HOMESTAKE MINERAL DEVELOPMENT COMPANY

OLD NATIONAL BANK BUILDING
SPOKANE, WASHINGTON 99201
TELEPHONE (509) 747-3045

July 23, 1974

Mr. Willard Puffett
U. S. Geological Survey
Denver Federal Center - Bldg. 53 - Room 28
Denver, Colorado 80225

Dear Willard:

Please find attached your report and maps describing the Idaho Champion prospect in Idaho County, Idaho.

We sincerely appreciate the chance to review this information.

Best personal regards.

Sincerely,

Donald A. Hull

Donald A. Hull
Regional Geologist

am

DAH/am

Office of Minerals Exploration Field Offices

Region I

Includes Idaho, Montana, Oregon, and Washington

Mr. Willard Puffett, Field Officer, Region I
Office of Minerals Exploration
U. S. Geological Survey
Denver Federal Center - Bldg. 53 - Room 28
Denver, Colorado 80225

RECEIVED JUN 24 1974

Mrs. Mary E. Clark, Secretary
Telephone; Area code 303
234-2451, 234-2452 or 234-2453

data. However, the historical assays, which the applicant has not verified, suggest the possibility of a block of ground 1500' long, 450' wide, and 800' deep, containing forty million tons averaging $9.29 per ton. See page 25, Exhibit X.

(e) The regional geology of the Orogrande District is well known. The oldest rocks comprise a thick series of gneisses, schists, and quartzites of the pre-cambrian belt series, which were intruded by the granodiortes and monzonite of the Idaho Batholith. After the intrusion of the batholith, the district was eroded to a region of low relief. It was then uplifted to 7000 or 8000 feet, greatly disected by erosion, and worn down to 4000 or 5000 feet by the processes of gradation.

The general structural trend of the intruded rocks is slightly west of north and the linear and planar foliations of the rock minerals are both oriented in a northwesterly southeasterly direction; they suggest that this may indicate a regional "stretching" or "flow" in that direction. This regional movement might be expected to develop the broad bands of northwest to northeast shearing, especially along contacts, and to develop tensional and torsional fractures across the direction of stretching. Resistance to this north-south stretching is believed to have caused the strong east-west rotational shearing and fracturing on the Idaho Champion claims.

The large deposits of low-grade ore, which occur as stockworks and disseminations, locally known as "dikes" extend northerly and southerly through the property. The "main dike", about 600 feet wide, traverses the westerly part of the claims, and a "second dike" about 300 feet wide, the

easterly part. Multiple east-west fissures and faults extending across the stockworks enrich the lower grade ore. Prior to 1908, an adit was driven from the Mable claim to intersect a major east-west fault on the Black Champion. Ore higher grade than the dike ore was stoped above east-west drifts along this fault.

The claims are on the edge of the Idaho Batholith. The ore minerals were formed by Magmatic fluids forced up into the weakened zones in the stockwords. The stockwork vienlets seen megascopically and microscopically were formed by crackling upon cooling of the upper and marginal parts of the intrusive igneous rocks. The network of small ore-bearing vienlets, and the larger viens were produced by the tensional and torsional forces.

Gold, according to Emigh, occurs in minute fractures and as a replacement of the pyrite. It is doubtful if gold directly replaces quartz, but samples of pure white quartz were crushed and gold was panned from these crushings. This shows perhaps contemporaneous gold-quartz deposition. Photographs of magnified specimens by Emigh (Figures 1 and 2) show gold replacing pyrite and chalcopyrite. Remnants of the replaced minerals are seen in the above-mentioned Figures. The gold-pyrite and gold-chalcopyrite association, however, accounts for the bulk of the mineralized mineable ore.

The sulfides seem to be prevalent in late quartz, as indicated in Figure 3, but they may also be found occasionally in shattered silicified wall rock. In Figs. 1 and 4, anglesite, (the only non-sulphide metallic mineral

3. Physical Description - IDAHO CHAMPION

associated with the gold-bearing ore) and chalcopyrite fill shattered late quartz cavities. The filling of shattered late quartz cavities by the sulfides is the general type of ore deposition. There exists also the possibility of some gold being contemporaneous with quartz; the possible age relationship of these minerals is shown in Figure 9. Galena shows a strong association with chalcopyrite. Only small remnants of sphalerite are seen in Figs. 1, 4, 6 and 7. This is due to the vigorous replacement of later sulfides. Sphalerite may be seen as the cement of fractured pyrite or, as in Figure 7, imbedded in tetrahedrite. Mr. F. A. Thomson, formerly Dean of the University of Idaho School of Mines, using picked samples of the ore, analyzed covellite, chalcopyrite, and pyrite minerals for gold and silver. These minerals assayed as follows:

Mineral	oz. /T Gold	oz. /T Silver
Covellite	30.00	25.50
Chalcopyrite	55.82	56.10
Pyrite	28.04	20.00

The above analysis is further proof of the close association of gold with the sulfide minerals, particularly chalcopyrite and pyrite.

Gold is thought to be the last mineral deposited (Emigh) (with the exception of the previously explained possibility of small amounts of gold and quartz being contemporaneously deposited); gold is shown in Figs. 1, 2, 3, and 4 replacing pyrite, chalcopyrite, and galena. Anglesite and covellite appear to be alteration products of galena and chalcopyrite respectively. Gold

deposition as indicated in the above paragraphs is almost entirely restricted to late quartz. The late quartz is a clear to bluish rock being distinguished from the older barren quartz by its color. The barren quartz has a cloudy appearance.

Economically, the problem is to produce gold, a standard commodity, which must be sold at a 1934 price, produced with 1962 costs. Earth moving costs, with advanced methods, have not materially increased since 1934, but milling costs are much higher than those of 1934. Loraine reports that the Orogrande - Frisco, less than four miles south of the Idaho Champion, in a similar disseminated deposit, obtained mining and milling costs for the year ending December 31, 1937, of $ .5929 per ton on a 600 ton per day open pit operation. Per ton costs itemized were: mining $ .1340, steam shovel and dump trucks $ .0620, milling $ .3181, assaying $ .0210, power, light and heat $ .0578.

With 15 feet or less of overburden open pit mining costs, on a 1000 ton per day operation, should not exceed $ .50 per ton. A tentative estimate of milling costs is $2.00 per ton and with loss in recovery estimated at $ .50 per ton, it would appear that all ore over $3.00 per ton probably could be mined at a profit at the $35.00 per oz. price of gold.

Bibliography.

H. S. Loraine U. S. Bureau of Mines, I. C. 7039 (1938)
Gold mining and milling in Idaho County, Idaho

Lindgren, Waldemar, The Gold and Silver Veins of the Silver City, De Lamar, and Other Districts in Idaho: 20th Ann. Rept., Geol. Survey, 1899, part III, p. 238.

3. Physical Description - IDAHO CHAMPION

Lorain, S. H., and Metzger, O. H., A Reconnaissance of Placer Mining Districts in Idaho County, Idaho: Inf. Circ. 7023, Bureau of Mines, 1938, 93 pp.

Emigh, G. D., Report on Center Star Mine, 1933

Geological map of parts of the Tenmile, Elk City, Buffalo Hump and Orogrande districts, R. W. Gromme, geologist, Moscow, Idaho, May 21, 1953.

Map of Orogrande zone system and Orogrande and Tenmile ledge systems in the Golden Orogrande and Elk City districts, north Central Idaho, by W. A. Hogan, Spokane, Washington, December, 1926; E. G. Wagner, Lewiston, Idaho, October, 1931

Map of Baner - Champion combination by E. G. Wagner showing "main dike" and "second dike".

Geology and ore deposits of Elk City, Orogrande, Buffalo Hump, and Tenmile District, Idaho County, USGS Circ. 9, (1934) (P. J. Shennon, Reed J.C.

Reconnaissance Geology of the Elk City Region, Idaho, October, 1959 by Rolland R. Reid

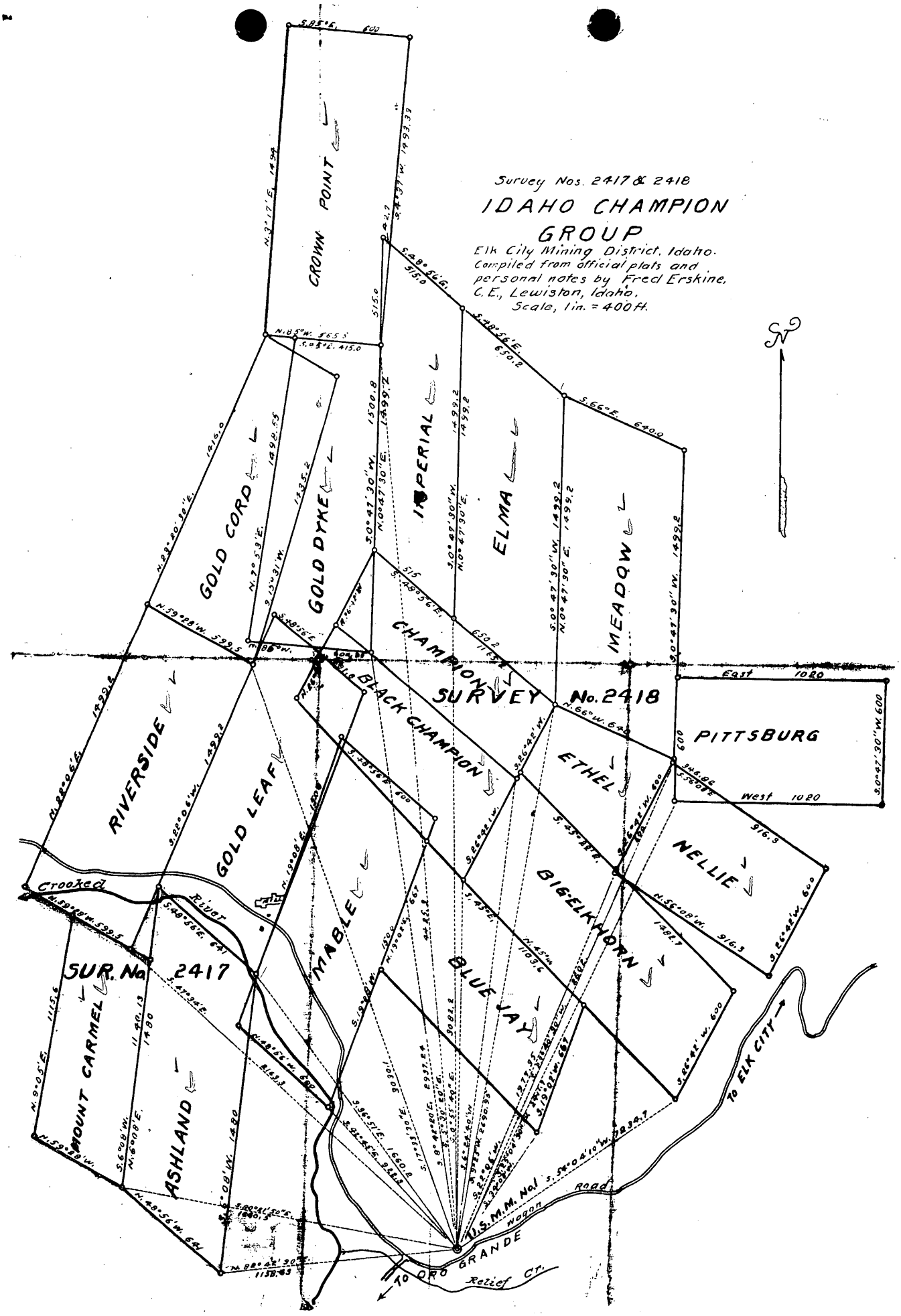
Placer Deposits of the Elk City Region, Idaho, July 1960, by Rolland R. Reid

Shenon, P. J., and Reed, J. C., Geology and Ore Deposits of the Elk City, Orogrande, Buffalo Hump, and Ten-mile Districts, Idaho County, Idaho: Geol. Survey Circ. 9, 1934, 89 leaves (mimeographed).

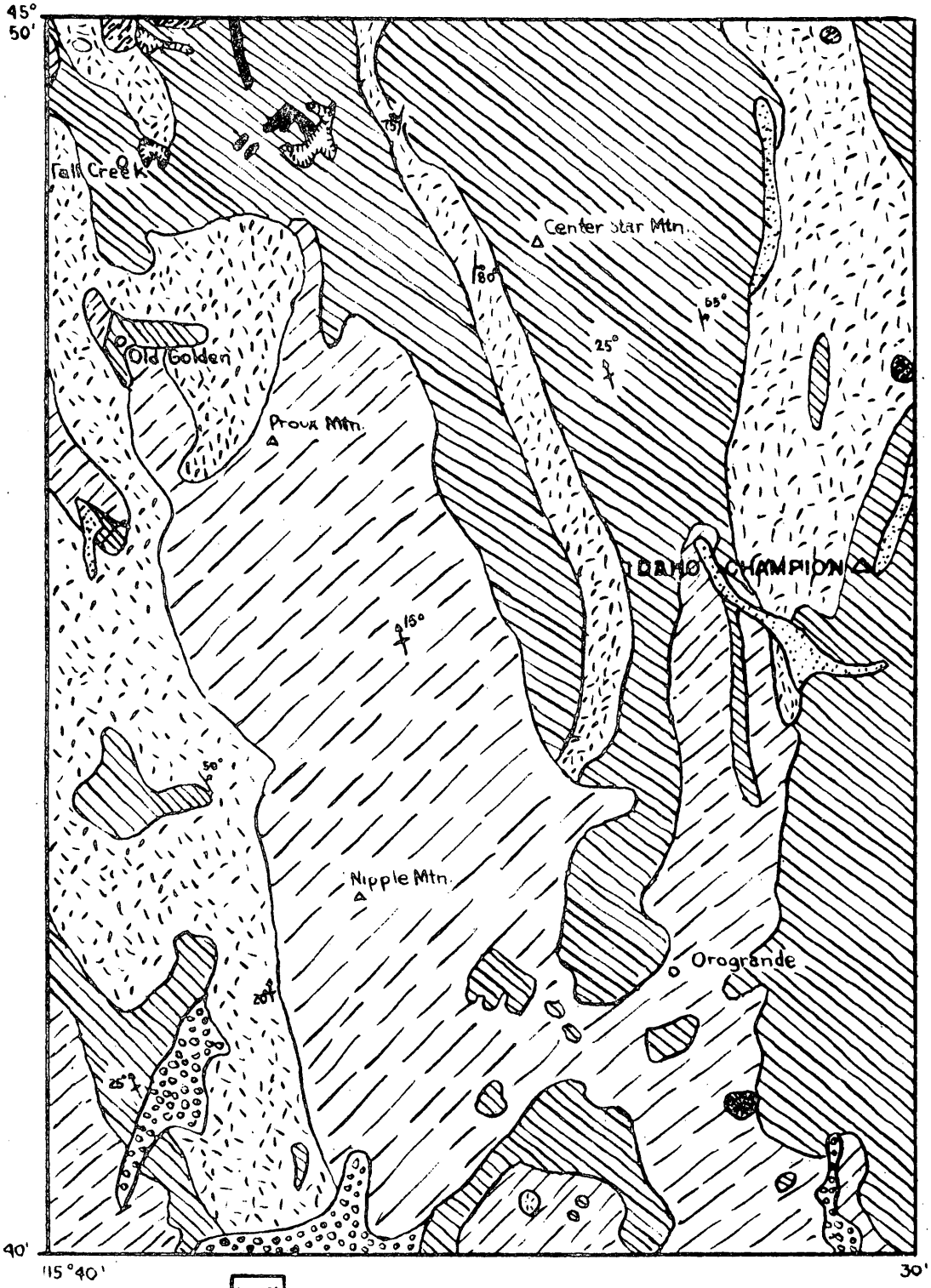
Reed, J. C., Geology and Ore Deposits of the Warren Mining District, Idaho County, Idaho: Idaho Bureau of Mines and Geology, Pamphlet 45, Moscow, Idaho, 1938.

Shenon, P. J., and Ross, C. P., Geology and Ore Deposits Near Edwardsburg and Thunder Mountain, Idaho: Idaho Bureau of Mines and Geology, Pamphlet 44, Moscow, Idaho, 1936.

3. Physical Description - IDAHO CHAMPION


Survey Nos. 2417 & 2418
IDAHO CHAMPION GROUP
Elk City Mining District, Idaho.
Compiled from official plats and personal notes by Fred Erskine, C.E., Lewiston, Idaho.
Scale, 1 in. = 400 ft.
CROWN POINT
GOLD CORD
GOLD DYKE
IMPERIAL
ELMA
MEADOW
CHAMPION
SURVEY No. 2418
BLACK CHAMPION
PITTSBURG
East 1080
West 1020
RIVERSIDE
GOLD LEAF
ETHEL
NELLIE
BIG ELKHORN
MABLE
BLUE JAY
SUR. No. 2417
MOUNT CARMEL
ASHLAND
Crooked River
U.S.M.M. No. 1
Wagon Road
ORO GRANDE
Relief Ct.
TO ELK CITY

Geological map of parts of the Tenmile, Elk City, Buffalo Hump, and Orogrande Districts



EXPLANATION

QUATERNARY
Sedimentary Rocks

Recent
Alluvium

Pleistocene
Morainal material

TERTIARY

Unconsolidated lake and stream deposit

ALGONKIAN
Metamorphic Rocks

Gneiss and related rocks

Quartzite

TERTIARY
Igneous Rocks

Porphyritic dacite

MESOZOIC

Granitic rocks

Strike and dip of bedding or foliation.

Direction and degree of pitch of linear stretching.

Placered ground

Placer pit

Scale in miles

0 1 2 3 4 5 6

Exhibit XIII

Mailed

Docket Matter

to

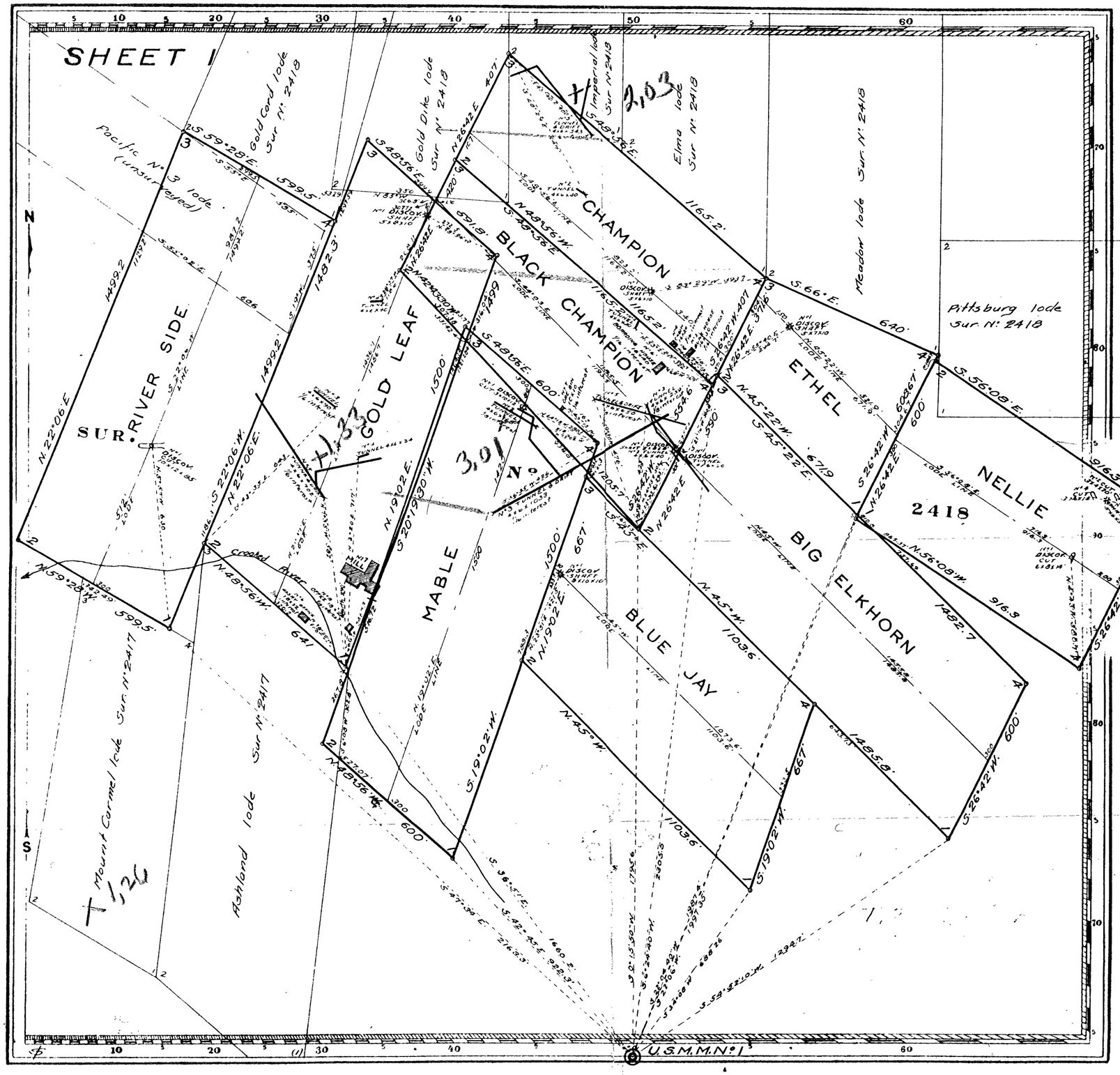
Don Hull

Homestake

Spokane

6/21/74

(4-675)



Claim Located [illegible] 190[illegible]
Company [illegible]
April 1 [illegible]

Mineral Survey Nº 2418 SHEET 1

~~Lot Nº~~

Lewiston Land District

PLAT

OF THE CLAIM OF

Thunder Mountain Gold Company

KNOWN AS THE

CHAMPION GROUP LODE CLAIM

IN Elk City MINING DISTRICT
Idaho COUNTY Idaho
Containing an Area of 240.156 Acres
Scale of 300 feet to the inch
Variation 21°30' E
SURVEYED September 12-28, 190[illegible] BY
Arthur A. Booth
U.S. Mineral Surveyor.

The Original Field Notes of the Survey of the Mining Claim of Thunder Mountain Gold Company known as the Champion Group comprising the Black Champion, Big Elkhorn, Nellie, Blue Jay, Champion, Gold Dike, Gold Leaf, Mabel, Imperial, Elma, Pittsburg, River Side, Mabel, Ethel, Crown Point and Gold Cord lodes, from which this plat has been made under my direction, have been examined and approved, and are on file in this Office, and I hereby certify that they furnish such an accurate description of said Mining Claim as will, if incorporated into a patent, serve fully to identify the premises, and that such reference is made therein to natural objects or permanent monuments as will perpetuate and fix the locus thereof.

I further certify that Five Hundred Dollars worth of labor has been expended or improvements made upon said Mining Claim by claimant or its grantors, and that said improvements consist of: 9 shafts, 11 cuts, 16 tunnels and 6 buildings.

Total Value $44,130.00

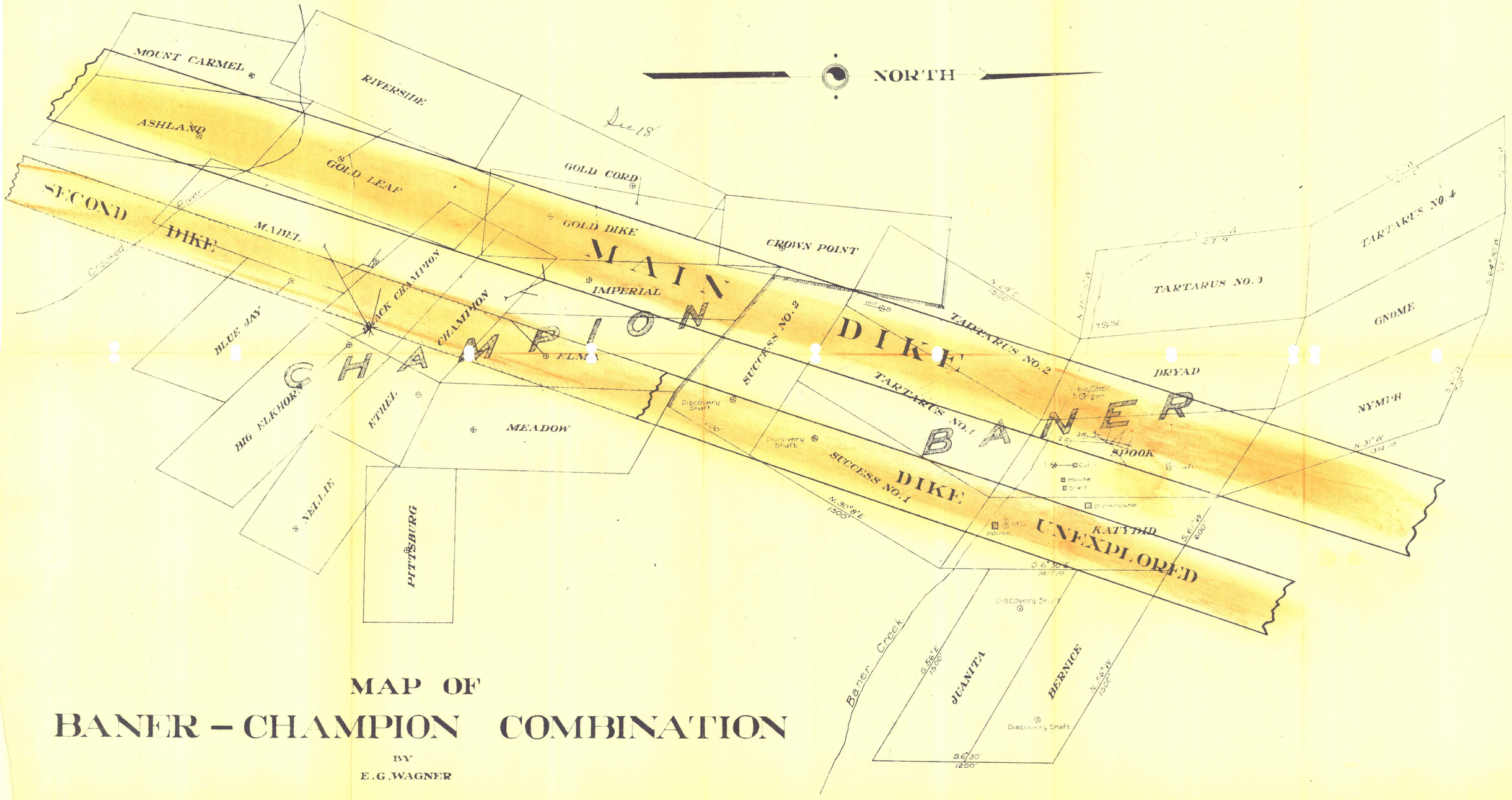
that the location of said improvements is correctly shown upon this plat, and that no portion of said labor or improvements has been included in the estimate of expenditures upon any other claim.

And I further certify that this is a correct plat of said Mining Claim made in conformity with said original field notes of the survey thereof, and the same is hereby approved.

U.S. Surveyor General's Office,
Boise City, Idaho
December 30, 1908

U.S. Surveyor General for Idaho

[illegible]erial 03157, Pat 296532, Pat [illegible] 912

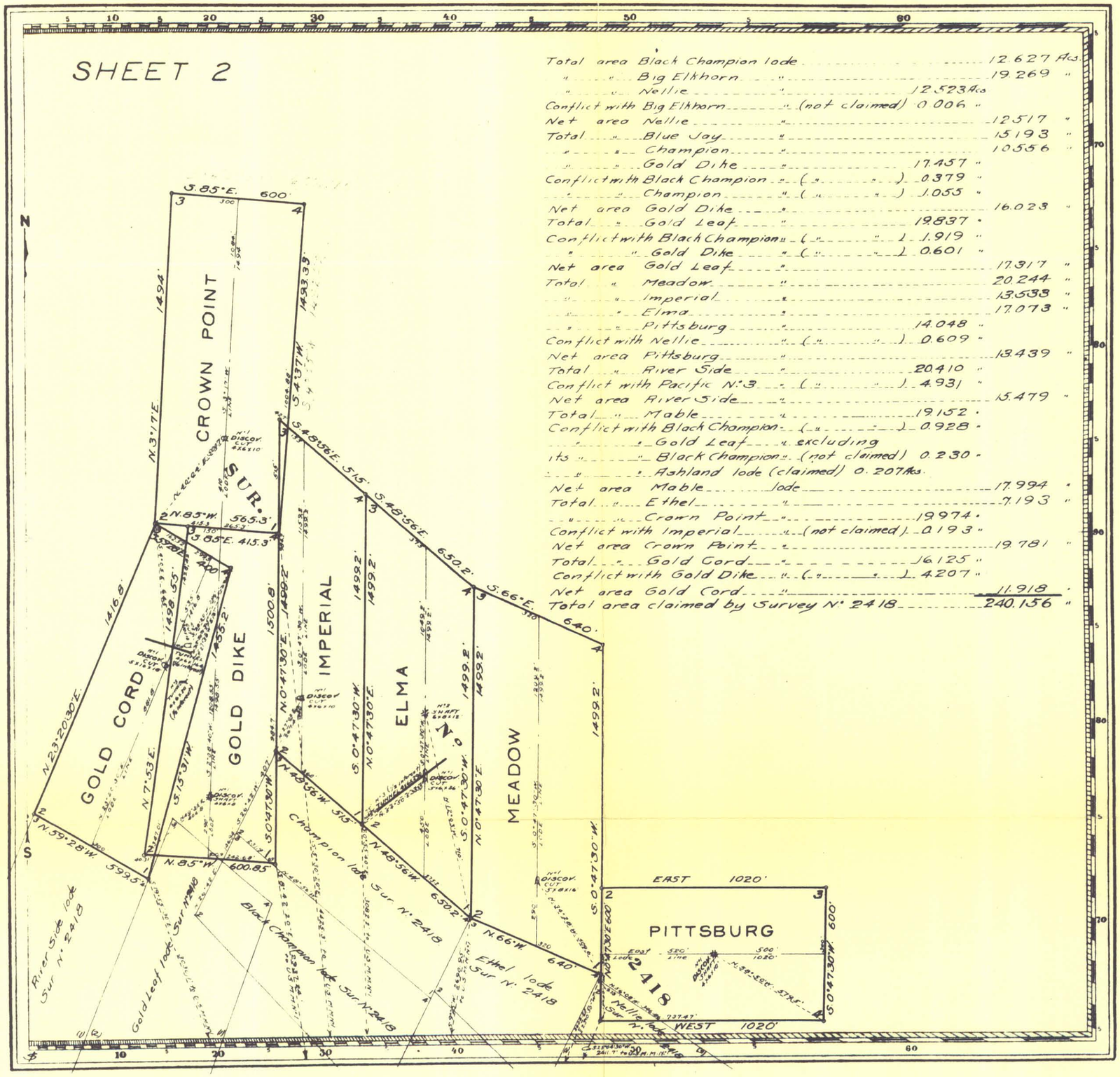


MAP OF
BANER – CHAMPION COMBINATION

BY

E.G.WAGNER

SHEET 2



Total area Black Champion lode		12.627 Acs.
" " " Big Elkhorn "		19.269 "
" " " Nellie "	12.523 Acs	
Conflict with Big Elkhorn " (not claimed)	0.006 "	
Net area Nellie "		12.517 "
Total " Blue Jay "		15.193 "
" " " Champion "		10.556 "
" " " Gold Dike "	17.457 "	
Conflict with Black Champion " (")	0.379 "	
" " " Champion " (")	1.055 "	
Net area Gold Dike "		16.023 "
Total " Gold Leaf "	19.837 "	
Conflict with Black Champion " (")	1.919 "	
" " " Gold Dike " (")	0.601 "	
Net area Gold Leaf "		17.317 "
Total " Meadow "		20.244 "
" " " Imperial "		13.533 "
" " " Elma "		17.073 "
" " " Pittsburg "	14.048 "	
Conflict with Nellie " (")	0.609 "	
Net area Pittsburg "		13.439 "
Total " River Side "	20.410 "	
Conflict with Pacific N° 3 " (")	4.931 "	
Net area River Side "		15.479 "
Total " Mable "	19.152 "	
Conflict with Black Champion " (")	0.928 "	
" " " Gold Leaf " excluding		
its " " " Black Champion " (not claimed)	0.230 "	
" " " Ashland lode (claimed)	0.207 Acs.	
Net area Mable lode		17.994 "
Total " " Ethel "		7.193 "
" " " " Crown Point "	19.974 "	
Conflict with Imperial " (not claimed)	0.193 "	
Net area Crown Point "		19.781 "
Total " " Gold Cord "	16.125 "	
Conflict with Gold Dike " (")	4.207 "	
Net area Gold Cord "		11.918 "
Total area claimed by Survey N° 2418		240.156 "

Claims Located Gold Dike, June 3, 1902
Meadow, July 3, 1902
Imperial, Sept 18, 1902, Elma, Pittsburg, Oct 20, 1902, Crown Point, Gold Cord, Nov 23, 1902

Mineral Survey No. 2418 SHEET 2

~~Lot~~ No.

Lewiston Land District.

PLAT

OF THE CLAIM OF

Thunder Mountain Gold Co.

KNOWN AS THE

CHAMPION GROUP
LODE CLAIM

IN Elk City MINING DISTRICT.
Idaho COUNTY. Idaho
Containing an Area of 240.156 Acres
Scale of 400 feet to the inch.
Variation 21°30' East

SURVEYED September 12 28, 1908 BY
Arthur A Booth
U.S. Mineral Surveyor.

The Original Field Notes of the Survey of the Mining Claim of Thunder Mountain Gold Company known as the Champion Group comprising the Black Champion, Big Elkhorn, Nellie, Blue Jay, Champion, Gold Dike, Gold Leaf, Meadow, Imperial, Elma, Pittsburg, River Side, Mable, Ethel, Crown Point and Gold Cord lodes from which this plat has been made under my direction have been examined and approved, and are on file in this Office; and I hereby certify that they furnish such an accurate description of said Mining Claim as will, if incorporated into a patent, serve fully to identify the premises, and that such reference is made therein to natural objects or permanent monuments as will perpetuate and fix the locus thereof.

I further certify that Five Hundred Dollars worth of labor has been expended or improvements made upon said Mining Claim by claimant or its grantors, and that said improvements consist of 9 shafts, 11 cuts, 16 tunnels and 6 buildings.

Total value $4473 00

that the location of said improvements is correctly shown upon this plat, and that no portion of said labor or improvements has been included in the estimate of expenditures upon any other claim.

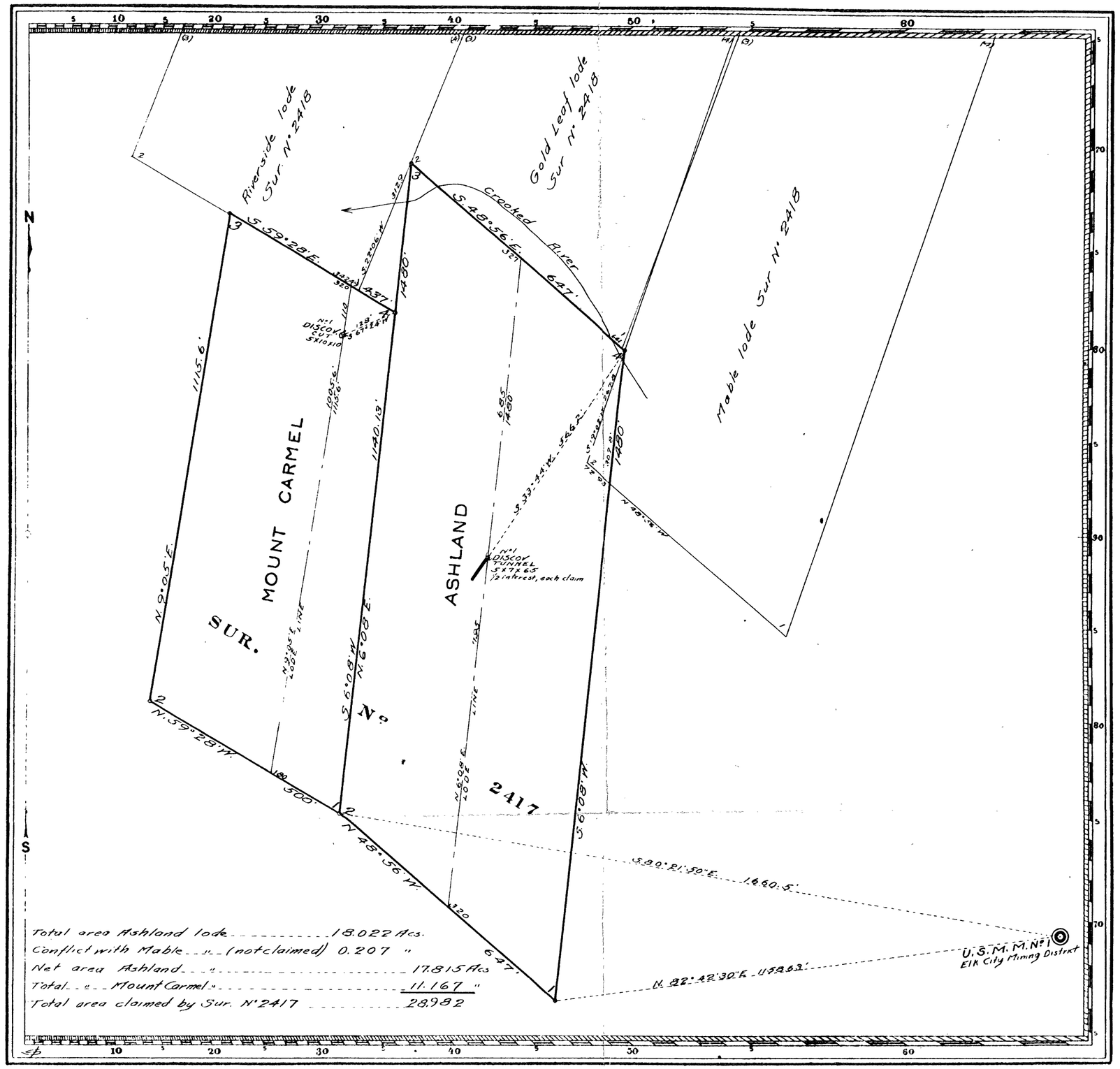
And I further certify that this is a correct plat of said Mining Claim made in conformity with said original field notes of the survey thereof, and the same is hereby approved.

U.S. Surveyor General's Office.
Boise City, Idaho
December 30, 1908

U.S. Surveyor General for
Idaho

2417

(4-675)



Claim Located July 14, 1906

Mineral Survey No. 2417

~~Lot No~~

Lewiston Land District.

PLAT

OF THE CLAIM OF

Thunder Mountain Gold Company

KNOWN AS THE

ASHLAND GROUP
LODE CLAIM

IN Oro Grande MINING DISTRICT,
Idaho COUNTY, Idaho

Containing an Area of 28.982 Acres.

Scale of 200 feet to the inch.

Variation 21°30' E.

SURVEYED September 12-28, 1908 BY
Arthur A. Booth
U.S. Mineral Surveyor,

The Original Field Notes of the Survey of the Mining Claim of Thunder Mountain Gold Company known as the Ashland Group comprising the Ashland and Mount Carmel lodes

from which this plat has been made under my direction have been examined and approved, and are on file in this Office; and I hereby certify that they furnish such an accurate description of said Mining Claim as will, if incorporated into a patent, serve fully to identify the premises, and that such reference is made therein to natural objects or permanent monuments as will perpetuate and fix the locus thereof.

I further certify that Five Hundred Dollars worth of labor has been expended or improvements made upon said Mining Claim by claimant or its grantors, and that said improvements consist of a cut and a tunnel

Value $1090.00

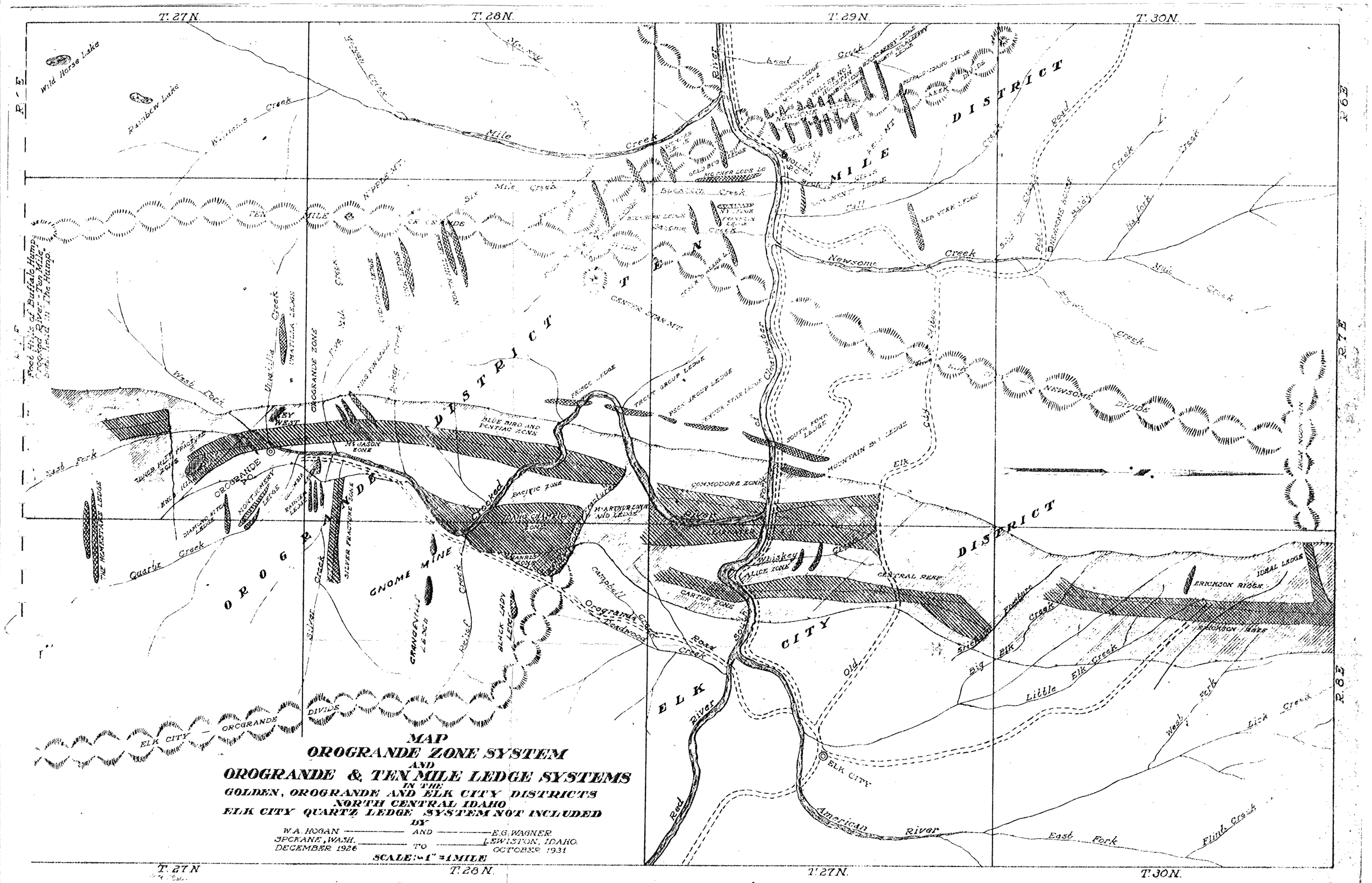
that the location of said improvements is correctly shown upon this plat, and that no portion of said labor or improvements has been included in the estimate of expenditures upon any other claim.

And I further certify that this is a correct plat of said Mining Claim made in conformity with said original field notes of the survey thereof, and the same is hereby approved.

U.S. Surveyor General's Office, Boise City Idaho, December 8, 1908

[illegible] U.S. Surveyor General for Idaho

Serial 03158, Pat 239770, Dec 21, 1911



MAP
OROGRANDE ZONE SYSTEM
AND
OROGRANDE & TEN MILE LEDGE SYSTEMS
IN THE
GOLDEN, OROGRANDE AND ELK CITY DISTRICTS
NORTH CENTRAL IDAHO
ELK CITY QUARTZ LEDGE SYSTEM NOT INCLUDED
BY

W. A. HOGAN — AND — E. G. WAGNER
SPOKANE, WASH. — TO — LEWISTON, IDAHO.
DECEMBER 1926 — OCTOBER 1931

SCALE: 1" = 1 MILE