

Item 13

(268)

0280 0011

NATIONAL LEAD COMPANY

ST. LOUIS SMELTING AND REFINING DIVISION

FREDERICKTOWN, MISSOURI

P. O. BOX 351

September 19, 1950

TELEPHONE 31

Mr. John M. Heizer
Lovelock, Nevada

Dear John:

Enclosed you will find a copy of my old report on the testing of antimony ores from Nevada. The data given in this report might be of interest to you even though it does not show results such as you desire at this time. As you will remember, we were striving for a concentrate grade of approximately 30% antimony in the gravity concentrate while you now wish a grade of 50 - 60% antimony.

In our telephone conversation, we did not discuss whether you anticipated building a new mill from scratch or if you intended converting some existing plant. Therefore, I am supposing that you intend to build a new mill at a suitable location.

In view of my work on both Nevada and Mexican ores, I would suggest the following flow scheme:

1. Crush the ores to approximately $1/2$ inch and screen on a double deck screen at $1/4$ " and $1/8$ ". The $1/2$ " x $1/4$ " and the $1/4$ " x $1/8$ " fractions would be concentrated on separate sets of jigs for concentrate recovery.
2. The $1/2$ " x $1/4$ " tailing would be crushed in a pair of rolls set to give - $1/4$ " product which would be returned to the original screen for rescreening and retreatment.
3. The $1/4$ " x $1/8$ " tailing would be crushed in another pair of rolls set to give a discharge of - $1/8$ " material. This product, also, would be returned to the original screen.
4. All of the ore, as it became - $1/8$ " in size, would be sent to a mechanical classifier for desliming. The slimes would be sent to flotation and the sands to a set of pulsating jigs adjusted to handle this size of material.
5. The tailing from these last jigs would be dewatered and sent to a ball mill for grinding, with the ball mill discharge returning to the classifier.

Mr. John M. Heizer

-2-

September 19, 1950

Discussion

The flow-sheet, outlined above, would tend to recover the antimony as soon as it was liberated from the gangue and with all of the ore finally being reduced to flotation size, and floated, you could expect the ultimate in overall recovery.

Several changes in this flow-sheet could be made to satisfy local conditions. For instance, the size of material entering the coarse jigs could be coarsened if desirable. Another change could be the substitution of tables for the pulsating jigs at the end of the gravity circuit. With tables, however, the top size would be about 10 mesh instead of 1/8" and a hydraulic sizer would be necessary ahead of the tables in order that each of several tables would have a closely sized feed for best performance.

If this information is not what you desire, or if I can be of any further help to you, I will be very glad to do what I can to help you get things into order.

Sincerely,

C. Marsh

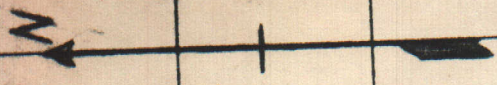
C. Marsh

CM:mjs

cc-Mr. Gloyd M. Miles

-Mr. Harold A. Krueger

enc.



Shatt

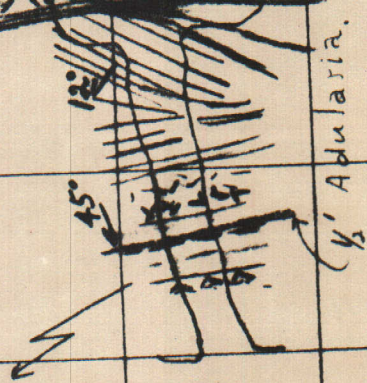


Vertical vein - Stepped above to north
and overhead above drift.
Min. in bedding and adjacent to bedding
Ch. shale & brecciated rhyolite.

Weak min. - Crinoids adjacent
to hard member (Rhyolite or quartzite)
- Contains Adularia & Qtz.

2' Cr. shale - Adularia - Qtz.

Ch. shale & walls of fissure
Ch. rhyolite with adul. & Qtz.



(268)

SOUTHERLAND

South Xcut
1" = 30'

BAROID SALES DIVISION

NATIONAL LEAD COMPANY

268

To:

Date:

From:

Office:

Subject:

DIAMOND DRILL LOG

Southerland Mine
Lovelock, Nevada

Drill Hole No. 1

Strike N 80° W

Dip 45° West

0	8	Surface soil and brown shale	No core
8	21	Light brown shale soft	50% core
21	31	" " " "	60% "
31	51	" " " harder	75% "
51	62	" " " "	100% "
62	76	" " " with increasing	
		dark grey shale	100% Core
76	131	Dark grey shale	100% "
131	189	Dark grey shale with a few quartz stringers 1/4" and smaller on bedding planes	100% Core
189	199	grey quartzite little pyrite	10% "
199	200	grey shale	
200	208	grey quartzite little pyrite	
208	211	Black shale soft some pyrite	
211	213	Black shale	
213	226	grey shale	
226	236	grey quartzite with interbedded thin grey shale	
236	241	grey quartzite with few quartz stringers showing a little pyrite	
241	261	grey quartzite little shale	
261	276	grey shale	
276	281	grey quartzite	
281	291	grey shale talcy on bedding	
291	316	grey quartzite	
316	320	grey quartzite with thin shale beds	
320	321	light grey shale	
321	328	grey quartzite	
328	331	light grey shale	

Sludge samples
taken from here
to bottom.

T. D. 331

Logged by:

C. G. Scott

C. G. Scott

Aug 5 - 1948
 El. surface 4575
 El. #2 level 4475

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N

Light but shale - Some calc. sh. all altered.
 to minor degree with sericite or talc
 on seams + bedding planes. - Thin bedded.

Laced off and Gobbed



Narrow vein 2' - No ore
 Qtz on H.W. Qtz etc. or

Rhyolite(?)

Qtz - Silicified sh or lims.
 Rhyolite?

HW dip flattens.
 Ore in bedding of H.W.
 Calcareous shale.

Ore in place now being mined
 30' below sill. Vein matter 8/or
 rhyolite on H.W.
 No sedimentary bed on H.W. here

SOUTHERLAND

No 2 level
 1" = 40'

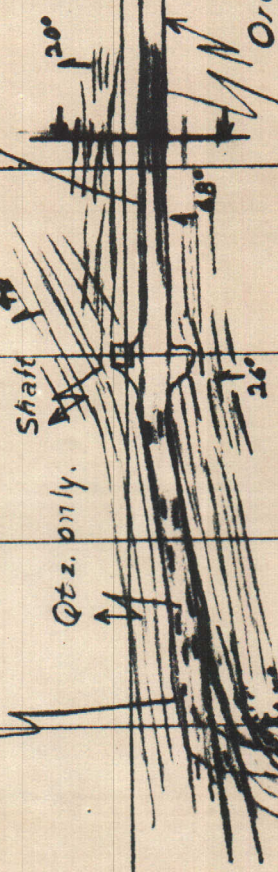
P-48 - Reiter

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N

2-2½' Qtz. - Heavy FeSO₄
 ASbS₂ minor but present - 5%.
 2-2½' of - unmineralized shale
 on H.W. side flattening in to 20° d.P.

Steep dip & contact with vein.
 Sh. thin & coarsely bedded.



Winge
 Timbered
 &
 Caved

Ore shoot apparently starts here.

Small stringers SbS₂ in Qtz. within crushed zone.
 Also infolded & shattered H.W. shale with Qtz. seams.

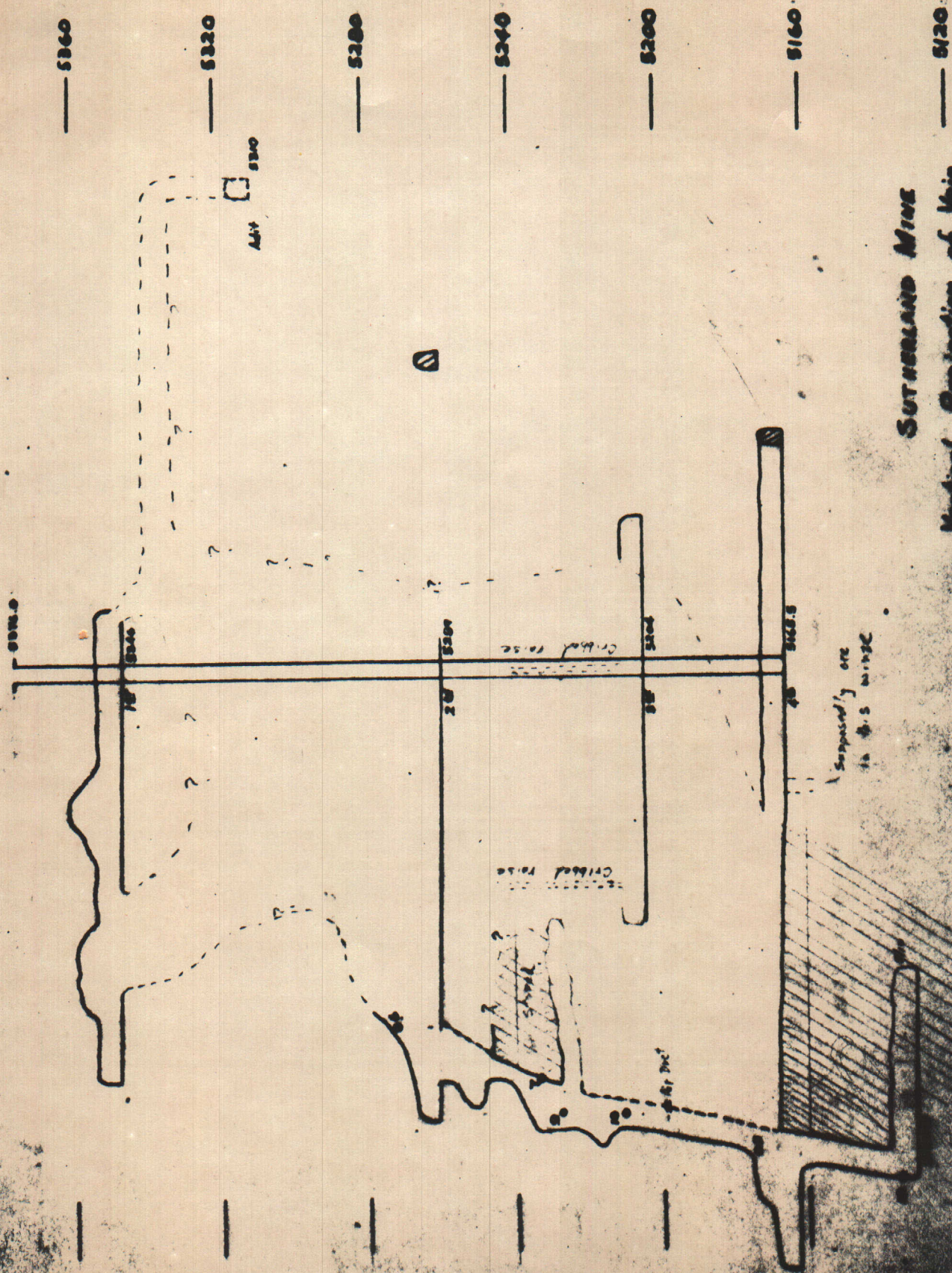
SOUTHERLAND

No 4 level
 1" = 40'

SbS₂ - Qtz
 FeSO₄ - Sericite

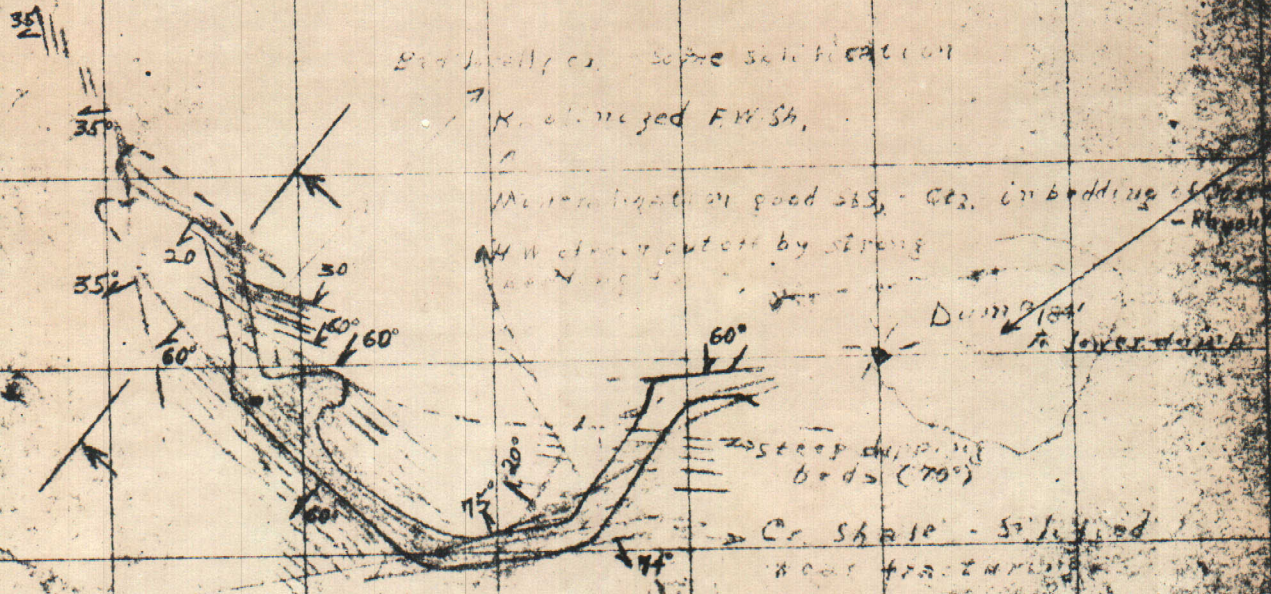
8-10 Feet

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SUTHERLAND MINE
Vertical Projection of Vein
1" = 40 ft.

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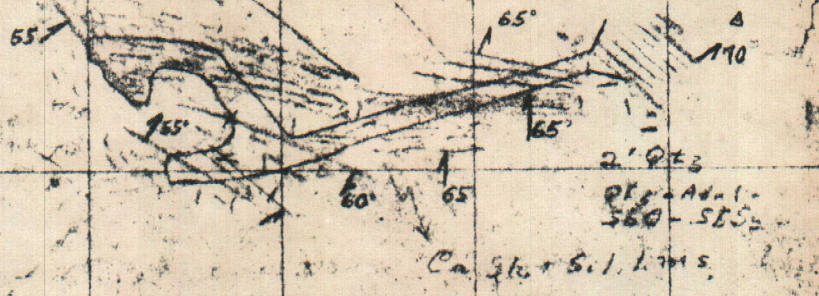
Bath. H.W. and F.W. horizon to 140'.
From this level to surface
bedded shales strongly folded.
All contacts conform with
dip of walls.

HOLLYWOOD

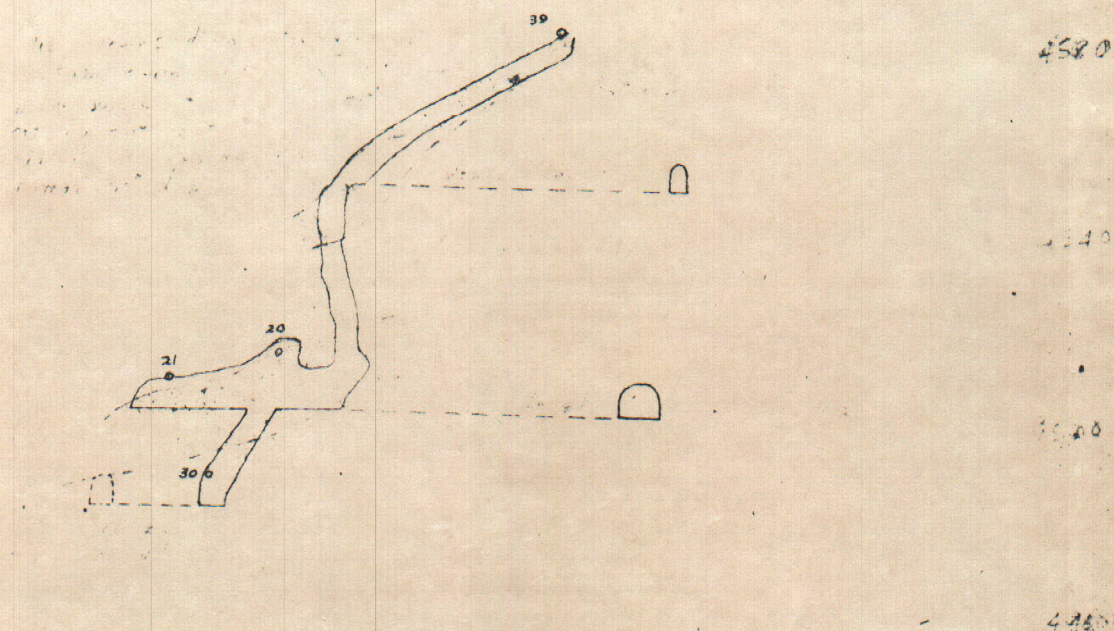


Strong vein
Strong min. Qtz. - Sb S.

On Sh. beds - Sil. L. 100%
Warped for strike & dip



HOLLYWOOD
Lower tunnel



Hollywood Mine
Section A A.
Thru Connecting Raise
Scale 1" = 40 ft.



Adit is 3 ft.
Above upper level - flat
terminating fault shows
in back at end of adit.

Hollywood Mine
Upper Level
1" = 40 ft.

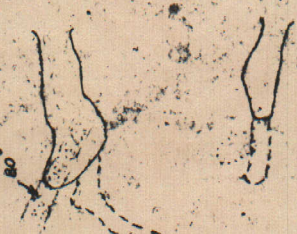
SEGERSTRÖM, HEIZER
AND DODGE CONSULTING



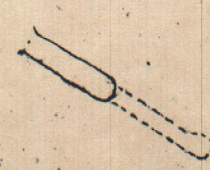
6 Δ



Δ B



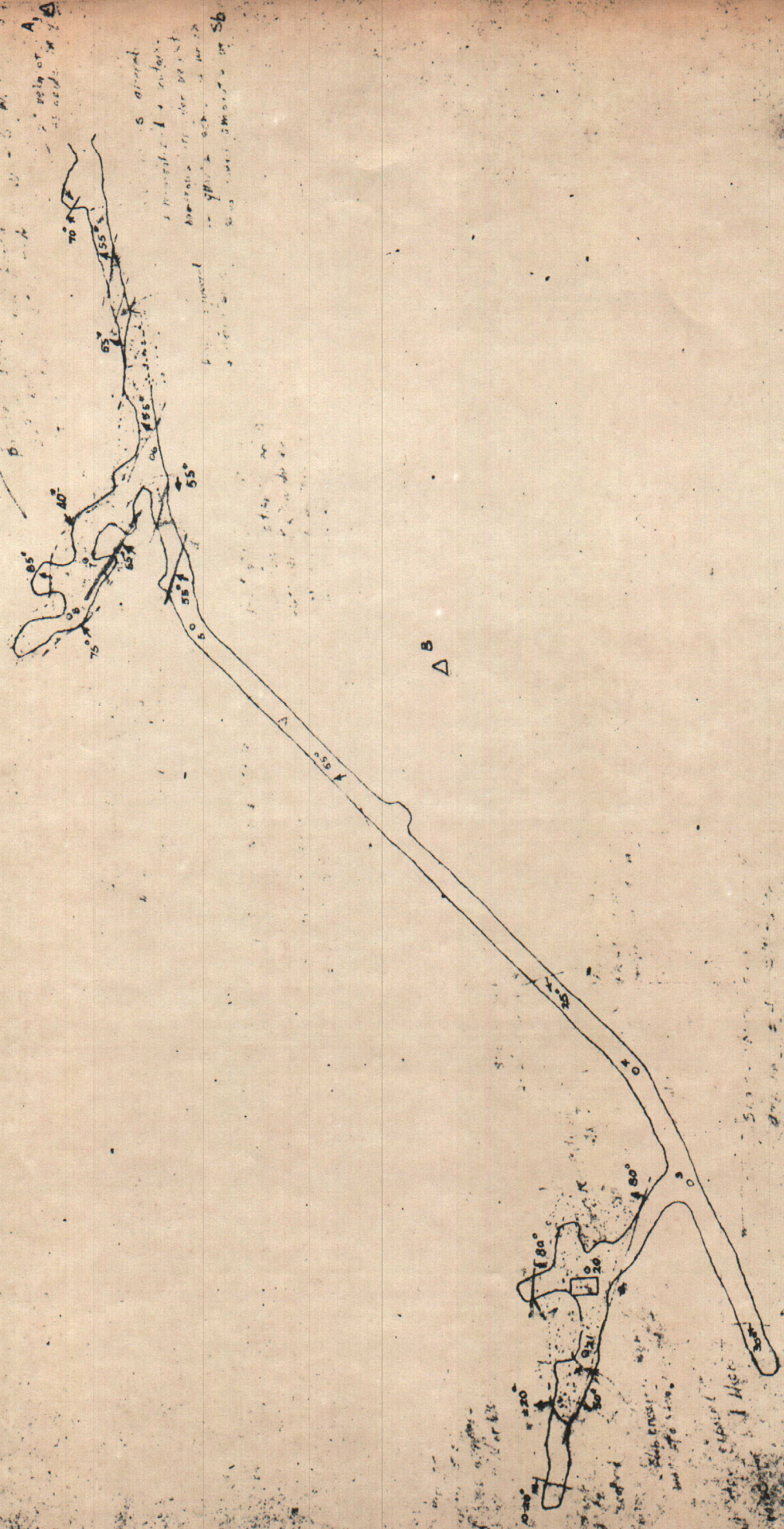
Δ D



Handwritten notes in the top right corner, possibly indicating a date or location.

Hollyhock Mine
Main Level
1" = 40'

SEGERSTROM, HEIZER
AND DODGE CONST. INC.



5' drift at top of drift tunnel
be approximately 10' to 15' in
vertical in the drift tunnel
in the drift tunnel

5' drift at top of drift tunnel
be approximately 10' to 15' in
vertical in the drift tunnel
in the drift tunnel

B

A

180°

20°

92°

180°

20°

92°

180°

20°

92°

180°

20°

92°

Underneath 500 ft

Open stream above

Long 75 ft

Point 1

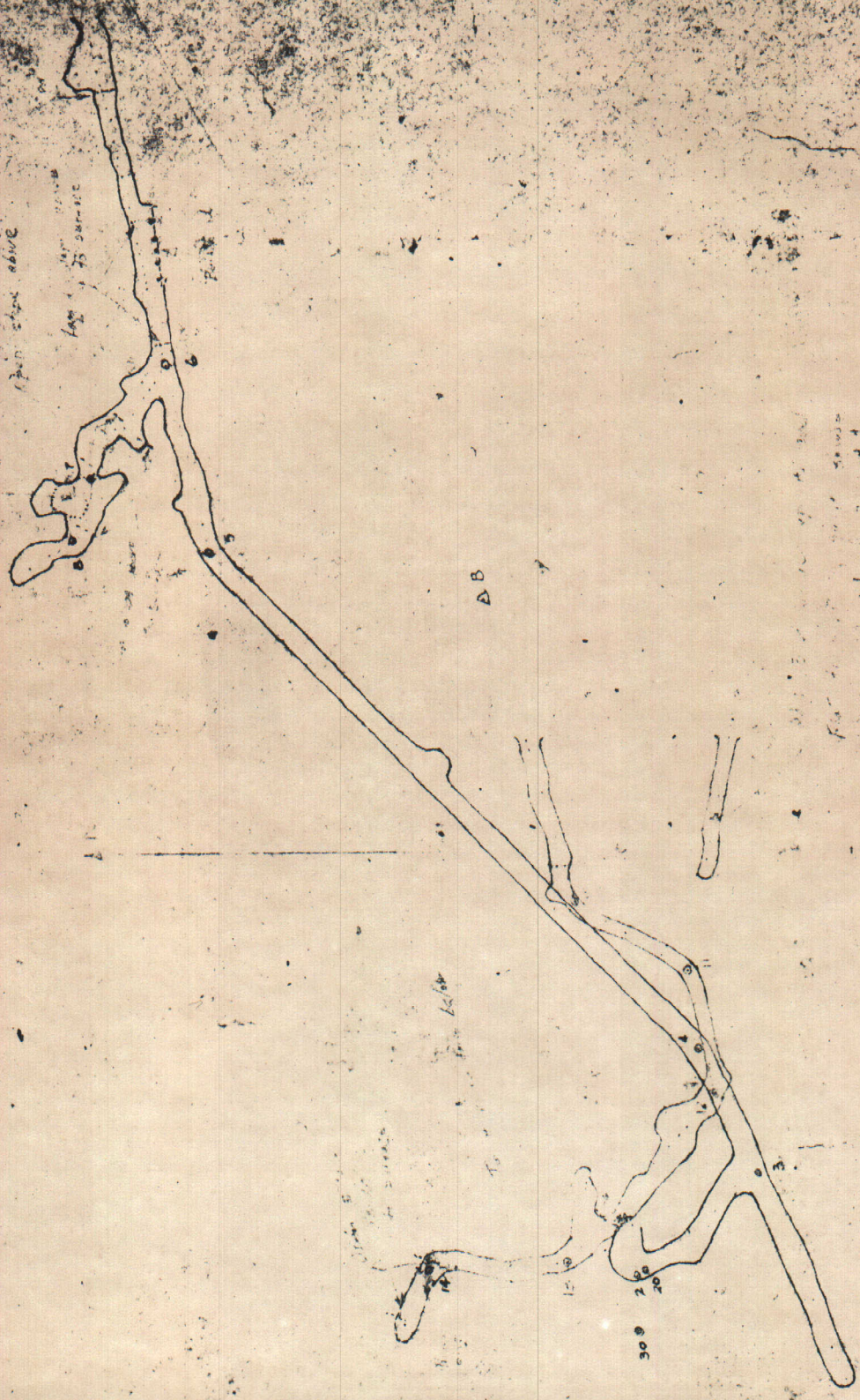
Δ B

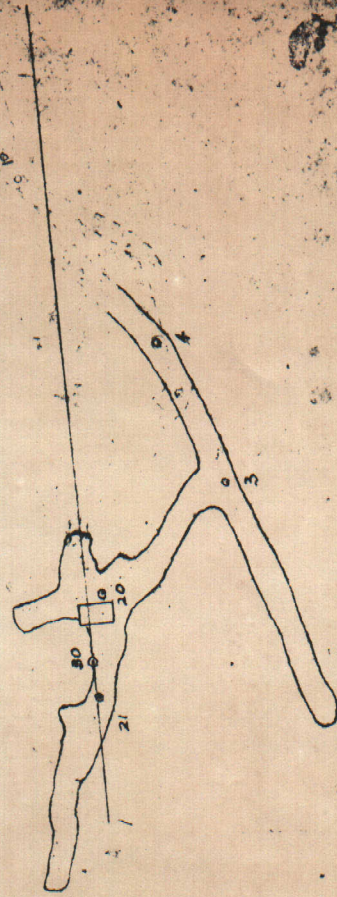
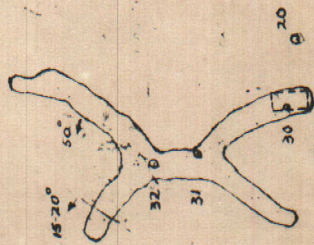
Point 10

Flat at end of 10 ft

Hollywood Mine

1" = 40 ft





Holmes Mine

Winn Level

1" = 40 ft

SEGENSTROM, MEYER
AND DODGE CONSULTING

✓ Heizer Copy

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Lovelock, Nevada
October 4, 1951

Mr. A. H. Heiser
National Lead Company
111 Broadway
New York 6, N. Y.

Dear Mr. Heiser:

In figuring economics of the project as per your request, I discussed with Mr. Heizer the problem of operating cost as applied to the various properties and the nature of work. As a result of this discussion we arrived at the following cost figures.

MINING - HAULING - MILLING COSTS

<u>Mining</u>		<u>Hauling</u>	
Mine operation	\$5.00	From Hollywood	\$2.50
Development	2.00	" Sutherland	2.00
Overhead	.35	" Johnson-Heizer	2.50
Total per ton	\$7.35	Above figures are per ton.	
<u>Recovery of ore in stopes</u>		<u>Milling</u>	
Mine work	\$2.50	Rental Hough	
Overhead	.35	Payloader	\$0.25
Total per ton	\$2.35	Labor	1.00
<u>Loading & screening dump ore</u>		Flotation reagent	.50
Operation	\$1.50	Power	.75
Overhead	.35	Overhead	.50
Total per ton	\$1.85	Total per ton	\$3.00

For evaluating the ore we had to make certain assumptions on the grade of concentrates to be produced and the recovery of antimony in this concentrate, and these assumptions are used in figures below. Value of concentrates is based on smelter schedule sent me from smelter at Laredo, Texas, on August 31, 1951, the new freight schedule, and royalty payments. Figures on same are given below.

We assumed that on new and sulphide ores, recovery would be 80% and grade would run 50% antimony which would be paid for on basis of \$4.86 per unit. For dump, fall and oxidized ore we would expect a recovery of 70% with grade of 45% antimony and pay on basis of \$4.76 per unit.

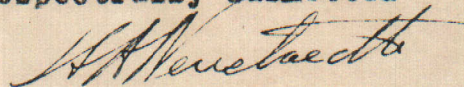
Grade	\$ STU	Value Ton	Freight	Value Ton	Royalty	Net Value
50%	\$4.86	\$243.00	\$24.88	\$218.12	\$21.81	\$196.31
46	4.76	214.20	24.88	189.32	18.93	170.32

From these figures we calculated that \$3.28 would be unit value in new and sulphide ores, and \$2.65 would be unit value for old or oxidized ores.

On the attached sheets are details of values of the ore reserves in the various mines, the recapitulation of same and returns on investment in the three projects under the two mill propositions.

I believe these figures are conservative and that more ore will be developed in the three mines - particularly at the Hollywood.

Respectfully submitted



H. A. Neustaedter

ESTIMATED RETURNS ON INVESTMENT

These returns are based on anticipated estimated investments on a small mill and the necessary estimated investment in developing the ore reserves as outlined in MF103, I and II applications. This estimate is presented in two parts because of difference in estimated cost of two different flow sheets.

Interest at 4½% for two years is used as it will require 6 months to build mill and about 18 months to deplete the ore reserves.

Application III has no bearing on these costs, but is for the purpose of outlining future development to increase ore reserves.

	<u>Flow sheet I</u>	<u>Flow sheet II</u>
Estimated cost of mill	\$ 48,811.00	\$ 57,724.00
Estimated development cost	25,500.00	25,500.00
Sub total	\$ 74,311.00	\$ 83,224.00
Interest	\$ 6,637.99	\$ 7,490.16
Total	\$ 80,948.99	\$ 90,714.16
Estimated income on operation	\$104,669.35	\$104,669.35
Indicated profits after amortization, but before depletion & taxes	\$ 23,670.36	\$ 13,955.19

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EVALUATION OF ORE RESERVES

Description	Tons	Grade % Sb	Value Per Unit	Cost Per Ton	
<u>HOLLYWOOD MINE</u>					
Dump ore	500	5.0%	\$ 2.65	\$12.85	\$
Blocked ore-NE vein	750	7.0	3.28	12.85	17
" " SW "	750	7.0	3.28	12.85	17
" " SW winze	200	7.0	3.28	12.85	
Total & average	2200	6.5	\$ 3.18	\$12.85	\$ 45
Indicated ore	500	7.0	\$ 3.28	\$12.85	\$ 17
<u>SUTHERLAND MINE</u>					
Filled stopes	3,750	3.25%	\$ 2.65	\$ 7.85	\$ 32
Blocked ore	1,000	10.0	3.28	12.35	32
High grade dump	350	3.23	2.65	6.85	
Total & average	5,100	4.99	\$ 2.89	\$ 9.26	\$ 73
Indicated ore	500	10.0	\$ 3.28	\$12.35	\$ 16
" dump values	300	3.0	2.65	6.85	
Total & average	800	7.37	3.17	10.30	16
<u>JOHNSON-HEIZER MINE</u>					
Filled stopes	250	5.0	\$ 2.65	\$ 8.35	\$
Blocked ore	420	10.0	3.28	12.85	17
Sulphide dump	150	3.37	3.28	7.35	
Oxide dump	200	6.67	2.65	7.35	
Total & average	1,020	7.14	\$ 3.06	\$ 9.68	\$ 22
Indicated ore	1,500	10.0	\$ 3.28	\$12.85	\$ 49
<u>RECAPITULATION:</u>					
<u>Positive ores</u>					
HOLLYWOOD MINE	2,200	6.5	\$ 3.18	\$12.85	\$ 45
SUTHERLAND "	5,100	4.99	2.89	9.26	73
JOHNSON-HEIZER MINE	1,020	7.14	3.06	9.68	22
Total & average	8,320				\$ 140
<u>Indicated ore</u>					
Hollywood Mine	500	7.0	\$ 3.28	\$12.85	\$ 17
Sutherland Mine	800	7.37	3.17	10.30	16
Johnson-Heizer Mine	1,500	10.0	3.28	12.85	49
Total	2,800				\$ 79
Total positive & indicated ore	11,120				\$ 220

Cost Per Ton	Net Value	Mining, Hauling & Milling Cost	Net Return
\$12.85	\$ 6,425.00	\$ 6,425.00	\$ 200.00
12.85	17,220.00	9,637.50	7,582.50
12.85	17,220.00	9,637.50	7,582.50
12.85	4,592.00	2,570.00	2,022.00
\$12.85	\$ 45,657.00	\$ 28,270.00	\$ 17,387.00
\$12.85	\$ 11,480.00	\$ 6,425.00	\$ 5,055.00
\$ 7.85	\$ 32,296.88	\$ 29,437.50	\$ 2,859.38
12.85	32,800.00	12,350.00	20,450.00
6.85	3,560.00	2,397.50	6,163.33
\$ 9.85	\$ 75,657.71	\$ 44,185.00	\$ 29,472.71
\$12.85	\$ 16,400.00	\$ 6,175.00	\$ 10,225.00
6.85	2,385.00	2,055.00	330.00
10.30	18,785.00	8,230.00	10,555.00
\$ 6.38	\$ 3,312.50	\$ 2,087.50	\$ 1,225.00
12.85	13,775.00	5,197.00	8,579.00
7.35	1,508.04	1,102.50	406.54
7.35	3,535.10	1,470.80	2,065.10
\$ 9.68	\$ 22,131.64	\$ 9,857.00	\$ 12,274.64
\$12.85	\$ 49,200.00	\$ 19,275.00	\$ 29,925.00
\$12.85	\$ 45,657.00	\$ 28,270.00	\$ 17,387.00
6.28	75,657.71	44,185.00	29,472.71
9.68	22,131.64	9,857.00	12,274.64
	\$ 141,446.35	\$ 82,312.00	\$ 59,134.35
\$12.85	\$ 11,480.00	\$ 6,425.00	\$ 5,055.00
10.30	18,785.00	8,230.00	10,555.00
12.85	49,200.00	19,275.00	29,925.00
	\$ 79,465.00	\$ 33,930.00	\$ 45,535.00
	\$ 220,911.35	\$ 116,242.80	\$104,669.35