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Item 15

Supplementary Memorandum on the
LONG TUNGSTEN MINE
Big Meadows District, Pershing County, Nevada

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Assistant Geologist
August 5, 1943

LONG TUNGSTEN MINE

Bib Meadows District, Pershing County, Nevada

Abstract

The writer revisited the Long tungsten mine in June 1943 and mapped the geology of the mine workings. About 9100 tons of scheelite ore have been mined from the property and about 3800 units of WO_3 recovered during the first year of operation. Reserves of measured, indicated, and inferred ore total 4200 tons estimated to contain 2400 units of WO_3 . It is predicted that these reserves will be exhausted during November 1943. It is not likely that new discoveries on the property will materially increase the tonnage of commercial ore.

Introduction

During the last week of June, Peter Joralemon and I spent a few days at the Long tungsten mine, a Rare Metals Corp. lease in the Big Meadows Mining District of Pershing County, Nevada. At that time we mapped the geology of underground workings completed since our examination in October 1942. During the interval October-June, this mine has been the only source of ore for the Toulon mill. An average of about 30 tons of ore have been mined and milled daily.

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Production

Mr. John H. Heizer, Superintendent of Rare Metals Corp., recently informed me that during the first year of operation (ended July 31, 1943) 9100 tons of ore were mined and milled. (1). No record of the grade of mill heads has been kept, but it is estimated to have been between 0.6 and 0.65 % WO_3 . Recovery is said to have averaged between 0.4 and 0.45 % WO_3 . If this figure is correct, about 3800 units of WO_3 have been produced. The tailings, estimated to average 0.25% WO_3 , are accumulated for retreatment by flotation.

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Ore Bodies**CONFIDENTIAL**

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Along most of the length of the marble-hornfels contact, shown on plate 1, the marble has been altered to tactite. The width of the altered zone varies from a few inches to 10'. At two places along this contact scheelite has been deposited in an amount sufficient to form commercial bodies of tungsten ore. Near the surface most of the tactite ore has been oxidized to a friable aggregate, consisting mainly of limonite and quartz. Lenses of scheelite-bearing tactite also occur along the contact between marble and quartz monzonite, but they are too small to be of commercial interest.

It is believed that the mineralizing solutions migrated along east and north-east trending fracture planes, now marked by faults with small post-mineral displacements. Fracturing was probably more intense at and near the synclinal nose than elsewhere, and scheelite deposition was concentrated here in altered marble beneath a relatively impermeable and chemically inert hornfels cover, forming the South ore body. The smaller and lower grade commercial ore zones in the North ore

(1). The figure of 6500 tons mentioned in my letter of June 25 was obtained from Mr. H. Burbridge, recently retired auditor of Rare Metals Corp. It probably does not include production during May, June and July.

zone are probably also related to transverse fractures, and possibly also to changes in strike and dip of the marble-hornfels contact.

South Ore Body.- In the South body, ore of commercial grade is localized at the nose, and along the trough of a syncline that pitched gently northeast. Up the limbs from the trough line, the intensity of scheelite mineralization decreases. Commercial ore cropped out only near the nose of the fold. The shape of the ore shoot resembles the smaller segment that would be formed by slicing a cone at a small angle to its axis. Grade of ore has averaged between 0.6 and 0.75% WO_3 .

The ore body is developed by an open cut leading into a 150' adit (0 level), and by a horse shoe-shaped level 30' below the adit. The open cut and adit follow ore for 120' along the west limb of the syncline. The adit extends 70' along the contact beyond the northeast limit of the ore shoot, but only narrow streaks of very low-grade scheelite mineralization are exposed. One branch of the horse shoe-shaped 30' level follows ore for 130' along the west limb of the fold, and continues for 55' along a sub-commercial contact zone. There is more scheelite in the sub-commercial zone on the 30' level than on the 0 level. The other branch of the 30' level follows commercial ore for 125'. In the last 10' of this branch the ore is thick (15'), but sub-commercial.

Commercial ore between the 0 and 30' levels terminates at a vertical or steeply dipping surface, normal to the axis of the syncline. If the cut-off continues vertically to the trough line, the shape of the body will closely resemble the cone segment mentioned above. If, however, the cut-off flattens as it nears the trough line, a crescentic tongue of ore may continue northeast along the trough below the 30' level. (See pl. 2, section C-C').

No commercial ore remains above the 0 level. Fifteen hundred tons can probably be mined from pillars on and above the 30' level, and 1250 tons of ore are inferred with reasonable assurance in the trough below the 30' level. If the cut-off of the ore shoot flattens below the north end of the 30' level and a tongue of ore continues northeast along the trough, the tonnage of inferred ore is greater by from 10 to 25 tons per foot of continuation along the trough northeast of the projected vertical cut-off. Such a tongue, if it contains 0.6-0.75% WO_3 ore might profitably be followed by a gently dipping incline ($\sim 15^\circ$ to $\sim 20^\circ$) along the trough line, and stoped along each limb to the limit of ore.

North ore body.- The North ore body lies along the marble-hornfels contact on the west limb of the syncline. It is separated from the South ore body by a 200' long barren interval. The south half of the body dips from $80^\circ E$ to vertical; near the north end the dip progressively flattens to $30^\circ E$. Ore of commercial grade is confined to two irregular shoots, comprising about 60% of the body above the adit.

The ore body is developed by a 100' cross cut and 250' of drift. (See pl. 1). Two stopes have been carried from the level to the surface. Ore from 3' to 4' wide and averaging 0.5% WO_3 was mined from a stope at the north end of the body. In the north face of the stope the average width of ore is 1' and the average grade is estimated to be 0.4% WO_3 . In the other stope, near the center of the body, 4' of ore averaged about 0.4% WO_3 . A sublevel, 15' above the floor of the drift, is in ore west of the low-angle normal fault shown on plate 2. Four hundred tons of ore estimated to contain between 0.4 and 0.5% WO_3 remain between the sub-level and the surface, and will probably be stoped. The block between the drift and the surface south of this stope contains about 1000 tons of ore. Part of this ore is very low-grade. Stoping will be carried to the commercial limit and may yield 700 tons of ore.

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It is predicted that the commercial zone at the north end of the ore body continues down dip below the level and contains between 15 and 20 tons of ore per foot of inclined depth. If the ore averages 0.5-0.6% WO₃ it can probably be mined without loss. The company plans to sink a winze in this zone, following ore as far as the grade permits. The smaller commercial zone farther south may also continue below the level, but in view of the probable low-grade and small tonnage it may not be explored below the level.

Ore Reserve

As the ore is localized in rather uniform and projectable structures, reserves of measured and indicated ore can be calculated with considerable assurance. Inferred ore in class A is also reasonably assured. Part of the reserve of inferred ore may not be mined, as a grade slightly lower than predicted on the basis of that already mined would probably be sub-commercial. The writer predicts that reserves of mineable ore will be during November 1943, if mining continues at the present rate. It is not likely that new discoveries on the property will materially increase the reserve of commercial ore.

Summary of Reserves On July 1, 1943

		<u>South Ore Body</u>	<u>North Ore Body</u>	<u>Total</u>
Measured	Tons	500	500	1000
	% WO ₃	0.7	0.5	
	Units WO ₃	350	250	600
Indicated	Tons	750	600	1350
	% WO ₃	0.7	0.4	
	Units WO ₃	525	240	765
Inferred (A)	Tons	1500	250	1750
	% WO ₃	0.6	0.4	
	Units WO ₃	900	100	1000
Inferred (B)	Tongue along trough may contain 10-25 tons of 0.6% WO ₃ ore per foot of continuation. Not more than 1000 Tons predicted.		Continuation of shoot at north end may contain 15-20 tons of 0.4-0.5% WO ₃ ore per foot along incline. Not over 750 tons predicted.	
				1750 ton maximum 900 unit maximum

Total tons of ore (measured, indicated, and inferred (A)): 4100
Total units of WO₃ " " " " : 2365

Inferred (A). Ore in structure predicted with reasonable assurance.

Inferred (B). Ore in structure predicted with less assurance. May in part be sub-commercial.

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M. R. Klepper
Assistant Geologist
August 5, 1943

GEOLOGIC AND TOPOGRAPHIC MAP
of
THE LONG TUNGSTEN PROPERTY
PERSHING COUNTY, NEVADA
M.R. KLEPPER U.S. GEOLOGICAL SURVEY
KECHIN HSU OCTOBER 1942

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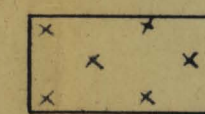
SCALE

0 20 40 60 80 100 200 300 400 500 Feet

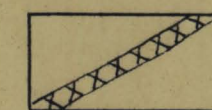
DATUM ASSUMED

CONTOUR INTERVAL 10'

EXPLANATION



Qtz. Monzonite.



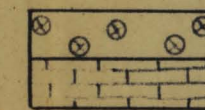
Quartzose Vein



Map } Hornfels.
Section }



Scheelite Ore.
(tactite and oxidized tactite.)



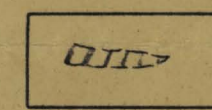
Map } Marble.
Section }



Low grade scheelite mineralization.
(in tactite and hornfels.)



Lamprophyre.



Possible extension of known
scheelite ore-bodies.

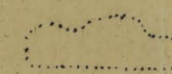
— Contact, located.

- - - Contact, approximate.

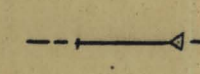
- - - Contact, gradational.

— Fault, located

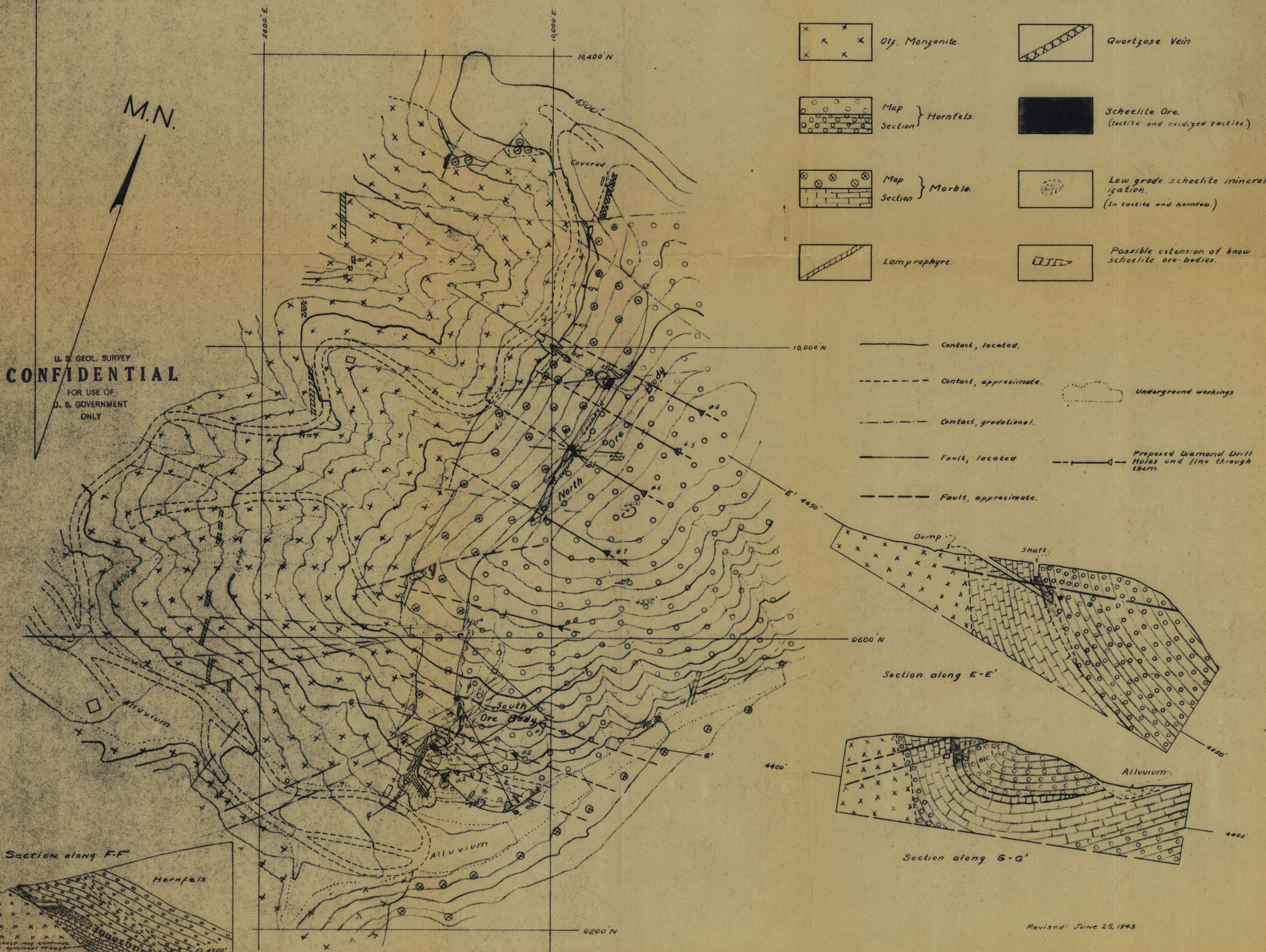
- - - Fault, approximate.



Underground workings



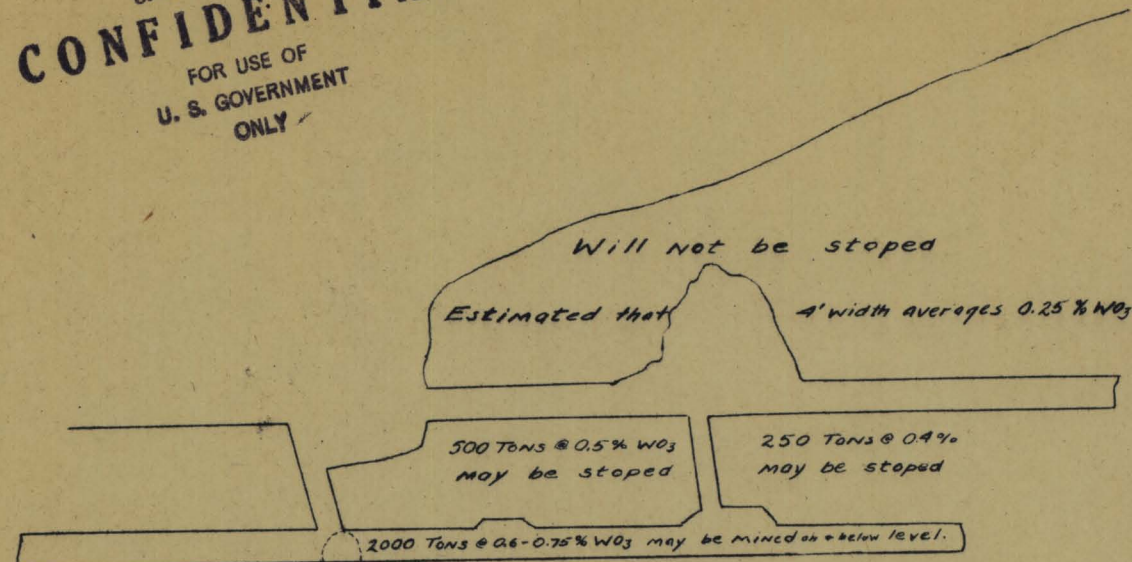
Proposed Diamond Drill
Holes and line through
them.



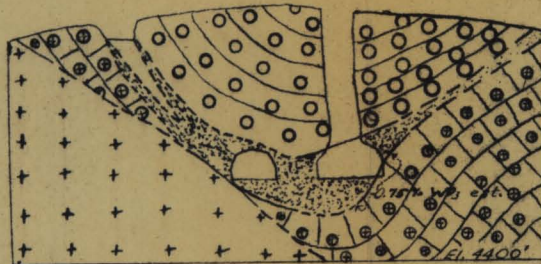
Revised: June 25, 1943

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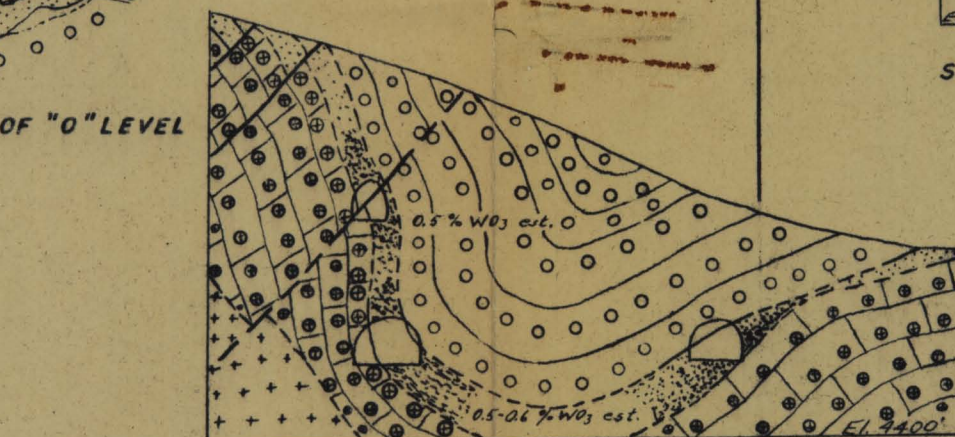
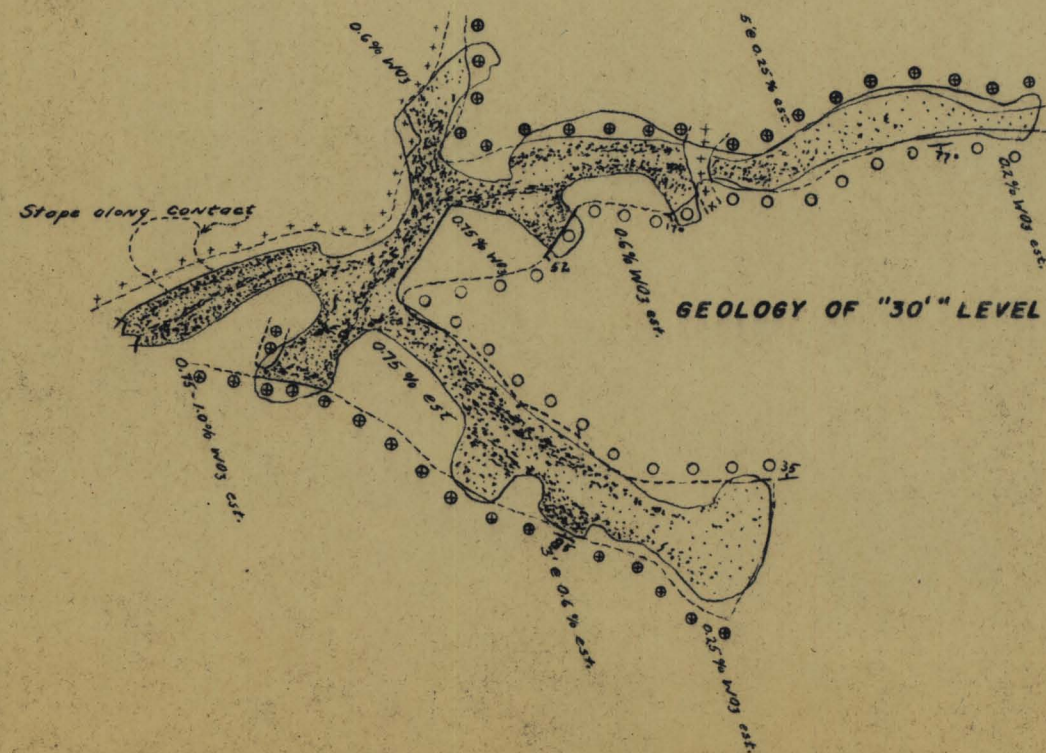
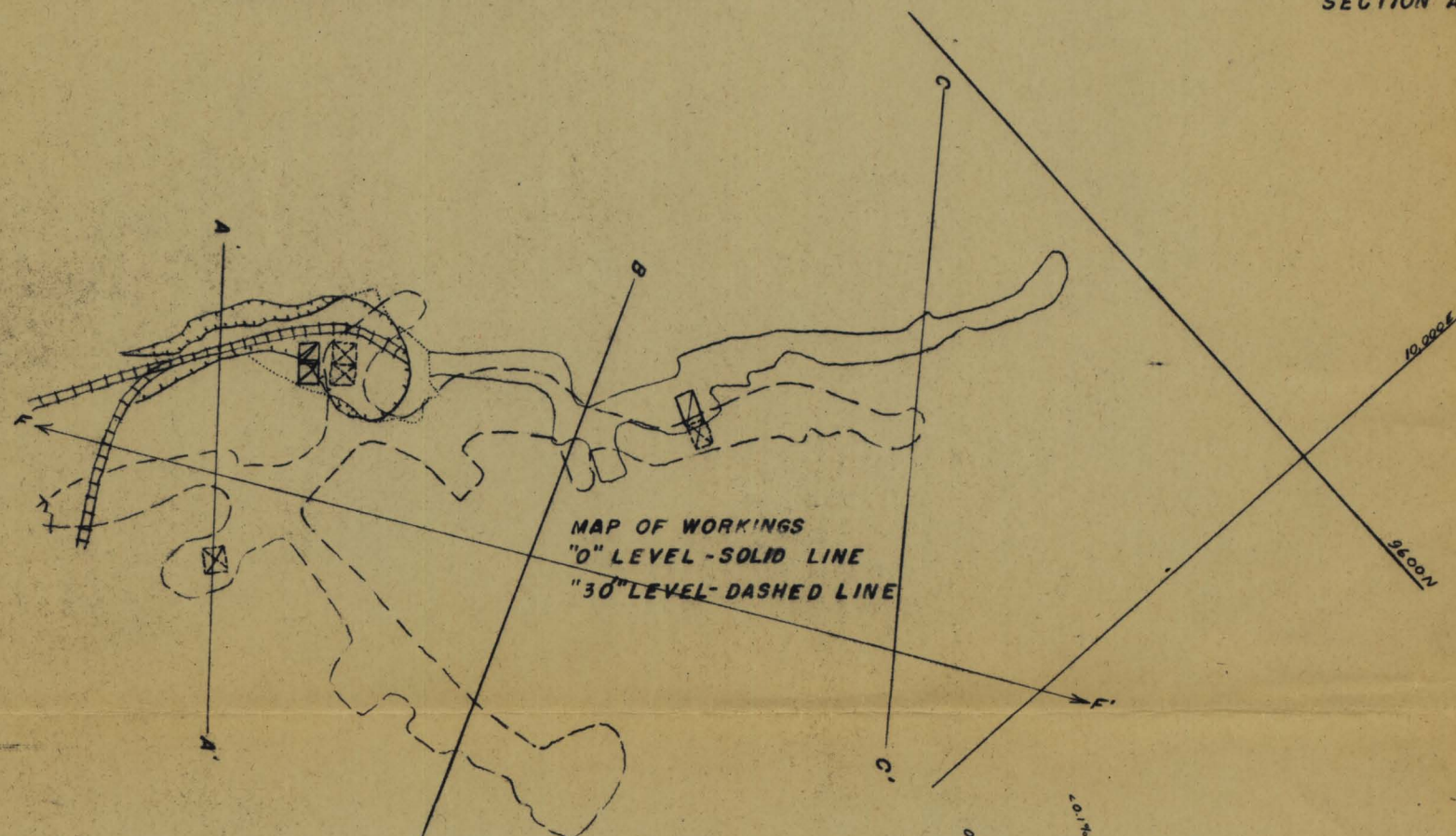
SOUTH ORE BODY



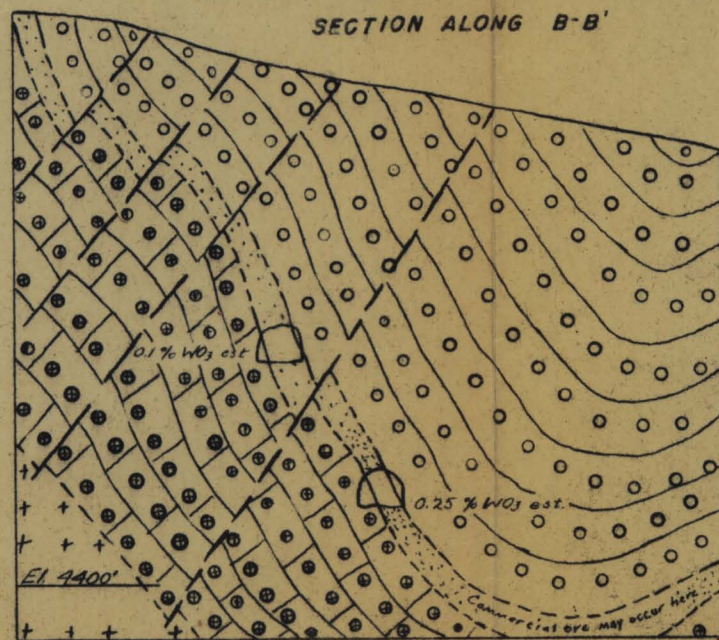
VERTICAL LONGITUDINAL PROJECTION



SECTION ALONG A-A'



SECTION ALONG B-B'

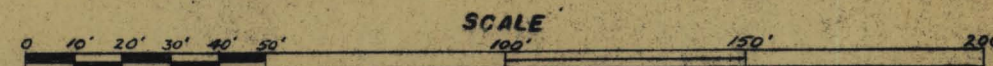


SECTION ALONG C-C'

5330 0014 (305)
 PLATE 2
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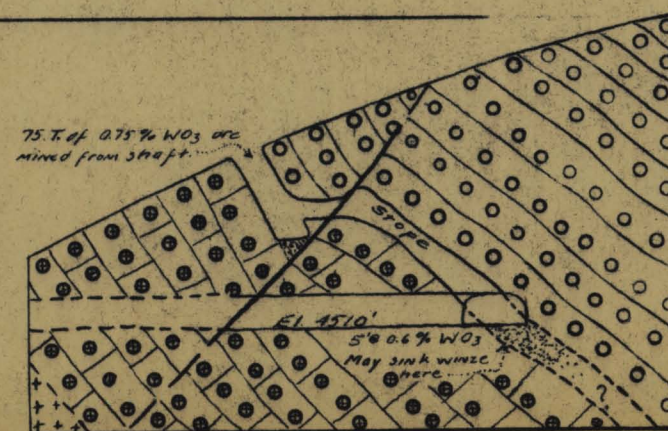
LONG TUNGSTEN MINE

BIG MEADOW MINING DISTRICT, PERSHING COUNTY, NEVADA
 M.R. KLEPPER
 U.S. GEOLOGICAL SURVEY
 P. JORALEMON
 JUNE 1943



EXPLANATION

- Tactite: concentration of dots shows approximate grade of ore in range between 0.00 and 1.0% WO₃. Est. means visual estimate under ultra-violet light.
- Quartz monzonite
- Marble
- Hornfels
- Contact located
- Contact uncertain
- Fault



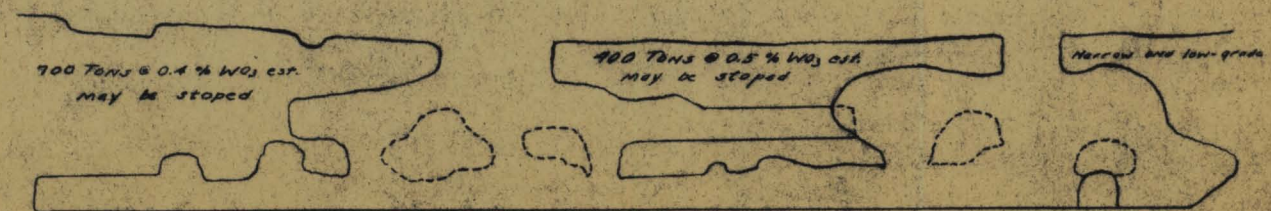
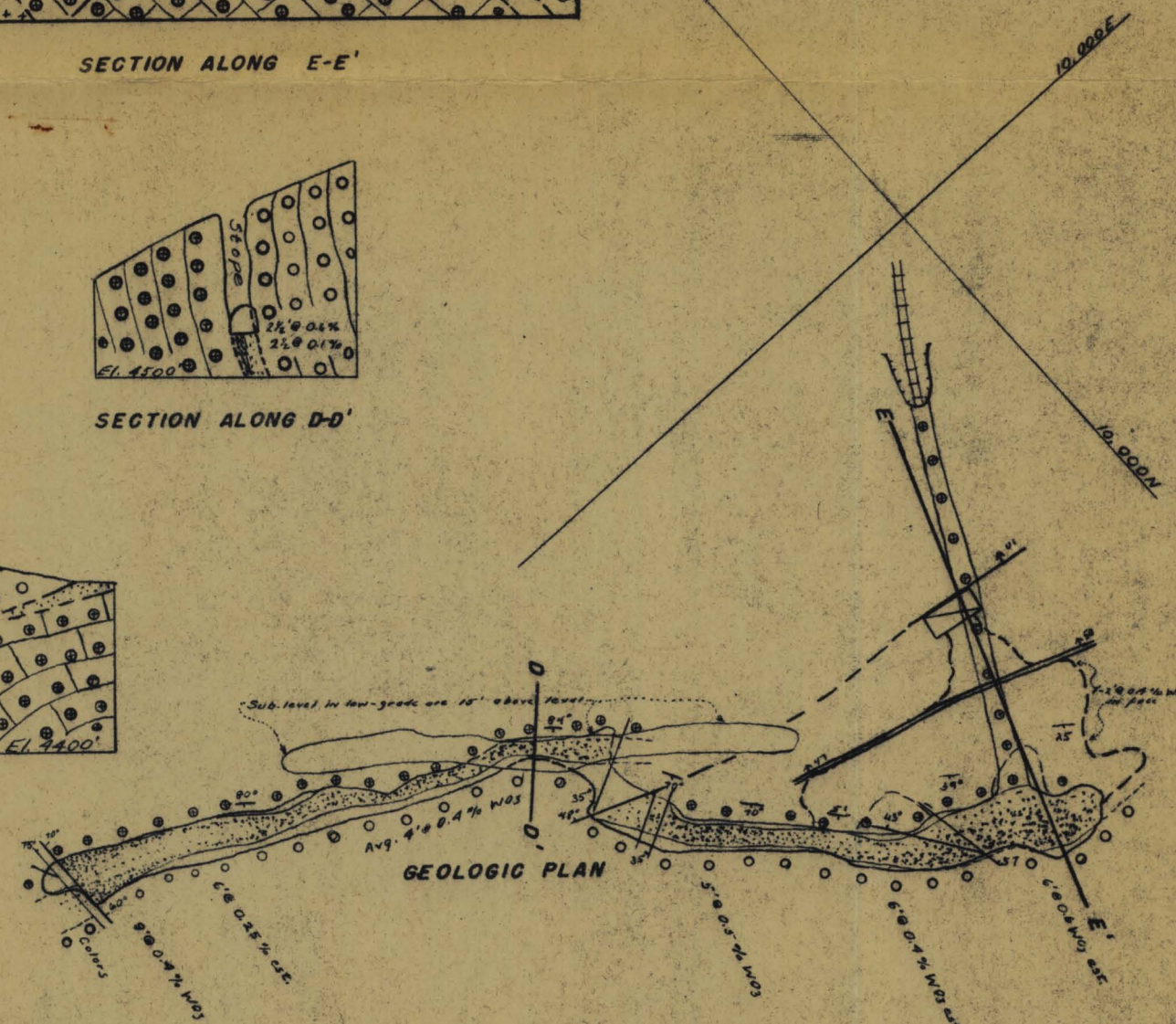
SECTION ALONG E-E'



SECTION ALONG D-D'

NORTH ORE BODY

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VERTICAL LONGITUDINAL PROJECTION