (Table 3). Despite the Idaho Mine Inspector's glowing descriptions of the early discoveries, no production has been recorded for the period before 1916.

Figure 12. Reconditioned 600 level crosscut adit (gated and locked) at the Golden Anchor Mine, with a section of culvert used for the portal. Rails extend from the gated adit to a large dump and the old mill building. Note the flow of water coming from the adit (photograph by Earl H. Bennett, Idaho Geological Survey).

Figure 13. Partially collapsed buildings which held the Golden Anchor amalgamation and flotation mill (photograph by Earl H. Bennett, Idaho Geological Survey).

Table 3. Gross production from the Golden Anchor Mine, 1916-1942 (Murray, 1984).

Year	Gross Production[1]
1916	$ 34,238.32
1917	177,105.64
1918	41,949.39
1920[2]	1,877.78
1921[3]	2,885.91
1932-33[4]	35,050.38
1934	6,149.76
1935	58,569.15
1936	257,581.58
1937	233,635.24
1938	216,680.01
1939	384,748.43
1940	276,108.08
1941	208,551.07
1942	49,535.64
Total	$ 1,984,667.38

[1]Production figures from 1916 to 1921 were taken from mint returns, using a gold price of $20.67 per troy ounce for gold and an average price of 86.42 cents per troy ounce for silver; production from 1932 onward was taken from company records (Murray, 1984). Dollar values have not been adjusted from their original values.
[2]February 1920 only.
[3]January 1921 only.
[4]No production was reported for the years between 1921 and 1932.

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