UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF MINES

OFFICE OF
REGIONAL DIRECTOR

REGION IV

224 NEW CUSTOMHOUSE
DENVER 2, COLORADO

April 27, 1951

Memorandum

To: Landon Strobel, Executive Secretary, Defense Minerals Administration

From: DMAField Team, Region IV

Subject: DMA Docket 12, Kokomo Metals Consolidated, Summit County, Colorado

We are attaching the report of the investigation of Kokomo Metals Consolidated, DMA Docket 12.

This property was investigated by Deane F. Kent, U. S. Geological Survey, and you will note that he concludes that the Robinson property does not warrant an exploration loan. However, the Michigan-Uthoff mines should be considered for an exploration loan.

Mr. Ryan, the applicant, has been contacted by Mr. A. H. Koschmann, regarding matching funds for the exploration of the Michigan-Uthoff mines. He has indicated that he will advise us within a few days.

J. H. East, Jr.

J. H. East, Jr.

A. H. Koschmann

A. H. Koschmann

Attachments

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KOKOMO METALS CONSOLIDATED
SUMMIT COUNTY, COLORADO

DEFENSE MINERALS ADMINISTRATION REPORT

DMA DOCKET 12

APPROVED:

J. H. East, Jr.

A. H. Koschmann

DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS ADMINISTRATION
James Boyd, Administrator

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
200 New Customhouse
Denver 2, Colo.

April 24, 1951

Memorandum

To : Field Team, DMA, Region IV

From : Supervising Geologist, Colorado-Wyoming

Subject: DMA Docket No. 12 - Kokomo Metals Consolidated, Summit County, Colorado.

Attached is field report by Mr. Deane F. Kent covering above Docket DMA 12. Mr. Kent recommends that this application be considered for an exploration loan to be applied on the Uthoff property. The Robinson group of claims and property, which is also included in this application for a loan, has only minor ore reserves, and the owner does not control the adjacent property underlain by the probable extension of known ore shoots. Mr. Kent therefore concludes that this property does not warrant an exploration loan. I concur in the conclusions and recommendations of Mr. Kent.

A. H. Koschmann
A. H. Koschmann
Supervising Geologist
Colorado-Wyoming

Attachment

Defense Minerals Administration

Docket No. 12

Kokomo Metals Consolidated, Summit County, Colorado

Geology of the Robinson and Michigan-Uthoff Mines, Kokomo, Colorado

by

Deane F. Kent

U. S. Geological Survey

1951

Kokomo Metals Consolidated

Robinson and Michigan-Uthoff Groups

Summit County, Colorado

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Summary, Conclusions, and Recommendations

The properties of the Kokomo Metals Consolidated are located in the Kokomo mining district, Colorado, just southwest of the town of Kokomo. All ore bodies of this part of the district are massive replacements of limestones of Pennsylvanian and Permian(?) age. Gentle flexures and normal faults localize the ore bodies which consist of a mixture of pyrite, pyrrhotite, sphalerite, galena, and chalcopyrite with minor amounts of gold and silver. There is no geologic evidence to preclude the continuance of known ore shoots to much deeper levels.

There are no measured ore reserves on either property. The Robinson group is not recommended for a development or exploration grant as the known indicated and inferred reserves of less than 1000 tons do not warrant the expense of production and the owner does not control the property underlain by the probable extension of known ore shoots.

The Michigan-Uthoff group is not recommended for a development loan but rather for an exploration grant. There are 12,000 tons of inferred reserves which might average 14.4 percent zinc, 3.8 percent lead, 0.4 percent copper, 4.5 ounces silver, and .095 ounces gold per ton. More reserves could probably be developed and the above proven with drilling and sampling. The relation of the property boundaries and mine workings is uncertain, therefore, an accurate mine and property survey and a detailed geologic map of the Uthoff level with all workings sampled must precede further work. A tentative drilling program, to be accompanied by reopening the Uthoff level, is proposed and the minimum cost of such a program is estimated at about $25,000.

It is recommended that this application be considered for an exploration grant.

Introduction

The properties of the Kokomo Metals Consolidated are in the Kokomo Mining District, located in the southwestern corner of Summit County in the central part of the state and is a part of the "Mineral Belt" of Colorado. The area is drained by the valley of Tenmile Creek, a tributary of the Blue River which flows into the Colorado River at Kremling. Kokomo, the only settlement of the district, is on State Highway 91 and is 17 miles north of Leadville, and has an average population of 70. Climax, 5 miles to the south, is on Highway 91 and is the terminus of a branch of the Colorado and Southern Railroad which connects with the Denver and Rio Grande Western Railway at Leadville. Kokomo is served by trucks at $1.50 per ton trip which haul the crude ore to the custom mills and smelter at Leadville. The district is subject to short cool summers and long cold winters with heavy snowfall which often makes mine road maintenance a serious problem.

The application contained in this docket refers to three groups of claims (Robinson, Uthoff, and Snowbank) in item No. 1 and to two additional groups (Champion and New York Placer) in the attached list of mining property, all in the Kokomo mining district. For clarity the Robinson, Champion, and New York Placer will be called the Robinson group in the report, and the Snowbank and Uthoff will be referred to as the Michigan-Uthoff group (see fig. 2). These are the accepted names of the properties and also refer to the mine workings which would be the access for any mining operations which would be conducted under this application.

History

Placer deposits were first worked in the area in 1861 and by 1879 many mines were operating on the silver ores of Sheep and Elk Mountains. Zinc and lead ore bodies were opened and intermittent production has continued until the present. The value of production from the district prior to 1902 is estimated at $20,000,000 and over $25,000,000 has been added since that date. Most of this production has come from the mines west and southwest of the town of Kokomo. The Robinson and Michigan-Uthoff mines are located southwest of the town. The groups of claims represented in this report are wholly owned by A. R. Rhine of 2550 Yarrow Street, Lakewood, Colorado.

General Geology

The geologic formation of the Kokomo district, on the west side of the Mosquito range, comprise three main groups: (1) pre-Cambrian gneisses, schists, and granites; (2) a thick series of Carboniferous and Permian (?) sandstones, shales, and limestones with remnants of the Cambro-Ordovician rocks beneath; and (3) the extensive intrusive rocks of late Cretaceous or early Tertiary age. The formations have been faulted and folded. The overall structure of the district is a northwest plunging syncline truncated on the east by the high angle reverse fault known as the Mosquito fault. The structure of the syncline is further complicated by a series of normal faults of relatively small displacement. The predominant trend of these faults is from N. 30° E. to N. 80° E. but another strong system has a strike of N. 20° W. to N. 60° W. Low angle or near bedding plane faults are found in every mine.

The Robinson Group

Location and History.- The Robinson group and mine is located at the end of a good gravel road 1.4 miles southwest of the town of Kokomo. Dates are uncertain but the mine was operating by 1882 and by 1896 [1] had produced in

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[1] Koschmann, A. H., and Wells, F. G., Preliminary report on Kokomo mining district, Colo.: Colo. Soc. Proc., vol. 15, no. 2, p. 56, 1949.

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excess of $6,000,000 from the No. 1 ore shoot. The No. 2 ore shoot produced about a third of that figure and $28,000 came from the No. 3 ore shoot. Between 1902 and 1919 31,924 tons of ore were mined but there is no recorded production since the latter date. A weighted average of 28,732 tons shows .033 ounces gold per ton, 4.67 ounces silver per ton, 9.4 percent lead, and 6.68 percent zinc. Several minor attempts to open the mine for production were made since 1919 but in 1948 the American Smelting and Refining Company reopened, track and pipe were laid, and the main level was advanced 1000 feet. Favorable areas were explored by diamond drill holes and exposed faces showing mineralization were sampled. No ore was found as result of this drilling. A geological map of the mine, scale 1 inch equals 50 feet, was completed in the winter of 1949 and is shown in fig. 2.

Ownership

The group of claims owned by Mr. Rhine is listed below and shown on figure 2. Note the relation of the stoped areas to the property boundaries.

Table I

Production of Robinson-International Mine

Owner	Year	Tons	Au Oz/ton	Ag Oz/ton	Cu	Pb	Zn
Robinson Consolidated Mining Co.	1902	2,817		7.100			
International Mining Co.	1908	315					16.502
International Mining Co.	1908	2,685	0.059	6.704		9.201	
Wilson Mining Co.	1910	11,460	0.019	4.492		8.829	6.567
Wilson Mining Co.	1911	8,106	0.029	5.832		9.621	8,476
King Solomon-Robinson Mining and Transportation Co.	1912	5,500	0.031	4.239	0.007	5.196	2.476
King Solomon-Robinson Mining and Transportation Co.	1912	26	0.121	21.115		50.187	
Progress Mining and Milling Company	1917	136	0.438	17.169	0.028	17.321	
Progress Mining and Milling Company	1917	60				6.083	24.00
Ready-Cash Mining and Milling Company	1918	220	0.100	5,914		1.584	
Ready-Cash Mining and Milling Company	1918	419	0.165	6.379		6.507	
Ready-Cash Mining and Milling Company	1918	159	0.075	3.962		2.870	38.68
Wilson Mill Cleanup	1919	21	0.019	5,048		3,340	

Robinson Group

"78"	No. 369	Denver City	No. 1668
Undine	368	Pirate No. 2	1065
Undine No. 2	1980	Sand	5115
Checkmate	407	Lime	5115
Hope	864	Shale	5115
G.B.R.	409	Rhone	406
Big Giant	547	Tenmile	513
Roberts	1049	Pirate	2086

Champion Group

Champion 1	No. 9674
Champion 2	9674
Champion 3	9674

New York Placer Group

The north 13½ acres of the New York Placer No. 1244

Mine Workings

The Robinson adit has been driven to a length of 3800 feet along the main limestone bed of the Robinson member (Figure 2). Three main ore shoots were mined from this level - No. 1, No. 2, and No. 3. Inclines were used to hoist or lower the ore to the tunnel level until depth made this method of mining uneconomic. Shafts were then put down (Champion, Felicia Grace, and Eldorado) for mining the ore from the lowest levels.

The ore shoots were developed by drifts from the inclines at intervals from 50 to 150 feet in depth. All of the stopes are caved with the exception of the upper 300 feet of the No. 2 shoot. A few narrow raises followed narrow veins up into the sandstone to a point where the mineralization diminished.

Plant

A smelter once stood near the portal but only the stack remains. The old blacksmith shop is the only building left on the property and it can only be used for temporary shelter. All other equipment, including rails and pipe, has been removed from the property.

Geology

Stratigraphy.- The Robinson mine workings are in the Robinson limestone member of the Minturn formation of Pennsylvanian and Permian (?) age. This member varies in thickness locally from 300 to 400 feet and contains three beds of limestone. The rest of the rocks making up the member are fine- to coarse-grained, red or gray sandstones and shales with lenticular beds of conglomerate. The limestones are gray and contain maroon streaks. They vary in thickness from 5 to 28 feet. The Robinson adit was driven on the lower of the three beds which is locally known as the lower Robinson limestone. This bed is 28 feet in thickness, has an irregular nodular structure, and has been replaced by coarse-grained dolomite in many places. This is the only bed replaced by ore in the Robinson mine.

Structure.- The mine area is located on the west side of the Kokomo syncline and the beds trend consistently to the northwest and dip from 25 to 30° northeast. The limestone is displaced by many normal faults which have a strike of from N. 45° E. to N. 70° E. These have been channels for the ore solutions in many cases and stoping has extended up 60 feet on one of these. The most important structures are minor flexures along the limestone bed. The changes of strike are slight but careful mapping of the contacts reveals their presence. The only ore shoot which could be mapped in the mine follows

the axial strike of a gentle anticline. This trend roughly parallels the major faults of the immediate area. These flexures fractured the limestones and prepared the openings for the ascending ore solutions which followed.

Ore deposits.- The ore shoots follow the trend of the axes of the flexures described above. They vary in thickness from a few inches to 13-15 feet and generally only the upper part of the limestone is replaced. The ore occurs as massive replacements or breccia fillings in dolomitized limestone. Very little silicification accompanied the mineralization of this area. The ore is composed of pyrite, sphalerite (marmatite), galena, chalcopyrite, and pyrrhotite, and contains varying amounts of silver and gold. The ore has been mined mainly for its lead and silver and the zinc discarded.

Ore Reserves

The adit portal was completely closed by a recent cave-in and all of the mine workings are inaccessible. The mine has been studied in detail by the writer and the only ore remaining was found in small pillars or pockets along the sides of the stopes. The exploration program conducted by the American Smelting and Refining Company did not find new ore. Mr. Mackey (Mr. Rhine's proposed operator) of Kokomo trenched part of the surface outcrop of the Robinson limestone on the up-dip extension of shoot No. 2 and found small pockets of rich lead ore. The distance from this occurrence to known workings is less than 40 feet on the dip which discounts the possibility of any sizeable deposit here. Other proposed work by Mr. Rhine includes robbing pillars and stoping the small veins extending upward into the sandstones. The known ore shoots might be extended by exploration but Mr. Rhine does not control the property (Fig. 2). Ore tonnage in all categories will not total over 1000 tons.

Recommendations

Due to problems of ownership and the lack of favorable geologic evidence this property is not recommended for development or exploration. More details are available at the end of this report.

The Michigan-Uthoff Group

Location

The Michigan-Uthoff group is located immediately southwest of the town of Kokomo - part of the property includes 17 acres of the townsite itself. Underground access is provided by three adits now in good shape (Upper Michigan, Lower Michigan, and Uthoff) and two inclined shafts now caved (Nettie B incline and Snowbank incline). Good gravel roads connect the portals of these adits with the main highway at Kokomo (Fig. 2).

Production

Production from this group is reported as early as 1871 but the exact figures are unknown. However, estimates compiled from several sources show an approximate production of $800,000 from the Nettie B. and Snowbank workings. This was largely high grade, lead-silver, oxidized ore near the surface. Considerable ore has been taken out since that time and Table II shows the total production of the group from 1902 to 1949. Table III gives the yearly production of the group.

Ownership

All of the claims comprising the group are owned by Mr. A. R. Rhine of Lakewood, Colorado. A list of claims follows:

Snowbank Group

Snowbank	No. 963	Hiawatha	No. 1067
Montour	961	Michigan	962
Wanette	1068		

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TABLE II

Total Production from Michigan-Uthoff Group 1902-1949

Mine	Incl.Date	Tons	Au Oz/Ton	Ag Oz/Ton	% Cu	% Pb	% Zn
Kokomo Metals Cons.	35-36	33	0.420	6.15		6.50	
Michigan Group	02-49	72,534	0.103	4.82	0.25	0.97	1.36
Nettie B. Group	02-49	9,130	0.095	4.52	0.36	3.81	14.41
Snowbank	02-49	5,776	0.034	3.55	0.22	2.12	7.69
Uthoff	04-08	4,360	0.155	5.93		10.18	18.49
TOTAL	02-49	91,833					

TABLE III

Yearly production from Michigan-Uthoff group, 1902-1949

Mine	Operator	Date	Tons	Au Oz/ton	Ag Oz/ton	% Cu	% Pb	%Zn
Uthoff Tunnel	Peter Fisher	1904	300	0.050	5.00	-	-	-
		1907	3000	0.50	6.000	-	-	-
		1907	1000	0.500	6.000	-	10.59	18.40
	Uthoff Tunnel Co.-F.G.Uthoff	1908	60	-	-	-	3.53	20.00
Nettie B. Group - Shafts,drifts	P. Fisher, lessee	1902	3000	0.053	4.500	-	-	-
		1903	2300	0.100	6.000	-	-	-
Inclined shaft	Uthoff Tunnel Co.	1906	900	0.175	5.000	-	2.35	17.50
		1906	100	-	-	-	11.77	40.00
Inclined shaft	L. L. B. Mining Co.	1912	942	0.161	4.208	-	5.28	16.23
		1912	23	0.083	10.174	0.59	24.83	-
		1913	1298	0.105	3.459	-	3.55	14.14
		1913	21	0.080	12.143	0.81	19.70	7.54
	A. R. Rhine	1943	162	0.036	1.08	0.10	0.27	1.91
	Clark-Mackey Development Co.	1948	32	0.031	2.50	-	1.19	5.62
		1949	210	0.038	0.29	-	2.79	8.54
		1949	142	0.014	4.88	0.56	0.70	5.73
Snowbank	J. Stetthauer	1902	155	0.129	7.000	-	21.18	-
	Clark-Mackey Development Co.	1946	1381	0.036	5.17	0.34	4.08	10.79
		1947	4166	0.030	2.88	0.18	0.75	6.65
		1949	74	0.100	3.54	-	6.29	10.87
Michigan Group - Tunnels & shafts	W. C. Acton	1902	?	0.750	15.000	-	19.61	-
		1902	6717	0.145	5.020	-	-	-
		1903	4504	0.093	3.735	-	-	-
		1904	1213	0.104	5.698	-	-	-
		1905	2000	0.105	5.161	-	-	-
		1906	1920	0.080	4.000	-	-	-
		1906	55	0.160	8.000	-	23.53	-
		1907	650	0.083	4.163	-	0.76	-

Mine	Operator	Date	Tons	Oz/ton	Oz/ton	% Cu	% Pb	%ZN
Michigan Group (continued)		1908	1600	0.050	3.000	-	-	-
		1909	3597	0.118	3.239	0.002	0.06	-
		1910	247	0.124	5.368	0.445	2.30	-
		1911	399	0.120	4.644	0.446	0.08	-
		1912	189	0.155	3.672	0.027	0.52	-
		1913	37	0.136	3.730	-	0.81	-
		1915	96	0.149	4.875	-	1.39	-
		1916	3198	0.153	5.136	0.78	0.58	-
		1916	84	0.459	6.464	-	12.28	2.09
		1917	8678	0.138	5.601	0.11	0.74	0.25
		1917	855	0.399	5.199	-	7.94	1.40
		1918	3174	0.081	4.562	0.10	0.23	-
		1919	1388	0.070	4.110	-	-	-
		1920	9108	0.081	5.125	0.39	-	-
		1921	7719	0.086	4.831	0.10	2.70	1.76
		1922	12980	0.074	5.074	0.45	0.11	-
		1923	2126	0.104	5.677	0.42	0.47	-
	Kokomo Metals Cons.- A. R. Rhine	1935	6	-	16.167	-	6.53	
		1936	27	0.419	3.926	-	-	-
Upper Michigan	Clark-Mackey Development Co.	1948	346	0.239	3.22	0.07	2.28	0.94
		1949	227	0.066	3.40	0.11	1.02	6.65
Lower Michigan		1948	1112	0.018	4.23	0.29	0.76	5.32
		1949	267	0.017	3.90	0.42	0.68	5.40
Porter J.		1949	128	0.016	3.93	0.20	1.42	6.73

Uthoff Group

Luminary	No. 1770	Sunrise	No. 1274
Morning Star	1275	Tiger	18294
Chesapeake	1227	Nettie B.	18294
Sunshine	1771	17 acres of Kokomo townsite (Fig.2)	

Mine Workings

All the shafts and inclines on the property are now caved and inaccessible. Three adits (Figs. 2 and 3) provide access to different levels of the underground workings at the Upper Michigan (Elev. of portal 10,998), Lower Michigan (Elev. of portal 10,866), and the Uthoff tunnel (Elev. of portal 10,684). Only the latter portal is on the property and a working agreement must be made with the American Smelting and Refining Company to use the Michigan adits. The Upper Michigan crosscut intersects the old Snowbank and Nettie B. inclined shafts and subsidiary workings. Stoping has been done above and below the level. The Lower Michigan level intersects the lower end of the Nettie B. incline and all stoping has been done above the level with the exception of a small stope below the level not on the property under consideration. The Uthoff tunnel (1700 feet long) crosscuts to the White Quail limestone, the ore horizon, and from there drifts extend north and south along the strike. Very little stoping has been done above or below the level; known production indicates approximately 4000 square feet of stopes (Fig. 3). The Uthoff tunnel portal was filled with ice at the time of this examination but a map, scale 1 inch equals 50 feet, was compiled from other sources. However, data are insufficient to give all the information desired for an accurate appraisal of the mine.

The American Smelting and Refining Company coordinate system was used on the maps. This was transferred from copies of other maps, and locations by coordinates, and may be considered accurate within 20 feet. Also, the different surveys of the Uthoff tunnel vary by $3\frac{1}{2}$ degrees which makes a considerable difference in the position of the workings, the geological interpretation and, to a lesser extent, the amount of the ore reserves. An accurate survey should be made of property boundaries and workings before any more work is done. However, the present map was compiled using all available data and, though subject to future adjustment, is accurate enough for this report.

Geology

The ore deposits of the group are found in the middle limestone of the White Quail member of the Minturn formation, approximately 800 feet above the Robinson member. The member consists locally of an upper dark gray siltstone (called the "upper limestone") containing limy beds, and varies in thickness from 2 to 21 feet. It is underlain by from 14 to 38 feet of massive bedded, coarse, gray to pink, conglomerates and grits. These beds are underlain by the main producing limestone. The unit is very consistent throughout the district and consists of 16 to 23 feet of dark gray, nodular and well bedded, fossiliferous limestone, both capped and underlain by up to 7 feet each of dark gray, limy siltstone. The total thickness of the unit varies from 21 to 41 feet. The upper 11 feet of the limestone is well bedded and was the favorable zone for ore replacement.

The lower part of the limestone everywhere contains pyrite veinlets and disseminated pyrite, but commercial ore is rarely found. The unit is underlain by 90 to 120 feet of coarse gray and pink grits and local conglomerate lenses. The base of the member is a 12 to 16 foot dark gray silty limestone which is commonly mineralized and often completely replaced by pyrite-pyrrhotite bodies containing some lead and zinc.

Structure

The structure of this area is identical in most respects to that of the Robinson mine area. It is on the southwest side of the Kokomo syncline, has numerous northeast trending normal faults, a few northwest to west striking normal faults and much bedding plane movement of a thrust fault nature. The minor northeast trending flexures characteristic of the district are present and are the dominant structural ore control.

Ore Deposits

The ore deposits found in the White Quail member are massive replacements of the upper part of the middle limestone bed following zones of weakness established by prior folding and faulting. The ore is an aggregate of pyrite, pyrrhotite, sphalerite, galena, and chalcopyrite. The siltstone at the top forms a cap over the ore and mineralization

penetrated this shaly zone only where it was cut by faults or fractures. Although the lower White Quail limestone has large bodies of massive pyrite and pyrrhotite containing small amounts of zinc and lead, no commercial zinc-lead bodies have been found in the unit. The possibility of the existence of ore in this limestone, however, should not be entirely discounted.

Though there are several ore shoots which were worked through the three adits described above and the extensions of these bodies are excellent prospects today, only the one ore body (Fig. 3 - Shoot No. 1) and possibly another (Shoot No. 2) falls within the claims covered by this application. The extension of No. 1 to the Uthoff level is probably in Area No. 1 (Fig. 3).

The No. 1 shoot varies in width from 140 to 240 feet, 3 to 10 feet in thickness, and has been mined for a stope length in excess of 300 feet on the northwest edge and over 500 feet on the southeast, or Nettie B. incline, side. The ore between these stoped areas consists largely of a pyrite-pyrrhotite core typical of the Kokomo ore bodies. The Ore shoot is narrowed as it extends down dip by a northeast trending, southwest dipping, normal fault which intersects the ore body at an acute angle. This fault is responsible for the probable elimination of the northeast side of the ore body (Fig. 3 - Shoot No. 1A), which is not on the property anyway. The Nettie B. incline shoot probably extends nearly to the Uthoff tunnel level. There it is cut off by the fault described above. This fault is in turn displaced to the west by a northwest trending, northeast dipping (40°) fault which moves the whole ore zone northwestward 250 feet

and off the property. Any possible extension of this zone back onto the property would be below the Uthoff level and would be included in Area No.1 (Fig. 3).

Shoot No. 2 is indicated as a good possibility for finding ore though the mineralization found in the tunnel was mostly pyrite. Confidential sources show at least one drill hole in this area in commercial ore.

Ore Reserves

There are no measured or indicated ore reserves on the property at today's metal prices. All reserves are in the inferred category. Shoot No. 1A cannot be considered as it is not on Mr. Rhine's property. Shoot No. 1 is the probable projection of the Nettie B. ore shoot. Its presence and exact position should be determined by drilling. If it persists at its present strike, width, and thickness, it should contain approximately 12,000 tons (8 cu. ft./ton) of inferred ore. Using the past production figures of this ore shoot this ore might assay 14.4 percent zinc, 3.8 percent lead, .4 percent copper, 4.5 ounces silver, and .095 ounces gold per ton (See Nettie B. Group, Table II). In terms of contained metal this would be approximately 3,450,000 pounds zinc and 900,000 pounds of lead. These figures are undoubtedly high as lower grade ore shipments were probably made from this part of the mine and included with the general Michigan mine totals (Table II). Although some ore may be found in Shoot No. 2 or Area No. 1, the writer cannot make any estimate of tonnage and grade.

Applicant's Proposals

1. The applicant proposes to drill three diamond drill holes with a total footage of 1000 feet. He has no idea of where they should be drilled and would leave the locations to his mine foreman, Mr. Mackey, who is not a mining engineer as stated in the application.

2. He proposes to equip both groups of properties, the Robinson and the Michigan-Uthoff, for mining. This would be unnecessary at this stage (see Recommendations).

3. Proposal to buy a bulldozer. Good roads lead to all portals and the county will maintain these in summer. The county pays half the cost and contracts all snow removal in winter. This would cost the applicant approximately $100 to $175 per month for a maximum of 6 months and would be less expensive than maintaining the bulldozer and operator on a standby basis.

4. A total tonnage (150,000 tons indicated and 50,000 tons inferred) of 200,000 tons of ore is given for both groups. Mr. Rhine stated to the writer and Scott Hazen, Engineer, U. S. Bureau of Mines, that this figure was arrived at through his experience in the district and that he had no other actual basis for the estimate.

5. R. E. Mackey is proposed as operator. Mr. Mackey is a very capable practical miner and has an excellent production record. He is not a mining engineer.

Recommendations

The writer believes that there is little possibility for developing new ore at the Robinson mine and intelligent exploration has failed to find new bodies. There is virtually no measured, indicated, or inferred ore on the property. The ore shoots trend off the applicant's property and have been mined to its boundaries. Therefore, neither development or exploration are recommended for the Robinson mine group.

The Michigan-Uthoff group presents an entirely different picture. Inferred reserves of well over 12,000 tons are possible and all mine workings are open. These reserves may be developed into much larger bodies by proper exploration. This group of claims is recommended for an exploration grant as follows:

1. The project must receive proper technical guidance. Mr. Rhine is a very capable business man and has been very successful with the promotion of several mining properties. As stated above, Mr. Mackey is a very competent mining operator but is neither a geologist nor engineer and so cannot perform the technical requirements of the proposed program.

2. Make an accurate survey of the property boundaries and mine workings and their relation to each other.

3. Make a detailed geologic map of the Uthoff level in the light of recent findings.

4. Sample all exposed ore faces on the Uthoff level for possible extensions of known ore shoots from the Michigan level.

5. Instigate a diamond drilling program to prove the inferred reserve areas and develop reserves in new areas. A sample program follows

as an estimate of probable footages and cost. Drill hole No. 1 (Fig. 3) is proposed to test the extension of ore shoot No. 2. Drill holes 2, 3, 4, and 9 would test the extension of shoot No. 1. Nos. 5, 6, 7, and 8 are proposed to explore Area No. 1 for possible extensions of the faulted segments of shoot No. 1. Table IV gives approximate location, elevation, and lengths of these holes. Boyles Bros., Salt Lake City, Utah, has a current price of $5.00 per foot, including holes. This footage of 3100 feet could then be drilled for a total cost of approximately $15,500. In addition approximately $10,000 would be required to reopen caved portions of the Uthoff tunnel and prepare the workings for underground exploration. This makes a total of about $25,000, exclusive of technical aid, which would be necessary for the owner to carry out the minimum amount of exploration required.

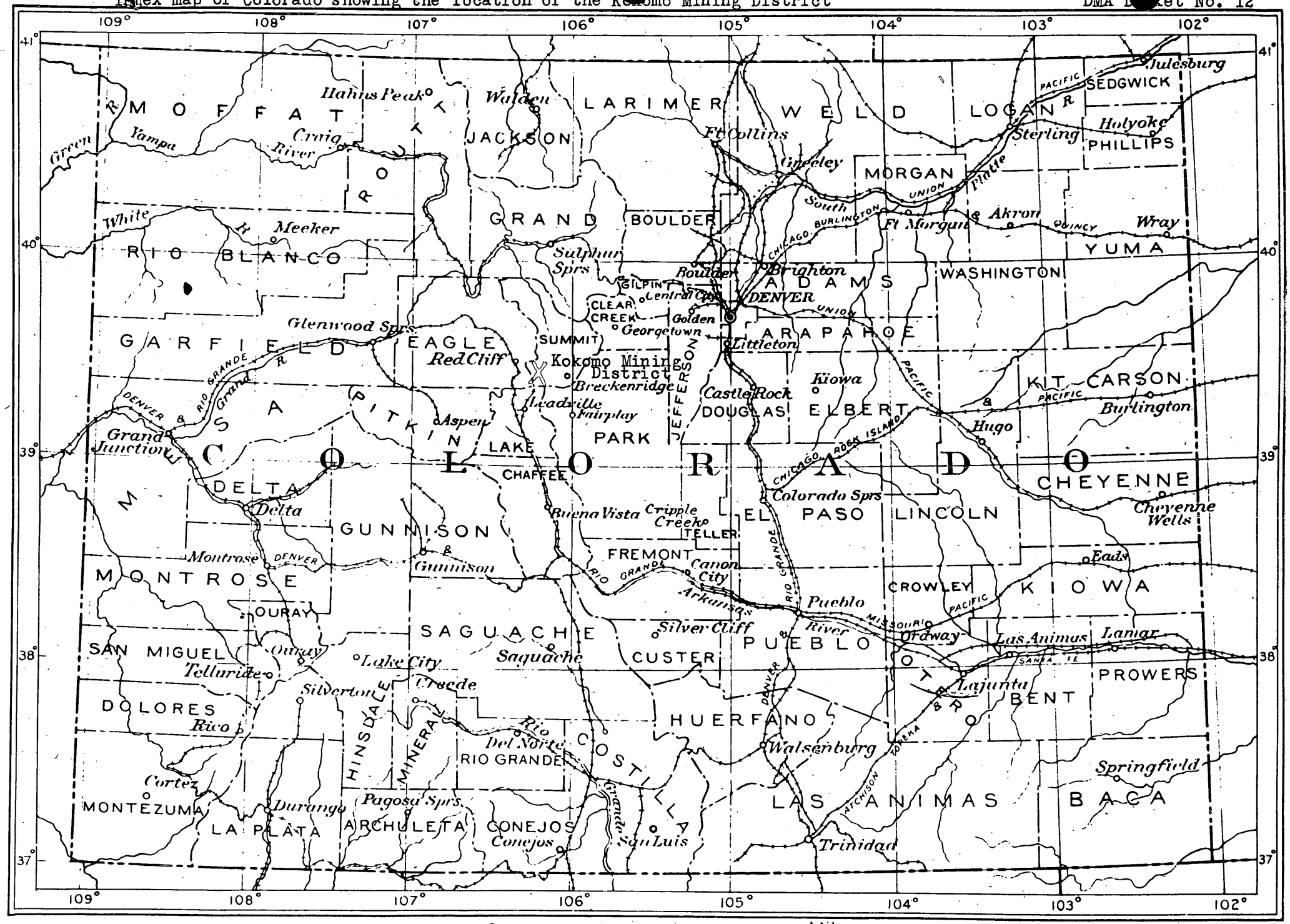
Table IV

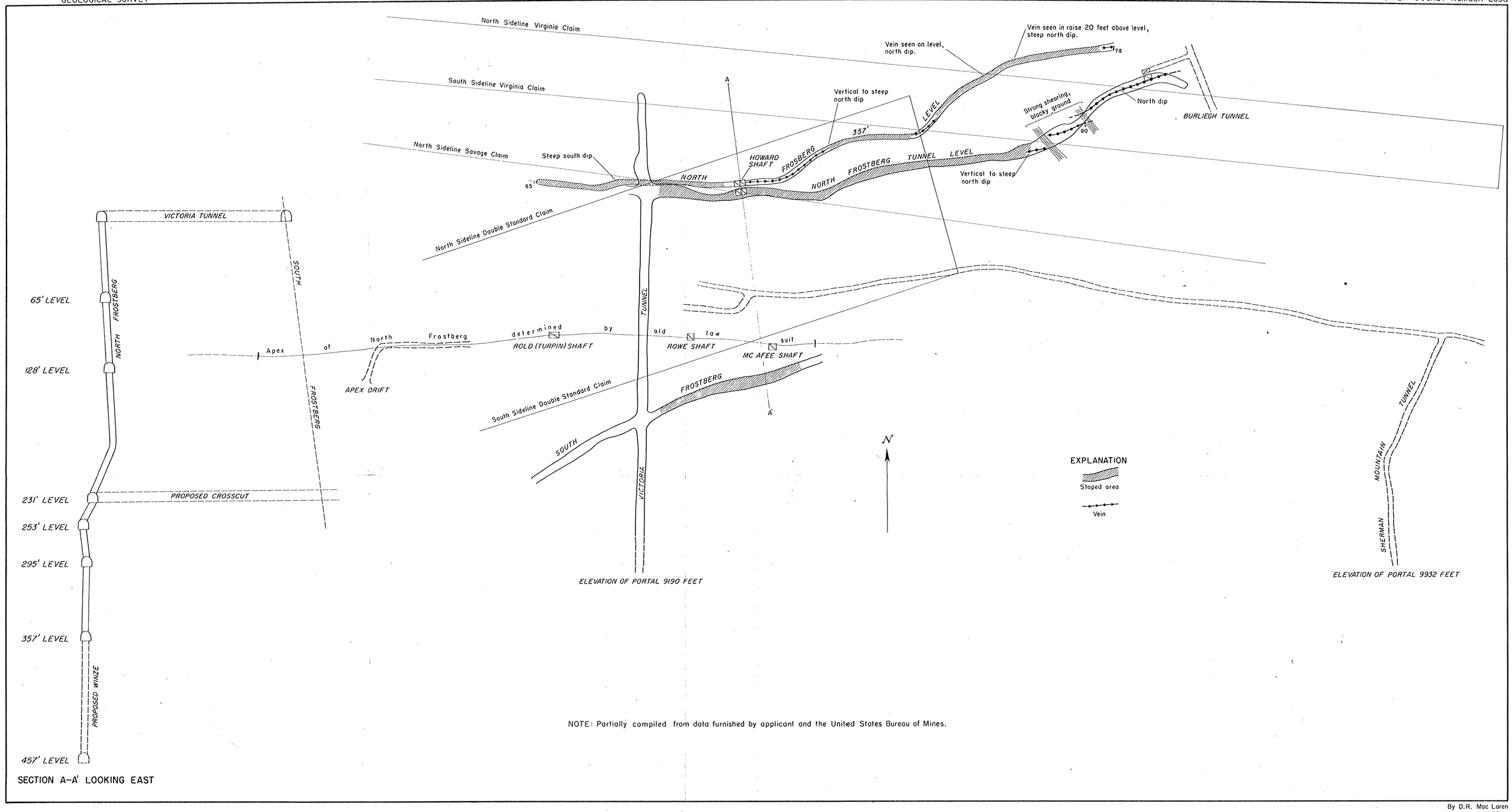
Proposed DDH No.	AS&R Coordinates N	E	Surf.Elev.	Approx. Depth to ore zone	Depth Hole(approx)
1	2760	1500	10,950 I	285'	325'
2	2845	1130	11,050 I	300'	350'
3	2865	1118	11,050 I	300'	350'
4	2890	1140	11,050 I	300'	350'
5	3740	1300	10,975 I	285'	325'
6	3970	1295	10,950 I	300'	350'
7	3940	1325	10,950 I	300'	350'
8	3810	1355	10,950 I	300'	350'
9	2920	1100	11,050 I	300'	350'
					3100' TOTAL

Figure 1

Index map of Colorado showing the location of the Kokomo Mining District

DMA Docket No. 12

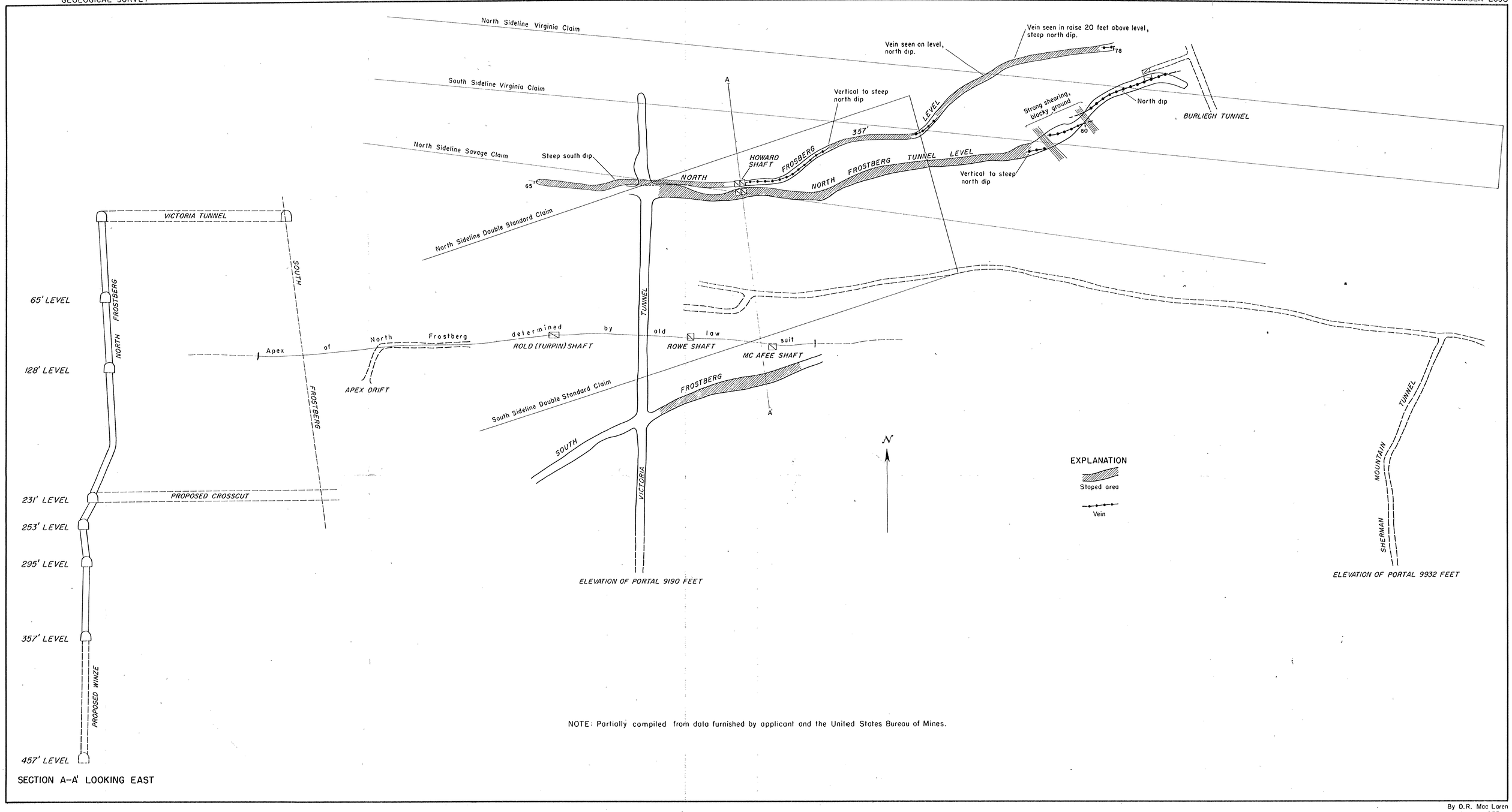




By D.R. Mac Laren
January, 1953

FIGURE 3– COMPOSITE SKETCH SHOWING PORTION OF SHERMAN MOUNTAIN AND VICTORIA TUNNEL LEVELS, APEX OF THE NORTH FROSTBERG VEIN, AND CROSS SECTION THROUGH NORTH AND SOUTH FROSTBERG VEINS, MENDOTA MINE, CLEAR CREEK COUNTY, COLORADO.

100 80 60 40 20 0 100 Feet



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