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Item 22

LINKA TUNGSTEN PROPERTY

RESULTS OF EXAMINATION AND SAMPLING

MAY 5-9, 1977

AND

EVALUATION OF ORE POTENTIAL

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Min-Ex Services Ltd.,
North Vancouver, B.C.

May 24, 1977

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SUMMARY

Tungsten mineralization on Linka Property occurs along a contact zone, or series of contact zones, between Middle Jurassic intrusive rocks and Ordovician carbonates. Mineralization is exposed intermittently for 2,700 feet along the northeasterly-trending contact zone and the extensions to the northeast and southwest are covered by alluvium and Tertiary tuffs. The zone is developed by three shafts, the Linka on the southwest, the Hillside in the central portion, and the Conquest on the northeast.

Tungsten was discovered on the property in 1941 but mining until 1954 consisted largely of small shipments of relatively high grade ore. The property was purchased by Consolidated Uranium Mines, Inc. in 1953 and after considerable development, a 400 TPD capacity mill was installed and production at the rate of 300 TPD was begun in August, 1955. When the U.S. Government ended its buying program for Tungsten in 1956, all stopes were pulled and the mine ceased operation late in the year. All usable equipment was subsequently sold. Production during World War II totalled 2,673 tons averaging 0.722% WO_3; production of shipping ore between 1951 and 1956 totalled 4,000 tons averaging 0.98% WO_3; approximately 60,000 tons of ore were milled in 1955-56 recovering an average of 0.4% WO_3.

Nearly all of the ore produced in the 1955-56 period was produced from the Linka Mine. The ore was mined from the 150' level using a system of shrinkage stoping and some ore remains above the now empty stopes. Consolidated Uranium conducted some diamond drilling in the mineralized zone below the 150' level as well as on the surface but no records survive the now defunct company. However, Consolidated is reported by the present owner to have sunk the Linka shaft to the 300' level in preparation for deeper mining, so it is assumed that the drilling showed the ore in the Linka Zone to

continue to at least that depth. Water level is at 175 feet and visual inspection of the lower portions of the shaft is not possible at present. Allowing for 80% mill recovery (due to the relatively short period of operation) and 15% mining dilution (due to the non-selective mining method), the grade of the ore in place within the portion of the orebody mined was probably about 0.6% WO_3. These calculations are more or less confirmed by the appended U.S. Bureau of Mines report (1955, p.6). Grade potential in the down-dip extension of the Linka Zone thus appears to be in the 0.6% WO_3 range.

No ore was produced from the Hillside shaft prior to closure of the operation but it appears that drilling in this area indicated ore as a loading pocket was prepared at the bottom of the 100-foot deep shaft.

Production from the Conquest was achieved by the present owner, who was solely concerned with high grade (+1%) shipping ore. The contact zone at the Conquest is cut up by several intrusive embayments, post-ore dykes, and faults; consequently the stopes are small. However, the most northeasterly of the workings on the 100' level end in a zone which appears to be more uniform. This zone, which from stoping and drilling, appears to be at least 12 feet wide, averages about 0.38% WO_3 and is open to extension to the northeast under the Tertiary tuffs.

The results of sampling by the writer and Union Carbide Corp. (29 samples) are impressive, averaging 0.73% in the Linka workings, 1.4% in the Hillside shaft, and 0.38% in the Conquest workings.

The prime target for development of additional ore is the down-dip extension of the Linka orebody. Inspection of the workings indicates the orebody is 470 feet long on the 150' level and the appended U.S. Bureau of Mines report (1955, p.6) indicates an approximate average width of 40 feet.

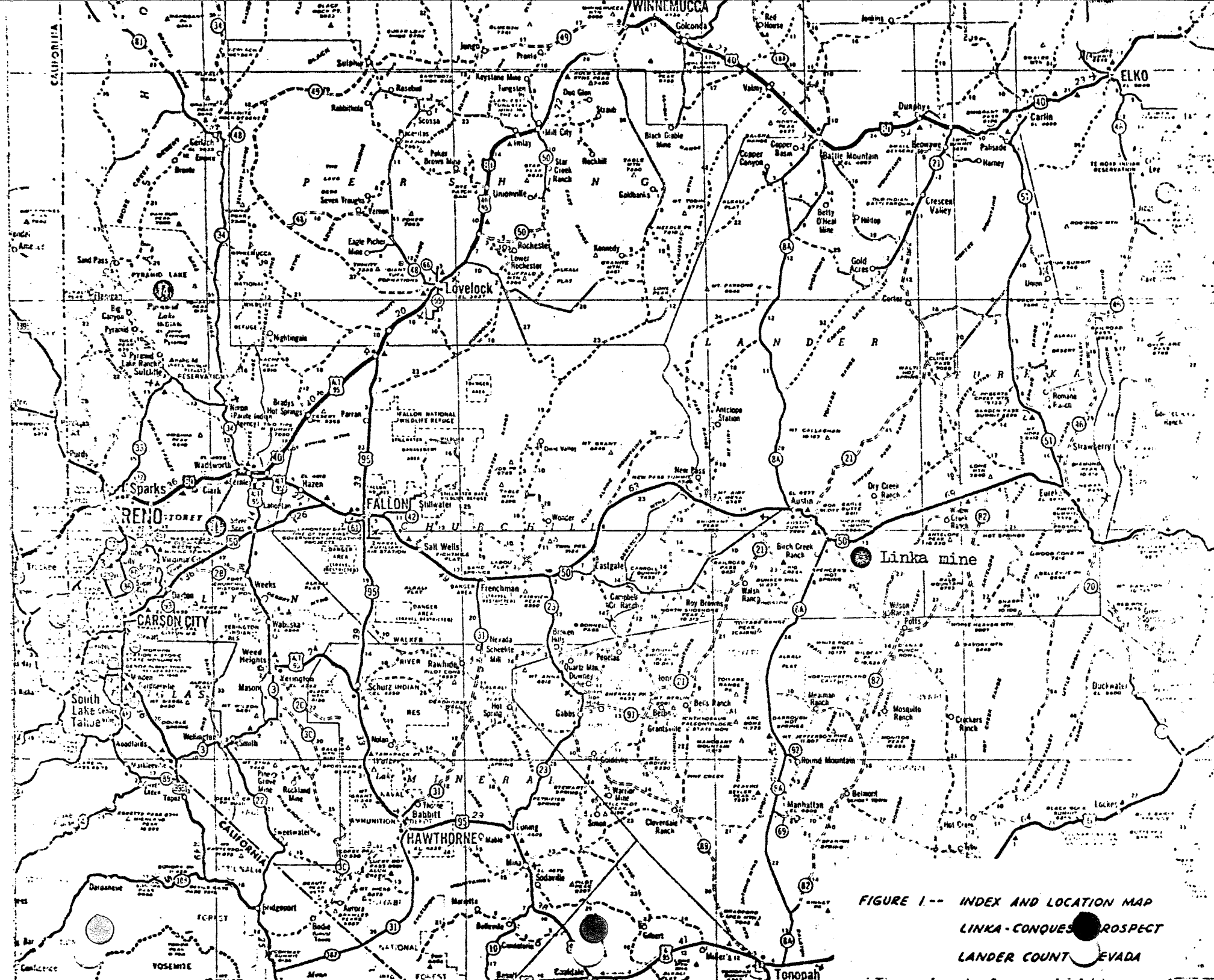


FIGURE 1.-- INDEX AND LOCATION MAP

LINKA - CONQUES[redacted] PROSPECT

LANDER COUNT[redacted] EVADA

Tonnage potential within this zone to a depth of 500 feet below the 150' level is approximately 700,000 tons.

Other targets for additional ore reserves include the Conquest and Hillside shaft areas. Tonnage potential in these areas is more difficult to evaluate due to the lack of underground openings and drilling data. Reasonable estimates include 100 feet of strike length and 15 feet of width at the Conquest (60,000 tons to 500 feet depth) and about 300 feet of strike length and 10 feet of width at the Hillside (125,000 tons to 500 feet depth). Grade potential in the Conquest area is in the 0.4% WO_3 range and at the Hillside is in the 0.6% range.

Exploration potential (as opposed to development potential) on the property is excellent as drilling to date in the contact zone between the three shafts is limited and the broader areas along the extensions of the zone and elsehwere on the periphery of the intrusive, covered by only a thin veneer of alluvium and/or welded tuff, have not been explored. In the broader area, the outline of the buried intrustive and the distribution of limestone, the potential ore host, are unknown.

Details in the remainder of this report are presented in outline or note form.

LINKA TUNGSTEN PROPERTY

Property

Garnet Group consisting of 24 unpatented mining claims and portions of three other claims totalling about 508 acres.

Owned by Gale Peer, Austin, Nevada.

Location

Approximately in Sections 7 and 18, T17N, R46E, Lander County, Nevada

Access

From Austin (nearest town) 17.7 miles east on U.S. 50, then 4.1 miles south on unimproved dirt road to property.

History

Linka Mine

Discovered by Steve Linka in 1941.

Exposure of garnetite 40'x4' in bottom of wash.

Bulldozer work revealed 30' width of garnetite ore.

In 1943-44 Linka shipped 2,420 tons, averaging 0.69% WO_3, to Battle Mountain buying station (U.S.Government).

Sold property to Consolidated Uranium Mines in 1953.

Consolidated conducted diamond drilling, sunk Linka ahaft to 210 feet, drove approximately 1,000' of drifts and crosscuts on 150' level, and established stopes.

U.S. Bureau Mines report, dated December, 1955, (see Appendix) indicated an orebody 500 feet long, 150 feet deep, and 40 feet wide containing 250,000 tons averaging about 0.6% WO_3.

The mining method employed large shrinkage stopes with open draw points. Ore was apparently withdrawn by use of mucking machines.

Between 1951 and 1956, over 4,000 tons of ore averaging 0.98% WO_3 were shipped directly from the property.

Between August 1955 and the latter part of 1956, 60,000 tons of ore were mined and milled, recovering an average of 0.4% WO_3.

The mine closed on cessation of the Government buying program, all stopes were pulled, and all usable equipment was sold.

Conquest Mine

Discovered by Gale Peer in 1943.

There were no outcrops in the mine area; while prospecting, Peer noticed decomposed garnet in the diggings from a badger hole which, upon panning, proved to contain scheelite. Subsequent bulldozer work exposed ore averaging 3% WO_3.

Peer opened a shallow pit (25' deep) and sunk an inclined shaft to 130'; shipments during World War II totalled 390 tons averaging 2.71% WO_3.

Shipments after World War II averaged in excess of 1% WO_3 but the tonnage is not known to the writer.

The last work on the 100' level exposes a zone 40' in length, 12' to 20' wide, and open to the northeast. Average grade appears to be slightly less than 0.4% WO_3 but the zone appears to be more uniform than those exposed elsewhere in the workings.

Hillside Shaft

This zone was apparently discovered by prospecting, panning, and bulldozer trenching.

Some drilling was done by Consolidated Uranium, the shaft was subsequently sunk to the 100' level, and an ore loading pocket was established.

The zone was not brought into production prior to closing of the operation.

Geology

The property covers a portion of a group of low hills which are surrounded on all sides by Quaternary alluvium and Tertiary tuffs.

The hills are underlain by a largely covered, complex, granitic intrusive (Middle Jurassic) which has at least three intrusive phases.

The intrusives cut Ordovician carbonates of the Antelope Valley formation and tungsten mineralization occurs in selected beds within the carbonate sequence which have been altered to garnetite (largely brown garnet).

The Roberts Mountains Thrust is exposed a short distance east of the workings; the Western Assemblage Vinini formation (Ordovician) is present in the upper plate of the thrust and does not contain tungsten mineralization.

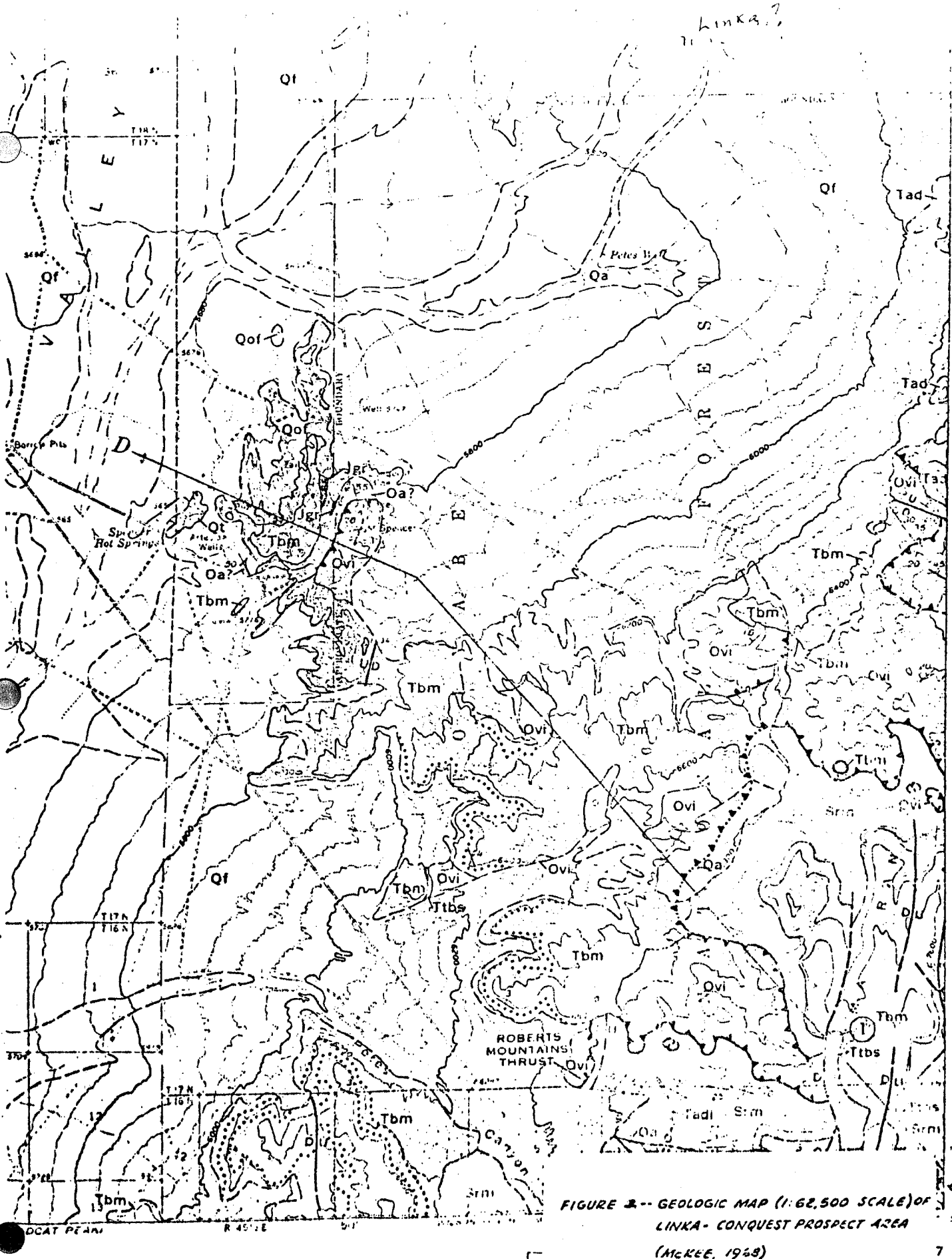


FIGURE 2 -- GEOLOGIC MAP (1:62,500 SCALE) OF LINKA - CONQUEST PROSPECT AREA

(McKEE, 1968)

Except in the area of exposure, the older rocks are covered by the Miocene Bates Mountain tuff, an ash flow which is believed by the U.S. Geological Survey to be relatively thin in the property area.

Extensions of the mineralization to the northeast and southwest are covered by Bates Mountain tuff and alluvium; no exploration has been conducted in these areas.

Structure

In the eastern portion of the mapped area, the Antelope Valley limestone dips steeply eastward while in the west and southwest portions it dips steeply northwest indicating that the Antelope Valley has been folded into a rough antiform structure.

In the eastern portion of the exposure of pre-Tertiary rocks, the Eastern Assemblage shelf-type carbonates of the Antelope Valley formation have been truncated by the flat to moderately dipping Roberts Mountains thrust and Western Assemblage, eugeosynclinal siliceous shales and cherts of the Vinini formation have been juxtaposed onto the Antelope Valley rocks.

There is some evidence that west- and northwest-trending faulting, roughly normal to the intrusive-carbonate contact, may have had some control on the distribution of mineralization.

Alteration

The limestone has been recrystallized as far as several hundred meters from the surface trace of the intrusive contact and contains a mineral assemblage typical of the albite-epidote-hornfels metamorphic facies. Bedding in the limestone is still discernible, however.

Within the mineralized zones, mineralized beds altered to medium- to coarse-grained grossularite-vesuvianite-calcite-quartz bands are intercalated with generally unmineralized bands altered to epidote-ferroactinolite-tremolite.

Mineralization

In the Linka pit and shaft area, mineralization consists of scheelite accompanied by lesser pyrite, molybdenite and chalcopyrite. Most of the scheelite fluoresces yellowish to cream but a significant portion (say 1/5 - 1/4) fluoresces white to blue-white, suggesting that there may have been two stages of scheelite deposition.

Sulfide content, and to some extent the ratio of yellowish fluorescing to blue-white fluorescing scheelite, diminishes from the Linka area northeastward through the Hillside and Conquest areas.

Although the yellowish fluorescence of the scheelite is undoubtedly due to molybdenum replacement of tungsten, the ratio of tungsten to molybdenum in 32 samples averages 29:1 and the highest molybdenum content was only 0.053% Mo. The data are insufficient to indicate whether or not the ratio increases to the northeast.

The scheelite occurs in fine to medium grained disseminations and in irregular streaks. The density of dissimination varies greatly over a few inches, making grade estimation using a UV light difficult. Fluorescent calcite and hyalite (opaline silica) are abundant in the contact zones and their fluorescence (red and green, respectively) tends to mask the scheelite fluorescence in many localities.

Sampling by Union Carbide indicates that gold-silver content of the ore is very low.

Sampling Results

Sampling of surface and underground exposures of garnetite is difficult due to 1) the extremely hard character of the rock, 2) the erratic dissemination of the scheelite, and 3) limited exposures. Consequently, a long, tedious sampling program would be necessary to accurately assess the grade of the various zones.

The samples taken by Union Carbide and the writer to date, however, indicate a number of zones which are of probable commercial grade and width at present prices.

Averages of the sampling by Union Carbide and the writer from various zones (detailed results are appended) are as follows:

Area	No. Samples	Weighted Average % WO_3	Average Sample width
Linka - surface	5	.95%	15.4'
Linka - underground	11	.73%	8.0'
Hillside-surface	3	.35%	8.9'
Hillside-underground	2	1.4%	6.9'
Hillside-surface (600' so.of shaft)	2	.58%	5.5'
Conquest - surface (high grade zone)	3	1.58%	4.0'
Conquest-underground (NE zone only)	3	.38%	6.0'
Grab samples and samples w/o locations (Union Carbide)			
Linka	15	.58%	
Conquest	5	.27%	

Development Potential

Development potential (as opposed to exploration potential) lies in the three shaft areas. The potential in each is largely limited to areas of garnetite which can be traced on the surface or underground and extended to a depth of 500 feet below present workings.

Linka Zone

The portions of the stopes which can be observed range from 15' to 70' wide; the U.S. Bureau of Mines (1955) reported an average width of 40'. The overall weighted average grade combining direct shipping ore and tungsten recovered after mining and milling was 0.44% WO_3. The in-place grade appears to have been approximately 0.6% WO_3 and the distribution of mineralization and sampling results suggest that a grade 50% higher (0.9% WO_3 in-place) could probably be achieved using a more selective mining method.

An extension of the widths and grade mined by Consolidated Uranium results in the following:

$$\frac{(450 \text{ ft L})(40 \text{ ft W})(500 \text{ ft D})}{12 \quad \text{ft}^3/\text{ton}} = 750{,}000 \text{ tons}$$

In-place Grade 0.6% WO_3

Hillside Zone

No mining has been conducted in the Hillside zone and sampling is insufficient to indicate grade of the zone but the potential might be as follows:

$$\frac{(300 \text{ ft L})(10 \text{ ft W})(500 \text{ ft D})}{12 \quad \text{ft}^3/\text{ton}} = 125{,}000 \text{ tons}$$

In-place Grade 0.6% WO_3

Conquest Zone

Potential is based only on an extension of the northeast stopes on the 100' level and the assumption it will continue along strike for double the stope length:

$$\frac{(50 \text{ ft L} \times 2)(15 \text{ ft W})(500 \text{ ft D})}{12.5 \text{ ft}^3/\text{ton}} = 62{,}500 \text{ tons}$$

In-place Grade 0.4% WO_3

TOTAL DEVELOPMENT POTENTIAL: 937,500 tons @ .59 WO_3

Exploration Potential

Exploration potential on the property lies in the following areas:

1) Southwest extension of the Linka zone.
2) Northeast extension of the Linka Zone.
3) Northeast and southwest extensions of the Hillside zone and search for parallel zones.
4) Northeast extension of the Conquest zone under the Tertiary tuffs.
5) Extension of the Linka zone below 650 feet in depth.
6) Extension of the Hillside zone below 500 feet in depth.
7) Extension of the Conquest zone below 600 feet in depth.

At least one-half of these possibilities will probably prove successful and the resulting ore may range from that equal to the Development Potential to an amount 3 to 4 times the Development Potential.

Profit Potential

Profit potential considered in this section is considered only with reference to the down-dip extension of the Linka Zone (development potential) and does not consider development potential in the Conquest and Hillside Zones or exploration potential elsewhere on the property. The profit potential considered also does not take into account taxes, depreciation, depletion, or interest. The cases used are hypothetical and assume success in the proposed drilling program.

CASE I

OPERATION OF THE LINKA ZONE

Ore Reserves: 700,000 tons @ 0.44% WO_3 recoverable
Milling Rate: 300 TPD

Gross recoverable value @ $160 per short ton unit		$70.40/ton
Operating Cost (includes drilling costs) as follows:		
Mining	$15.00/ton	
Milling	12.00/ton	
Development	1.00/ton	
Exploration	.30/ton	
Overhead	5.00/ton	33.30/ton
Operating Profit (before taxes)		37.10/ton
	say	37.00/ton
Operating Profit per Year		$3,663,000.00
Total operating profit before taxes, depreciation, depletion, recovery of capital, etc.		
700,000 tons x $37/ton		25,400,000
Capital Cost (exclusive of exploration and development, and property purchase)		1,150,000

Total Investment prior to production (including property purchase, exploration, development)	$ 2,481,000
Total Operating Profit after recovery of investment and before taxes	23,419,000
Life of Operation	7.07 years
Return on investment exclusive of interest	10.4:1

CASE II

SALE OF DRILL-INDICATED ORE RESERVES -- LINKA ZONE

Ore Reserves : 700,000 tons @ 0.6% WO_3 (in place)

Total Contained WO_3		8,400,000 lbs.
Propose sale @ $1.00/lb. WO_3		$ 8,400,000.00
Cost to develop:		
Stages I & II	$260,000	
Property Purchase	500,000	760,000.00
Net Profit (before taxes)		$7,640,000.00
Out of pocket investment: (assume 18 months to sale)		
Property	$150,000	
Drilling	260,000	410,000.00

Return on Investment: $\frac{\$7,640,000}{410,000}$ = 18.6:1

PROPERTY AGREEMENT

The owners, Mr. Gale Peer and Mr. Frank Zadow are both in their 60's and are interested only in a purchase agreement structured in such a way as to allow them to take long term capital gains. Peer is a competent small mine operator and is most interested in seeing a sincere, competent group acquire the property.

The writer has proposed and received verbal agreement from Peer and Zadow on the following terms:

1.	Payment on execution of agreement	$ 25,000.00
2.	Payment within 180 days	25,000.00
3.	Payment one year from date of execution	100,000.00
4.	Payment two years from date of execution	100,000.00
5.	Payment three years from date of execution	100,000.00
6.	Payment four years from date of execution	150,000.00
	TOTAL PURCHASE PRICE:	$500,000.00

There would be no residual royalties with the exception that ore currently stockpiled on the surface would not be included in the agreement. Peer has indicated a willingness to negotiate a separate agreement on the stockpiled ore once a decision is made to build a mill.

CONCLUSIONS

Consideration of the location, physical setting, and grade of past production comined with the sampling results and the current strong tungsten market, leads to the conclusion that the Linka Property offers an outstanding opportunity to rapidly prove up ore of commercial grade. If the recommended program is fully successful, sale of the drill-indicated reserves should generate funds sufficient for development of the remainder of the property as well as allowing for capture of a substantial profit.

RECOMMENDATIONS

LINKA ZONE- PROPOSED DRILLING OF DOWN-DIP EXTENSION

Drilling of the down-dip extension of the Linka Zone is premised on diamond drilling a block of ore which is 450 feet long x 500 feet deep on a 105 ft x 105 ft. diamond grid. A total of 8,400 feet would be drilled in 17 holes if the program is fully successful. The program is broken into two stages to allow assessment of the program after completion of the first five drill holes.

STAGE I

1.	Establish survey control on surface and underground	- est. $ 2,500
2.	Conduct further checks of presently available geologic mapping and conduct additional mapping as necessary	- est. 3,000
3.	Conduct bulldozer trenching along the strike extensions of the Linka Zone and to the southeast of the Linka Zone	- est 2,500
4.	Diamond drilling	

1 rig, 2 shifts/day

Estimate includes:

Drilling
Mobilization, de-mobilization
Moves between drill holes
Core splitting personnel

Geologist Personnel expenses Travel expenses Rental truck est. 1,465 feet @ $30.00/ft.	$43,950
Sub Total:	$51,950
Add Contingency (10%)	5,195
TOTAL STAGE I:	$57,145

STAGE II

1.	Diamond drilling - Continue grid drilling to bottom of block. 2 rigs, 2 shift/day Estimate includes items enumerated in Stage I but includes no increase in personnel est. 6,935 feet @ $25.75/ft.		$178,576
2.	Evaluation and report 30 days @ $150/day Plus office, drafting, etc.	$4,500 1,500	6,000
	Sub Total:		$184,576
	Add Contingency (10%)		18,458
	TOTAL STAGE II		$203,034
	TOTAL STAGES I & II		$260,179

M. J. Fitzgerald

APPENDIX

A. SAMPLE DESCRIPTIONS AND RESULTS

B. REPORT ON PRELIMINARY EXAMINATION BY U.S. BUREAU OF MINES, DECEMBER 5, 1955

LINKA TUNGSTEN PROPERTY

SAMPLE DESCRIPTIONS

SAMPLE NO.	DESCRIPTION	% WO_3
	Linka- Underground	
36852	Cont.chips across 6.1'vert.; banded garnet and calc-silicate (CS) greenish, fine grained (fg); bands dissem.scheelite throughout w/ weaker dissem.between stringer-like bands; 4/5 yellow; 1/5 blue-white scheelite	0.46
36853	Cont.chips across 5.2' vert., grainy CS w/only minor visible garnet; consid. lim after py and garnet (?) med.grained (mg) diss.scheelite in bands	0.21
36854	Cont.chips across 5.2' vert.; f.g. to m.g. CS w/20% garnet; abnt f.g. to m.g. diss. cream scheelite; very hard-sample prob. 20-40% low - couldn't get chips from best mnlz.	1.17
36855	Semi-cont.chips across 20' horiz; mixed CS & garnet; irreg. but local garnet bands; 2/3 yellow, 1/3 blue scheelite in f.g. dissem.band & pods; local coarser blue scheelite; best mnlz w/garnet	1.50
36856	Cont.chips across 3.7' horiz.; garnetite w/ abnt.diss. sheelite-coarser than usual; very hard-sample may be low graded by ~ 30%.	0.62
	Linka Pit	
36857	Semi-cont.chips across 15.2' horiz; abnt f.g. dissem.scheelite (4/5 yellow); representative sample, coarse garnet-little else; abundant hyalite	0.66
36858	Semi-cont.chips across 13.7' horiz.; continues east from 36857; abnt.f.g. diss. scheelite (yellow); 80% brown & green garnet, wk lim; trc.bismutite; sample prob.low graded; abnt.hyalite on fract.	1.14

SAMPLE NO.	DESCRIPTION	% WO_3
36859	Semi-cont,chips across 12,0' horiz.; tactite rather than garnetite (mixed brown garnet and greenish CS); some admixed marble; v. abnt. dissem. scheelite- f.g. & m.g.; 3/4 - 4/5 yellow, trc. bismutite; representative sample	1.06
	Conquest - Underground	
36860	Stope - NE end; semi-cont.chips across 4.7' horiz; Cse.garnet & CS; general dissem; sample may be low graded; hard;	0.39
36861	Stope - NE end; semi-cont.chips across 5.8' horiz; Cse. dk. brn. garnet & f.g. CS; good dissem.scheelite (2/3 yellow); hard	0.40
36862	Semi-cont.chips across 7.6' horiz.; face of NE drift; hard and soft tactite (garnet & CS); difficult to sample; f.g. dissem. scheelite (2/3 yellow); hard	0.36
	Conquest - Surface	
36863	Shaft zone; cont.chips across 3.7' vert.; Cse. garnetite lying just below flat granodiorite contact; some epidote & CS; some bismutite; abnt. Cse scheelite blebs	2.95
36864	Short adit N. of shaft; cont.chips across 2.2' vert.; Cse. garnet & CS - weathered; abnt. scheelite in Cse. blebs; 1/2 yellow	2.28
	Hillside Shaft - Surface	
36865	Semi-cont.chips across 10.7' horiz.; where could get them; massive garnetite- very hard; moderate dissem. (f.g.) scheelite	0.30
36866	Cont.chips across 6.0' horiz.; o/c of mass. garnetite in road cut; brn. garnet intercalated w/bands green CS; abnt. fine dissem.scheelite	0.82

SAMPLE NO.	DESCRIPTION	% WO_3
36868	500' So. of Hillside shaft; cont. chips across 6.0' horiz.; black to dk. brn. garnetite - m.g.; not lamped	0.65
	Hillside Shaft - Underground	
36867	28' below collar of shaft - SW wall; cont.chips across 7.8' vert.; below surface cut in garnetite; weathered garnetite & tactite; mod. to abnt. dissem.scheelite - fine to relatively Cse	1.84

UNITED STATES
DEPARTMENT OF THE INTERIOR
DOUGLAS McKAY, SECRETARY

BUREAU OF MINES
J. J. FORBES, DIRECTOR

PRELIMINARY EXAMINATION

Linka Tungsten Property
Lander County, Nevada

(Tungsten)

W. T. Benson, Mining Engineer
U. S. Bureau of Mines

December 5, 1955

PRELIMINARY EXAMINATION

Linka Tungsten Property
Lander County, Nevada

(Tungsten)

SUMMARY

The Linka tungsten property controlled by the Consolidated Uranium Mines, Inc., is situated in south central Lander County, Nevada, about 23 miles southeast of Austin and 121 miles south of Battle Mountain, the shipping point on the Western and Southern Pacific Railroads.

The discovery of tungsten on the property is fairly recent. During the past three years considerable development work has been done and preparations made for production. Milling at the rate of 300 tons per day was started on August 15, 1955.

Rocks in the area consist of thin bedded limestone which have been intruded by granodiorite. Near the contact the sedimentary rocks are considerably altered and silicified in a zone 50 to 100 feet wide.

As exposed in the mine workings this altered zone 530 feet in length varies from 40 to 100 feet in thickness. In this silicified zone scheelite mineralization occurs finely disseminated. The gangue minerals are chiefly quartz with minor amounts of garnet and epidote.

In addition to a small surface pit and a 130 foot inclined shaft, the principal workings consist of a 210 foot vertical shaft from which about

1,000 feet of drifts and crosscuts have been driven on the 150 foot level. These workings outline an ore zone 500 feet long and 40 feet wide, which probably contains 250,000 tons that may average 0.6 percent WO_3.

The property is well equipped and adequately staffed. Mine preparation has progressed far enough to permit production at a rate of 300 tons per day for a period of 2 years.

Additional exploratory work is contemplated. As new workings may disclose additional ore, it is recommended that the property be visited occasionally by Bureau engineers for the purpose of inspecting new development openings.

INTRODUCTION

The Consolidated Uranium Mines, Inc., known as the Linka tungsten property was examined October 13, 1955, by an engineer 1/ of the Bureau of Mines accompanied by D. J. Woodward, mine foreman, who resides at the property. Officials of the company include: E. G. Frowley, president, Gus A. Hockanson, general superintendent, William McClean, assistant superintendent, and Robert Curry, office

Property holdings comprise the Garnetite group of six claims, and the Spruce Mountain and Toiyabe placer claims, situated in T. 17 N., R. 46 E., Lander County, Nevada, about 23 miles southeast of Austin, the supply base, and 121 miles south of Battle Mountain, the shipping point on the Southern and Western Pacific Railroads.

1/ W. T. Benson

To reach the property from Austin, Highway 50 is traveled south and east 13 miles to the Linka mine road turnoff. The Linka road is then followed 5 miles south to the property which lies near the crest of a low ridge that juts up from the floor of Smokey Valley.

HISTORY

Tungsten mineralization on the property was discovered by Mr. Linka in the late 1940's. Only assessment work was done on the property until the spring of 1953 when it was secured by J. A. Carpenter and associates on a bond and lease arrangement. In the fall of 1953 the lease was taken over by the Consolidated Uranium Mines, Inc., under the direction of E. G. Frowley. Considerable development work was done during 1954 and 1955. A 400 ton capacity flotation mill was erected and milling on a 300 ton daily basis started on August 15, 1955.

PHYSICAL FEATURES

The claims are located in an area of low relief near the north end of Smokey Valley at an altitude of about 5,700 feet. Climate in the area is temperate with moderate summers and occasional severe winters. Precipitation occurs usually as snow with some rains during the fall and spring months. Winter storms generally are not severe enough to impede or stop travel to the mine. Sage brush and desert grass constitute the vegetation on the property. Water for domestic use is supplied from a well in the valley floor, 2 miles west. For milling needs, water is

supplies from the mine workings. Water from this source approximates 500 gallons per minute.

No transmitted electric power is available. To supply the diesel engines for power generation, fuel oil is supplied by tank trucks from Austin, 23 miles northwest.

HOUSING FACILITIES

Housing facilities at the mine consist of two large bunk houses, a cook house, and a trailer camp comprising 10 units, which are sufficient to accommodate a crew of 100 men.

In addition to the housing facilities, structures for the surface plant include a hoist house, blacksmith shop, office building, change and dry room, and a warehouse.

EQUIPMENT

Equipment for mining in the open pit consists of a 3/4 yard, diesel powered shovel, two-20 ton dump trucks and a wagon drill. Compressed air for drilling purposes is supplied by two - 600 cubic foot portable compressors.

Underground, the mine is well equipped with slusher hoists, an assortment of compression drills, electric haulage, tugger hoists and mucking machines.

The mill building houses a jaw type primary crusher, underneath the coarse ore bin, a pan conveyor to a gyratory secondary crusher which discharges to the fine ore bin, the fine ore is fed to a 75 ball mill in close circuit with an Atkins classifier, the overflow from the clas-

pulp is led to a scrubber conditioning tank, overflow from the tank, by various stages, goes to four banks of six cells each flotation machines which are used as roughers, primary cleaners, cleaners and as scavengers. Flotation concentrates are sent to a concentration table. Concentrates are pan dried and sacked for shipment. Middlings and tails will be acid treated in a plant which is being built on the south side of the mill building. The mill has a rated capacity of 400 tons per day, but at the time of visit 300 tons per day were being milled.

GEOLOGY

Rocks in the area include thin bedded limestone which have been intruded by granodiorite. The sedimentaries strike about north-south and dip from 32° to 45° east. Close to the contact the limestones are cut by a few minor faults striking northeast that dip at low angles to the southeast. Near the contact the limestones are considerably altered and silicified in a zone 50 to 100 feet wide.

As exposed in the mine workings this zone is 530 feet in length. Near the north end of the workings a mineralized zone 40 to 100 feet wide is being mined for a length of 150 feet. Above this area, and on the surface, is an area 100 feet long and 50 feet wide that is being mined by open pit methods. In the south end of the mine there are two small superimposed areas that are being prepared for stoping.

In the silicified areas scheelite mineralization occurs finely disseminated. The gangue minerals are chiefly quartz with minor amounts of epidote and garnet.

In addition to a surface pit, 100 feet long, 50 feet wide and 25 feet deep, the main underground workings consist of a 210 foot vertical shaft from which about 1,000 feet of crosscuts and drifts have been extended on the 150 foot level. From these workings shrinkage stopes have been prepared for mining.

Other workings include a 130 foot shaft inclined 45° south which is about 1,500 feet northeast of the main workings. This opening follows the footwall of a tactite zone that is about 20 feet thick.

SAMPLING

Since the property is being systematically developed and mined, no attempt was made to sample the mine workings. From a company assay map it is estimated the grade of the ore presently exposed averages about 0.6 percent WO_3.

Grab samples taken from the skip as the 130 foot inclined shaft was being sunk averaged about 1.0 percent WO_3.

Daily mill heads vary from 0.4 to 0.6 percent WO_3.

ORE RESERVES

Development openings on the 150 foot level of the mine roughly outline an ore body 500 feet in length, 150 feet deep and 40 feet wide. Providing a tonnage factor of 12 cubic feet per ton is used, a block of this size contains about 250,000 tons which from company assay results may average 0.6 percent WO_3.

In the inclined shaft workings a block 150 x 50 x 20 feet is indicated. Providing the same tonnage factor is used, this block contains about 10,000 tons of indicated ore that may average 1.0 percent WO_3.

These reserve tonnage estimates may be considerably reduced as selective mining will be necessary in order to maintain an ore grade that is high enough to be profitably worked.

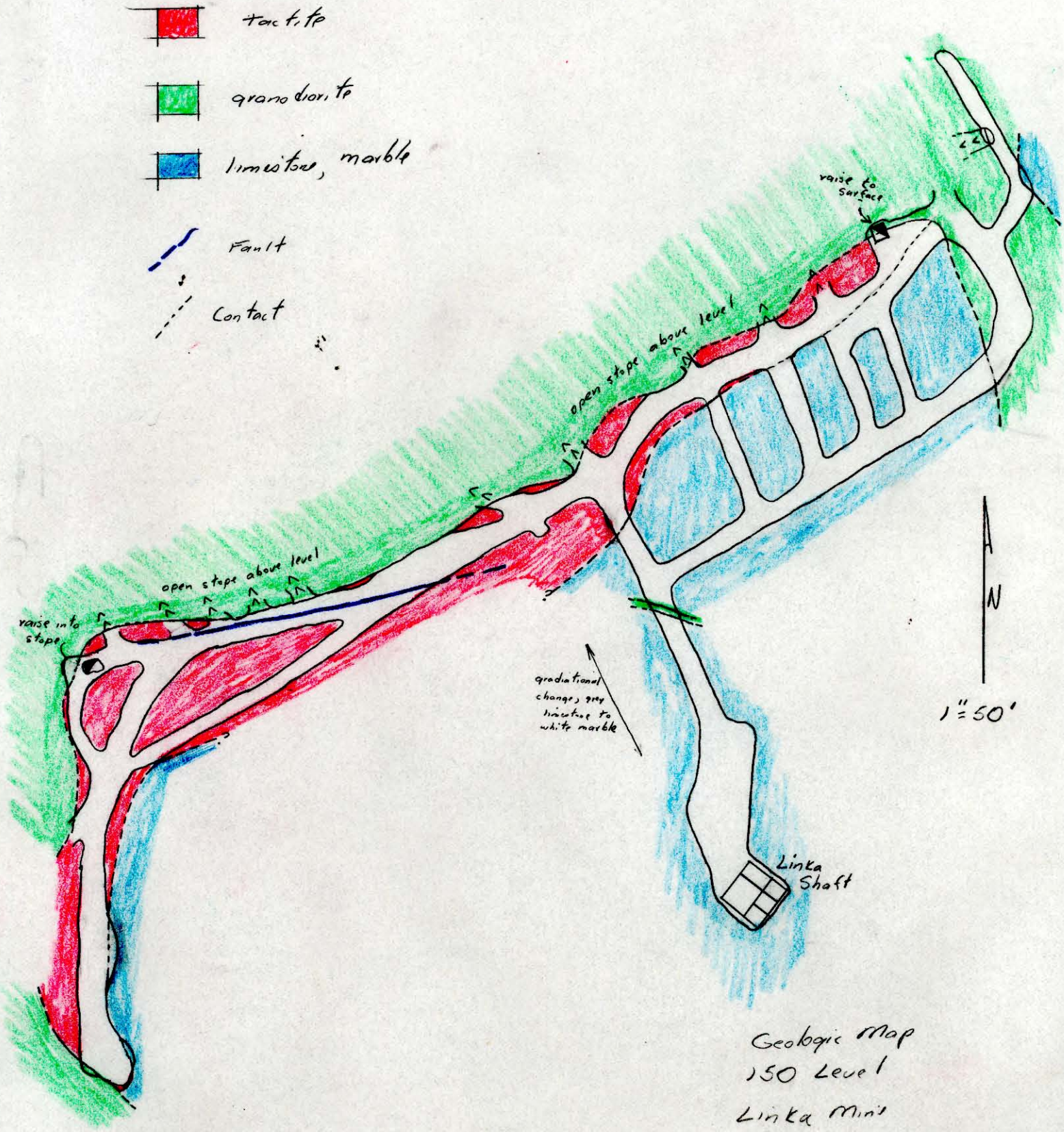
PLAN OF OPERATION

Most of the preparatory work for stoping operations has been completed. Production at a rate of 300 tons per day or better is contemplated.

In the near future additional work will be done in the inclined shaft to more definitely outline the ore possibilities in this area. Should this work disclose worth while ore sections, the area will be prepared for stoping.

CONCLUSIONS

The property is well equipped and adequately staffed. Mine preparation has progressed far enough to permit production at a rate of 300 tons per day for a period of 2 years. New exploratory work is contemplated. As new workings may disclose additional ore, it is recommended that the property be visited occasionally by Bureau engineers for the purpose of inspecting new development openings.



Geologic map
150 Level
Linka Mine
J. Tingley 7/7/71

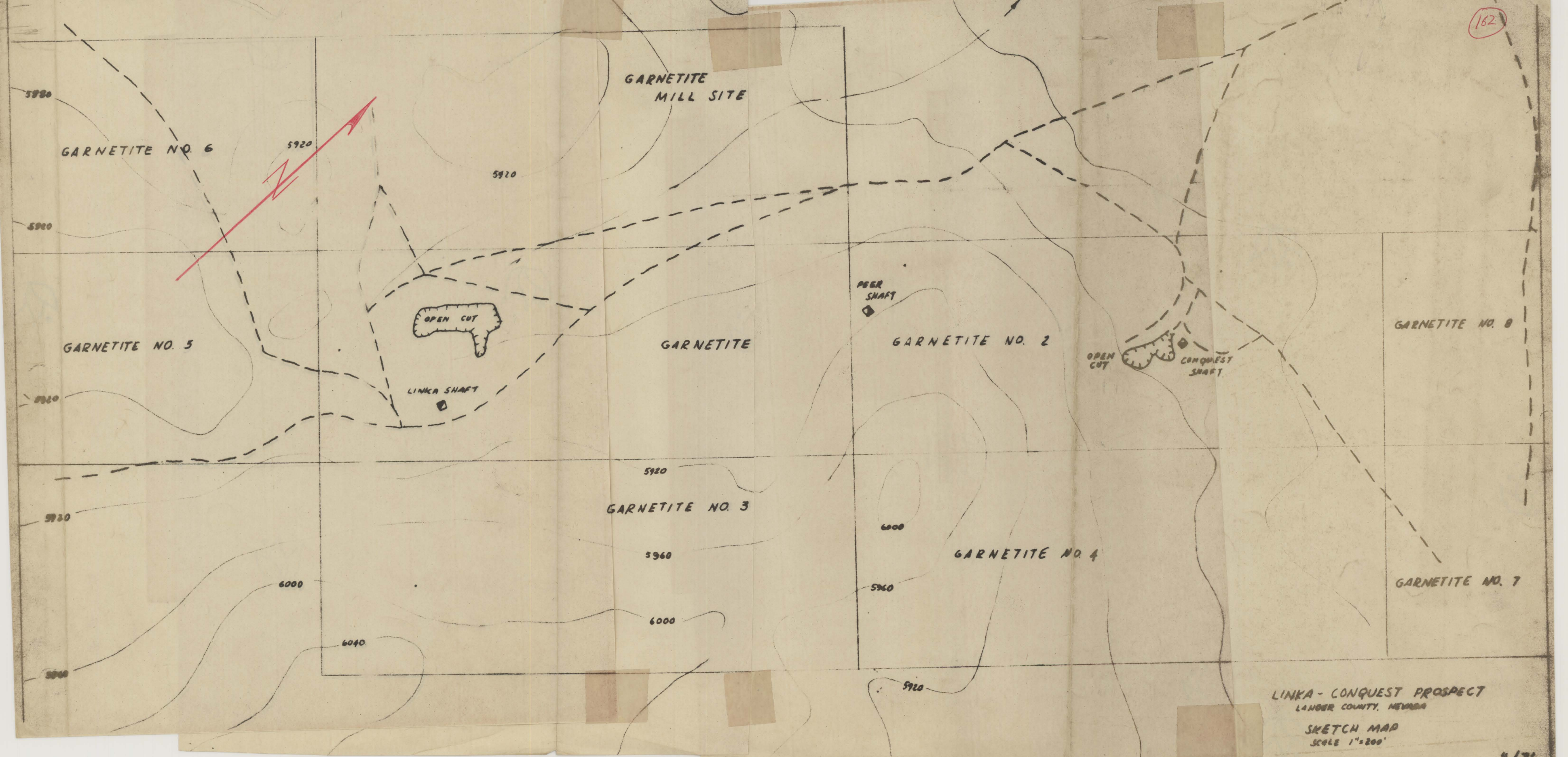


FIGURE 2

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