.45
80
.3600

.35/T

Item 30

	Tons milled	Grade	Units Rec.	
1940-44	61,289	0.9	35,448	Lincoln mine?
1945-48	24,812	0.66	± 8,750	Atolia mine
1948-50	± 300	± 1.00	± 300	Kozer & Theriot
1951-52	4,330 + 50,000 Tails	.5 ± tailings	13,000	with Chang?
1953-57	880,000		219,969	Wah Chang
	970,731		277,467	

Year	S.T.	% WO_3	Units
1953	~~2,704~~ 270.4	~~57.~~	16,352
1954	871	54.9	47,836
1955	1,308	51.2	66,907
1956	860	62.4	53,685
1957	829	42.4	35,189
	4,138.4	53.1	219,969

7 Mo 5,027/Mo

	Tons	Grade
1953	58,044	0.48
54	171,822	0.45
55	225,000	0.4
56	251,726	0.416
57	± 120,000	
	~~826~~ ,592	

20,000
6
120,000

225,000
~~90,000~~

66,907
90,000 units

826,592 | .4
331 | 1036.8

90 | 670 .24
630
400

331 | 2200 .56
1986
2140

.38
.65
190
228
.2470

212
4|847

212
23
636
424
4876
05
24380

Geology

The Lincoln mine of the Wah Chang Mining Corporation is underlain by Upper Paleozoic limestone, hornfels, and quartzite that have been folded, faulted, and intruded by two small granite stocks. The geology and ore deposits of this and the adjoining Y.Z. Mining Company's North Ten Pints mine (DMEA-327) have been studied and explored in considerable detail by the U.S. Geological Survey and the U.S. Bureau of Mines. [Only a brief descriptive summary of the geology and ore deposits will be given here.]

Bryant, D.G., and Lemmon, D.M., 1951, Tungsten deposits in the Ten Pints district, Lincoln County, Nevada: U.S. Geol. Survey open file report.

Binyon, E.O., Holmes, G.H., Jr., and Johnson, A.C., 1950, U.S. Bureau of Mines Report of Investigations No. 4626.

A geologic map and section of the ground to be explored, by the proposed program, accompanies the docket and is reproduced for this report. [Only ... by A.R. Sutton, company geologist]

The Lincoln mine is on the western flank of the southern and larger of the two granite stocks

This stock is about a mile in diameter and is separated from the northern stock by a belt of limestone and hornfels about 600 feet wide. The northern stock is about 4,000 feet in diameter and is probably joined at shallow depth to the southern stock. The stocks form the core of a faulted dome in the sedimentary rocks.

The beds, dip, away from the intrusive stocks for more than half their perimeter, but in the area of the Lincoln mine the rock in contact with the granite is a dense gray limestone. A thick layer of garnet tactite about 2,000 feet long and [illegible] feet thick occurs between the limestone and the granite in the vicinity of Lincoln mine. This tactite layer is known as the Hubbard ore zone. A second tactite layer about 6,200 feet long and from 40 to [illegible] feet thick is separated from the first layer by about 80 feet of white platy hornfels. This tactite layer is known as the Moody ore zone.

Faulting has offset many of the sedimentary beds on the property. These faults have offsets of only a few feet but appear, in many places, to have been important controls in the formation of the ore bodies. In places these fractures contain rich seams of scheelite, fluorite, and sphalerite.

Ore Deposits

The deposits are of the contact metamorphic type and the ore minerals are scheelite, molybdenite, powellite, sphalerite, and fluorite.

Scheelite is widespread in the surface and underground exposures of tactite but has been mined from only the stubstake and roddy zones. Ore bodies within the stubstake zone range from to feet long, from to feet wide and have been stoped for as much as feet. Ore bodies within the roddy zone range from to feet long, from to feet wide and have been stoped for as much as feet. These ore bodies range in grade from — percent to — percent WO_3 and average about — percent WO_3. The tactite between the bodies averages about 0.2 percent WO_3, most of the scheelite in the ore occurs as small disseminated crystals scattered throughout the tactite groundmass, but rich seams of scheelite have been noted along fractures cutting the tactite and adjacent rocks.

Other minerals, in addition to the scheelite, contained in the tactite are garnet, quartz, epidote, calcite, fluorite, molybdenite, powellite, pyrite, pyrrhotite, and sphalerite.

39,852

2 50
.46
1500
1000
115.00

40 × .95 = 38.00
2 50 × .46 = 115.00
290 — 153.00

check %

80,000
173,000
253,000
.39 83
297

Au = .03 × $35 = 1.05
Ag = .311 × .85 = .26
Pb = .05 × 85 = 14.25
Cu = 1.75 × .30 = 10.50
Ni = .9 × .60 = 10.80
26.86

The Lincoln mine has produced about 300,000 tons of ore that averaged about 0.52 percent WO_3. Most of this ore has come from the woody ore zone.

.52
290)151.0
145 0
6 00

Ore Reserves

Ore Reserves calculated by the applicants, as of the end of August 1954 included 65,350 tons of 0.48% WO_3 ore broken in the shrinkage stopes and 36,450 tons of 0.49 percent WO_3 measured ore in place. About 80,000 tons of this ore has been milled since these calculations were made but about 40,000 tons of additional ore has been developed

.57
.8
.456
.03
5.0
5.486

2.5
2
5.0

1.3

1.2
4.3)5.486
4.3
1 18
86
32


LOOKING NW
6600
6400
6200
6000
SHALY LIMESTONE
MASSIVE BANDED LIMESTONE
PLATY LIMESTONE
MASSIVE BANDED LIMESTONE
VOLCANITE
FRESH GRANITE SPINE
VOLCANITE
GRANITE
700 LEVEL ADIT
N.9500 E.4852
WAH CHANG MINING CORPORATION
LINCOLN MINE — TEMPIUTE, NEVADA
VERTICAL SECTION
THRU N.9500, E 4852
BEARING N 85°E.
DATE 9/1/54 SCALE 1"=100'

LINCOLN MINE OCT. 26, 1954

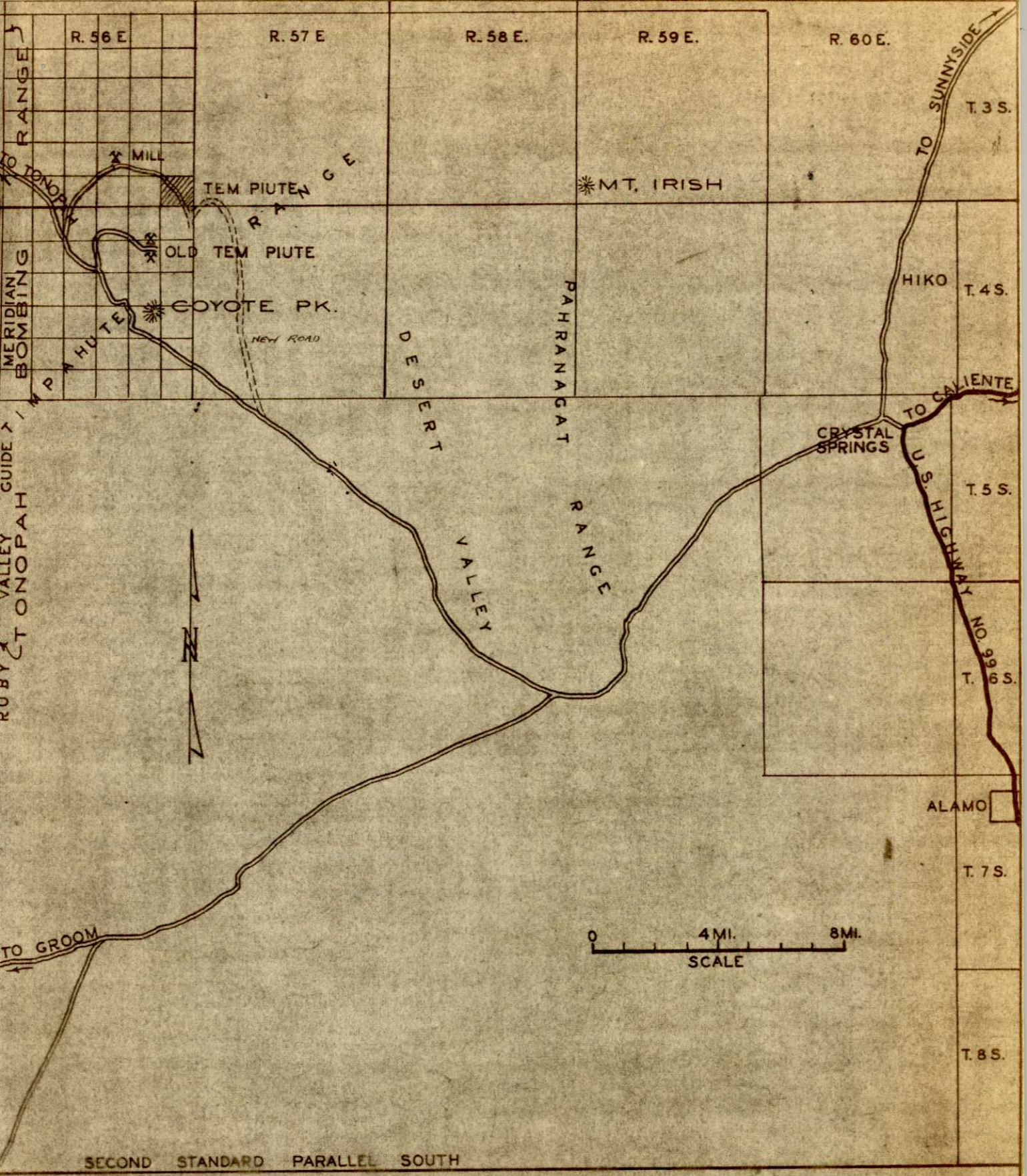
PECK - GEOLOGIST

DMEA LOAN FOR 2,700' ADIT

7'x9' IN PLATY HORNFELS & LIMESTONE

±$52.00/FT. OR ABOUT $140,400

ABOUT 50' ABOVE MILL LEVEL — WILL PASS BENEATH ALL WORKINGS AND SERVE AS MAIN HAULAGEWAY.



TEM PIUTE MINING DISTRICT
LINCOLN COUNTY, NEVADA

FIG. 1

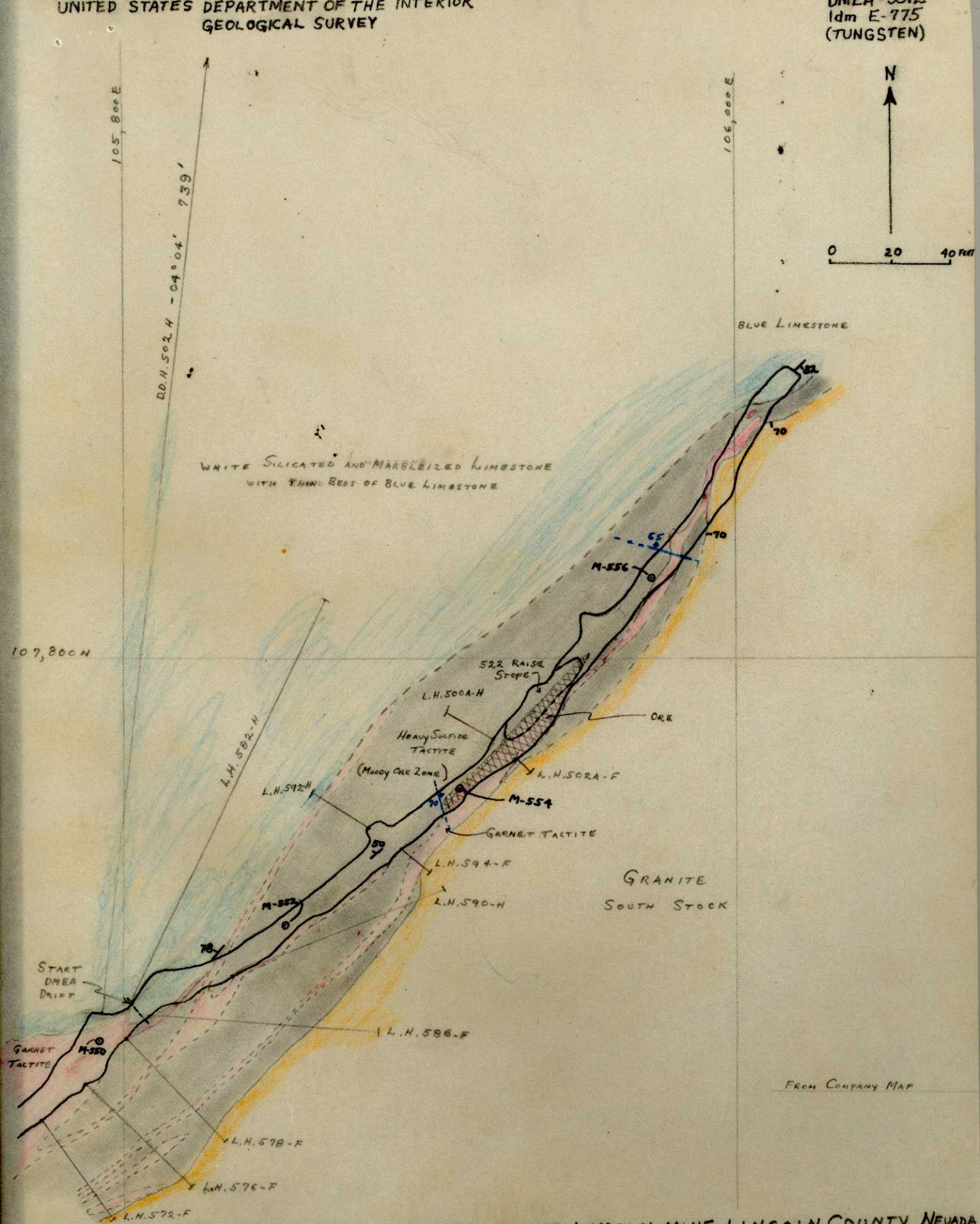


FIGURE 3. GEOLOGIC MAP, 500 LEVEL DMEA DRIFT, LINCOLN MINE, LINCOLN COUNTY, NEVADA

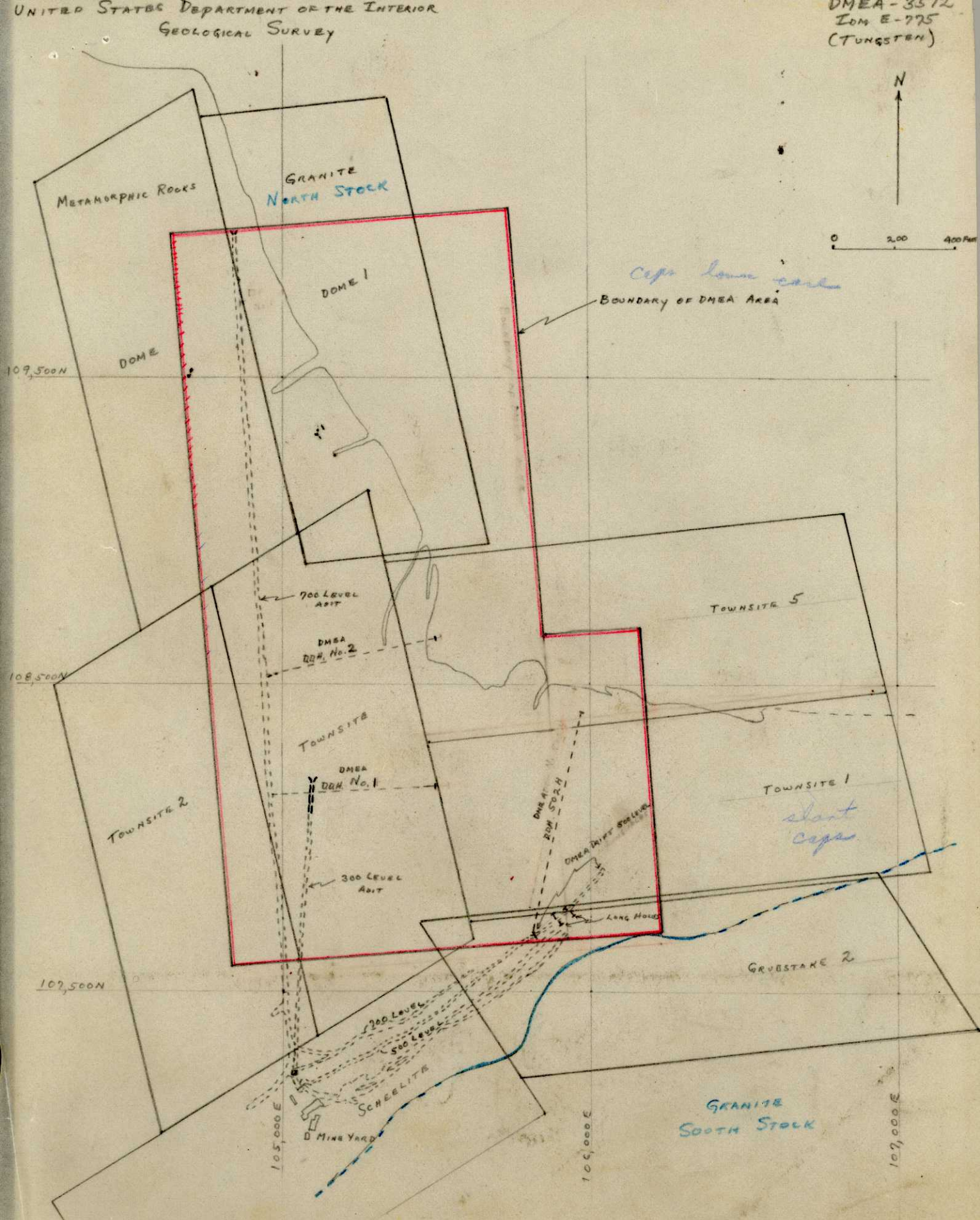


FIGURE 2 -- CLAIM MAP, LINCOLN MINE, TEMPIUTE, LINCOLN COUNTY, NEVADA

0+2-Wash
3cc (76)
2-MP Item 30
0+7cc

UNITED STATES
DEPARTMENT OF THE INTERIOR
FRED A. SEATON, SECRETARY

DEFENSE MINERALS EXPLORATION ADMINISTRATION

REPORT OF EXAMINATION BY FIELD TEAM
REGION II

See p. 13 of this draft — 9 typed "ORE". O.K.?

FINAL REPORT

DMEA 3512, Contract Idm-E775 (Tungsten)
Wah Chang Mining Corporation
Lincoln Mine, Lincoln County, Nevada

See p. 16 draft last item on total tons July 1954?

by

Glenn G. Gentry
Mining Engineer
U. S. Bureau of Mines

Harold K. Stager
Geologist
U. S. Geological Survey

January , 1958

See p. 14 of draft scheelite? 9 typed it "scheelite"

CONTENTS

ILLUSTRATIONS

INTRODUCTION

The Lincoln mine, Tempiute, Lincoln County, Nevada, was explored by the Wah Chang Mining Corporation, 137 Clark Street, Bishop, California. Part of this exploration was done in cooperation with the Defense Minerals Exploration Administration, docket DMEA-3512, contract Idm-E775, dated March 17, 1955. The total cost of the DMEA project was $20,592.25 of which the Government's share at 75 percent was $15,444.19. Work was begun during March 1955 and was terminated by mutual agreement as of July 12, 1957. An examination of the property to evaluate the completed work was made on September 24, 1957 by G. G. Gentry, U. S. Bureau of Mines, and H. K. Stager, U. S. Geological Survey, accompanied by Mr. R. M. MacDonald, chief mining engineer, representing the operator.

The geology and ore deposits of this and the adjoining Y. Z. Mining Company's North Tem Piute mine (DMEA-3273, Idm-E680) have been studied and explored in considerable detail by the U. S. Geological Survey[1] and the U. S. Bureau of Mines[2].

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[1] Wyant, D. G., and Lemmon, D. M., 1951, Tungsten deposits in the Tem Piute district, Lincoln County, Nevada: U.S.Geol. Surv. open file report.

[2] Binyon, E. O., Holmes, G. H., Jr., and Johnson, A. C., 1950, U. S. Bureau of Mines Report of Investigations No. 4626.

SUMMARY

The purpose of the project was to explore the possible downward continuation of two tungsten-bearing tactite bodies that crop out on the property. The project was justified by past production of 300,000 tons of ore that averaged about 0.52 percent WO_3; by inferred reserves of 300,000 tons of ore averaging about 0.5 percent WO_3; and by a favorable geologic setting.

Two diamond drill holes were drilled from the 700 level and one diamond drill hole was drilled from the 500 level to intersect the tactite bodies about 400 feet below the outcrop. Although tungsten-bearing material was discovered in the locations where ore had been inferred, the mineralized zones were too narrow and too low grade to be commercial. Three hundred feet of exploratory drift was driven and 57 feet of test hole was drilled on the 500 level in the second tactite body, and one minable ore body was discovered. About 850 tons of ore that averaged about 0.38 percent WO_3 was mined from this body and milled during the period of the contract. The indicated and inferred reserves resulting from the DMEA exploration total 10,000 tons of ore that averages about 0.4 percent WO_3.

The operators final report, dated August 1, 1957, was received by the Region II Executive Officer, and transmitted to the DMEA Operating Committee, on October 9, 1957.

CONCLUSIONS AND RECOMMENDATIONS

Exploration on the 700 level of the Lincoln mine was not adequate to positively determine the absence of minable ore bodies in the Grubstake ore zone but the work that was done indicates that if ore bodies are present they are smaller and probably of lower grade than was inferred at the start of DMEA work.

The Moody ore zone in the area of the 500 level north drift has been adequately explored and the DMEA work discovered one ore body that was partly mined during the contract period and still contains about 10,000 tons of reserves. ~~About 850 tons of ore was mined from this ore body and was milled during July 1957.~~ Royalties ~~are~~ due the Government on ~~this~~ production from this ore body have been paid. ~~If the concentrates have been sold.~~

Numerous exploration targets exist above and below the 500 level along the Moody ore zone and these were being explored by the company at the time mining activies were terminated due to the suspension of Government purchases of tungsten. Additional exploration of the Moody ore zone is justified and Government participation in this exploration, if requested, should be given favorable consideration if the mine is reopened ~~at some future date~~.

Certification of discovery is warranted for the ore body found by DMEA work on the 500 level and ~~is~~ has been recommended by the Field Team.

LOCATION, ACCESSIBILITY, AND LOCAL FACILITIES

The Lincoln mine is in Sec. 36, T. 3 S., R. 56 E., ~~S.B.B.&M.~~ M.D.B.&M., Lincoln County, Nevada (fig. 1). It is in the Tem Piute mining district, on the northwest flank of the Timpahute range at an altitude of 6,300 feet.

From Caliente, Nevada, the mine is reached by traveling west 44 miles on U. S. Highway 93, an all-weather road, to Crystal Springs. From Crystal Springs travel west 34 miles on Nevada Highway 25, an all-weather road, to the Lincoln mine turnoff, then travel north 10 miles on a graded and graveled road to the mine, mill, and camp at Tempiute, Nevada. The all-weather roads are maintained by the Nevada State Highway Department and the mine access road is maintained by the Wah Chang Mining Corporation. The mine is accessible by ordinary passenger car except during infrequent heavy snow storms that cause temporary blocking of the mine road.

A ~~500~~ 700 ton-per-day flotation and concentrating mill is located near the 700-level portal of the mine. Mine labor, equipment, and supplies are usually available in Pioche, Las Vegas, or Tonopah, Nevada (fig. 1). The closest railroad, truck, and telegraph service is at Caliente, Nevada. Water for mining, milling, and camp use is pumped from company-owned wells at the foot of the range about ~~5~~ four miles from the camp. Telephone and mail service is available at the mine camp of Tempiute and electric power from Boulder Dam is available over a 58.5 mile, company-owned, transmission line to Delamar Valley, between Crystal Springs and Caliente, Nevada.

PROPERTY

History and Ownership

The Tem Piute district first became active between 1868 and 1870 when silver ore was discovered on the west side of the Timpahute range. Tungsten was first discovered in 1916 by the Millick brothers but was not mined until 1936 when Wesley Koyen located two claims on the principal outcrop. In 1938 C. L. Baker and A. K. McFarlane leased the property. The lease was assigned to J. G. Berry who transferred it to D. B. Fegles of the Fegles Construction Company, Minneapolis, Minnesota. A 40-ton mill was constructed in 1939 and mill operations were started in 1940 under the name of Lincoln Mines, Inc. Capacity of the mill was increased to 75 tons in 1941. The lease was acquired by the Atolia Mining Co., of San Francisco in June 1945 and the property was operated by that company until September 1948. The Atolia company surrendered the lease to the owners, Wesley and Eva Koyen and George and Dean Theriot, who continued small intermittent operations until 1951 when the ownership of the claims, that had increased to 29 in number, was acquired by the Wah Chang Mining Corporation. A new 700 ton-per-day mill was completed in 1953 and operations were continuous until August 1957 when the mine and mill were closed. The suspension of the Government purchases of tungsten concentrate for the national stockpile was given as the reason for closing.

Claims

The property consists of 29 claims. Ten of these claims are patented, all of which are covered by U. S. Mineral Survey No. 4760, and the amended notices of location are recorded in Book M-1, pages 207-213, Lincoln County, Nevada. Nineteen claims are held by location and are recorded in Books L-1, M-1, and N-1.

The DMEA contract area is confined to one unpatented and seven patented claims and consists of portions of the claims which lie within vertical planes as outlined in figure 2. These claims are:

Patented (Survey 4760)

Claim	Book	Page
Dome	M-1	211
Grubstake No. 2	M-1	211
Scheelite	M-1	209
Townsite	M-1	212
Townsite No. 1	M-1	207
Townsite No. 2	M-1	213
Townsite No. 5	M-1	207
Unpatented		
Dome No. 1	N-1	209-210

The DMEA contract area is further described by metes and bounds as follows: "Starting at the mouth of the 700 level adit of the Lincoln mine, on the Dome claim, thence N. 85°26' E. 900 feet, thence S. 4°34' E. 2,400 feet, thence S. 85°26' W. 1,100 feet, thence N. 4°34' W. 2,400 feet, thence N. 85°26' E. 200 feet to point of beginning." This area was increased by Amendment No. 1 by the following additional area: "Starting at the southeast corner of the area previously approved for

royalty in Annex I, on the Grubstake No. 2 claim, thence N. 4°34' W. 1,000 feet; thence N. 85°26' E. 300 feet; thence S. 4°34' E. 1,000 feet; thence S. 85°26' W. 300 feet to the point of beginning."

Development

The mine is developed by more than 20,000 feet of underground workings on six levels, the 100, 200, 300, 500, 700, and 900 levels, with adits on the 100, 300, and 700 levels and an inclined shaft from the surface to the 900 level. Mining is by shrinkage stopes. The workings require little support and all were in good condition and accessible at the time mining was suspended in August 1957. Compressor capacity is about 4,500 cubic feet. Five battery trammers of 1-1/2 and 3-ton size are used with one- and two-ton mine cars.

The mill is of gravity and flotation type with three-stage crushing and two-stage grinding in rod and ball mills. Nominal capacity of grinding is 700 tons per day. The mill was built in 1953 and is in excellent condition.

The company-owned townsite of Tempiute Nevada, houses about 500 people and has a school, store, gasoline station, mess hall, and guest houses. Water is pumped to the town through four miles of six inch pipe line with a 1,500 foot lift.

Production

The Lincoln mine has produced about 1,000,000 tons of ore that averaged about 0.45 percent WO_3, and yielded about 280,000 units of WO_3. Most of this ore has come from the Moody ore zone. At the time operations were suspended the mill was operating at a rate of about 780 tons of ore per day that averaged about 0.4 percent WO_3, or a yield of about 5,000 units of WO_3 per month.

THE DMEA PROJECT

The work proposed in the contract consisted of a three-stage project. Stage I was to consist of the excavation of six diamond-drill stations on the east side of the 700 level adit, and the drilling of six near horizontal diamond-drill holes, for a total of 2,600 feet, to explore the Grubstake and Moody ore zones. Stage II was dependent on the results of Stage I and consisted of the driving of three crosscuts, for a total of 1,180 feet, to expose the two ore zones where intersected by the Stage I drill holes. Stage III consisted of the driving of 550 feet of drifts to further explore the ore zones exposed by the Stage II crosscuts.

Five diamond-drill stations were completed and two diamond-drill holes were drilled, for a total of 1,108 feet, on the 700 level. This work did not discover minable ore and indicated that the target area was not as favorable as had been inferred. The contract was therefore amended (Amendment No. 1) on July 9, 1956 to increase the area subject to DMEA royalty (fig. 2), to increase the period for royalty and lien to March 17, 1966, and to permit the drilling under Stage I of a near horizontal diamond-drill hole from the 500 level. This drill hole was drilled to a depth of 739 feet but did not intersect ore-grade material. The amendment also permitted the suspension of work between June 30, 1956 and November 30, 1956 and extended the completion time for the contract from June 30, 1956 to February 28, 1957. The contract was further amended on February 27, 1957 (Amendment No. 2) to delete the original Stages II and III and substitute a 300-foot exploratory drift along the Moody ore zone on the 500 level for Stage II. This amendment also provided for the drilling of ten long holes, for a total of not more than 240 feet, to explore the walls and back of the drift. The time for completion of

the work was extended to June 17, 1957 by Amendment No. 2 and to September 17, 1957 by Amendment No. 3, dated June 10, 1957. The 300 feet of drifting was completed and four long holes, for a total of 57 feet, were drilled (fig. 3). One ore body was discovered by this work and about 850 tons of ore was mined from the body and milled before work was suspended in August 1957. A TOTAL OF 257,497 UNITS OF WO_3 WAS RECOVERED FROM THIS ORE AND SOLD FOR $36.00 PER UNIT. The exploration work was well done and is satisfactory to the Government.

Expenditures

Total approved cost of the project (original).....	$76,300.00
Total approved cost of the project (amended).....	21,569.00
Units, unit cost, and total expenditures	
5 diamond drill stations @ $165.00 ~~each~~....	825.00
1,847 ~~feet~~ of diamond drilling @ $5.00 ~~feet~~....9,235.00	
57 ~~feet~~ of long hole drilling @$1.25 ~~feet~~...	71.25
300 ~~feet~~ of drifting @ $33.00 per ~~feet~~.....9,900.00	
10 ~~feet~~ of car passes @ $33.00 per ~~feet~~.....	330.00
77 assays for WO_3 @ $3.00 ~~each~~.....	231.00
Total expended.....	$20,592.25
Government's share of the total expenditures at 75 percent..	15,444.19
Unexpended funds.....	976.75
Government's share of unexpended funds at 75 percent.....	732.56
Value of production during operations, subject to DMEA royalty, ~~and~~ the Government's share at 5 percent..	9,269.89 Undetermined 463.49 (PAID)

Equipment

Work performed under this contract was on a unit-cost basis and all equipment was furnished by the operator.

$2.49

GEOLOGY

Geologic Setting

The Lincoln mine is underlain by Upper Paleozoic limestone, hornfels, and quartzite that have been folded, faulted, and intruded by two small granite stocks.

The mine is on the northwestern flank of the southern, and larger, of the two granite stocks at the north end of the Timpahute range. This stock is about a mile in diameter and is separated from the northern stock by a belt of limestone and hornfels about 500 feet wide. The northern stock is about 4,000 feet in diameter and is probably joined at shallow depth (±1,000 feet) to the southern stock. These two stocks form the core of a faulted dome in the sedimentary rocks. The beds strike from N. 50° E. in the vicinity of the main workings of the mine to N. 25° W. in the area explored by Stage I of the DMEA project and dip away from the intrusive from 55 degrees to 80 degrees. Hornfels is in contact with the stocks for more than half their perimeters but in the area of the mine the rock in contact with the granite is a dense gray limestone. Contact metamorphism formed a thick layer of scheelite-bearing garnet and sulfide tactite about 6,200 feet long and averaging 40 feet thick occurs between the limestone and the south granite stock in the vicinity of the main workings. This tactite layer is known as the Moody ore zone, ~~and has yielded the major part of the tungsten ore produced from the mine.~~ A second major scheelite-bearing tactite layer about 2,000 feet long and averaging 30 feet thick is separated from the Moody ore zone by 100 to 200 feet of white platy hornfels and two thin tactite layers. This upper tactite layer is known as the Grubstake ore zone.

Faulting has offset many of the sedimentary beds on the property. These faults have offsets of only a few feet but appear, in many places, to have been important controls in the formation of the ore bodies. In places these fractures contain rich seams of scheelite, fluorite, and sphalerite.

Ore Deposits

The ore deposits are concentrations of scheelite, molybdenite, powellite, pyrite, pyrrhotite, sphalerite, and fluorite in parts of the two tactite deposits.

Scheelite is the principal ore mineral and is widespread in the surface and underground exposures of tactite but has been mined from only the Grubstake and Moody zones. Ore bodies within the Grubstake zone range from 80 to 300 feet long, from a few feet to 20 feet thick, and have been stoped for as much as 200 feet up the dip. Ore bodies within the Moody zone range from 60 to 300 feet long, from a few feet to 40 feet wide and have been stoped for as much as 400 feet up the dip. These ore bodies range in grade from 0.3 percent to 2.5 percent WO_3 but average about 0.45 percent WO_3. The tactite between the bodies averages between 0.1 and 0.2 percent WO_3. Most of the scheelite in the ore occurs as small disseminated crystals scattered throughout the tactite groundmass, but rich seams of pure scheelite have been noted along fractures cutting the tactite and adjacent rocks.

The other ore minerals, powellite, molybdenite, sphalerite, and fluorite are less common although concentrates containing commercial quantities of molybdenite, zinc, and acid-grade fluorite have been recovered from the ore. Pyrrhotite and pyrite are common and are the major gangue minerals of the Moody zone. The gangue minerals of the Grubstake zone, and to a lesser extent of the Moody zone, are garnet, epidote, calcite, and quartz.

The DMEA drill holes cut scheelite-bearing tactite and silicated limestone near the north granite stock but the mineralized zones were too thin and too low in grade to warrant the crosscutting and drifting provided for under Stage II of the contract. This drilling indicates that the major mineralized zones are confined to the vicinity of the south granite stock.

Exploration of the Moody ore zone on the 500 level (figs. 2 and 3) was almost entirely in dense pyrrhotite-tactite. This pyrrhotite-tactite OVER MOST OF THE DRIFT LENGTH BUT NARROWED TO 6 FEET IN THE FACE. is about 40 feet wide, [redacted] contains numerous thin lenses, pods, and stringers of garnet-tactite. Scheelite is sparsely disseminated throughout the zone. The tactite averages about 0.1 percent WO_3 along the 300 feet of DMEA drift except in the area of the ore body where the grade ranges from 0.1 percent to 0.9 percent WO_3 and averages about 0.4 percent WO_3. The highest grade part of the ore body was about 7.6 feet wide, 285 feet long, and was stoped for about 20 feet up a nearly vertical dip. This high-grade part of the body averaged about 0.55 percent WO_3. The ore shoot containing this higher grade core is about 65 feet long, 10 feet wide, and is inferred to extend 100 feet above and below the level. The ore shoot is mainly scheelite-bearing garnet tactite but disseminated scheelite of ore grade extends into the dense pyrrhotite-tactite at each end and for several feet into the hanging wall.

SAMPLING

During the period of the contract 82 samples were taken and assayed by the operator and 9 samples were taken by the DMEA engineer and assayed by the U. S. Bureau of Mines. Of the 82 samples taken by the operator only 77 were charged to the DMEA contract.

Stage I

Diamond-drill hole No. 1, 700-level, depth 547 feet. Examination of the cores from this hole indicated minor, sporadic occurrences of scheelite, with the exception of the zone from 418.1 feet to 423.1 feet. This section was sampled and assayed as follows:

Increment feet	Length feet	Operator's Sample No.	%WO_3	DMEA Sample No.	%WO_3
418.1-419.4	1.3	26304	0.51	1967	0.74
420.4-420.8	0.4	26305	0.09	1968	0.06
421.4-423.1	1.7	26306	0.79	1969	0.92

Diamond-drill hole No. 2, 700-level, depth 561 feet. Examination of the cores from this hole indicated minor and sporadic occurrences of scheelite. No samples were taken.

Diamond-drill hole No. 502-H, 500-level, depth 739 feet. Examination of the cores from this hole indicated minor and sporadic occurrences of scheelite from 670 feet to 676 feet. The grade was estimated to be less than 0.01 percent WO_3, by ultraviolet light, and no samples were taken.

Stage II

DMEA drift, 500-level north [redacted], length 300 feet. The operator took 50 samples of the ore zone during the driving of this drift. The location and grade of each of these samples is shown on the assay map (fig. 4).

Six samples were taken by the DMEA engineer. The location of these samples is shown on the assay map and the assays are as follows:

Sample No.	Width (feet)	Description	Percent WO_3
2194	5.0	Face of drift on April 4, 1957	<0.01
2250	4.0	Across back, Station 554+36	0.15
2251	4.0	Across back, Station 554+80	<0.01
2252	2.5	West side of drift across back	0.56
2355	40.0	Grab sample along foot wall under stope and 522 raise.	0.03
2356	---	Grab sample of muck pile along track at bottom of 522 raise.	0.45

DMEA long holes, 500-level north drift. The operator took a total of 19 samples from the long hole drill cuttings. The location of these holes is shown on figure 3 and the assays are as follows:

Hole No.	Interval feet	Length feet	Description	Percent WO_3
500 AH	0 - 3	3	Sulfide tactite	nil.
	3 - 6	3	" "	nil.
	6 - 9	3	" "	nil.
	9 -12	3	" "	nil.
	12-15	3	" "	nil.
	15 -18	3	" "	nil.
502 AF	0 - 3	3	Sulfide tactite	nil.
	3 - 6	3	Granite	nil.
592 H	0 - 3	3	Sulfide tactite	nil.
	3 - 6	3	" "	0.02
	6 - 9	3	" "	0.03
	9 -12	3	" "	0.03
	12-15	3	Fault gouge "	0.05
	15-18	3	Garnet tactite	0.34
	18-21	3	Limestone	0.02
594 F	00- 3	3	Sulfide tactite	0.38
	3 - 6	3	Garnet tactite	0.24
	6 - 9	3	Garnet tactite	0.04
	9 -12	3	Granite	0.01

During the mining of the DMEA ore body on the 500 level the operator took 10 samples of the ore as it was removed from the 522 raise and stope. The assays and the tonnage of ore represented by each are as follows:

Tons of ore	Percent WO_3	
29	0.38	
27	0.85	Milled in May 1957
60	0.22	- 250 Tons of 0.42% WO_3
51	0.49	
56	0.53	
27	0.13	
27	0.22	Milled in June 1957
58	0.60	- 102 Tons of 0.53% WO_3
17	0.79	
495	0.33	- Milled in July 1956

ORE RESERVES

The reserves in the DMEA area at the Lincoln mine, and attributable to DMEA exploration, total 10,000 tons of ore that averages about 0.4 percent WO_3.

Class	Tons	Grade (Percent WO_3)
Measured and Indicated	1,000	0.4
Inferred	9,000	0.4
Total	10,000	0.4

All of these reserves are contained in the ore body discovered by DMEA exploration in the Moody ore zone on the 500-level (fig. 3). About 850 tons of ore that averaged 0.38 percent WO_3 was mined from this ore body during the period of the contract. Reserves that can be classified as measured total only a few tens of tons of ore exposed in the back and ends of the 522-stope and are therefore included with the indicated reserves. Total measured and indicated reserves are 1,000 tons of ore averaging 0.4 percent WO_3 contained in a block of ground 65 feet long, ~~ten~~ 10 feet thick, and extending ~~ten~~ 10 feet below and ~~twenty~~ 20 feet above the 500-level. Inferred reserves are 9,000 tons of ore averaging 0.4 percent WO_3 in a block of ground 65 feet long, 10 feet thick, extending from 20- to 100-feet above the 500-level and from 10- to 100-feet below the 500-level.

(Glenn's draft---Lincoln mine final report)

(176)

Item 30

INTRODUCTION

The 700 (or 600) level and the 500 level north drift of the Lincoln mine were explored by the Wah Chang Mining Corporation, 137 Clark Street, Bishop, California, in cooperation with the Defense Minerals Exploration Administration, docket DMEA-3512, contract Idm-E775 dated March 17, 1955.

Stage I was conducted on the 700 level main haulage adit which was started during January 1955 and extended at the expense of the operator.

The DMEA work comprised cutting drill stations and diamond drilling. The work was started during March 1955 and completed on May 26, 1956.

Stage II, comprising drifting and long hole drilling on the 500 level north, was started on [redacted] March 12, 1957 and was discontinued on July 12, 1957, due to the low price for tungsten which caused the operator to close the mine and mill.

During the period of the contract three amendments were approved:

No. 1 dated July 9, 1956

No. 2 dated February 27, 1957

No. 3 dated June 10, 1957.

The operator's final report, dated August 1, 1957, states that no further work will be completed on the DMEA project. The project was therefore terminated as of July 12, 1957 by mutual agreement.

The examination to evaluate the work performed was made on September 24, 1957.

(Glenn's draft---Lincoln mine final report)

SUMMARY

The purpose of the project was to explore two geological targets:

Stage I To explore by diamond drilling from the 700 level the downward extension of a tactite vein which was mineralized on the surface.

Stage II To explore the Moody vein in an unknown area on the 500 level north by drifting easterly and long hole drilling from the drift.

The work accomplished by the operator consisted of excavating 5 drill stations and 1,847 feet of diamond drilling under Stage I; 300 feet of drifting and 57 feet of long hole drilling under Stage II.

Because additional exploration under Stage I was not justified, the expenditure of $76,300.00 approved by the Government was reduced to $21,569.00, of which $976.75 was not spent. Twenty thousand, five hundred ninety two dollars and twenty five cents was expended on the project and the Government's participation at 75 percent was $15,444.19.

There was no production of ore from Stage I. Tungsten ore produced from Stage II is reported as 847 tons having a weighted average of 0.3803 percent WO_3.

This ore was milled in the company-owned mill during July 1957. Royalty on this production is due the Government but has not been paid.

The exploration work has been well done and is satisfactory to the Government.

CONCLUSIONS AND RECOMMENDATIONS

The exploration completed on the 700 level under Stage I failed to disclose a minable deposit of tungsten ore.

The drift extended on the 500 level north under Stage II was successful in finding a minable deposit of tungsten ore thereby increasing the ore reserves in the mine.

Further exploration on this level and above and below the 300 foot drift, either by the company or with Government assistance, is justified.

Fifty samples taken by the company during the extension of the 300 foot drift on the 500 level north show a weighted average of 0.134 percent WO_3.

The principal ore shoot in the drift beginning at Station 552+70 and ending at Station 554+60, a length of 65 feet, shows a weighted average of 0.4394 percent WO_3.

Long hole drilling from this level produced the following sample information:

Hole No. 592H: 3 feet of ore from 15 to 18 feet, averaging 0.34 percent WO_3.

Hole No. 594F: 6 feet of ore from 0 to 6 feet averaging 0.31 percent WO_3.

We therefore recommend a certification of discovery.

LOCATION, ACCESSIBILITY, AND LOCAL FACILITIES

The Lincoln mine at Tempiute, Nevada, is situated in the western central part of Lincoln County and near the western boundary line of the county.

From Caliente, Nevada, the mine is reached by traveling westerly 44 miles via U. S. Highway 93, an all-weather road, to Crystal Springs. Thence turn right (north) and travel westerly 34 miles via Nevada State Highway No. 25, an all-weather road, thence turn right (north) for 10 miles via a graded and gravelled road.

The all-weather roads are maintained by the Nevada State Highway Department and the [illegible] Wah Chang Mining Corporation maintains the mine access road.

Only limited interruptions in mining and mining operations would be expected during the winter months.

Competent mining personnel can usually be obtained from [illegible] Pioche, Las Vegas, or Tonopah, Nevada.

Necessary supplies are generally in stock in the company warehouses and the commissary at the mine camp.

Electric power, water, and housing are provided by the company. Telephone, telegraph, trucking, and railroad services are available at Caliente, Nevada.

The company has provided a 700-900 ton-per-day flotation and concentrating mill with all necessary facilities located near the portal of the 700 level adit.

PROPERTY

The land referred to in Article 2 of the contract consists of these portions of the claims listed below which lie within vertical planes, as outlined on the map (fig. 2) Wah Chang Mining Corporation, Lincoln mine, Tempiute, Nevada. The names of the claims, all of which are patented (Survey No. 4760), are as follows:

Dome	Townsite No. 2
Dome No. 1	Townsite No. 5
Townsite	Grubstake No. 2
Townsite No. 1	Scheelite

NOT PATENTED

The land is further described by metes and bounds as follows: "Starting at the mouth of the 700 level adit of the Lincoln mine, on the Dome clain, thence N. 85° 26' E. 900 feet, thence S. 4°34' E. 2,400 feet, thence [redacted] S. 85°26' W. 1,100 feet, thence N. 4°34' W. 2,400 feet, thence N. 85°26' E. 200 feet to point of beginning."

LOC & acres

The Lincoln mine and the Tem Piute tungsten deposit are situated in sec. 36, T. 3 S., R. 56 E., in the North Tempiute [redacted] mining district, Lincoln County, Nevada, and are of record in the County Recorder's office, Pioche, Nevada.

Pursuant to Amendment No. 1, dated July 9, 1956, the contract is amended by adding the following land: "That part of Townsite No. 1, Townsite No. 5, and Grubstake No. 2 mining claims, Survey No. 4760, outlined on the map entitled 'Wah Chang Mining Corporation, Lincoln mine, Tempiute, Nevada' and bearing date of May 10, 1956."

The area is described by metes and bounds as follows: "Starting at the southeast corner of the area previously approved for royalty in Annex I, on the Grubstake No. 2 claim, thence N. 4° 34' W. 1,000 feet; thence N. 85° 26' E. 300 feet; thence S. 4° 34' E. 1,000 feet; thence S. 85° 26' W. 300 feet to the point of beginning."

Draft agreement

Amendment

The contract specified three stages of work on the 700 level, Stages II and III dependent upon results from previous stages.

Amendment No. (2) revised the exploration by providing for work on the 500 level north, including work in Stage I previously performed on the 700 level and reduced the total expenditures from $76,300.00 to $21,569.00.

Work to be performed on the 700 level:

	Approved costs
Stage I	
6 diamond drill stations	$990.00
Timbering of drill stations	210.00
2,600 ft. diamond drill holes	13,000.00
Total, Stage I	$14,200.00
Stage II	
1,180 ft. crosscutting	$38,940.00
Timbering of crosscuts	3,010.00
Total, Stage II	$41,950.00
Stage III	
550 ft. drifting	$18,150.00
Timbering of drift	1,400.00
Total, Stage III	$19,550.00
200 samples (Stages I, II, and III), to be analyzed for WO_3	$600.00
Estimated total cost of the project	$76,300.00
Government participation at 75 percent. .	$57,225.00

The following work was accomplished:

	Cost
Stage I	
Excavated for 5 diamond drill stations, 25 ft. @ $33.00/ft.	$825.00
1,847 ft. diamond drilling @ $5.00/ft.	9,235.00
3 samples, analyzed for WO_3, @ $3.00/ea.	9.00
Total, Stage I	$10,069.00

The above work was completed during the month of May 1956 and the project was idle until March 12, 1957.

On November 12, 1956 the operator requested that work on the 700 level be discontinued due to the lack of success in finding ore and that a part of the remaining funds used in exploration on the 500 level north.

Pursuant to this request, Amendment No. 2, dated February 27, 1957, was prepared and executed.

Locations of work completed under Stage I:

No. 2 DD Station on the Dome claim at coordinates 108,955 N-104,920 E.

No. 3 DD Station on the Townsite claim at coordinates 108,555N-104945E.

No.4 DD Station on the Townsite claim at coordinates 108,145N-104,974E.

No.5 DD Station on the Townsite claim at coordinates 107,746N-105,000E.

No.6 DD Station on the Townsite No. 2 claim at coordinates 107,550N-105,014E

Diamond drilling:

DDH No. 1 was drilled from Station No. 4, collared at coordinates 108,144N; 104,982E on the Townsite No. 2 claim. The course of the drill hole was N. 86° 35' 54" E., inclined minus 1° plus 5° to a depth

of 547 feet and ended on the Townsite claim.

DDH No. 2 was drilled from Station No. 3, collared at coordinates 108,510N; 104,956E on the Townsite claim. The course of the drill hole was N. 77° E., inclined minus 4° to a depth of 561 feet and ended on the Townsite No. 5 claim.

DDH No. 502H, drilled under Amendment No. 1, from the 500 level, was collared at coordinates 107,770N; 105,810E. on the Townsite No. 1 claim. The course was N. 11° 30' E., inclined minus 4° to a depth of 739 feet and ended on the additional land described in Amendment No. 1.

Under Amendment No. 2 the following work and costs were approved:

	Cost
Stage I work completed	$10,069.00
and added Stage II: 500 level north:	
Drifting, 300 ft. @ $33.00/ft.	9,900.00
Car passes, 10 ft. @ $33.00/ft.	330.00
Long hole drilling, 240 ft. @ $1.25/ft.	300.00
Timbering, 100 ft. @ $7.00/ft.	700.00
90 samples, analyzed for tungsten, @ $3.00/ea.	270.00
Estimated total cost of the project	$21,569.00
Government participation at 75 percent . . .	$16,177.00

Pursuant to this amendment 300 feet of drifting was completed, beginning on the Townsite No. 1 claim at coordinates 107,687N, 105,807E, and ending on the additional land provided by Amendment No. 1 at coordinates 107,896N, 106,020E.

Two car passes were completed at coordinates 107,745N, 105,890E and 107,818N, 105,955E. Four long holes totaling 57 feet were drilled:

No. 592H, depth 21 feet, collared at coordinates 107,743N, 105,880E.

No. 594F, depth 12 feet, collared at coordinates 107,736N, 105,891E.

No. 502AF, depth 6 feet, collared at coordinates 107,767N, 105,928E.

No. 500AH, depth 18 feet, collared at coordinates 107,771N, 105,921E.

Timbering: None required

74 samples were analyzed for tungsten.

Resume of work and expenditures as revised by Amendment No. 2

Stage I, 700 level:

Item	Costs Approved	Costs Expended	Status
5 diamond drill stations, 25 ft. @ $33.00/ft.	$825.00	$825.00	completed
1,847 ft. diamond drill holes @ $5.00/ft.	9,235.00	9,235.00	completed
3 samples, analyzed for WO_3, @ $3.00/ea.	9.00	9.00	completed

	Costs		
	Approved	Expended	Status
Stage II, 500 level north:			
Drifting, 300 ft. @ $33.00/ft.	$9,900.00	$9,900.00	completed
Car passes, 10 ft. @ $33.00/ft.	330.00	330.00	completed
Long hole drilling, 240 ft. @ $1.25/ft.	300.00	71.25	57 ft. completed
Timbering, 100 ft. @ $7.00/ft.	700.00	---	not required
90 samples, to be analyzed for WO_3, @ $3.00/ea.	270.00	222.00	74 assayed.

Estimated cost of the project---$21,569.00
Actual cost of the project---------- $20,592.25
Government participation at 75 percent----- $15,444.19
Unexpended---------- $ 976.75

Under Amendment No. 1, item 5, the period for royalty payments and lien for payment thereof is extended to eleven (11) years from date of contract and would expire on March 17, 1966.

SAMPLING

Stage I, ~~700 level~~ 700-level depth: 547 feet:

DDH No. 1, Examination of the drill cores from this hole indicated minor, sporadic occurrences of scheelite with the exception of the area from 418.1 feet to 423.1 feet. This section was sampled as follows:

Increment, feet	Length, feet	Operator's Sample No.	Percent WO_3	DMEA Sample No.	Percent WO_3
418.1-419.4	1.3	26304	0.51	BM-1967	0.74
420.4-420.8	0.4	26305	0.09	BM-1968	0.06
421.4-423.1	1.7	26306	0.79	BM-1969	0.92

DDH No. 2, depth: 561 feet: Examination of the drill cores indicated minor and sporadic occurrences of finely-disseminated scheelite. No samples were taken.

DDH 502H, 500 level, depth: 739 feet: Examination of the drill cores indicated minor and sporadic occurrences of scheelite from 670 feet to 676 feet. The degree of GRADE mineralization was estimated at less than 0.01 percent WO_3 and no samples were taken.

500 level north, 300 ft. drift:

Sampling by the operator: 50 samples from the entire drift averaged 0.134 percent WO_3. Sampling from Station 552+70 to 554+60 (65 ft.) averaged 0.4394 percent WO_3. Eight hundred and forty seven tons of ore averaging 0.3803 percent WO_3 was produced from the drift and raise No. 522.

Samples by the DMEA (identified on the Assay Map) were as follows:

BM Sample No.	Width, feet	Location	Percent WO_3
2194	5.0	Face of drift.	<0.01
2250	4.0	Across back Station 554+36	0.15
2251	4.0	Across back Station 554+80	<0.01
2252	2.5	West side of drift across back.	0.56
2355	grab. length 40 ft.	Grab along foot wall under raise 522.	0.03
2356	grab	Small muck pile along track at bottom of raise 522.	0.45

Long hole drilling: Sludge samples

(No. 592H-depth 21 ft.)

		Formation	
0-3ft.	3 ft.	Sulphide tactite.	nil.
3-6 ft.	3 ft.	Sulphide tactite.	0.02
6-9 ft.	3 ft.	Sulphide tactite.	0.03
9-12 ft.	3 ft.	Sulphide tactite.	0.03
12-15 ft.	3 ft.	Fault gouge.	0.05
15-18 ft.	3 ft.	Garnet tactite.	0.34
18-21 ft.	3 ft.	Limestone	0.02

(No. 594F-depth 12 ft.)

0-3 ft.	3 ft.	Sulphide tactite.	0.38
3-6 ft.	3 ft.	Garnet tactite.	0.24
6-9 ft.	3 ft.	Garnet tactite.	0.04
9-12 ft.	3 ft.	Granite.	0.01

(No.502 AF-depth 6 ft.)

0-3 ft.	3 ft.	Sulphide tactite.	nil.
3-6 ft.	3 ft.	Granite.	nil.

(No. 500 AH-depth 18 ft.)

0-3 ft.	3 ft.	Sulphide tactite.	nil.
3-6 ft.	3 ft.	Sulphide tactite.	nil.
6-9 ft.	3 ft.	Sulphide tactite.	nil.
9-12 ft.	3 ft.	Sulphide tactite.	nil.
12-15 ft.	3 ft.	Sulphide tactite.	nil.
15-18 ft.	3 ft.	Sulphide tactite.	nil.

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Item 3c

WAH CHANG MINING CORPORATION
LINCOLN MINE DIVISION
TEMPIUTE, NEVADA

Final Rept.

August 1, 1957

Lincoln Mine, Moody 500 North Exploration Drift
(DMEA Contract Idm-E 775, Stage II)

The Moody 500 North Drift was extended 300 feet in the Moody Zone. The entire advance was through a heavy sulphide tactite containing lenses of garnet tactite. Near the end of drift the granite foot wall and the limestone hanging wall of the Moody Zone were exposed. The zone width narrowed down from a width of forty feet at the start of the exploration project to six feet near the face of the drift. One small ore shoot was exposed by the drift. The weighted averages of the cut samples on this lense of sulphide type ore indicated an ore shoot 28.5 feet long, 7.6 feet wide with a grade of 0.56% WO_3.

The Grubstake Zone and the contact zone along the North Granite Stock were eliminated as areas meriting any further exploration by diamond drill hole 502-H. This diamond drill hole was completed under Stage I of the exploration contract.

Ore Reserve Estimate

Although the Moody Zone on the 300 level above the ore shoot exposed in the Moody 500 N. Drift contains some scattered scheelite values, the possibility of projecting the 522 ore shoot to the 300 level is remote. Ore Reserves in 522 Block found by the exploration drive are estimated as follows:

Location	Tons Possible	Tons-Probable	Total Tons
Moody-522	800-0.35% WO_3	400-0.40% WO_3	1200-0.37% WO_3

Assay Data:

An assay plan map, showing the daily cut samples taken by the mine geologist, is included with this report.

A summary of the production assays not shown on the assay plan map is as follows:

Tons	%WO_3
29	0.38
27	0.85
60	0.22

Assay Data (cont'd)

Tons	% WO_3
51	0.49
56	0.53
27	0.13
27	0.22
58	0.60
17	0.79
495	0.33
847	

A summary of the long hole sludge samples assayed for WO_3 is as follows:

Hole No.	Increment, Feet	Length, Feet	% WO_3	Formation
592-H	0-3	3.0	Nil	Sulphide Tactite
	3-6	3.0	0.02	Sulphide Tactite
	6-9	3.0	0.03	Sulphide Tactite
	9-12	3.0	0.03	Sulphide Tactite
	12-15	3.0	0.05	Fault Gouge
	15-18	3.00	0.34	Garnet Tactite
	18-21	3.0	0.02	Limestone
594-F	0-3	3.0	0.38	Sulphide Tactite
	3-6	3.0	0.24	Garnet Tactite
	6-9	3.0	0.04	Garnet Tactite
	9-12	3.0	0.01	Granite
502 A-F	0-3	3.0	Nil	Sulphide Tactite
	3-6	3.0	Nil	Granite
500 A-F	0-3	3.0	Nil	Sulphide Tactite
	3-6	3.0	Nil	Sulphide Tactite
	6-9	3.0	Nil	Sulphide Tactite
	9-12	3.0	Nil	Sulphide Tactite
	12-15	3.0	Nil	Sulphide Tactite
	15-18	3.0	Nil	Sulphide Tactite

The long holes are shown on the geology map included with this report.

Summary of Work and Unit Costs Thereof:

Although a summary of the work completed under Stage I of the contract was included in the report "Exploration Project Around the North Granite Stock Area of Lincoln Mine, Tempiute, Nevada", this information will be included in the final summary as follows:

Summary of Work and Unit Costs Thereof (cont'd)

Stage I	Unit	Unit Costs	Total Units	Total Cost
5 Diamond Drill Stations	Feet	$33.00	25	$ 825.00
Diamond Drilling	Feet	5.00	1847	9,235.00
Assaying	WO_3 Determinations	3.00	3	9.00
Total Stage I				$10,069.00
Stage II				
Drifting	Feet	$33.00	300	$ 9,900.00
Car Passes	Feet	33.00	10	330.00
Long Holing	Feet	1.25	57	71.25
Assaying	WO_3 Determinations	3.00	74	222.00
Total Stage II				$10,523.25
Total Stage I and Stage II				$20,592.25

A summary of the production subject to a royalty payment is as follows:

Month	Tons	% WO_3	Source
July	495	0.327	Moody 522 Raise
June	102	0.530	Moody 500 N. Drift and 522 Raise
May	250	0.425	Moody 500 North Drift
	847	0.3803 Weighted Avg.	

The raise operations in 522 Block were carried out at no cost to the government. All the broken ore from the raise was removed and milled in July. The present market price of tungsten forced the Lincoln Mine to cease operations in the last week of July. No further work will be completed on the D.M.E.A. Exploration Project (Docket No. D.M.E.A. 3512).

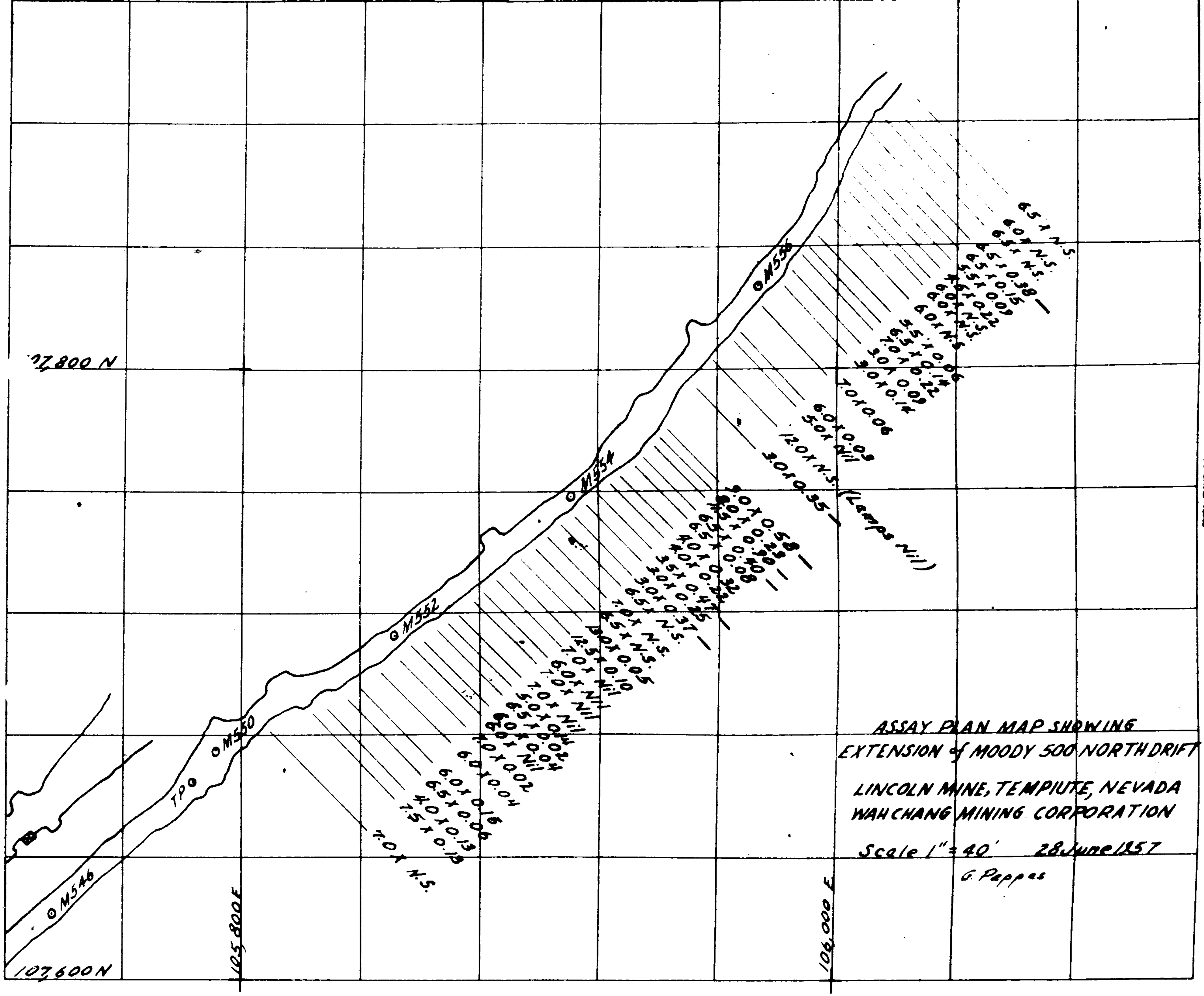
Upon resumption of mining operations, the ore shoot in the back of 522 Raise should be explored by raising and stoping.

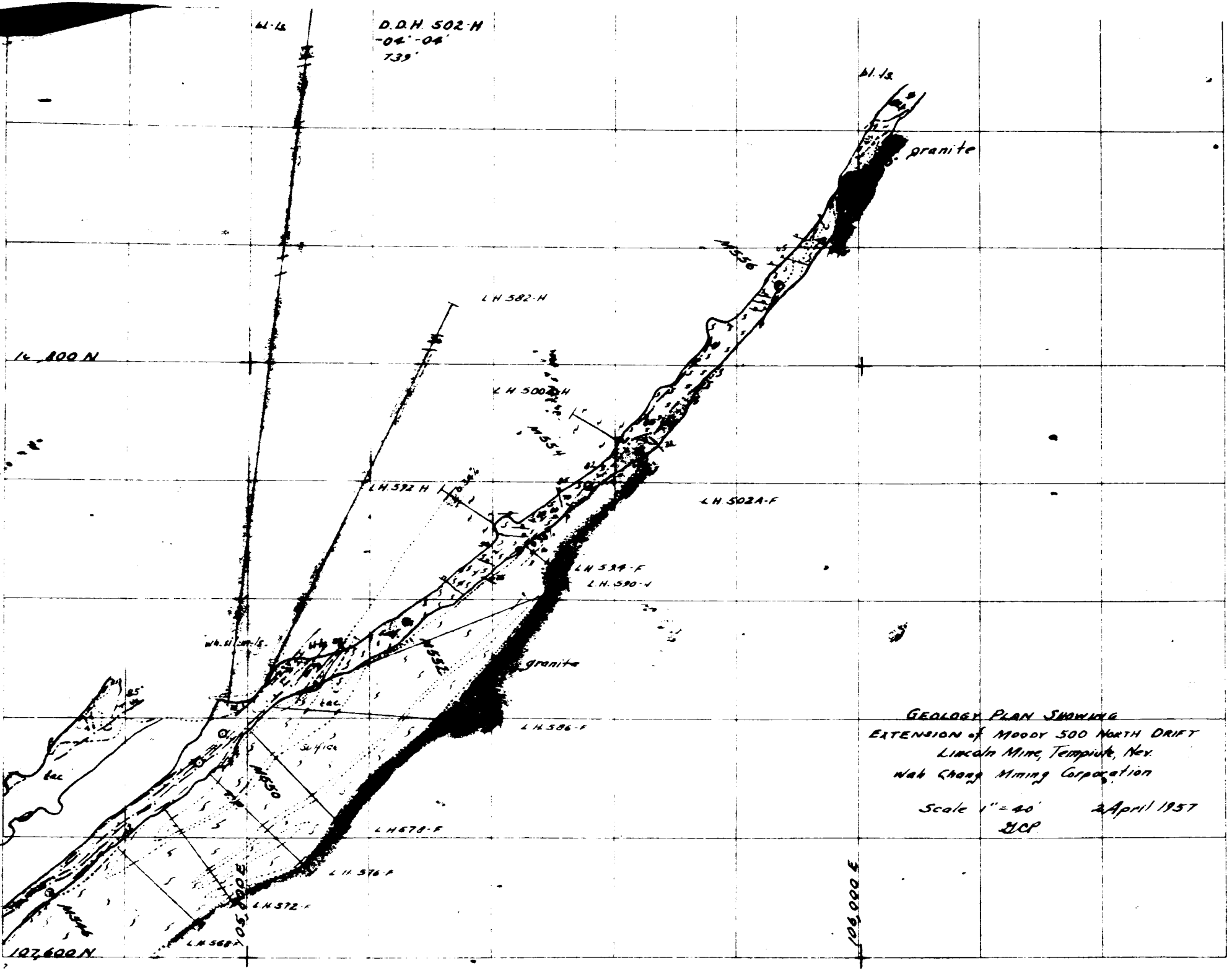
Respectfully submitted,

WAH CHANG MINING CORPORATION
Lincoln Division

John J. Russell
Ass't General Superintendent

Tempiute, Nevada
July 31, 1957


ASSAY PLAN MAP SHOWING
EXTENSION of MOODY 500 NORTH DRIFT
LINCOLN MINE, TEMPIUTE, NEVADA
WAH CHANG MINING CORPORATION
Scale 1" = 40'
28 June 1957
G. Pappas
107,800 N
107,600 N
105,800 E
106,000 E
M546
TP
M550
M552
M554
M556
(Lamps Nil)
SALT LAKE BLUE



GEOLOGY PLAN SHOWING
EXTENSION of MOODY 500 NORTH DRIFT
Lincoln Mine, Tempiute, Nev.
Wah Chang Mining Corporation

Scale 1" = 40' 2 April 1957
JCP