

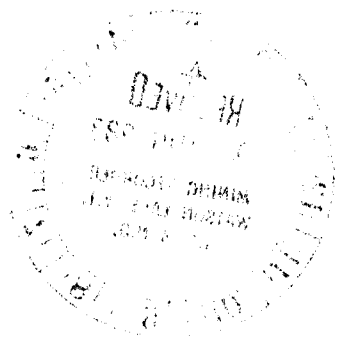


1982 WORK REPORT
CIMA MINES OPTION
MT. HUNDERE PROPERTY
WATSON LAKE MINING DISTRICT
YUKON TERRITORY

091470

A. D. MUTCH, P.Eng.

DECEMBER 1982



RETURNED

The ... by
the ... Unit
... Quartz
...
of ... amount

4,800
R. Watson
... and
Geological Service ... Commissioner
of Yukon Territory.

TRANSMITTAL FORM

M.R. File No. _____

R.M.M.R. File No. _____

Date Fwd 25 Aug 83

FROM Mining Recorder at Watson Lake

TO: Regional Manager, Mineral Rights at Whitehorse, Y.T.



FOR ACTION ARE:

NEW APPL'N for PLACER LEASE to PROSPECT Name: _____ Lease No. _____

RENEWAL APPL'N PLACER LEASE to PROSPECT Name: _____ Lease No. _____

AFFIDAVIT of EXPENDITURE on PLACER LEASE Name: _____ Lease No. _____

SECURITY DEPOSIT

FINANCIAL ABILITY

ASSIGNMENT of PLACER LEASE No. _____
From: _____ To: _____

GROUPING APPL'N UNDER SEC 52(2) PLACER MINING ACT.
Owner: _____

DIAMOND DRILL LOGS:
Claims: Alma, mica Claim sheet no: 105-A-10

QUARTZ ASSESSMENT REPORT:
Claims: _____ Claim sheet no: _____

Type of report: _____

Submitted by: _____

Cls work performed on _____

\$ Req. for ren application _____

[Signature]
Signature

REPLY ACTION.

Date Ret. _____

copy of letter advising location of drill core attached



Telephone: (416) 792-2700
Telex: 06-97762

CANADIAN MINE SERVICES LTD.

1595 CLARK BOULEVARD, BRAMPTON, ONTARIO L6T 4C1

August 15, 1983



Ms. Yolanda Burkhard
Mining Recorder
Watson Lake Mining District
Indian and Northern Affairs
P. O. Box 269
WATSON LAKE, Yukon
Y0A 1C0

Dear Ms. Burkhard:

RE: CIMA, MICA MINERAL CLAIMS

I acknowledge your letter of August 3, 1983.

All the core from the 1982 drilling is stored at Dina Core Library in Whitehorse along with the core from the 1979 and 1981 drilling.

Yours very truly,

CANADIAN MINE SERVICES LTD.

A. D. Mutch, P.Eng.
Consulting Geologist

dv

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LOCATION AND ACCESS

The Mt. Hundere property is located 53 kilometers north of Watson Lake.

(See map 1.)

The prospect access road begins near kilometer post 56 on the Robert Campbell Highway just south of the Francis River Bridge.

The road to camp is 25.6 kilometers. When conditions permit, freight trucks can proceed to the lake depot, 15 kilometers from the highway. Beyond that, because of three steep grades, a four-wheel drive is required for the last 10 kilometers.

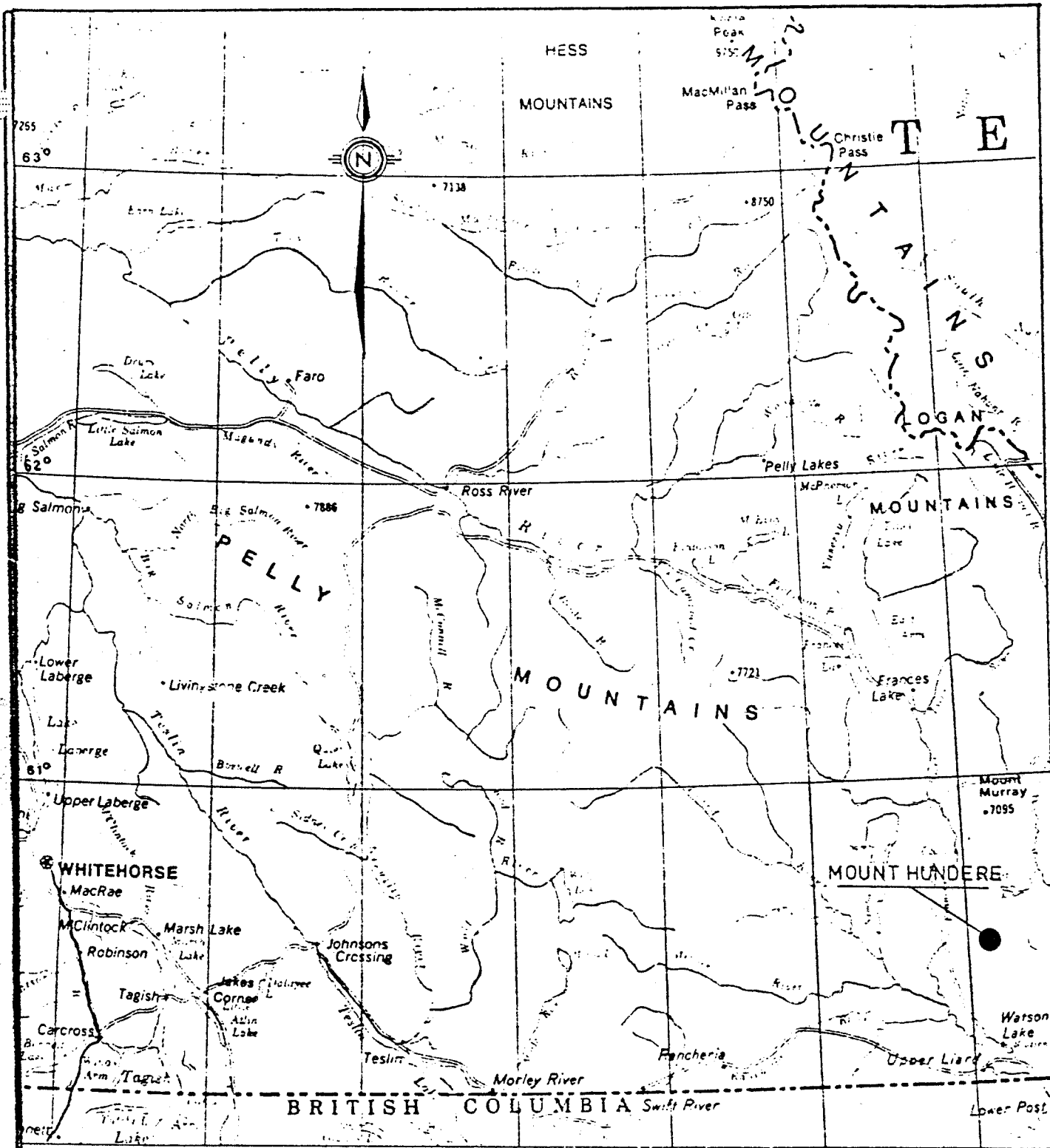
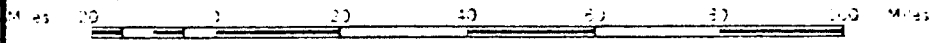


FIGURE # 2

CIMA RESOURCES LTD.
LOCATION MAP
N.T.S. 105-A-10

SCALE 1:2,000,000

1 inch equals approximately 32 miles



LOCAL CLIMATE AND GEOGRAPHY

Being located in the Yukon, the area has a sub-arctic continental climate, with warm and pleasant summers and long frigid winters.

An additional weather bias is that the mineral prospect is located at an elevation 1500 to 1580 meters above sea level, above the tree line at about 1400 meters.

The topography is one of rounded barren hills and mountains covered with grass moss and lichen which becomes an expanse of wild flowers during the summer months.

Permafrost was cored in the September 1982 drilling, down to depths of 50 meters. Evidence that permafrost is widespread in the occurrence of patterned ground on mountain saddles and in solid fluxtion flows on the hill sides.

CAMP

The camp is located near the end of the access road and is about 500 meters from the western extremity of the south showing.

The camp consists of a 14' x 17' plywood sleep camp for four men. A cookhouse tent frame, 12' x 32', suitable for two 12' x 16' tents, plus three other tent platforms.

Probable plundering of wood and pipe fittings in the off-season has to be included in any planning.

CLAIMS

Mount Hunderere Mines Limited, of which Cima Resources Limited is a major shareholder, and Cima Resources Limited hold the following 104 mineral claims:

CLAIM NAME AND NUMBER	GRANT NUMBER	NO. OF CLAIMS	RECORDING DATE	DUE DATE
Mica 1- 8	YA412-YA419	8	AUG 3, '76	MAR 1, '85
Mica 9-12	YA 35947-YA35950	4	MAR 1, '79	MAR 1, '85
Mica 40-41	YA45297-YA45298	2	AUG 17, '79	MAR 1, '85
Cima 13-30	YA 35951-YA35968	18	MAR 1, '79	MAR 1, '85
Cima 31-39	YA45288-YA45296	9	AUG 17, '79	MAR 1, '85
Cima 42-43	YA45689-YA45690	2	SEPT 4, '79	MAR 1, '85
Cima 44-51	YA45631-YA45638	8	SEPT 4, '79	MAR 1, '85
Cima 52-53	YA45691-YA45692	2	SEPT 4, '79	MAR 1, '85
Cima 54-56	YA46141-YA46143	3	SEPT 28, '79	MAR 1, '85
Cima 57-64	YA46144-YA46151	8	OCT 1, '79	MAR 1, '85
Cima 65-70	YA46152-YA46157	6	OCT 1, '79	MAR 1, '85
Cima 71-78	YA46246-YA46253	8	OCT 9, '79	MAR 1, '85
Cima 79-102	YA46158-YA46181	24	OCT 1, '79	MAR 1, '85

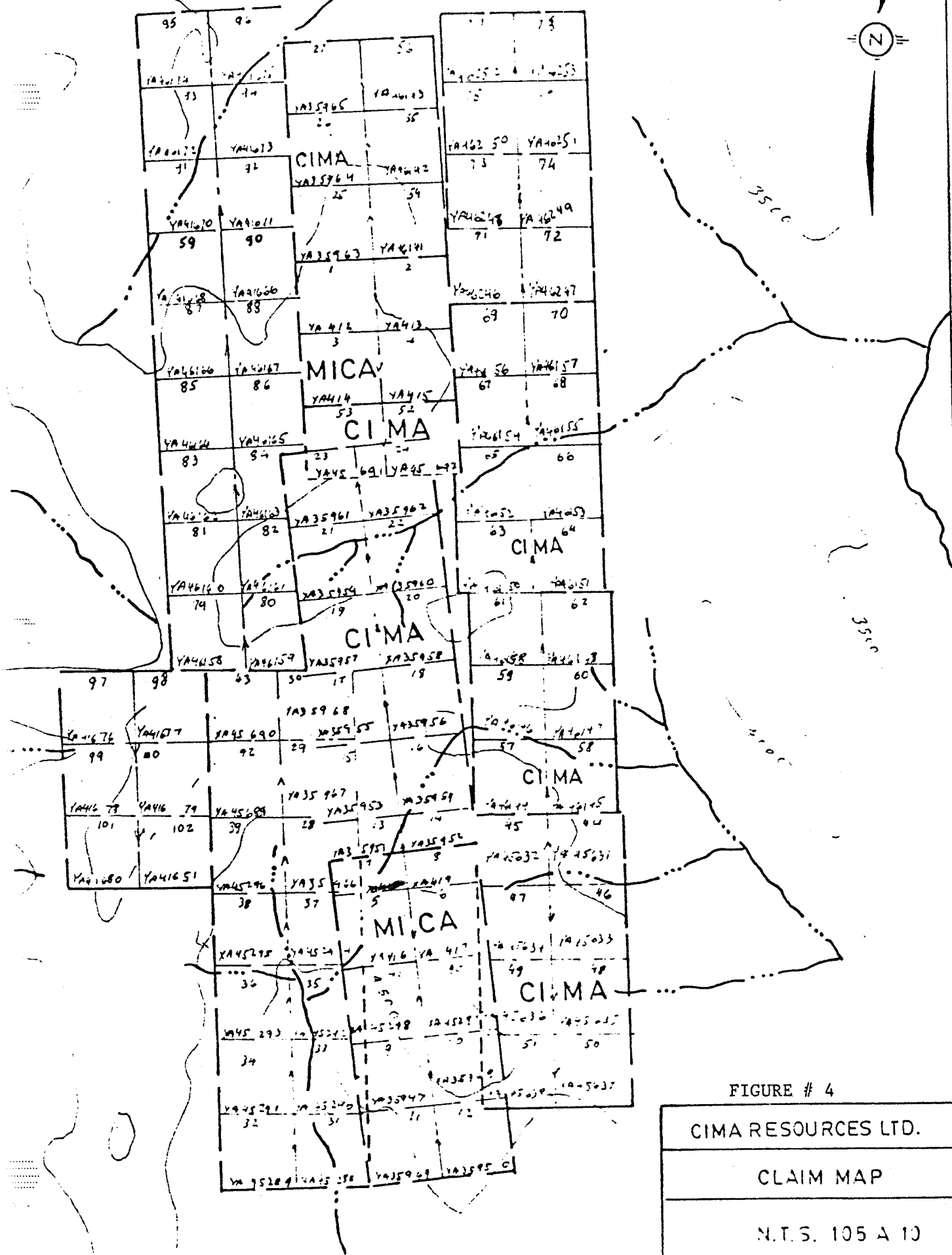
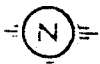


FIGURE # 4
CIMA RESOURCES LTD.
CLAIM MAP
N.T.S. 105 A 10

HISTORY

The property was discovered and staked by prospectors, Jake Hundere and Peter Rico, in 1962. Subsequently, under the direction of Dr. A. E. Aho, geological mapping, geochemical sampling, and bulldozer trenching were carried out and a twelve mile access road was constructed. This exploration effort led to the discovery of the North and South Showings.

In 1963, Kerr Addison, Newconex, and Canex Aerial formed the Francis River Syndicate and expanded the claim block. During the field season, they deepened several trenches, diamond drilled one hole on the North Showing and six on the South Showing. At that time, they concluded:

- a) The North Showing contained residual mineralization lacking in depth and grade. This conclusion was based on the results of one drill hole and the exposure along strike of small rusty zones with sparse lead-zinc mineralization.
- b) The high grade South Showing was considered too limited in extent to be of economic value

In 1966, Atlas Exploration optioned the property and carried out geological mapping and bulldozer trenching. The geologist in charge, J. W. Staniford, concluded that insufficient trenching and soil sampling had been done to determine the full economic potential of the property.

No further work was done from 1967 to 1978. In 1979, under the supervision of W. S. Read, Cima Resources Limited carried out a detailed exploration program over the South Showing. The program consisted of road construction, grid preparation, geological mapping, hand trenching, and the drilling of eighteen holes. As a result, Cima blocked out 66,442 tonnes of high grade lead-zinc mineralization. It was evident that the tonnage could be increased if further exploration was done towards the east and the west of the main zone of the South Showing.

Under the supervision of R. G. Kidlark, during the 1980 field season, Cima Resources Limited carried out a detailed exploration program consisting of line cutting, soil sampling, geological mapping, and the drilling of 26 diamond drill holes. This program blocked out an additional 181,448 tonnes.

The 1981 exploration program, oriented to investigate high silver values in the East Zone and to test soil anomalies on the West and North Showings, consisted of nineteen diamond drill holes. This program blocked out some additional tonnage, both on strike to the east and at depth.

Summary of reserves calculated by Cima Resources Limited for the 1979 through 1981 drilling:

LOCATION	TONNES	% Pb	% Zn	Oz/T Ag
1979 Main Zone	66,442	14.8	18.1	2.23
1980 West Extension of Main Zone	54,910	11.5	13.2	2.11
1980-1981 East Zone	137,274	6.44	6.31	5.29

The results of the 1979 - 1981 drilling were reported by A. D. Mutch, March 1982, as drill indicated open pit ore:

WEST ZONE (READ ZONE)

	% Pb	% Zn	Ag OPT
80,000 tonnes	15.6	18.9	2.36

EAST ZONE (SILVER ZONE)

80,000 tonnes	6.8	4.9	9.43
---------------	-----	-----	------

The difference between the Cima estimate and the Mutch estimate is that Cima's numbers are geological reserves and Mutch's are indicated mining reserves.

The degree of confidence for the Read Zone is high from abundant outcrop, drilled off shape, and indications of reasonable metallurgy.

The degree of confidence for the silver zone was low because there was little outcrop. The distribution of the ore was complex and the bodies were highly oxidized. No metallurgy was carried out on the silver zone material in 1981.

1982 DRILLING PROGRAM

The purpose of the 1982 drilling was two-fold:

- 1) To localize the high grade silver mineralization. A hoped-for target was to nail down 1,000,000 ounces of silver.
- 2) To test for stacked deep mineralization below the silver zone as indicated by the 1981 hole, number S62.

The 1982 program failed miserably to prove the hoped-for silver target.

The objective of indicating deep stacked mineralization was partially achieved by hole S71 which intersected over fifteen meters of over 12% combined lead-zinc plus minor silver.

1982 DRILL RESULTS
MT. HUNDERE OPTION

HOLE NO.	LOCATION	DIP	FROM	TO	METERS	LEAD %	ZINC %	SILVER OPT	ZONE
S71	0 + 34 S 3 + 90 W	90°	9.3	14.5	5.2	1.19	5.38	0.78	Upper
			18.1	21.0	2.9	5.19	7.18	2.77	Lower?
			56.1	71.4	15.3	0.96	11.30	1.03	Deep
S72	0 + 23 N 3 + 30 W	90°	4.5	13.1	8.6	1.61	3.87	1.47	Upper
			19.7	27.7	8.0	13.86	3.31	60.0	Lower
S73	0 + 20 S 3 + 69 W	90°	7.8	16.2	8.4	5.00	7.31	5.59	Upper
S74	0 + 50 S 3 + 59 W	90°	19.5	23.3	3.8	7.07	4.43	14.40	Lower
S75	0 + 13.2 S 3 + 50 W	90°	16.2	20.6	4.4	4.98	1.69	14.00	Lower
S76	0 + 52.5 S 3 + 45 W	90°	31.4	34.1	2.7	2.90	13.5	4.46	Lower
S77	0 + 52.5 S 3 + 45	68° S	31.1	34.3	3.2	1.43	5.43	3.04	Lower

1982 DRILL RESULTS
MT. HUNDERE OPTION

HOLE NO.	LOCATION	DIP	FROM	TO	METERS	LEAD %	ZINC %	SILVER OPT	ZONE
S78	0 + 47 S	68° S	21.9	26.4	4.5	9.47	14.0	3.92	Upper
	3 + 65 W		26.6	35.4	5.8	0.69	7.92	0.28	Lower
			36.3	40.2	3.9	2.48	15.60	1.41	Lower
S79	0 + 47 S	90°	22.0	28.0	6.0	4.06	8.82	2.32	Upper
	3 + 65 W		35.1	49.4	14.3	2.82	11.22	8.69	Lower
			Including 43.8	46.3	2.5	8.90	12.55	35.7	

CONTROL OF MINERALIZATION AND OXIDATION

Understanding of the geology of the east (silver zone) has been hampered by little outcrop, poor ground, and high oxidation.

The weight of evidence continues to support that the ore controls are a footwall fault zone ore channel. The simple control recognized for the Read Zone of all the ore occurring in phyllite scharn under a limestone cap does not hold in the east zone.

In 1982, a new classification of scharn was recognized where much or all of the original rock was converted into vuggy quartz.

This vuggy quartz scharn is the core or the locus to much of the primary mineralization.

Unfortunately, the porous vuggy quartz scharn appears to also have been the locus for continuing hot spring activity which in turn converted the primary sulphides to oxides.

ORE RESERVES

Using the best fit of data, reserves were re-calculated. Rounded results were as follows:

ZONE	TONNES	LEAD %	ZINC %	SILVER OPT
Upper Low Silver	50,000	5.8	11.4	1.7
Upper High Silver	30,000	6.7	7.7	4.8
Lower High Silver	35,000	4.0	7.5	10.1
TOTAL	115,000	5.48	9.25	4.80

These results compare with Cima's 1981 estimate for the east zone of

137,274	6.44	6.31	5.29
---------	------	------	------

The major objective was to improve on Mutch's 1981 estimate of the silver zone

80,000	6.8	4.9	9.43
--------	-----	-----	------

and with any luck, the close drilling was to prove up 50,000 tonnes of 20 OPT silver in the lower silver zone (totalling 1,000,000 ounces).

As drilled off in 1982, the continuity of silver values between holes was erratic and the lower zone tonnage was limited to 35,000 tonnes and 10 OPT silver.

In regard to deeper ore bodies, hole number 71 intersection 15.3 meters of over 12% combined lead-zinc, reinforces the interpretation that the mineralization will repeat at depth, opening the door for the search of additional targets of 500,000 to 1,000,000 tonnes.

METALLURGY (SEE APPENDIX)

These preliminary results are in line with what was indicated with the geology:

- 1) Using sulphide techniques, recoveries are not satisfactory.
- 2) Much of the silver reports with sulphide. This strengthens the field interpretation that high grade silver occurs with galena.

As known, before the above testing, mastering of the metallurgy will involve recovery of oxides. This remains an unfinished assignment.

RECOMMENDATIONS FOR FURTHER WORK

Based on the understanding of the regional geology, as summarized in March 1982, and the results of prospecting and other drilling, I believe we are localized on the structure, which is the strongest, has the richest mineralization and the evidence of longest continuing ore forming activity.

The cheapest area to search is the undrilled-near surface extension to the east looking for repetitions.

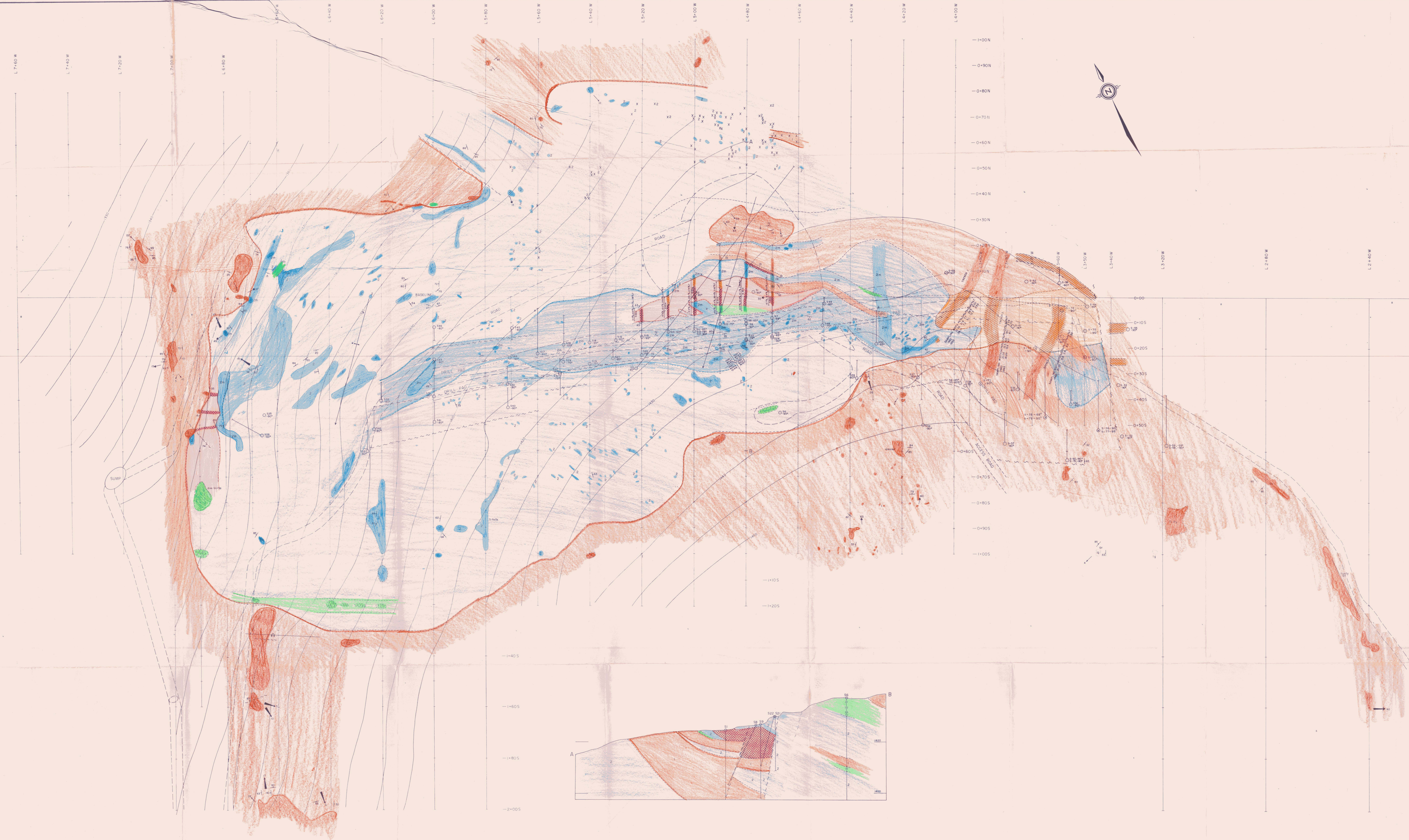
The next target is to try to expand the deep "ore" as indicated in holes S62 and S71.

The major frustration is the depth of oxidation and the interpretation that it is deep-seated and not surface-related.

The major hope for the property is to find larger tonnages of unoxidized rich ore at depth.

APPENDIX

- 1) SOUTH SHOWING GEOLOGICAL MAP
- 2) 1982 DRILL LOGS
- 3) GEOLOGICAL CROSS-SECTIONS
- 4) METALLURGY



LEGEND

- LOWER CAMBRIAN ?
- ALTERED LIMESTONE - COARSELY CRYSTALLINE
 - FINE GRAINED, BLUE- GREY LIMESTONE
 - ALTERED PHYLLITE - GREEN TO BROWN, SILICEOUS
 - BLACK TO GREY PHYLLITE AND SLATE*
 - GREEN, COARSE GRAINED ACTINOLITE SKARN
MAY CONTAIN MINERALIZATION
 - OXIDIZED MINERALIZED ZONE WITH REMNANT SULPHIDE
 - PRIMARY SULPHIDE
 - X OUTCROP
 - FELSENMEER, FLOAT
 - GEOLOGICAL CONTACT - DEFINED, ASSUMED
 - FAULT OR SHEAR SHOWING DIP
 - BEDDING ATTITUDE
 - JOINTING ATTITUDE, FRACTURE - INCLINED, VERTICAL
 - CLEAVAGE FOLIATION ATTITUDE INCLINED
 - LINEATION SHOWING PLUNGE
 - B1 - S TYPE FOLDS AND WRINKLE CRENULATIONS SHOWING PLUNGE
 - B2 - LARGE SCALE OPEN TO TIGHT FOLDS SHOWING PLUNGE
 - MAJOR FOLD AXIS ANTICLINE, SYNCLINE, SHOWING PLUNGE
(OVERTURNED ANTICLINE; OVERTURNED SYNCLINE)
 - DIAMOND DRILL HOLE (COLLAR, SURFACE PROJECTION)
 - DRILL ACCESS ROAD

Cp CHALCOPYRITE Py PYRITE Cc CALCITE
 Gp GALENA Fl FLUORITE
 Sp SPHALERITE Qv QUARTZ VEIN

TO ACCOMPANY REPORT BY R.G. KIDLARK, DATED SEPTEMBER 24, 1981

CIMA RESOURCES LTD
 MOUNT HUNDERE PROPERTY
 YUKON TERRITORY

SOUTH SHOWING
GEOLOGICAL MAP

SCALE 1:400 091470

COMPILLED BY: DATE OCT 24, 1980 REVISION: SEPT 4, 1981 NTS 105 & 110 MAP NO 1

DIAMOND DRILL LOG AND SAMPLE RECORD

 LOCATION: 0 + 34 (~~X~~) (S)

 LOCATION: 3 + 90 (~~X~~) (W)

 DIP AT COLLAR: 90°

BEARING ASTR: _____

ELEVATION AT COLLAR: _____

CORE SIZE:

~~XXXXXXXX~~: N.Q.

 D.D.H. NO.: S-71

 PAGE: 4

 PROPERTY NAME: MT. HUNDERE

 STARTED: JULY 11/82

 DEPTH DRILLED: 90.9 METERS

 FINISHED: JULY 19/82

 PROVINCE: YUKON

 LOGGED BY: A. D. MUTCH

DEPTH (m)		RECOVERY %	FORMATION	DESCRIPTION DETAILS	ESTIMATED Pb + Zn	SAMPLE NUMBER	FROM	TO	WIDTH	ASSAYS			
FROM	TO									% Pb	% Zn	% Cd	oz. Ag
51.5	71.4		ORE ZONE	CONTINUED									
				LIGHT GREEN SCHARN LOW OXIDATION	20	4463	51.5	52.8	1.3	0.10	1.32	-	0.20
				LIGHT GREEN SCHARN LOW OXIDATION	20	4464	52.8	54.2	1.4	0.24	2.24	-	0.38
				LIGHT GREEN SCHARN LOW OXIDATION	30	4465	54.2	55.6	1.4	0.20	1.64	-	0.28
				LIGHT GREEN SCHARN LOW OXIDATION	30	4466	55.6	56.1	0.5	0.36	1.98	-	0.52
				LIGHT GREEN SCHARN LOW OXIDATION	30	4467	56.1	58.4	2.3	1.32	12.3	-	1.44
				DARK GREEN SCHARN MEDIUM OXIDATION	40	4468	58.4	59.7	1.3	1.46	13.8	-	0.70
				DARK GREEN SCHARN MEDIUM OXIDATION	40	4469	59.7	61.1	1.4	0.84	10.4	-	0.68
				DARK GREEN SCHARN MEDIUM OXIDATION	35	4470	61.1	62.5	1.4	1.36	10.4	-	0.94
				DARK GREEN SCHARN MEDIUM OXIDATION	20	4471	62.5	63.9	1.4	0.38	10.3	-	0.46
				DARK GREEN SCHARN LOW OXIDATION	20	4472	63.9	65.2	1.3	0.56	4.5	-	0.92
				DARK GREEN SCHARN HIGH OXIDATION	40	4473	65.2	67.1	1.9	0.90	15.1	-	0.96
				MASSIVE CRYSTALLINE CALCITE	NIL	4474	67.1	67.5	0.4	0.06	0.26	-	0.08
				HIGH QUARTZ HIGH OXIDATION	20	4475	67.5	69.2	1.7	1.36	7.20	-	1.70
				HIGH QUARTZ HIGH OXIDATION	20	4476	69.2	71.4	2.2	0.66	16.5	-	1.24
				67.5 - 71.4 UP TO 50° VUGGY QUARTZ	AVERAGE		51.5	56.1	4.6	0.20	1.76	-	0.31
					AVERAGE		56.1	71.4	15.3	0.96	11.30	-	1.03

DIAMOND DRILL LOG AND SAMPLE RECORD

LOCATION: 0 + 34 (X) (S)
 LOCATION: 3 + 90 (X) (W)
 DIP AT COLLAR: 90°
 BEARING ASTR: _____

ELEVATION AT COLLAR: _____

CORE SIZE: _____
~~XXXXXXXX~~: N.Q. D.D.H. NO.: S-71 PAGE: 5
 PROPERTY NAME: MT. HUNDERE STARTED: JULY 11/82
 DEPTH DRILLED: 90.9 METERS FINISHED: JULY 19/82
 PROVINCE: YUKON LOGGED BY: A. D. MUTCH

DEPTH(m) FROM	TO	RECOVERY %	FORMATION	DESCRIPTION DETAILS	ESTIMATED Pb + Zn	SAMPLE NUMBER	FROM	TO	WIDTH	ASSAYS				
										% Pb	% Zn	% Cd	oz. Ag	
71.4	81.7	100	PHYLITE	LIGHT GREY GREEN										
			SCHARN	FG - M.G. LINEATION										
				UP TO 70° DIP										
				LIGHT GREEN ACTINOLITE SCHARN -										
				UNOXIDIZED	15	4477	71.4	72.3	0.9	0.28	3.26	-	0.66	
				LIGHT GREEN ACTINOLITE SCHARN -										
				UNOXIDIZED	15	4478	72.3	73.7	1.4	0.08	0.34	-	0.22	
				WEAK CALCITE + SPHALERITE	10	4479	78.6	79.1	0.4	0.04	0.02	-	0.06	
81.7	85.2	100	ORE ZONE											
				HEAVY SULPHIDES IN ACTINOLITE SCHARN										
				UNOXIDIZED										
				HEAVY SPHALERITE	15	4480	81.7	83.4	1.7	1.30	3.60	-	2.82	
				HIGH GALENA	50	4481	83.4	83.8	0.4	13.2	23.9	-	2.12	
				MINOR STRINGERS	10	4482	83.8	85.2	1.4	1.66	4.60	-	2.06	
				84.9 - 85.2 HEAVY OXIDATION IN VUGGY QUARTZ	AVERAGE		81.7	85.2	3.5	4.25	6.32	-	2.44	

DIAMOND DRILL LOG AND SAMPLE RECORD

 LOCATION: 0 + 20 (X) (S)

 LOCATION: 3 + 69 (X) (W)

 DIP AT COLLAR: 90°

 BEARING ASTR: -

 ELEVATION AT COLLAR: 1430.5 METERS

CORE SIZE:

~~XXXXXXXX~~ N.Q.

 D.D.H. NO.: S-73

 PAGE: 1

 PROPERTY NAME: MT. HUNDERE

 STARTED: JULY 22/82

 DEPTH DRILLED: 43.0 METERS

 FINISHED: JULY 24/82

 PROVINCE: YUKON

 LOGGED BY: A. D. MUTCH

DEPTH (m)		RECOVERY %	FORMATION	DESCRIPTION DETAILS	ESTIMATED Pb + Zn	SAMPLE NUMBER	FROM	TO	WIDTH	ASSAYS			
FROM	TO									% Pb	% Zn	% Cd	oz. Ag
0	7.8		CASING										
7.8	16.2		ORE ZONE										
				HIGH VARIABLE GREY TO DARK GREY OXIDIZED SCHARN									
		95		DARK BLUE BROWN	30	4496	7.8	9.7	1.9	4.68	7.66	-	4.66
		50		MOSTLY DARK SCHARN	10	4497	9.7	11.2	1.5	1.76	6.40	-	2.34
		85		DARK BLUE BROWN SCHARN	30	4498	11.2	12.2	1.0	7.30	8.50	-	8.56
		90		DARK BLUE BROWN SCHARN	40	4499	12.2	14.3	2.1	9.40	7.10	-	10.1
		95		MEDIUM RED TO BROWN SCHARN	15	4500	14.3	15.5	1.2	2.48	7.90	-	3.64
		95		DARK GREY SCHARN	5	5377	15.5	16.2	0.7	0.60	6.30	-	0.66
					AVERAGE		7.8	16.2	8.4	5.00	7.31	-	5.59

DIAMOND DRILL LOG AND SAMPLE RECORD

 LOCATION: 0 + 20 (X) (S)

 LOCATION: 3 + 69 (X) (W)

 DIP AT COLLAR: 90°

 BEARING ASTR: -

 ELEVATION AT COLLAR: 1430.5 METERS

CORE SIZE:

~~XXXXXXXX~~ N.Q.

 D.D.H. NO.: S-73

 PAGE: 3

 PROPERTY NAME: MT. HUNDERE

 STARTED: JULY 22/82

 DEPTH DRILLED: 43.0 METERS

 FINISHED: JULY 24/82

 PROVINCE: YUKON

 LOGGED BY: A. D. MUTCH

DEPTH (m) FROM TO	RECOVERY %	FORMATION	DESCRIPTION DETAILS	ESTIMATED Pb + Zn	SAMPLE NUMBER	FROM	TO	WIDTH	ASSAYS				
									% Pb	% Zn	% Cd	oz. Ag	
26.6	43.0		CONTINUED										
			HEAVY OXIDATION		5378	26.6	26.8	0.2	0.84	4.30	-	1.44	
			RUSTY SCHARN		5379	26.8	28.1	1.3	0.16	3.40	-	0.30	
			AVERAGE			26.6	28.1	1.5	0.25	3.52	-	0.39	
			HEAVY OXIDATION		5380	30.1	30.4	0.3	0.56	7.20	-	3.10	
			RUSTY SCHARN		5381	32.2	33.1	1.1	0.06	0.54	-	0.10	
			VARIABLE LIGHT GREEN SCHARN + MINOR CALCITE GALENA & SPHALERITE LOWER SILVER ZONE?	5	5382	37.1	38.8	1.7	1.92	3.04	-	4.32	
			OXIDIZED		5383	38.8	39.2	0.4	3.14	10.1	-	8.40	
			VUGGY QUARTZ + 60¢ SILICA		5384	39.2	40.9	1.7	1.38	0.36	-	3.42	
			OXIDIZED		5385	40.9	41.4	0.5	0.10	5.20	-	0.24	
			AVERAGE			37.1	41.4	4.3	1.62	2.89	-	3.87	
			OXIDIZED		5386	41.6	42.1	0.5	0.08	0.28	-	0.16	

DIAMOND DRILL LOG AND SAMPLE RECORD

 LOCATION: 0 + 50 (X) (S)

 LOCATION: 3 + 59 (X) (W)

 DIP AT COLLAR: 90°

 BEARING ASTR: -

 ELEVATION AT COLLAR: 1425.5 METERS

CORE SIZE:

~~XXXXXXXX~~ NQ

 D.D.H. NO.: S-74

 PAGE: 1

 PROPERTY NAME: MT. HUNDERE

 STARTED: SEPT 19/82

 DEPTH DRILLED: 27.7 METERS

 FINISHED: SEPT 19/82

 PROVINCE: YUKON

 LOGGED BY: A. D. MUTCH

DEPTH (m)		RECOVERY %	FORMATION	DESCRIPTION DETAILS	ESTIMATED Pb + Zn	SAMPLE NUMBER	FROM	TO	WIDTH	ASSAYS			
FROM	TO									% Pb	% Zn	% Cd	oz. Ag
0	3.7	NIL	CASING										
3.7	8.2	100	PHYLITE	F.G. LIGHT GREY DIP 30° INCREASING SILICIFICATION									
8.2	14.4	100	SCHARN	V.C.G. DARK GREY GREEN ACTINOLITE - EPIDOTE - CALCITE & MINOR QUARTZ									
				C.G. SCHARN SAFETY	TR?	45915	8.2	11.3	2.1	0.02	0.50	-	0.04
				C. G. SCHARN SAFETY	TR?	45916	11.3	14.3	3.0	0.02	1.64	-	0.10
14.4	19.5	100	PHYLITE	F.G. LIGHT GREY WEAK DISTORTION & BRECCIATION THROUGHOUT DIPS VARIABLE 45° TO 60°									
						45917	15.9	16.3	0.4	2.88	0.66	-	8.10
				LOW SULPHIDES - PHYLITE		45918	16.3	18.3	2.0	0.36	0.50	-	1.10

DIAMOND DRILL LOG AND SAMPLE RECORD

 LOCATION: 0 + 525 (N) (S)

 LOCATION: 3 + 45 (E) (W)

 DIP AT COLLAR: 90°

 BEARING ASTR: -

 ELEVATION AT COLLAR: 1434 METERS

CORE SIZE

~~XXXXXX~~: NQ

 D.D.H. NO.: S-76

 PAGE: 2

 PROPERTY NAME: MT HUNDERE

 STARTED: SEPT 21/82

 DEPTH DRILLED: 53.7 METERS

 FINISHED: SEPT 22/82

 PROVINCE: YUKON

 LOGGED BY: A. D. MUTCH

DEPTH (m) FROM	TO	RECOVERY %	FORMATION	DESCRIPTION DETAILS	ESTIMATED Pb + Zn	SAMPLE NUMBER	FROM	TO	WIDTH	ASSAYS				
										% Pb	% Zn	% Cd	oz. Ag	
21.5	31.4	98	PHYLITE	F.G. BLOCKY GREY WEAK BX 30° DIP										
				21.8 - 22.3 RUSTY BX GOUGE		45908	21.8	22.3	0.5	0.12	10.6	-	0.46	
				29.6 - 31.4 VERY WEAK MINERALIZATION	TR?	45909	29.6	31.4	1.8	0.02	1.16	-	0.02	
31.4	35.1	98	ORE ZONE	SCHARN PHYLITE MINERALIZATION										
				31.4 - 32.2 WEAK MINERALIZATION, MOSTLY ZnS	10%	45910	31.4	32.2	0.8	3.54	11.2	-	12.2	
				32.2 - 33.2 10%Zn 10% PbS, WEAK OXID	20%	45911	32.2	33.2	1.0	2.54	15.2	-	1.16	
				33.2 - 34.1 HIGHLY PITTED, WEAK OXID	10%	45912	33.2	34.1	0.9	2.84	13.8	-	1.26	
				34.1 - 35.7 WEAK MINERALIZATION, NO OXID		45913	34.1	35.7	1.6	0.02	0.40	-	0.06	
				AVERAGE			31.4	34.1	2.7	2.90	13.5	-	4.46	

DIAMOND DRILL LOG AND SAMPLE RECORD

 LOCATION: 0 + 525 (N) (S)

 LOCATION: 3 + 45 (E) (W)

 DIP AT COLLAR: 68° S

 BEARING ASTR: N 28° E

 ELEVATION AT COLLAR: 1434 METERS

CORE SIZE:

~~XXXXXXXX~~ NQ

 D.D.H. NO.: S-77

 PAGE: 1

 PROPERTY NAME: MT HUNDERE

 STARTED: SEPT 22/82

 DEPTH DRILLED: 52.4 METERS

 FINISHED: SEPT 24/82

 PROVINCE: YUKON

 LOGGED BY: A. D. MUTCH

DEPTH(m)		RECOVERY %	FORMATION	DESCRIPTION DETAILS	ESTIMATED Pb + Zn	SAMPLE NUMBER	FROM	TO	WIDTH	ASSAYS				
FROM	TO									% Pb	% Zn	% Cd	oz. Ag	
0	16.2	NIL	CASING	IN GOUGE, ETC.										
16.2	16.5	100	GOUGE	RUSTY										
16.5	22.4	100	LIMESTONE	F.G. NEAR MASSIVE WHITE, WEAK BEDDING DIP 0, UNMINERALIZED										
22.4	30.9	97	PHYLITE	F.G. GREY BLOCKY, DIP 45°, UNMINERALIZED										
30.9	34.3	90	ORE ZONE	C.G. RUSTY RED, POROUS TO SANDY, VERY HIGH IN QUARTZ DIP WHERE SEEN 45°										
			31.1 - 32.6	MOSTLY SANDY QUARTZ 1 TO 3 mm	10	45931	31.1	32.6	1.5	1.92	6.96	-	2.74	
			32.6 - 34.3	MOSTLY VUGGY QUARTZ	10	45932	32.6	34.3	1.7	1.00	4.10	-	3.30	
					AVERAGE		31.1	34.3	3.2	1.43	5.43	-	3.04	

DIAMOND DRILL LOG AND SAMPLE RECORD

LOCATION: 0 + 47 (N) (S)

LOCATION: 3 + 65 (E) (W)

DIP AT COLLAR: 68°

BEARING ASTR: N 28° E

ELEVATION AT COLLAR: 1434 METERS

CORE SIZE:

~~XXXXXXXX~~ FILE CODE: NQ

D.D.H. NO.: S-78

PAGE: 1

PROPERTY NAME: MT HUNDERE

STARTED: SEPT 25/82

DEPTH DRILLED: 47.9 METERS

FINISHED: SEPT 26/82

PROVINCE: YUKON

LOGGED BY: A. D. MUTCH

DEPTH (m) FROM	TO	RECOVERY %	FORMATION	DESCRIPTION DETAILS	ESTIMATED Pb + Zn	SAMPLE NUMBER	FROM	TO	WIDTH	ASSAYS				
										% Pb	% Zn	% Cd	oz. Ag	
0	11.3	0	CASING											
11.3	16.0	100	PHYLITE	F.G. GREY BLOCKY										
16.0	21.9	100	LIMESTONE	F.G. WHITE FAINT BANDING @ 30°	UPPER									
21.9	26.4		ORE ZONE	VARIABLE BUT MOSTLY DARK RED TO BLACK										
		100	21.9 - 23.5	MASSIVE DARK RED PITTED BEGINNING IN L.S.	10	45937	21.9	23.5	1.6	6.70	10.4	-	1.00	
		70	23.5 - 25.3	SANDY DARK RED	10	45938	23.5	25.3	1.8	2.94	17.6	-	3.72	
		100	25.3 - 25.7	VERY RICH GALENA (VERY HIGH SILVER)	30%	45939	25.3	25.7	0.4	62.0	4.54	-	12.9	
		90	25.7 - 26.4	RUSTY SAND	10% ?	45940	25.7	26.4	0.7	3.88	18.6	-	6.4	
					AVERAGE		21.9	26.4	4.5	9.47	14.0	-	3.92	

DIAMOND DRILL LOG AND SAMPLE RECORD

LOCATION: 0 + 47 (N) (S)
 LOCATION: 3 + 65 (E) (W)
 DIP AT COLLAR: 68°
 BEARING ASTR: N 28° E

ELEVATION AT COLLAR: 1434 METERS

CORE SIZE: ~~XXXXXXXX~~ NQ D.D.H. NO.: S-78 PAGE: 3
 PROPERTY NAME: MT HUNDERE STARTED: SEPT 25/82
 DEPTH DRILLED: 47.9 METERS FINISHED: SEPT 26/82
 PROVINCE: YUKON LOGGED BY: A. D. MUTCH

DEPTH (m)		RECOVERY %	FORMATION	DESCRIPTION DETAILS	ESTIMATED Pb + Zn	SAMPLE NUMBER	FROM	TO	WIDTH	ASSAYS				
FROM	TO									% Pb	% Zn	% Cd	oz. Ag	
36.3	43.6		ORE ZONE	VARIABLE, MOSTLY HIGHLY POROUS DARK GREY										
			50	36.3 - 37.2 SANDY GOUGE		45944	36.3	37.2	0.9	1.14	21.6	-	0.64	
			90	37.2 - 38.7 SANDY GOUGE BECOMING MORE DENSE		45945	37.2	38.7	1.5	1.72	15.9	-	1.50	
			95	38.7 - 40.2 PITTED VERY DARK RED		45946	38.7	40.2	1.5	4.04	11.6	-	1.80	
					AVERAGE	459	36.3	40.2	3.9	2.48	15.6	-	1.41	
			95	40.2 - 41.5 STRUCTURE AFTER PHYLITES		45947	40.2	41.5	1.3	0.44	3.86	-	0.40	
			100	41.5 - 43.0 BX PHYLITE WITH VERY HEAVY ZnS, NO OXIDATION		45948	41.5	43.0	1.5	0.10	1.00	-	0.26	
				137.8 - 138.4 NEAR MASSIVE										
				43.0 - 43.6 WEAK DISSEMINATION IN PHYLITE		5373	43.0	43.6	0.6	0.10	1.10	-	0.28	

DIAMOND DRILL LOG AND SAMPLE RECORD

LOCATION: 0 + 47 (N) (S)
 LOCATION: 3 + 65 (E) (W)
 DIP AT COLLAR: 90°
 BEARING ASTR: -

ELEVATION AT COLLAR: 1434 METERS

CORE SIZE: ~~XXXXXX~~ NQ D.D.H. NO.: S-79 PAGE: 2
 PROPERTY NAME: MT HUNDERE STARTED: SEPT 27/82
 DEPTH DRILLED: 49.4 METERS FINISHED: SEPT 29/82
 PROVINCE: YUKON LOGGED BY: A. D. MUTCH

DEPTH (m)		RECOVERY %	FORMATION	DESCRIPTION DETAILS	ESTIMATED Pb + Zn	SAMPLE NUMBER	FROM	TO	WIDTH	ASSAYS				
FROM	TO									% Pb	% Zn	% Cd	oz. Ag	
23.5	29.7	90	SCHARN	C.G. QUARTZ, RICH, HIGHLY OXIDIZED, PITTED AND BROKEN, LIGHT RUSTY RED										
				RUSTY RED, POROUS SCHARN, HIGHLY OXIDIZED	20	5355	23.5	25.0	1.5	5.20	15.4	-	2.50	
				PINK HIGH QUARTZ SCHARN	20	5356	25.0	26.6	1.6	1.66	14.4	-	3.62	
				RUSTY RED VUGGY QUARTZ	10	5357	26.6	28.0	1.4	2.08	4.80	-	1.96	
				AVERAGE			22.0	28.0	6.0	4.06	8.82	-	2.32	
				HIGH QUARTZ		5358	28.0	30.0	2.0	0.70	4.50	-	0.72	
29.7	35.1	98	GOUGE	LIGHT GREY GREASY, STRUCTURELESS										
					5	5359	30.0	32.6	2.6	0.44	2.54	-	0.54	
					5	5360	32.6	35.1	2.5	0.16	3.64	-	0.18	

DIAMOND DRILL LOG AND SAMPLE RECORD

 LOCATION: 0 + 47 (N) (S)

 LOCATION: 3 + 65 (E) (W)

 DIP AT COLLAR: 90°

 BEARING ASTR: -

 ELEVATION AT COLLAR: 1434 METERS

CORE SIZE:

~~XXXXXXXX~~ NQ

 D.D.H. NO.: S-79

 PAGE: 3

 PROPERTY NAME: MT HUNDERE

 STARTED: SEPT 27/82

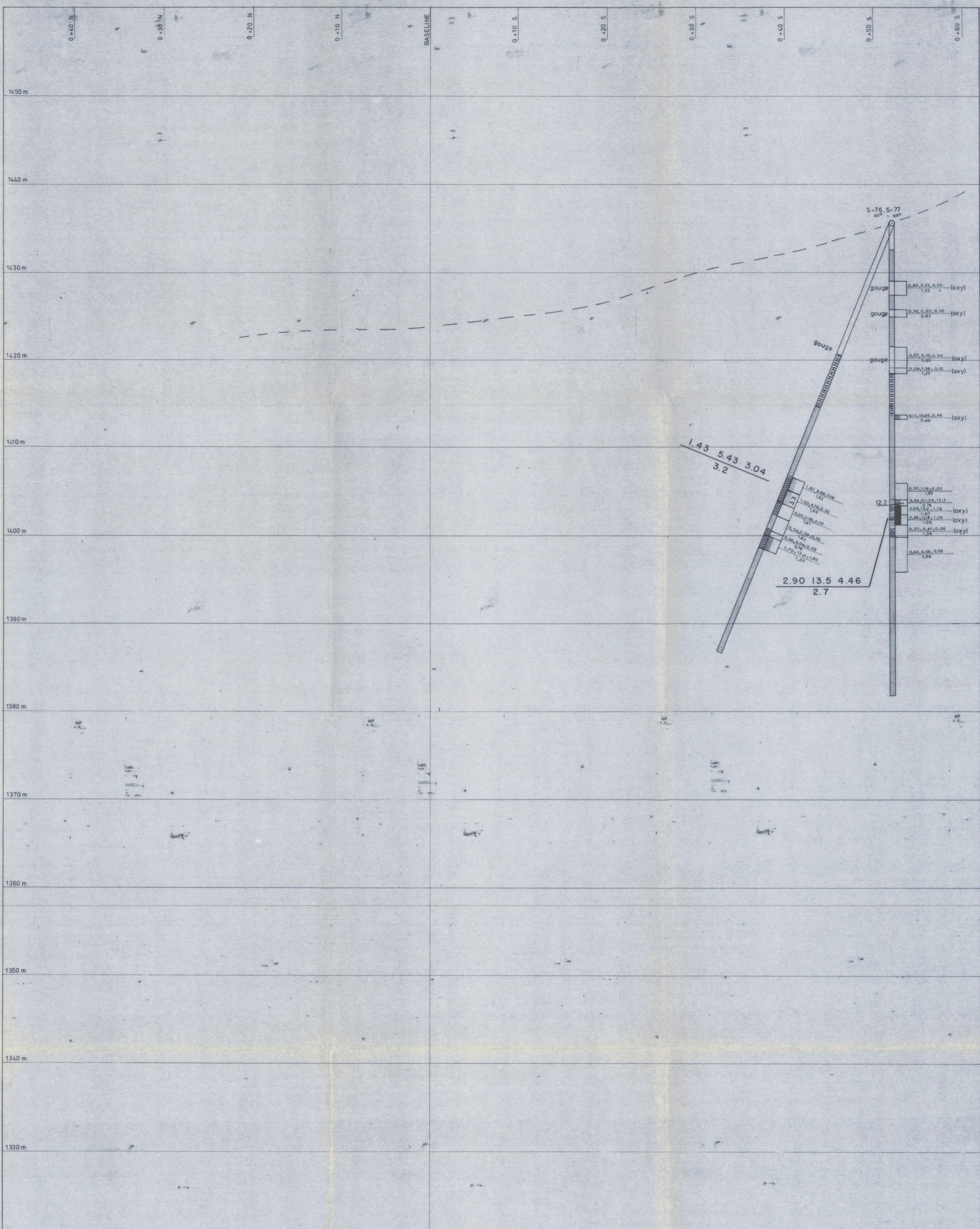
 DEPTH DRILLED: 49.4 METERS

 FINISHED: SEPT 29/82

PROVINCE: _____

 LOGGED BY: A. D. MUTCH

DEPTH(m)		RECOVERY %	FORMATION	DESCRIPTION DETAILS	ESTIMATED Pb + Zn	SAMPLE NUMBER	FROM	TO	WIDTH	ASSAYS				
FROM	TO									% Pb	% Zn	% Cd	oz. Ag	
35.1	37.2	90	ORE ZONE	QUARTZ RICH SCHARN VERY BLOCKY, MINOR VISABLE GALENA										
				DARK RUSTY RED AFTER SCHARN	20	5361	35.1	35.8	0.7	2.16	17.8	-	3.50	
				RUSTY GREY QUARTZ SCHARN	30	5362	35.8	37.2	1.4	6.40	28.9	-	14.6	
37.2	42.8	100	GOUGE	LIGHT GREY TO PINK, STRUCTURELESS										
				RUSTY GOUGE	5	5363	37.2	39.3	2.1	0.24	2.20	-	0.98	
				GOUGE	5	5364	39.3	42.1	2.8	0.16	6.00	-	0.26	
				LIGHT RED GOUGE	20	5365	42.1	42.8	0.7	0.34	17.0	-	0.62	
42.8	49.4	100	ORE ZONE	QUARTZ RICH SCHARN, DARK RED OXIDIZED										
				TRANSITION HIGHLY KAOLINIZED	30	5366	42.8	43.8	1.0	0.34	33.4	-	0.60	
				CG MASSIVE GALENA & DISSEMINATION	20	5367	43.8	44.1	0.3	9.30	15.0	-	51.6	



S-76, S-77

gouge 0.60, 0.22, 0.20
1.53 (oxy)

gouge 0.10, 0.02, 0.10
0.92 (oxy)

gouge 0.02, 0.10, 0.04
3.05 (oxy)

0.04, 1.36, 0.10
1.72 (oxy)

0.12, 10.05, 0.45
0.46 (oxy)

0.02, 1.16, 0.02
1.93 (oxy)

3.54, 11.20, 12.2
1.07 (oxy)

2.54, 13.5, 1.16
1.06 (oxy)

0.02, 0.47, 0.06
1.38 (oxy)

0.02, 0.58, 0.08
3.94 (oxy)

1.43 5.43 3.04
3.2

2.90 13.5 4.46
2.7

LEGEND

- UNIT 2 LIMESTONE
- UNIT 2m ALTERED LIMESTONE
- UNIT 1 PHYLLITE
- ACTINOLITE SKARN
- QUARTZ SKARN
- 5% <(Pb + Zn)% < 10%
- 10% <(Pb + Zn)% < 15%
- 15% <(Pb + Zn)% < 20%
- 20% <(Pb + Zn)%
- oz/T Ag

ASSAY SEQUENCE

Width (metres)	Pb%	Zn%	oz/T Ag
5.00, 6.00, 4.80			
5.25			

091470

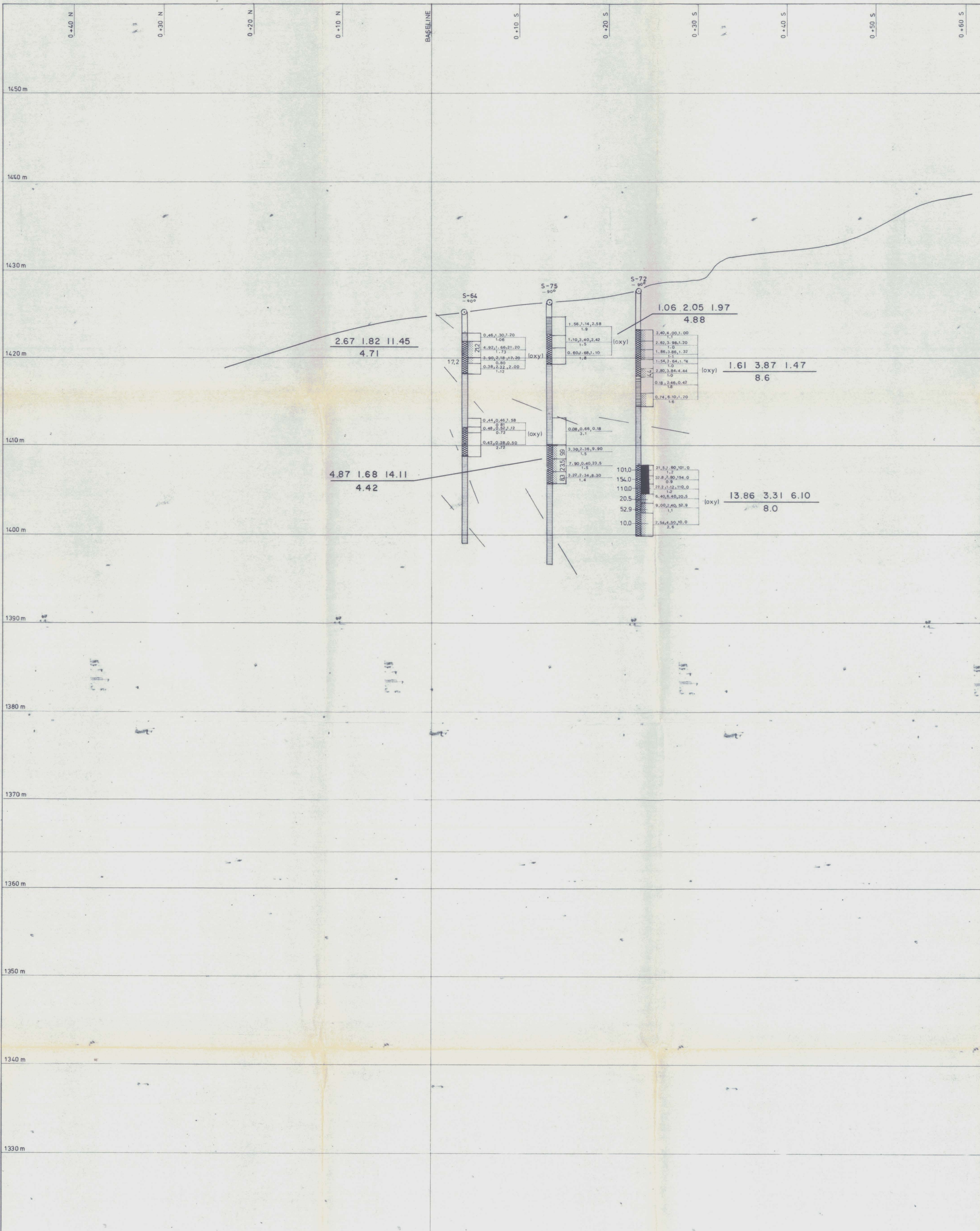
MOUNT HUNDERE PROPERTY
YUKON TERRITORY

SOUTH SHOWING

CROSS SECTION 3+45 W

Metres 5 0 5 10 Metres

N.T.S. 105-A/10



LEGEND

- UNIT 2 LIMESTONE
- UNIT 2m ALTERED LIMESTONE
- UNIT 1 PHYLLITE
- ACTINOLITE SKARN
- QUARTZ SKARN
- 5% < (Pb + Zn)% < 10%
- 10% < (Pb + Zn)% < 15%
- 15% < (Pb + Zn)% < 20%
- 20% < (Pb + Zn)%
- oz/T Ag

ASSAY SEQUENCE

5.00, 6.00, 4.80
5.25 Pb%, Zn%, oz/T Ag
Width (metres)

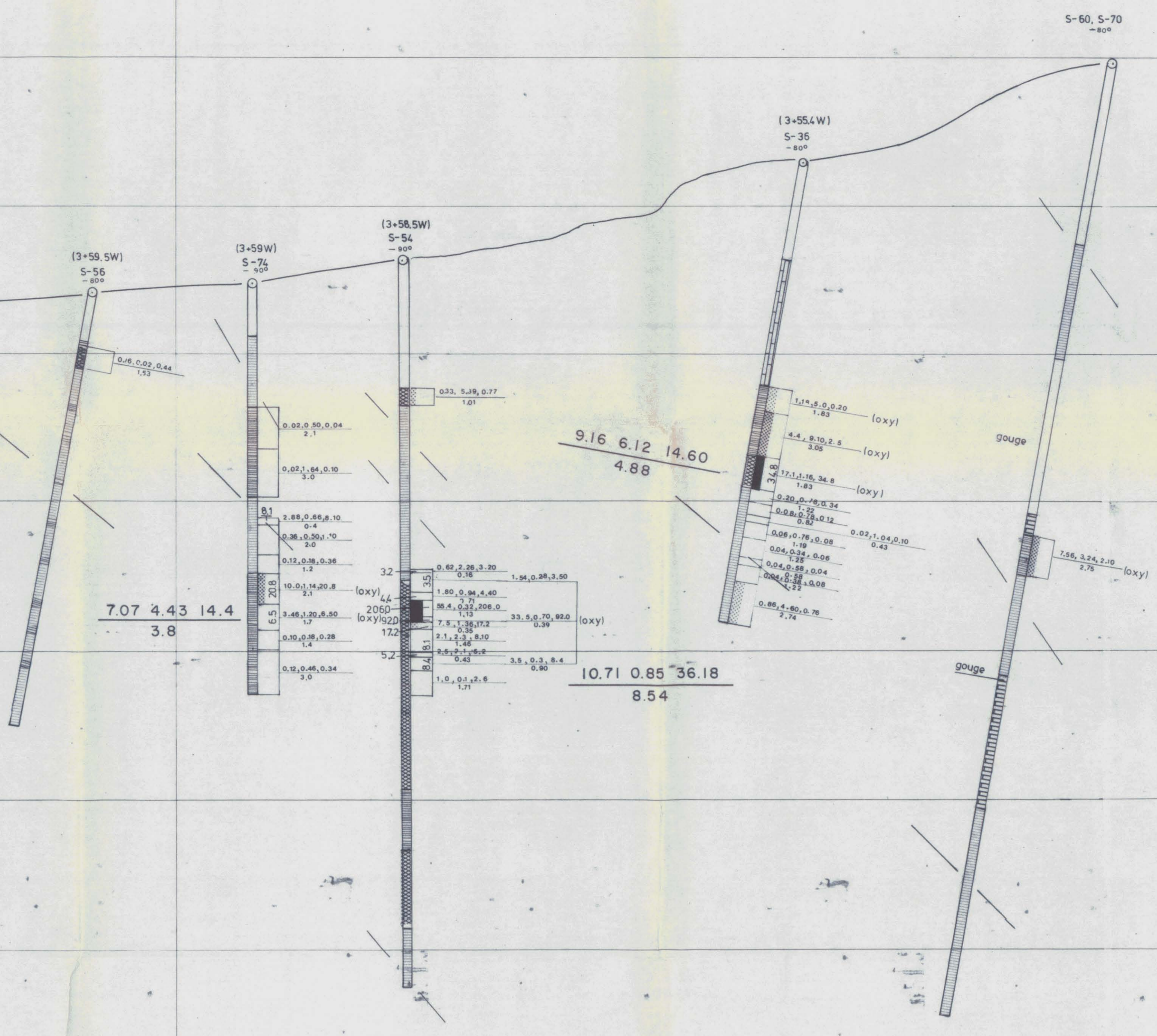
091470

MOUNT HUNDERE PROPERTY
YUKON TERRITORY
SOUTH SHOWING
CROSS SECTION 3+50 W

Metres 5 0 5 10 Metres

N.T.S. 105-A/10

0+40 N 0+30 N 0+20 N 0+10 N BASELINE 0+10 S 0+20 S 0+30 S 0+40 S 0+50 S 0+60 S



LEGEND

- UNIT 2 LIMESTONE
- UNIT 2m ALTERED LIMESTONE
- UNIT 1 PHYLLITE
- ACTINOLITE SKARN
- QUARTZ SKARN
- 5% < (Pb + Zn) % < 10%
- 10% < (Pb + Zn) % < 15%
- 15% < (Pb + Zn) % < 20%
- 20% < (Pb + Zn) %
- oz/T Ag

ASSAY SEQUENCE

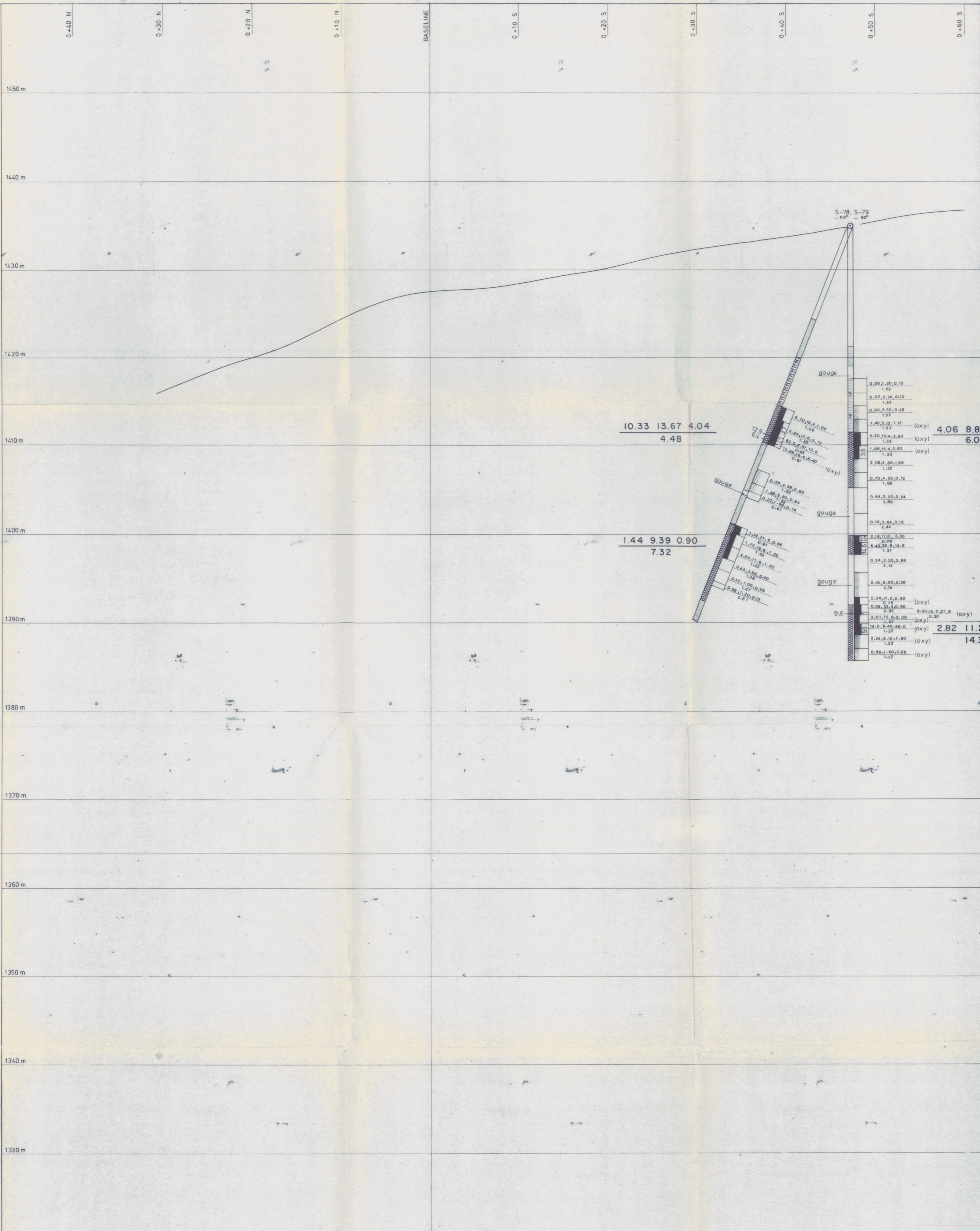
Width (metres)	Pb%	Zn%	oz/T Ag
5.00, 6.00, 4.80			
5.25			

MOUNT HUNDERE PROPERTY
YUKON TERRITORY
SOUTH SHOWING
CROSS SECTION 3+57W

Metres 5 0 5 10 Metres

N.T.S. 105-A/10

091 1 0



LEGEND

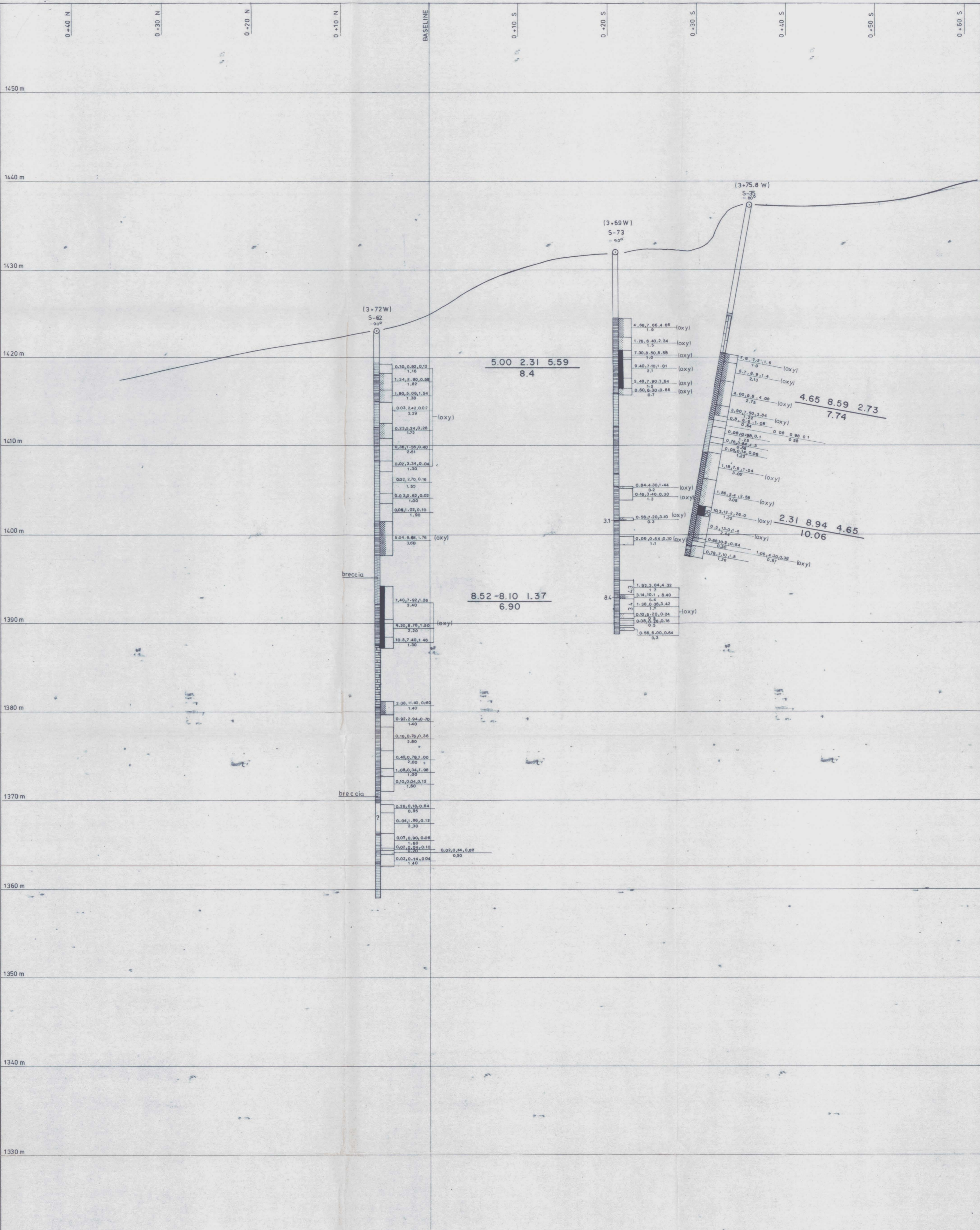
- UNIT 2 LIMESTONE
- UNIT 2m ALTERED LIMESTONE
- UNIT 1 PHYLLITE
- ACTINOLITE SKARN
- QUARTZ SKARN
- 5% <(Pb · Zn)>% < 10%
- 10% <(Pb · Zn)>% < 15%
- 15% <(Pb · Zn)>% < 20%
- 20% <(Pb · Zn)>%
- 3 oz/T Ag

ASSAY SEQUENCE

5.00, 6.00, 4.80	Pb%, Zn%, oz/T Ag
5.25	Width (metres)

091470

MOUNT HUNDERE PROPERTY
YUKON TERRITORY
SOUTH SHOWING
CROSS SECTION 3+65 W
Metres 5 0 5 10 Metres
N.T.S. 105-A/10



LEGEND

- UNIT 2 LIMESTONE
- UNIT 2m ALTERED LIMESTONE
- UNIT 1 PHYLLITE
- ACTINOLITE SKARN
- QUARTZ SKARN
- 5% <(Pb - Zn)% < 10%
- 10% <(Pb - Zn)% < 15%
- 15% <(Pb - Zn)% < 20%
- 20% <(Pb - Zn)%
- oz/T Ag

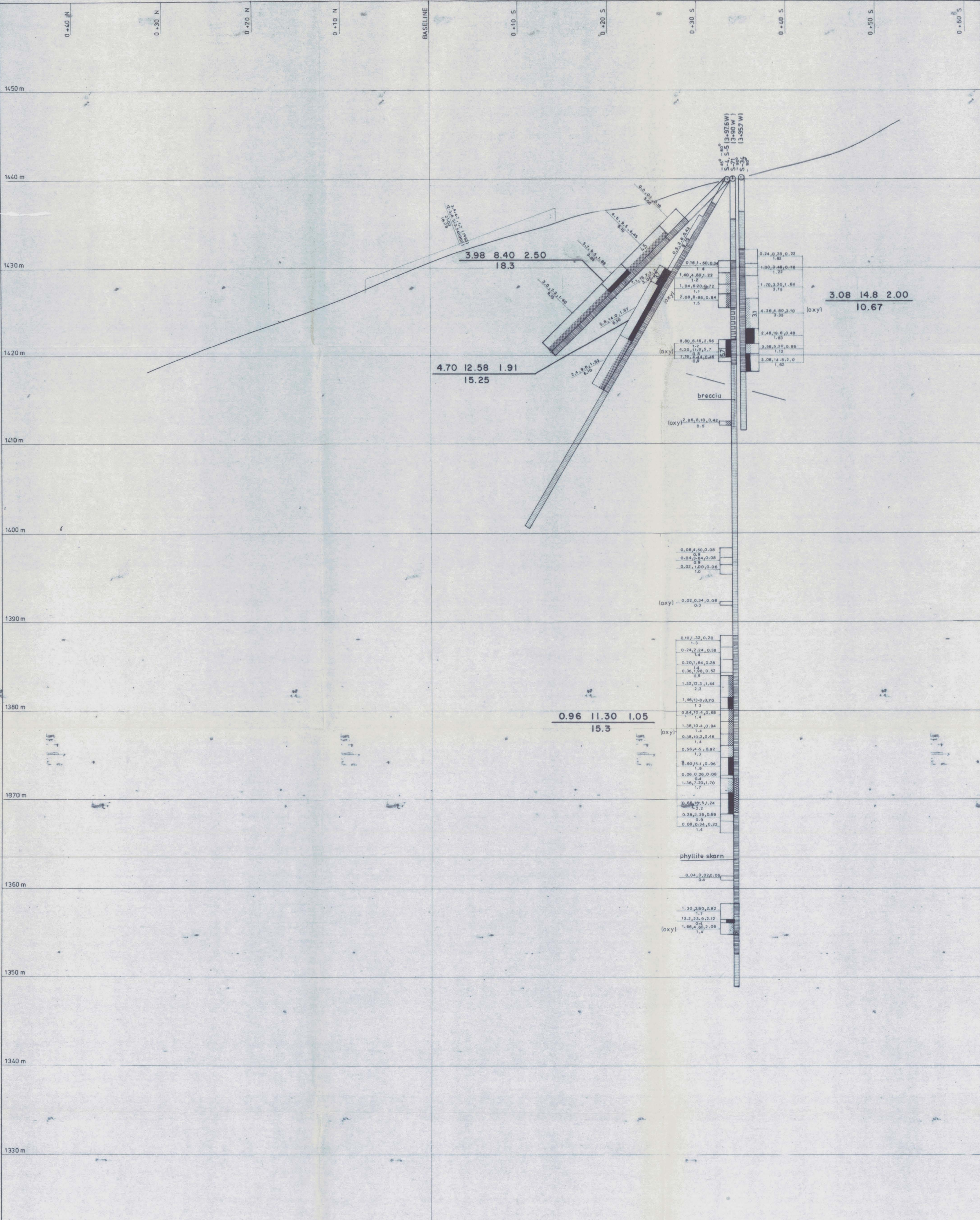
ASSAY SEQUENCE

Assay Sequence	Pb%	Zn%	oz/T Ag
5.00 5.00 4.80			5.25

MOUNT HUNDERE PROPERTY
YUKON TERRITORY
SOUTH SHOWING
CROSS SECTION 3+70 W

Metres 5 0 5 10 Metres

N.T.S. 105-A/10
091470



LEGEND

- UNIT 2 LIMESTONE
- UNIT 2m ALTERED LIMESTONE
- UNIT 1 PHYLLITE
- ACTINOLITE SKARN
- QUARTZ SKARN
- 5% <(Pb + Zn)% < 10%
- 10% <(Pb + Zn)% < 15%
- 15% <(Pb + Zn)% < 20%
- 20% <(Pb + Zn)%
- oz/T Ag *

ASSAY SEQUENCE

5.00, 6.00, 4.80
5.25 Pb%, Zn%, oz/T Ag
Width (metres)

0914-0
091470

MOUNT HUNDERE PROPERTY
YUKON TERRITORY
SOUTH SHOWING
CROSS SECTION 3+95W

Metres 5 0 5 10 Metres

N.T.S. 105-A/10



Telephone: (416) 792-2700
Telex: 06-97762

CANADIAN MINE SERVICES LTD.

1595 CLARK BOULEVARD, BRAMPTON, ONTARIO L6T 4C1

November 30, 1982

TO: A. D. McCUTCHEON
M. D. ROWSWELL
S. JONES

From: A. D. Mutch

RE: METALLURGY - CIMA

Attached are the results. These are in line with my expectations:

1. Recovery is largely dependent on sulphides.
2. In the high grade silver zone, most of the silver follows the lead-- probably as solid solution in galena.

These results reinforce the view that oxide ores are not an attractive target.

Lakefield suggests another couple of weeks' work on sample no. 1 to see if they can improve the recovery by trying to concentrate both the sulphides and the oxides.

Any success would improve the potential for better recoveries on the other samples.

I plan to go ahead with the work recommended by Lakefield.

A. D. Mutch
Consulting Geologist



LAKEFIELD RESEARCH OF CANADA LIMITED

P.O. BOX 430, LAKEFIELD, ONTARIO, CANADA K0L 2H0

PHONE (705) 652-3341
TELEX NO. 06 962842

November 26, 1982

Mr. A.D. Mutch
Canadian Mine Services Ltd.
1595 Clark Boulevard
Brampton, Ont.
L6T 4C1

Dear Mr. Mutch:

Please find enclosed a summary of the work conducted to date on the composites prepared from the five groupings of samples sent to Lakefield, and copies of the individual tests. The testwork included rougher flotation tests on each composite and one cleaner flotation test on composite 1 to investigate the recovery of lead, zinc and silver. As shown in the results, it was found that the recovery was dependent on the content of non-sulphide Pb and Zn in the feed. A formal report will follow shortly.

Yours sincerely,

LAKEFIELD RESEARCH OF CANADA LIMITED

I. Underhill

Project Engineer

IU:slb

Enc.

SUMMARY

1. Head Analyses

<u>Composite</u>	<u>1</u>	<u>3</u>	<u>4</u>	<u>5</u>	<u>6</u>
Lead, Total (Pb), %	3.17	1.87	9.51	0.94	3.14
Lead, Oxide (Pb), %	1.85	1.14	5.94	0.39	0.33
Zinc, Total (Zn), %	7.91	8.09	4.66	11.0	7.09
Zinc, Oxide (Zn), %	6.47	7.05	3.98	7.41	0.63
Sulphur (S), %	0.41	0.43	0.44	1.78	3.73
Silver (Ag), g/t	120	91.6	1146	38.4	95.7

- Composite 1 - Upper zone, low silver
- Composite 3 - Lower zone, low silver
- Composite 4 - Lower zone, high silver
- Composite 5 - Deep zone, oxidized
- Composite 6 - Deep zone, unoxidized

ALL OXIDIZED.

Summary - Continued

2. Results

Test No.	Composite	% -200 Mesh	Product	Weight %	Assays, %, g/t			% Distribution		
					Pb	Zn	Ag	Pb	Zn	Ag
1	1	81.6	Pb Ro. Conc.	1.72	13.6	9.36	1728	7.7	2.1	28.1
			Zn Ro. Conc.	13.14	2.92	12.5	152	12.6	22.1	18.7
			Ro. Tailing	85.4	2.86	6.66	66.2	79.7	75.8	53.2
			Head (Calc.)	100.00	3.05	7.48	106	100.0	100.0	100.0
3	3	86.3	Pb Ro. Conc.	3.66	15.8	8.11	1409	28.1	3.7	51.6
			Zn Ro. Conc.	9.58	1.84	14.1	83.9	8.6	16.6	8.0
			Ro. Tailing	86.76	1.50	7.45	46.6	63.3	79.7	40.4
			Head (Calc.)	100.0	2.06	8.11	100	100.0	100.0	100.0
4	4	73.9	Pb Ro. Conc.	6.07	45.7	5.22	11672	28.0	6.8	58.9
			Zn Ro. Conc.	6.66	11.0	7.50	1203	7.4	10.8	6.7
			Ro. Tailing	87.27	7.32	4.38	474	64.6	82.4	34.4
			Head (Calc.)	100.00	9.89	4.64	1202	100.0	100.0	100.0
5	5	78.8	Pb Ro. Conc.	3.39	11.9	10.6	757	42.4	3.2	63.2
			Zn Ro. Conc.	14.38	0.55	27.5	23.7	8.3	36.6	8.4
			Ro. Tailing	82.23	0.57	7.89	14.1	49.3	60.1	28.5
			Head (Calc.)	100.00	0.95	10.8	40.7	100.0	100.0	100.0
6	6	71.4	Pb Ro. Conc.	5.75	48.3	5.64	1379	95.2	5.0	86.8
			Zn Ro. Conc.	13.52	0.14	42.8	24.7	0.6	89.6	3.7
			Ro. Tailing	80.73	0.15	0.43	10.8	4.2	5.4	9.5
			Head (Calc.)	100.00	2.92	6.46	91.4	100.0	100.0	100.0

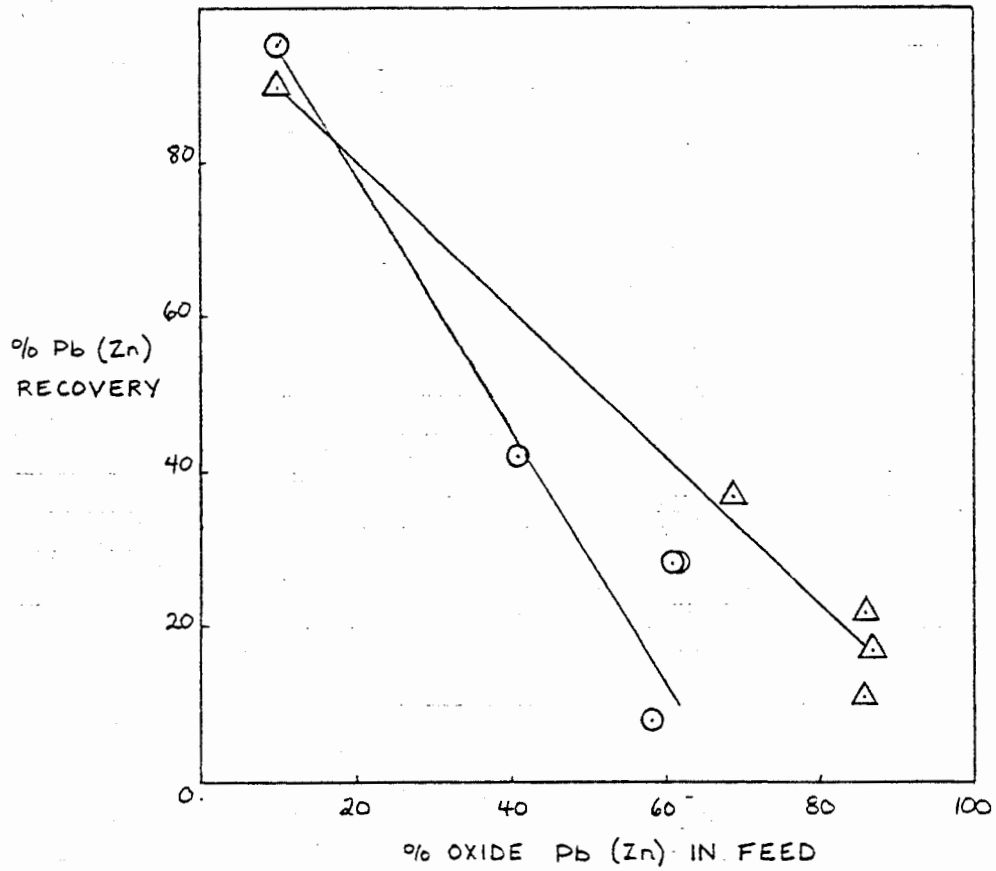
Not Oxidized

6

OXIDE CONTENT IN FEED

VS

RECOVERY



○ Pb
△ Zn

LAKEFIELD RESEARCH OF CANADA LIMITED

Test No.: 1 Project No.: 2636 Date: Nov 3 Operator: RL

Purpose: To investigate the sequential flotation of lead and zinc from Composite 1

Procedure: As shown below

Feed: 2kg minus 10 mesh Composite 1

Grind: 25 min in lab ball mill at 65% solids

Conditions: _____

	REAGENTS ADDED, GRAMS PER METRIC TON							TIME, MINUTES			
	Na ₂ S	ZnSO ₄ / NaCN 3:1	R404	A343	MIBC	Ca(OH) ₂	CuSO ₄	GRIND	COND.	FROTH	pH
Grind	500	200									
Pb Rougher			10	5	15				2	1	7.4
		100							3		7.5
			10	5					1	2	
			10	5					1	1/2	
Pb 1st Cleaner			10						1	1/2	
									1	1/2	7.5
			5		2.5					1	
Zn Rougher						1500	100		2		4.5
				20					1	1/2	
				30			200		2	1	
				20			200		2	2	
				10	2.5				1	1	
Zn 1st Cleaner				20			250		2	2	
						750			1		10.8
				10					1	1	
Zn 2nd Cleaner				5	2.5		50		1	1	
					2.5					1	
				5					1	1	
Zn 3rd Cleaner					2.5	100			1	1	11.0

Stage	Roughers	Pb Cleaner	Zn 1st Cleaner	Zn 2nd, 3rd Cleaners
Flotation Cell	1000g D-1	250g D-1	500g D-1	250g D-1
Speed: r.p.m.	1900	1100	1500	1100
% Solids				
% - mesh				

LAKEFIELD RESEARCH OF CANADA LIMITED

Test No.: 1

Project No.: 2636

Date: _____

Metallurgical Results

PRODUCT	WEIGHT		ASSAYS, %, g/t				% DISTRIBUTION				METAL UNITS			
	g	%	Pb	Zn	Ag		Pb	Zn	Ag					
Pb Cl Conc	4.0	0.22	67.5	4.33	9286		4.9	0.1	19.3		14.85	.95	2043	
Pb Cl Tail	27.6	1.50	5.70	10.1	620		2.8	2.0	8.8		8.55	15.15	930	
Zn 3rd Cl Conc	16.7	0.91	0.64	58.1	253		0.2	7.1	2.2		.582	52.87	230	
) Tail	3.8	0.21	4.02	24.2	872		0.3	0.7	1.7		.744	5.08	183	
) 2nd	35.4	1.93	3.32	10.0	228		2.1	2.6	4.1		6.41	19.30	440	
) 1st	185.2	10.09	3.03	8.65	113		10.0	11.7	10.1		30.57	87.28	1140	
) Re Tail	1563.0	85.14	2.86	6.66	66.2		79.7	75.8	53.2		43.50	567.03	7634	
Head (calc.)	1835.7	100.00	3.05	7.48	106		100.0	100.0	100.0		305.3	747.66	1060.2	

3.17 7.91 120

Calculated Grades and Recoveries

Pb Ro	1.2	1.72	13.6	9.36	1728		7.7	2.1	28.1					
	3.4	1.12	1.27	51.7	369		0.5	7.8	3.9					
	3.5	3.05	2.57	25.3	280		2.6	10.4	8.0					
Zn Ro	3.6	13.14	2.92	12.5	152		12.6	22.1	18.7					
	3.7	98.28	2.87	7.44	77.6		92.3	97.9	71.9					

RV

LAKEFIELD RESEARCH OF
SCREEN ANALYSIS

Operator *Arnold*

Project No. *2*

*Corn Prod
#1*

Sieve No.	Mesh size (Tyler)	Weight grams	% Retained		% Pass. Cum.
			Ind.	Cum.	
51	10				
58	14				
63	20				
69	28				
77	35				
85	48				
98	65	<i>1</i>		<i>1</i>	<i>99.9</i>
107	100	<i>1.2</i>		<i>1.3</i>	<i>98.7</i>
144	150	<i>5.6</i>		<i>6.9</i>	<i>93.1</i>
175	200	<i>11.5</i>		<i>18.4</i>	<i>81.6</i>
230	270	<i>14.6</i>		<i>33.0</i>	<i>67.0</i>
	400	<i>11.7</i>		<i>44.7</i>	<i>55.3</i>
	-400	<i>55.3</i>		<i>100.0</i>	<i>—</i>
	Total	<i>100.0</i>			

LAKEFIELD RESEARCH OF CANADA LIMITED

Test No.: 2 Project No.: 2636 Date: Nov 3 Operator: RU

Purpose: To investigate the effect of floating the sulphide Pb and Zn
from the sulphidizing with Na₂S

Procedure: as shown below

Feed: 2 kg minus 10 mesh Composite 1

Grind: 20 min in lab ball mill at 65% solids

Conditions: _____

	REAGENTS ADDED, GRAMS PER METRIC TON							TIME, MINUTES			
	ZnSO ₄ / NaCN 3:1	242	A343	MIBC	Ca(OH) ₂	CuSO ₄	Na ₂ SiO ₃	GRIND	COND.	FROTH	pH
Grind	300							20			
Pb Rougher		20	5	15					1	1	7.0
		20							1	1	
Zn Rougher 1		M2030			2000	500			2		9.0
			30	10					1	1	
		20	10				250		1	2	
		20	10						1	2	
2						500			2		
		20	20						1	2	
		20	20						1	1	
		404			Na ₂ S						7.9-9.1
Grind Pb Rougher	200				500				1	1	
		20							1	2	
		20									

Stage	Roughers			
Flotation Cell	1000g D-1			
Speed: r.p.m.	1900			
% Solids				
% - mesh				

CANADA LIMITED

RECORD

36 Date Nov 4 82

COB PROD

#2

Mesh size (Tyler)	Weight grams	% Retained		% Pass. Cum.
		Ind.	Cum.	
10				
14				
20				
28				
35				
48				
65	.6		6	99.4
100	2.7		3.3	96.7
150	8.9		12.2	87.8
200	13.5		25.7	74.3
270	13.7		39.4	60.6
400	10.1		49.5	50.5
-400	50.5		100.0	—
Total	100.0			

LAKEFIELD RESEARCH OF CANADA LIMITED

Test No.: 3 Project No.: 2636 Date: 9 Nov/82 Operator: _____

Purpose: To perform a Pb and Zn rougher flotation on composite 3 ore.

Procedure: As shown below

Feed: 2000 grams of minus 10 mesh composite 3 ore.
 Grind: 20 minutes at 65 percent solids in a laboratory ball mill
 Conditions: _____

	REAGENTS ADDED, GRAMS PER TONNE							TIME, MINUTES			pH
	3:1:2 ZnSO ₄ NaCN Ca(OH) ₂	Na ₂ S	CuSO ₄	Ca(OH) ₂	A343	404	MIBC	GRIND	COND.	FROTH	
Grind	300							20			7.9
Pb Rougher 1					10	10	20		2	2	
					10	10	5		1	2	
Pb Rougher 2		100			10	10			2	2	8.2
3		100			10	10			2	2	8.2
Zn Flotation Condition 1									5		9.4
2			500						5		8.7
Zn Rougher 1	H2030 10				20				1	3	
Zn Rougher 2	10	200			20				2	3	9.1
Zn Rougher 3	5	200			10				2	3	9.0

Stage	Rougher			
Flotation Cell	1000g D-1			
Speed: r.p.m.	2500			
% Solids				
% - mesh				

2630

Comp 3

- Pb Ro 1 : fine gal some mid
some sph
fine gangue
- 2 : v. little fine gal - v. light froth
some carbonate little at recty
- 3 : mostly fine gangue
similar to 2

- Zn Ro 1 : honey, brown sph
fine gangue
- 2 : mostly fine gangue - v. light froth
little sph
some carbonate, some tabular?
few pieces of gal or Fe rich sph
- 3 : mostly fine gangue
similar to 2


LAKEFIELD RESEARCH O
SCREEN ANALYSIS

Operator Arnold Project No. 2

Como Prod
#3

Mesh size (Tyler)	Weight grams	% Retained		% Pass.
		Ind.	Cum.	Cum.
10				
14				
20				
28				
35				
48				
65	2		2	99.8
100	.9		1.1	98.9
150	4.2		5.3	94.7
200	8.4		13.7	86.3
270	11.5		25.2	74.8
400	10.4		35.6	64.4
-400	64.4		100.0	—
Total	100.0			

LAKEFIELD RESEARCH OF CANADA LIMITED

Test No.: 4 Project No.: 2636 Date: 9 Nov /82 Operator: _____

Purpose: Repeat test 3, on composite 4 ore

Procedure: Similar to test 3

Feed: 2000 grams of minus 10 mesh composite 4 ore

Grind: 20 minutes at 65 percent solids in a laboratory ball mill

Conditions: _____

	REAGENTS ADDED, GRAMS PER TONNE							TIME, MINUTES			pH
	3:1:2 ZnSO ₄ NaCN Ca(OH) ₂	Na ₂ S	CuSO ₄	Ca(OH) ₂	A343	H ₂ O ₄	H ₂ BC	GRIND	COND.	FROTH	
<u>Grind</u>	<u>300</u>							<u>20</u>			<u>7.2</u>
<u>Pb Rougher 1</u>					<u>10</u>	<u>10</u>	<u>15</u>		<u>2</u>	<u>3</u>	
"					<u>10</u>	<u>10</u>	<u>5</u>		<u>1</u>	<u>3</u>	
" " <u>2</u>		<u>100</u>			<u>10</u>	<u>10</u>	<u>5</u>		<u>2</u>	<u>3</u>	<u>7.3</u>
" " <u>3</u>		<u>100</u>			<u>10</u>	<u>10</u>	<u>5</u>		<u>2</u>	<u>3</u>	<u>7.3</u>
<u>Zn Flotation Condition 1</u>				<u>1500</u>					<u>5</u>		<u>9.6</u>
" <u>2</u>			<u>500</u>								<u>9.1</u>
<u>Zn Rougher 1</u>	<u>10</u>				<u>20</u>				<u>1</u>	<u>3</u>	
<u>Zn Rougher 2</u>	<u>10</u>	<u>200</u>			<u>20</u>				<u>2</u>	<u>3</u>	<u>8.9</u>
" " <u>3</u>	<u>5</u>	<u>200</u>			<u>10</u>				<u>2</u>	<u>3</u>	<u>8.7</u>

Stage	<u>Rougher</u>			
Flotation Cell	<u>1000g D-1</u>			
Speed: r.p.m.	<u>2300</u>			
% Solids				
% - mesh				

2636

Comp 4

Pb Ra 1 Galena, with some sphalerite. Coarser than comp. 3. Less gangue minerals

2 - Sphalerite very active. Less galena

3 Light froth, with gangue slimes, coarse galena and sphalerite

Zn Rougher 1 Coarse sphalerite with fine gangue

2 Mostly gangue slimes, few pieces of coarse sphalerite

3 Similar to rougher 2

CANADA LIMITED

RECORD

636

Date Nov 12 82

COMB PROD
#4

Mesh size (Tyler)	Weight grams	% Retained		% Pass. Cum.
		Ind.	Cum.	
10				
14				
20				
28				
35				
48				
65	1.1		1.1	98.9
100	3.6		4.7	95.3
150	9.0		13.7	86.3
200	12.4		26.1	73.9
270	14.7		40.8	59.2
400	10.4		51.2	48.8
-400	48.8		100.0	—
Total	100.0			

LAKEFIELD RESEARCH OF CANADA LIMITED

Test No.: 5 Project No.: 2636 Date: 10 Nov/82 Operator: _____

Purpose: Repeat test 3, using composite 5 ore

Procedure: Similar to test 3

Feed: 2000 grams of minus 10 mesh composite 5 ore

Grind: 20 minutes at 65 percent solids in a laboratory ball mill

Conditions: _____

	REAGENTS ADDED, GRAMS PER TONNE							TIME, MINUTES			pH
	3:1:2 ZnSO ₄ NaCN Ca(OH) ₂	N ₂ S	CuSO ₄	Ca(OH) ₂	A343	404	MIBC	GRIND	COND.	FROTH	
Grind	300							20			8.0
Pb Rougher 1					10	10	15		2	3	
					10	10	5		1	3	
Pb Rougher 2		100			10	10	5		2	3	8.2
" " 3		100			10	10			2	2	8.2
Zn Flotation Condition 1				800	-				5		9.7
2			500						5		9.1
Zn Rougher 1	H2O2 10				20				1	3	
" " 2	10	200			20				1	3	8.9
" " 3	5	200							1	3	

Stage	<u>Rougher</u>			
Flotation Cell	<u>1000g D-1</u>			
Speed: r.p.m.	<u>2300</u>			
% Solids				
% - mesh				

Comp. 5

Pb Ro 1 Similar to comp. 3 with coarse gangue and galena. Middling present with sphalerite

2 fine gangue, some galena sphalerite

Light froth
3 Light froth, fine gangue

Zn Ro 1 Heavy froth, honey colored sphalerite with reddish brown sphalerite. Little gangue floating

2 Light froth, gangue slime

3 Similar to rougher 2

Coms Prod
#5

Sons	Mesh size (Tyler)	Weight grams	% Retained		% Pass. Cum.
			Ind.	Cum.	
51	10				
68	14				
33	20				
39	28				
17	35				
15	48				
8	65	.4		.4	99.6
7	100	2.0		2.4	97.6
4	150	6.7		9.1	90.9
4	200	12.1		21.2	78.8
3	270	13.7		34.9	65.1
7	400	11.7		46.6	53.4
	-400	53.4		100.0	—
	Total	100.0			

LAKEFIELD RESEARCH OF CANADA LIMITED

Test No.: 6 Project No.: 2636 Date: 10 Nov/82 Operator: _____

Purpose: Repeat test 3, using composite 6 ore

Procedure: Similar to test 3

Feed: 2000 grams of minus 10 mesh composite 6 ore.

Grind: 20 minutes at 65 percent solids in a laboratory ball mill

Conditions: _____

	REAGENTS ADDED, GRAMS PER TONNE							TIME, MINUTES			pH
	3:1:2 ZnSO ₄ NaCN Ca(OH) ₂	Na ₂ S	CuSO ₄	Ca(OH) ₂	A343	404	MIBC	GRIND	COND.	FROTH	
Grind	300							20			8.4
Pb Rougher					10	10	15		2	3	
					10	10	5		1	3	
					10	10	5		1	3	8.4
Zn Flotation											
Condition	1			600					5		9.8
	2		500						5		9.0
		H2030									
Zn Rougher	1	10			20		7.5		1	3	8.7
" "	2	10			20				1	3	
" "	3	5	200		10				2	3	9.0

Stage	<u>Rougher</u>			
Flotation Cell	<u>1000g D-1</u>			
Speed: r.p.m.	<u>2300</u>			
% Solids				
% - mesh				

2656

Comp. 6

Pb Ro 1 Stronger flotation than previous concentrates
Some liberated sphalerite

Pb Ro 2 Some galena, sphalerite, coarse gangue

Pb Ro 3 Similar to 2nd rougher

Zn Ro 1 Very heavy froth, honey colored
and brown sphalerite

Zn Ro 2 Less selective more coarse gangue

Zn Ro 3 Similar to 2nd rougher

COND PROD

6

Mesh size (Tyler)	Weight grams	% Retained		% Pass. Cum.
		Ind.	Cum.	
10				
14				
20				
28				
35				
48	.4		.4	99.6
65	1.2		1.6	98.4
100	4.1		5.7	94.3
150	9.9		15.6	84.4
200	13.0		28.6	71.4
270	13.1		42.7	57.3
400	10.2		52.9	47.1
-400	47.1		100.0	—
Total	100.0			