

42E125W0026 63.3814 MCCOMBER

010

63.3814

MINERAL EXPLORATION ASSISTANCE PROGRAM

GB-75

CONTRACT G.B.-75

The Property:

The property is located in the townships of Summers and McComber in the Thunder Bay Mining Division. It extends from the town of Beardmore on the west about 6 1/4 miles east, straddling the CNR Longlac Thunder Bay rail line from Beardmore east about 1 1/2 miles and then lies immediately south of the rail line for 4 3/4 miles. The property includes the following 72 claims:

TB 4881, 4928, 5003, 4803, 10374, 4834

4803, 4804, 4831, 4805, and W 1/4 Fractions

4815, 4812, 5059 all patented - Summers Township

506598, 506599, 506600, 510708, 510713, 510714,
510715, 510716, 510717, 465854, 465855, 513709,
513710, 513711, 513712, 538483, 518068, 518069,
518070, 518071, 519883, 557849 - Summers Township

506601, 506602, 506603, 506604, 506605, 506606
506607, 506608, 506609, 506610, 506611, 506612
506613, 506614, 506615, 506616, 506617, 506618
506619, 506620, 506621, 506622, 506623, 506624
506625, 206626, 506627, 506628, 506629, 506630
506631, 506632, 506633, 506634, 506635, 506636
506637, 510718

McComber Township

Exploration Program:

The patented claims contain the underground workings of the Northern Empire Gold Mines, operated by Newmont from 1934 to 1941,

Producing 149,493 ozs. gold, 19,803 ozs. silver from 425,866 tons milled.

The unleased claims include 6 old gold mine properties that were all well prospected but sparingly drilled and like the Northern Empire Gold Mine, most records have been lost through the years. To utilize the limited information that was available and tie in the many showings on this large property it was decided to cut a baseline the full length of the property and carry-out a geochemical survey that we could correlate with known information on the patented claims and determine what underlies the many small swamps that could not be prospected easily during the development of this area in the 1930's. At the same time the shaft was dewatered, to investigate 2 working levels (150 and 300) for mineable ore remnants.

THE NORTHERN EMPIRE GOLD MINES - DEWATERING

The Shaft:

The shaft is located on claim TB 4803 approximately 500 ft. south of the CN rail line. It is a 2 compartment shaft to the 600 ft. level, then 3 compartment to the bottom level at 2415 ft. The manway to the 600 ft. level is located 25 ft. east of the shaft and is cribbed through a small back-filled stope to the 150 ft. level then through rock with the exception of cribbing again through small stopes 40 ft. above the 300 ft. level and 90 ft. above the 600 ft. level.

A 600 ft. thick diabase sill cuts the narrow vein type orebody from the 650 ft. horizon. There are 4 levels above the sill at 150, 300, 450 and 600 ft. and 4 working levels below the sill at 1400, 1560, 1725 and 1900 ft. The bottom level with a limited amount of lateral work is at the 2415 ft. level. The mine was worked 1800 ft. east of the shaft and 1400 ft. to the west. (see longitudinal section enclosed).

Dewatering Technique:

A small headframe was built and the submersible pump lowered with an air-hoist, discharging into 4" victaulic pipe

that was secured to the hoisting cable. This allows the pump to be moved around any obstructions that might be encountered and proved beneficial when broken muck jammed the two compartments from the 90 ft. horizon to 180 ft. horizon.

The former optionee had slashed ore in the south wall of the shaft from the 40 to 90 elevation and in so doing severely damaged 6 sets of timber and filled the shaft with muck. The muck was removed (with a great deal of difficulty) and the sets replaced or repaired.

The east compartment was used as a manway and to service the pump.

Equipment used:

- Flygt Electric Submersible Pump
Model B2201, 575 V
850 g.p.m., 325 ft. head max.
- 75 KW: diesel generator
3 phase 550 V. 60 cycle
- 750 CFM rotary compressor
- CIR single drum air hoist with 500 ft.
3/8" cable
- 500' thin wall 4 inch diam. victaulic pipe

Ground Conditions:

Ground conditions were excellent with the only evidence of any pressure being in the area west of the shaft where sill timbers had buckled or burst. The pressure occurred during the mining period 40 odd years ago because the "pony-sets" replacing the damaged ones were "like-new" and no pressure was evident.

Drifts and cross-cuts are large at a minimum of 6 x 7 ft. with no evidence of ground pressure or movement.

The resuing method of stoping was used and the fill appears to be well consolidated. With the exception of the bursted sill timbers mentioned above, the timber in the shaft and stopes is in excellent condition.

Potential Ore:

The vein of the vein type orebody is very strong through the mine and in fact has been traced for many miles on surface. The ore zones mined by the original operator were actually located on surface and developed confidently and mined without the assistance of a diamond drill hole. There are no pillars as such other than the normal crown and sill pillars so what has been left inside the boundaries of the mine workings are considered as ore remnants.

These ore remnants were examined and sampled sufficiently to indicate potential ore in excess of 100,000 tons of mineable grade, east of the shaft only, above the 450 ft. level. Future development is warranted when hydro is installed and proper conveyances to transport personnel. Bulk sampling will certainly be necessary to prove the potential ore outlined and with proper conveyances the deeper levels can be examined where ore has been developed but not mined.

The cut-off grade in the upper levels during the operating period was 0.4 oz. per ton so one would expect to find the ore remnants grading somewhat less than this and ore beyond the old workings possibly grading up to the 0.4 oz. per ton.

Surface Dump and Tailings Pond:

The surface dump was survey and thoroughly sampled by W. J. Riddell whose report is enclosed.

Geochemical Report - Summers & McCombers Townships

A Complete Report on the Geochemical Survey by W. H. Higgins, P. Eng. is enclosed.*

* THIS FILE EXTRACTED FROM REPORT - DUPLICATE OF REPORT FILED FOR ASSESSMENT CREDIT - SEE FILE 2.3703.





42E12SW0026 63.3814 MCCOMBER

020

REPORT ON THE
TONNAGE AND GOLD CONTENT IN THE SURFACE DUMPS

E. R. DAVIS PROPERTY

(Northern Empire Mine)

BEARDMORE ONTARIO .

Toronto, Ontario, Canada
November 27, 1980

W. J. Riddell, P.Eng.

TABLE OF



42E12SW0026 63.3814 MCCOMBER

020C

1.0	SUMMARY	1
2.0	INTRODUCTION	3
3.0	LOCATION AND ACCESS	4
4.0	HISTORY OF MINE DUMP	5
5.0	DUMPS - VOLUME AND TONNAGE	6
	5.1 Topographic Records	6
	5.2 Topographic Survey	6
	5.3 Volume Calculation	7
	5.3.1 Volume by Levels	
	5.3.2 Volume by Areas	9
	5.4 Tonnage Calculation	9
	5.4.1 Tonnage Factor	
	5.4.2 Tonnage by Levels	
	5.4.3 Tonnage by Area	
6.0	SAMPLING	12
	6.1 Past Dumping Method and Sampling Method	12
	6.2 Number, Weights and Lo- cation of Samples	13
	6.3 Assaying	13
7.0	RESERVE CALCULATIONS	15
8.0	SCREENING TESTS	17
	8.1 Samples Tested	17
	8.2 Screening and Assay Re- sults	18
	8.3 Dump Averages	20
9.0	MILL TAILINGS	22
10.0	CONCLUSIONS	24
11.0	RECOMMENDATIONS	25
	APPENDIX 1 - Assay Results Dumps and Sample Location Map Pocket	26

conducted to determine if any upgrading would occur in either of the two fractions. The results of the test indicated that only a small increase in gold content occurred in the minus 2 1/2" fraction.

The Consultant assisted in collection of samples from the old tailings pond. The results from three separate augered holes indicate a weighted average grade of 0.038 oz of gold per ton. No tonnage estimate was made of the tailing pond.

In conclusion it is stated that the grade and tonnage estimate of the dumps may be considered to be accurate within \pm 15%. The screening of the dump to produce an upgraded product does not seem a too promising concept but does require further investigation. A gold content remains in the old mill tailings and a rigorous tonnage estimate and sampling is required. It is also concluded that metallurgical test work is required to determine the quantity of gold that can be recovered.

It is recommended that the mill tailings be sampled and a tonnage estimate made in a similar rigorous manner as was employed on the dump. Metallurgical testing of both dump and tailings is recommended.

2.0 INTRODUCTION

On October 30, 1980 Mr. W. J. Riddell, P.Eng. was commissioned by Mr. E. R. Davis to undertake a reserve calculation of the material contained in the surface dumps surrounding the old Northern Empire Mine at Beardmore, Ontario. The volume measurement and sampling of the dumps was undertaken at the mine site between November 4 and November 7, 1980. Samples were consigned by public transport to the Bell-White laboratory in Haileybury, Ontario and the results were received in Toronto on November 18, 1980.

The calculation of reserves and the report preparation was completed between November 11 and November 28, 1980.

The work was entirely confined to the reserves of gold contained in the old dumps at the mine. Ownership of the dumps was not confirmed nor was any investigation made of the underground workings of the mine.

3.0 LOCATION AND ACCESS

The old Northern Empire Mines is located approximately one mile south of the town of Beardmore, Ontario. Beardmore is located on Highway No. 11 approximately 100 miles north and east of Thunder Bay, Ontario.

A Canadian National Railway branch line passes through the town of Beardmore and also within 100 ft of one portion of the Northern Empire Dumps.

4.0 HISTORY OF MINE DUMP

The Northern Empire Mine operated from 1934 until 1941. During the period of operation rock, mainly from the developing headings and shaft sinking, was dumped to the northeast and to the south of the mine shaft. Most material was dumped below the shaft collar elevation although in later years a belt conveyor was installed and material was dumped to an elevation approximately 40 ft above the shaft collar elevation.

The dumps were formed mainly by end dumping from mine cars hoisted from the underground. This method of dumping is evident from the strata exposed in one large open face of the Main Dump and by the existence of numerous narrow 'fingers' which extend in a fan shape to the west of the Main Dump.

The dumps have not been disturbed to any extent except for some past trench sampling and the excavation of a fairly large quantity of material for use as road fill in the town of Beardmore.

5.0 DUMPS - VOLUME AND TONNAGE

5.1 Topographic Records

A topographic map dated June 25, 1936 prepared by an Ontario Land Surveyor from Thunder Bay was employed to determine the original topography surrounding the mine site. The map identifies a small dump to the northeast of the shaft which is now contained within a larger dump in the same location.

5.2 Topographic Survey

A topographic survey was made by W. J. Riddell, P.Eng. of the present dumps on November 4 and 5, 1980. A stadia method was employed using a Japanese theodolite and stadia rod. All crests and toes of the dumps were identified. The collar of the shaft was employed as the main reference point for which the survey was conducted as this landmark is clearly identified on the 1936 topographic map.

The results of the survey were plotted in Toronto at a scale of 1" = 100' and superimposed on the original topography measured in 1936.

On completion of the plotting the volume of the various dumps and 'fingers' were measured employing

horizontal 'slices' at intervals of five feet. A total of 26 separate intervals were carefully measured by planimeter and the volume calculated for each to determine the total dump volume.

Sampling of the dump was performed by separate areas and it was necessary to recalculate the total volume so as to define the specific areas where sampling was undertaken. The great irregularity of the dumps necessitated some arbitrary definition of the volume in each specific area.

5.3 Volume Calculation

Two separate dumps exist at the mine and may be identified on the enclosed plan of the site.

5.3.1 Volume by Levels - The volume by levels is as

follows:

North East Dump

<u>Elevation</u>	<u>Volume (ft³)</u>
1095 - 1098	89,940
1090 - 1095	127,600
1085 - 1090	122,800
1080 - 1085	126,000
1075 - 1080	109,250
1070 - 1075	103,650
1065 - 1070	69,400
1060 - 1065	48,650
1055 - 1060	27,900
1050 - 1055	21,550
	<u>846,740</u>

Main, Flat and Finger Dumps

<u>Elevation</u>	<u>Volume (ft³)</u>
1135 - 1142	143,990
1130 - 1135	118,000
1125 - 1130	159,500
1120 - 1125	180,200
1115 - 1120	185,000
1110 - 1115	188,200
1102 - 1110	348,320
1095 - 1102	496,790
1090 - 1095	319,800
1085 - 1090	256,000
1080 - 1085	197,750
1075 - 1080	137,950
1070 - 1075	85,350
1065 - 1070	48,650
1060 - 1065	23,900
1055 - 1060	7,200
	<u>2,896,600</u>
Grand Total	3,743,340

5.3.2 Volume by Areas - The volume by areas is as follows:

<u>LOCATION</u>	<u>VOLUME (ft³)</u>
<u>NORTH EAST DUMP</u>	
Trench #1	120,000
Trench #2	140,000
Trench #3	160,000
Trench #4	155,000
Trench #5	145,000
Trench #6	80,000
Westend	46,740
	<u>846,740</u>
<u>MAIN DUMP</u>	
Old Surface to 1042	1,791,130
<u>FLAT DUMP</u>	
Excluding fingers	452,470
<u>FINGERS</u>	
Finger #1	54,000
Finger #2	83,000
Finger #3	100,000
Finger #4	176,000
Finger #5	110,000
Finger #6	130,000
	<u>653,000</u>
Grand Total	3,743,340

5.4 Tonnage Calculation

5.4.1 Tonnage Factor - A bulk density determination was not conducted during the field investigation.

It was reported by a nearby mine who presently truck haul screened dump material that the

bulk density of the trucked material amounted to 17.5 ft³/short ton. Assuming that the Northern Empire dump material was screened in a similar way the bulk density of the oversize is assumed to be 20 ft³/short ton.

Based on the calculation contained in Section 8.0 a factor of 18.0 ft³/short ton is employed for the tonnage factor of the unscreened material in the Northern Empire dumps.

5.4.2 Tonnage by Levels - The tonnage by levels is as follows:

<u>ELEVATION</u>	<u>TONS</u>
<u>NORTH EAST DUMP</u>	
1095 - 1098	5,000
1090 - 1095	7,090
1085 - 1090	6,820
1080 - 1085	7,000
1075 - 1080	6,070
1070 - 1075	5,760
1065 - 1070	3,850
1060 - 1065	2,700
1055 - 1060	1,550
1050 - 1055	1,200
	<u>47,040</u>
<u>MAIN, FLAT AND FINGER DUMPS</u>	
1135 - 1142	8,000
1130 - 1135	6,550
1125 - 1130	8,860
1120 - 1125	10,010
1115 - 1120	10,280
1110 - 1115	10,450
1102 - 1110	19,350
1095 - 1102	27,600
1090 - 1095	17,770
1085 - 1090	14,220
1080 - 1085	10,990
1075 - 1080	7,660
1070 - 1075	4,740
1065 - 1070	2,700
1060 - 1065	1,330
1055 - 1060	400
	<u>160,910</u>
GRAND TOTAL	207,950

5.4.3 Tonnage by Area - The tonnage by area is as follows:

<u>LOCATION</u>	<u>TONS</u>
<u>NORTH EAST DUMP</u>	
Trench #1	6,670
Trench #2	7,780
Trench #3	8,890
Trench #4	8,610
Trench #5	8,050
Trench #6	4,440
Westend	2,600
	<u>47,040</u>
<u>MAIN DUMP</u>	99,500
<u>FLAT DUMP</u>	25,140
<u>FINGERS</u>	
Finger #1	3,000
Finger #2	4,610
Finger #3	5,550
Finger #4	9,780
Finger #5	6,110
Finger #6	7,220
	<u>36,270</u>
<u>GRAND TOTAL</u>	207,950

6.0 SAMPLING

6.1 Past Dumping Method and Sampling Method

The end dumping of underground rail cars in the past resulted in a segregation of material on each dump normal to the rail direction from which the cars were dumped. It follows that a sampling method excavated normal to the segregation or parallel to the assumed track direction should produce a representative sample of the dump. All samples were recovered employing a procedure as described above.

Segregation of coarse material at the toe of the dump was not observed to any major degree. Visual examination of the open face of the Main Dump and the trenches excavated by the backhoe demonstrated an even distribution of coarse and fine material.

To accomplish the sampling procedure described above a rubber tire mounted backhoe machine was employed for the sampling. In all cases except for the Main Dump the backhoe excavated a trench three to four feet deep. From the bottom of the trench, using a round nose spade, a sample weighing approximately 80 pounds was recovered over a sample interval of 25 ft.

In the case of the Main Dump the backhoe excavated a ledge on the open face from which samples were recovered at intervals of 20 ft in a similar manner as described above.

In all cases the samples were placed in clean plastic bags and each personally tagged by W. J. Riddell and transported to the crusher located at the Leitch Gold Mines a distance of approximately 10 miles.

6.2 Number, Weights and Location of Samples

A total of 48 samples was taken from 16 different areas of the dump weighing in total approximately 3800 pounds. The location from which the samples were taken is recorded on the enclosed plan.

6.3 Assaying

All samples were crushed to minus 1/2 inch in a small crusher located at the Leitch Gold Mine. After crushing the samples were riffled at 1/2 inch and the size of sample reduced to approximately 8 to 10 pounds. All of this work, including tagging was under the direct supervision of W. J. Riddell. The samples were placed in clean sample bags with tags, sealed with ties and transported by bus from Beardmore to Haileybury for assaying. All assaying performed was by a fire

assaying method at the Bell-White Analytical Laboratories Ltd. A certificate of the assay may be found in the appendix.

A separate set of sample tags was employed at the sampling site and a separate set was employed for the final sample sent to Haileybury for analysis. Control of the location from which each sample was taken was maintained by W. J. Riddell so that no sample sent from Beardmore to Haileybury could be identified as to where it was recovered from the dump.

No check assaying at a second laboratory was performed.

7.0 RESERVE CALCULATIONS

The samples recovered from each separate area of the dumps were weight averaged by sample length to give a weighted assay value for each area. In summary the weight averaging produced the following results:

<u>LOCATION</u>	<u>Au OZ/TON</u>
<u>NORTHEAST DUMP</u>	
Trench #1	0.055
Trench #2	0.200
Trench #3	0.043
Trench #4	0.030
Trench #5	0.123
Trench #6	0.011
Grab-Westend	0.510
<u>MAIN DUMP</u>	0.039
<u>FLAT DUMP</u>	0.085
<u>FINGERS</u>	
Finger #1	0.027
Finger #2	0.030
Finger #3	0.085
Finger #4	0.020
Finger #5	0.023
Finger #6	0.021

Applying the tonnages for each area as set out in Section 5.0 the following weighted average calculation results:

	LOCATION	TONS	Au OZ/TON	TONS x OZ/TON
<u>NORTH EAST DUMP</u>	Trench #1	6670	0.055	366.850
	Trench #2	7780	0.200	1556.000
	Trench #3	8890	0.043	382.270
	Trench #4	8610	0.030	258.300
	Trench #5	8050	0.123	990.150
	Trench #6	4440	0.011	48.840
	West End Grab	2600	0.510	1326.000
		47,050	0.105	4928.410
<u>MAIN DUMP</u>		99,500	0.039	3880.500
<u>FLAT DUMP</u>		25,140	0.085	2136.900
<u>FINGERS</u>	Finger #1	3000	0.027	81.000
	Finger #2	4610	0.030	138.300
	Finger #3	5550	0.085	471.750
	Finger #4	9780	0.020	195.600
	Finger #5	6110	0.023	140.530
	Finger #6	7220	0.021	151.620
		36,270	0.033	1178.800
GRAND TOTAL		207,950	0.058	12,124.610

The Northern Empire dumps containing 207,950 tons at an average weighted grade of 0.058 oz Au/ton. The dump contains 12,124.61 oz of gold.

8.0 SCREENING TESTS

A series of screening tests were conducted on nine samples collected during the dump sampling. The purpose of the tests was to determine if any upgrading would occur in one of the fractions after screening.

The tests were prompted by the success at the Leitch Gold Mine during the past summer whereby a screening at 3" produced an upgraded product in the minus 3" fraction. Some gold was lost in the coarse fraction however the long truck haul required to deliver the material to an operating mill justified the minor gold loss.

At the Northern Empire no completely barren area of the dumps was identified. The past history of mining is known to include shaft sinking through approximately 500 ft of barren diabase. It would be expected that this material would have been dumped in a separate dump. The separate dump was not identified and it was hoped that the screen testing of the nine samples would demonstrate that the barren diabase could be separated by simple screening.

8.1 Samples Tested

A total of nine samples from different areas of the dump were selected for screening. The samples were screened on a circular hand screen with 2 1/2" openings

after weighing the initial sample on a balance arm scale. The oversized material recovered was re-weighed and both fractions were then crushed and riffled in a similar manner as described above. Samples were bagged tagged and sent for assay with the remainder of the samples from the programme.

8.2 Screening and Assay Results

The following were the results of the screening test:

	Fraction	Wt (lbs)	% Wt	Oz/Ton
<u>A) SAMPLES - MAIN DUMP</u>				
1)	+ 2 1/2	4.00	9.8	0.010
	- 2 1/2	<u>37.00</u>	<u>90.2</u>	<u>0.045</u>
		41.00	100.0	0.042
2)	+ 2 1/2	18.25	24.5	0.005
	- 2 1/2	<u>56.25</u>	<u>75.5</u>	<u>0.020</u>
		74.50	100.0	0.016
3)	+ 2 1/2	9.75	13.6	0.030
	- 2 1/2	<u>61.75</u>	<u>86.4</u>	<u>0.015</u>
		71.50	100.0	0.017
4)	+ 2 1/2	5.00	7.7	0.040
	- 2 1/2	<u>60.00</u>	<u>92.3</u>	<u>0.085</u>
		65.00	100.0	0.082
Summary - Main Dump	+ 2 1/2	37.00	14.6	0.017
	- 2 1/2	<u>215.00</u>	<u>85.4</u>	<u>0.041</u>
		252.00	100.0	0.037
<u>B) SAMPLES - FLAT DUMP</u>				
	+ 2 1/2	19.75	27.3	0.005
	- 2 1/2	<u>52.50</u>	<u>72.7</u>	<u>0.015</u>
		72.25	100.0	0.012
<u>C) FINGER #6</u>				
	+ 2 1/2	24.75	27.8	0.020
	- 2 1/2	<u>64.25</u>	<u>72.2</u>	<u>0.040</u>
		89.00	100.0	0.034
<u>D) NORTH EAST DUMP</u>				
Trench #1	+ 2 1/2	26.75	34.7	0.040
	- 2 1/2	<u>50.25</u>	<u>65.3</u>	<u>0.040</u>
		77.00	100.0	0.040
Trench #5	+ 2 1/2	14.25	17.8	0.615
	- 2 1/2	<u>65.75</u>	<u>82.2</u>	<u>0.130</u>
		80.00	100.0	0.216
Trench #6	+ 2 1/2	15.75	17.1	0.015
	- 2 1/2	<u>76.25</u>	<u>82.9</u>	<u>0.010</u>
		92.00	100.0	0.011
Summary - North East Dump	+ 2 1/2	56.75	22.8	0.177
	- 2 1/2	<u>192.25</u>	<u>77.2</u>	<u>0.059</u>
		249.00	100.0	0.086
<u>E) GRAND SUMMARY</u>				
	+ 2 1/2	138.25	20.9	0.082
	- 2 1/2	<u>524.00</u>	<u>79.1</u>	<u>0.045</u>
		662.25	100.0	0.053

8.3 Dump Averages

The calculations above demonstrate that 20.9% of the material from the dump would be rejected if screened on a 2 1/2" opening screen. During the sampling some large pieces of rock were not included in the sample due to their inability to fit in the sample bag. Arbitrarily, it is the opinion of the Consultant that a 22% rejection at 2 1/2" would be a reasonable assumption for any further calculations.

The assay results demonstrate that on average the + 2 1/2" material is of higher grade than the - 2 1/2" material. This is due primarily to the one high grade sample recovery from Trench #5 on the north east dump. If this single sample is rejected completely in the calculations the results are as follows:

<u>Fraction</u>	<u>Wt (lbs)</u>	<u>% Wt</u>	<u>Oz/Ton</u>
+ 2 1/2"	124.00	21.3	0.020
- 2 1/2"	<u>458.25</u>	<u>78.7</u>	<u>0.033</u>
	582.25	100.0	0.030

After screening there is an indication that the gold content is only raised from 0.030 oz/ton to 0.033 oz/ton, an increase of 10%. If the whole dump was screened the total material available for treatment would be reduced to 162,000 tons of minus 2 1/2" material containing 0.064 oz Au/ton.

From this initial work it would not seem justified to

consider screening of the dump before treatment. A further investigation of this possibility is needed to confirm the opinion of the Consultant.

9.0 MILL TAILINGS

During the same period the Consultant assisted in the recovery of 18 samples from the old tailings pond of the mine. The samples were recovered employing a hand auger. Three holes were drilled near the first tailings discharge point on commencement of the mining operation in 1934.

The samples were assayed by Erana Mines Ltd. but no direct supervision of the tagging and shipment of the samples was exercised by the Consultant. Five samples were check assayed by the Bell-White laboratory.

The results of the sampling are as follows:

Hole	Interval (ft)	Au - Oz/Ton
#1	1 - 3 1/2	0.034
		B-W check
	3 1/2 - 4 1/2	0.040
		B-W check
	4 1/2 - 5 1/2	0.024
		B-W check
	5 1/2 - 6 1/2	0.030
		B-W check
	6 1/2 - 7 1/2	0.086
#2	7 1/2 - 8 1/2	0.105
		B-W check
	8 1/2 - 10	0.067
		B-W check
	2 - 3	0.050
		B-W check
	3 - 4	0.051
	4 - 5	0.045
	5 - 6 1/2	0.029
#3	6 1/2 - 8	0.059
	8 - 9 1/2	0.019
	9 1/2 - 10 1/2	0.015
	6 - 7 1/2	0.039
	7 1/2 - 8 1/2	0.034
	8 1/2 - 10	0.034
#3	10 - 10 1/2	0.051
	7 1/2 - 8 1/2	0.048
	8 1/2 - 10	0.019
	10 - 10 1/2	0.019

The weighted average grade of all samples amounts to 0.038

oz gold/ton.

The results of the work clearly demonstrate that a gold content remains in the tailings and that a regular pattern of auger drill holes is required over the tailing pond to evaluate the tons available for treatment and the average gold content.

10.0 CONCLUSIONS

The results of the stadia survey and sampling of the dumps at the Northern Empire Mine demonstrate that a total of 207,950 tons of material is contained in the dumps and that the gold content is 0.058 oz of gold per ton. It is the opinion of the Consultant that the accuracy of the stadia survey and the number and quantity of samples taken from the dump should assure that the estimate of tonnage and grade are within a \pm 15% degree of accuracy.

The possibility of a screening of the dump material to produce an upgraded product for treatment to recovery gold does not seem to be a particularly promising concept. A further investigation is required.

The mill tailing samples demonstrate that a gold content remains in the tailings pond and that a tonnage estimate and sampling is required in a manner similar to that employed on the dumps.

Recovery of the gold from both the dumps and tailings pond will require metallurgical tests and flow sheet development to determine the quantity of gold that can be recovered from each.

11.0 RECOMMENDATIONS

It is recommended that the tailings pond be surveyed and sampled in a similar rigorous manner as the dumps. A representative composite sample of the dump material should be prepared for metallurgical testing followed by a similar test on a composite sample from the mill tailings.

Respectfully submitted,



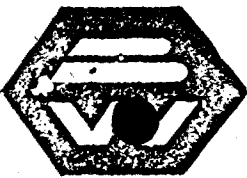
W. J. Riddell, P.Eng.

WJR:g

APPENDIX 1 - ASSAY RESULTS

Dumps and Sample
Location

Map Pocket



BELL-WHITE ANALYTICAL LABORATORIES LTD.

P.O. BOX 187.

HAILEYBURY, ONTARIO

TEL: 672-3107

Certificate of Analysis

NO. 29153

DATE: November 17, 1980

SAMPLE(S) OF: Rock(59)

RECEIVED: November 1980

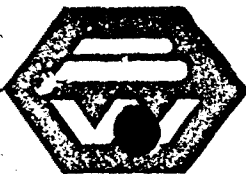
SAMPLE(S) FROM: Mr. E. R. Davis, P. O. Box 487, T.M.R., Montreal, Que.

<u>Sample No.</u>	<u>Oz. Gold</u>	<u>Sample No.</u>	<u>Oz. Gold</u>
F0551	0.08	F0580	0.065
2	0.11	1	0.005
3	0.045	2	0.055
4	0.01	3	0.06
5	0.015	4	0.03
6	0.02	5	0.035
7	0.005	6	0.005
8	0.01	7	0.04
9	0.01	8	0.02
F0560	0.02	9	0.51
1	0.055	F0590	0.005
2	0.02	1	0.015
3	0.03	2	0.01
4	0.11	3	0.045
5	0.03	4	0.005
6	0.04	5	0.02
7	0.06	6	0.615
8	0.085	7	0.13
9	0.01	8	0.02
F0570	0.005	9	0.04
1	0.09	F0600	0.03
2	0.025	E6201	0.015
3	0.015	2	0.04
4	0.035	3	0.04
South 4	0.05	4	0.04
5	0.44	5	0.085
6	0.31	6	0.015
7	0.005	E.Dump7	0.01
8	0.025	7	0.005
9	0.07		

IN ACCORDANCE WITH LONG-ESTABLISHED NORTH AMERICAN CUSTOM, UNLESS IT IS SPECIFICALLY STATED OTHERWISE GOLD AND SILVER VALUES REPORTED ON THESE SHEETS HAVE NOT BEEN ADJUSTED TO COMPENSATE FOR LOSSES AND GAINS INHERENT IN THE FIRE ASSAY PROCESS.

BELL-WHITE ANALYTICAL LABORATORIES LTD.

PER



BELL - WHITE ANALYTICAL LABORATORIES LTD.

P.O. BOX 187.

HAILEYBURY, ONTARIO

TEL: 672-3107

Certificate of Analysis

NO. 29242

DATE: November 17, 1980

SAMPLE(S) OF: Tailings(5) Core(2)

RECEIVED: November 1980

SAMPLE(S) FROM: Mr. E. R. Davis, F. C. Box 487, T.M.R., Montreal, Que.

<u>Sample No.</u>	<u>Oz. Gold</u>
14613	0.04
14615	0.03
14617	0.105
14619	0.05
14621	0.045
0526	0.02
0527	0.185

BELL-WHITE ANALYTICAL LABORATORIES LTD.

IN ACCORDANCE WITH LONG-ESTABLISHED NORTH AMERICAN CUSTOM, UNLESS IT IS SPECIFICALLY STATED OTHERWISE GOLD AND SILVER VALUES REPORTED ON THESE SHEETS HAVE NOT BEEN ADJUSTED TO COMPENSATE FOR LOSSES AND GAINS INHERENT IN THE FIRE ASSAY PROCESS.

PER 

Nov. 13, 1980
file no. 120

Assay Report to
Eric Davis

<u>Sample#</u>	<u>Description</u>	<u>Auger Ton</u>	<u>Cu %</u>
146161	2½' Tailing	.024	.004
146291	Tailing	.034	.005
146181	2' Tailing	.086	.003
146241	1' Tailing	.015	
146201	2' Tailing	.067	
146221	Tailing	.051	
14633✓	1' Tailing	.048	
146261	1' Tailing	.034	
14632✓	1½' Tailing	.051	
146141	2½' Tailing	.034	
14634✓	1½' Tailing	.019	.003
146231	1' Tailing	.019	.002
146281	1½' Tailing	.019	.002
14635✓	½' Tailing	.019	.004
14630✓	1' Tailing	.029	

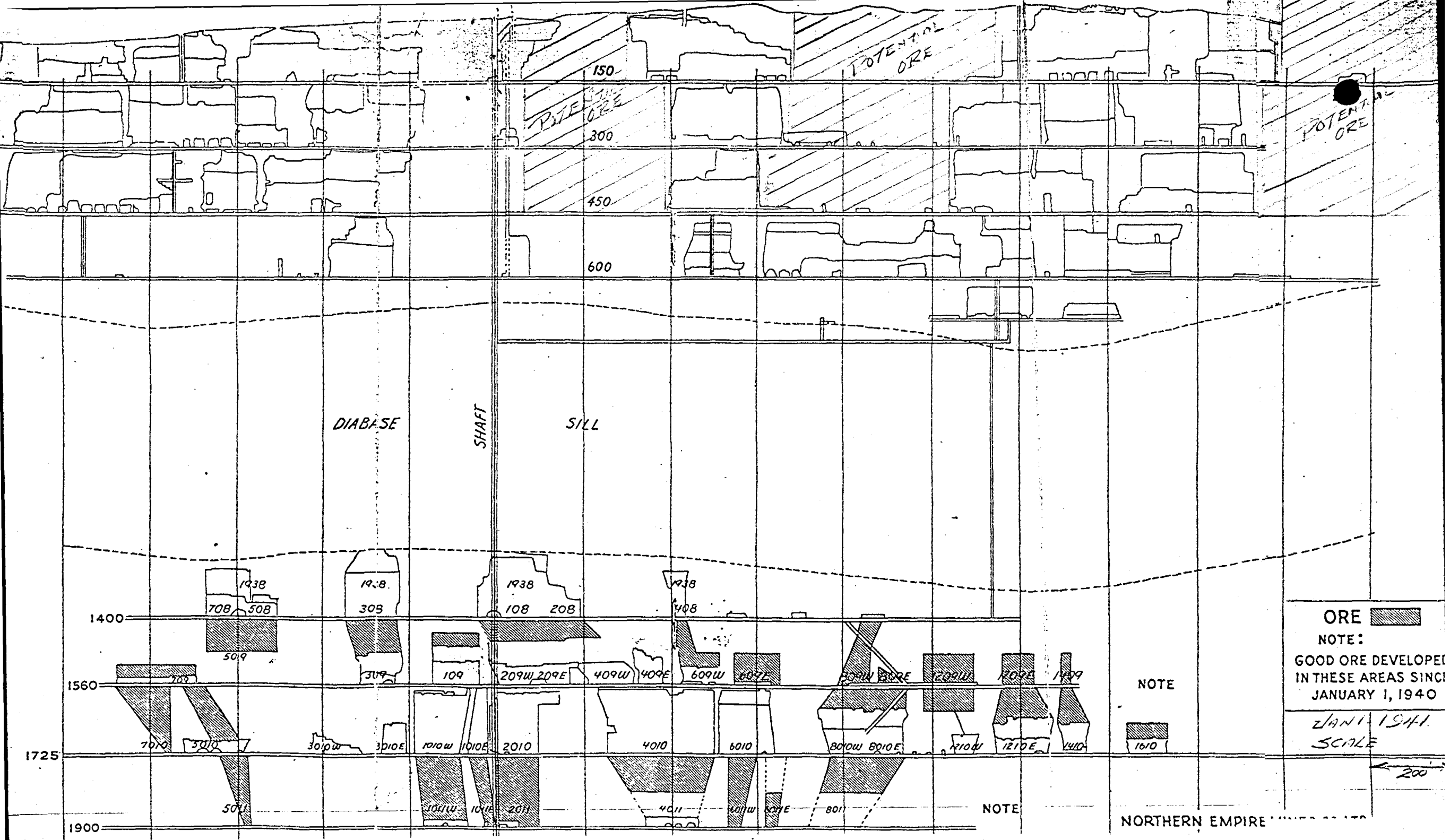
<u>Sample #.</u>	<u>Description</u>	<u>Au oz/TON</u>	<u>Cu %</u>
14627J	1½' Tailing	.039	
14625J	1' Tailing	.039	
14631V	1½' Tailing	.059	

SAMPLE LOCATION AND ASSAY RESULTS

WJR	B-W	Location	Assay
14610	0551	Dump - 25'	0.08
14611	0552	Dump - 25'	0.11
14612	0568	Dump - 25'	0.085
14636	0554	Dump - 20'	0.01
14637	0600	+ 2 1/2 - Dump - 20'	0.03
	6201	- 2 1/2	0.015
14638	0553	Dump - 20'	0.045
14639	6204	+ 2 1/2 - Dump 20'	0.04
	6205	- 2 1/2	0.085
14640	0594	+ 2 1/2 - Dump 20'	0.005
	0595	- 2 1/2	0.02
14641	0559	Dump - 13'	0.01
14642	0556	Dump - 20' North	0.02
14643	0555	Dump - 20' North	0.015
14644	0563	Dump 20' North	0.03
14645	0592	+ 2 1/2 - Dump 10' North	0.01
	0593	- 2 1/2	0.045
14646	0557	Finger #1 - 25' West	0.005
14647	0562	Finger #1 - 25' MID.	0.02
14648	Q561	Finger #1 - 25' East	0.055
14649	0566	Finger #2 - 25' West	0.04
14650	0560	Finger #2 - 25' East	0.02
14651	0564	Finger #3 - 25' West	0.11
14652	0567	Finger #3 - 25' East	0.06
14653	0565	Finger #4 - 25' West	0.03
14654	0558	Finger #4 - 25' East	0.01
14655	0574	Finger #5 - 25' South	0.035
14656	0569	Finger #5 - 25' North	0.01

WJR	B-W	Location	Assay
14657	0572	Finger #6 - 25' South	0.025
14658	0570	Finger #6 - 25' MID.	0.005
14659	0598	+ 2 1/2 Finger #6	0.02
	0599	- 2 1/2 - 25' North	0.04
14660	0575	Flat Near Fingers - 25' West	0.44
14661	0573	Flat Near Fingers - 25' East	0.015
14662	0580	Flat East - 25' South	0.065
14663	0582	Flat East - 25' North	0.055
14664	0586	Flat West - 25' South	0.005
14665	0577	Flat West - 25' MID.	0.005
14666	0590	+ 2 1/2	0.005
	0591	Flat West - 25' North - 2 1/2	0.015
14667	6202	+ 2 1/2	
	6203	East Dump #1 North - 2 1/2	0.04 0.04
14668	0579	East Dump #1 South	0.07
14669	0576	East Dump #2 North	0.31
14670	0571	East Dump #2 - South	0.09
14671	0578	East Dump #3 North	0.025
14672	0583	East Dump #3 South	0.06
14673	0587	East Dump #4 North	0.04
14674	0588	East Dump #4 South	0.02
14675	0584	East Dump #5 North	0.03
14676	0596	+ 2 1/2	0.615
	0597	East Dump #5 South - 2 1/2	0.13
14677	0589	Grab - West End East Dump	0.51

WJR	B-W	Location	Assay
14678	0585	East Dump #6 - East	0.035
14679	0581	East Dump #6 MID.	0.005
14680	6206	+ 2 1/2 East Dump #6 West	0.015
	6207	- 2 1/2	0.01



POTENTIAL ORE
 POTENTIAL ORE
 POTENTIAL ORE

DIABASE SILL
 SHAFT

ORE [hatched box]
 NOTE:
 GOOD ORE DEVELOPED
 IN THESE AREAS SINCE
 JANUARY 1, 1940
 JAN 1 1941
 SCALE

NORTHERN EMPIRE

200

DIAMOND DRILL RECORD

NAME OF PROPERTY HANNA MINES
 HOLE NO. 1 LENGTH 203
 LOCATION T.B. 4805
 LATITUDE 49 degrees 46' N DEPARTURE 87 degrees 59' NW
 ELEVATION _____ AZIMUTH N 20 W DIP -45 degrees
 STARTED Oct. 19, 1980 FINISHED Oct. 22, 1980

FOOTAGE	DIP	AZIMUTH	FOOTAGE	DIP	AZIMUTH

HOLE NO. 1 SHEET NO. 1

REMARKS _____

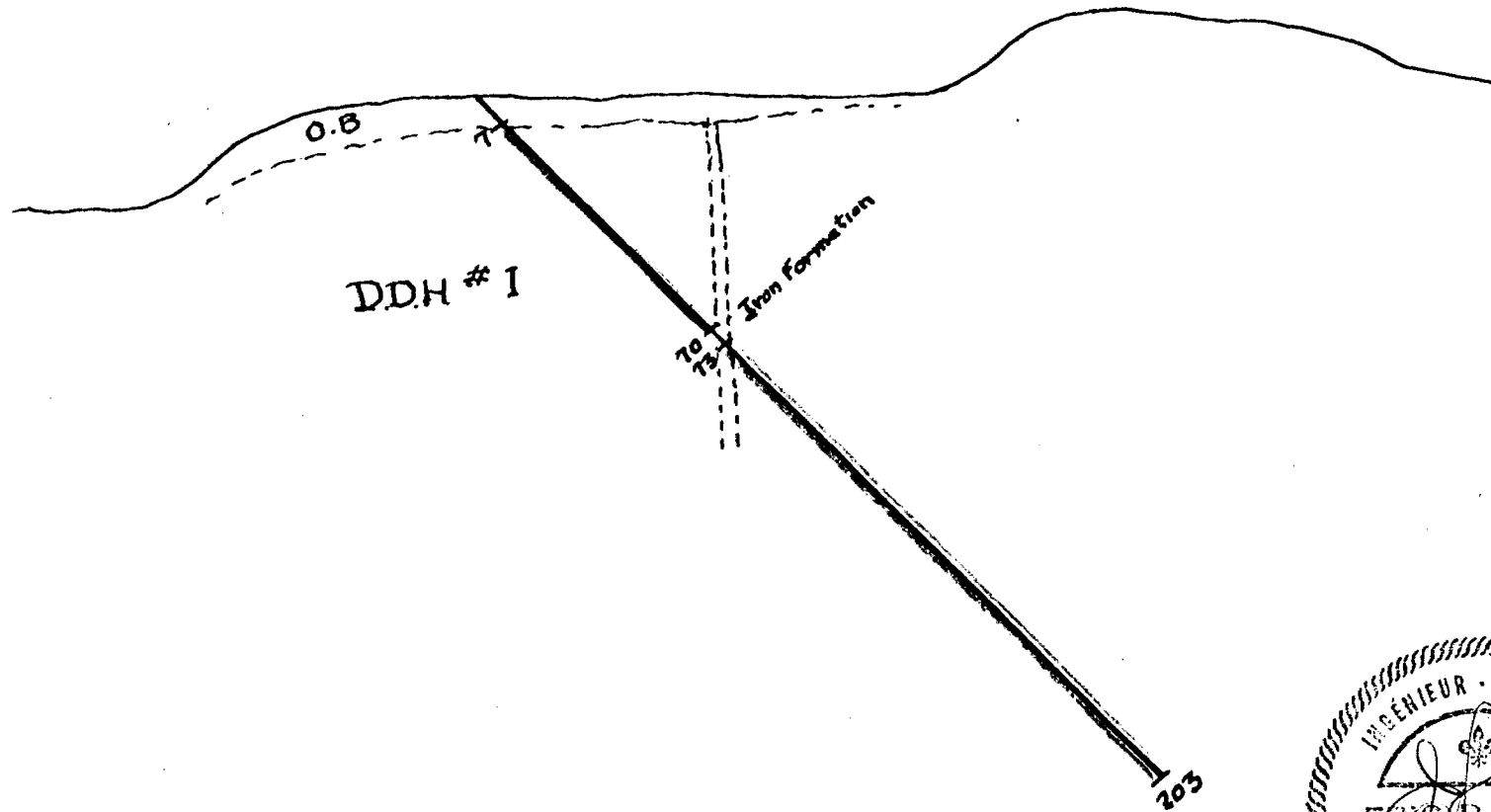
LOGGED BY _____

FOOTAGE		DESCRIPTION	SAMPLE				ASSAYS					
FROM	TO		NO.	% SULPHIDES	FOOTAGE			%	%	OZ/TON	OZ/TON	
					FROM	TO	TOTAL					
0	7	Overburden										
7	41.5	Grey-green Andesite Tuff - chlorite 30%, Carbonate 20%, Feldspar 40%, Sericite 10% - well banded parallel to shearing (40 degrees to core) with narrow white qtz-feldspar bands - 1% sulfides										
41.5	54	Pale green and fairly massive Andesite Flow - no shearing or banding										
54	65	Dark green to black chlorite schist										
65	74.5	Grey Andesite Tuff - band of Iron formation with quartz stringers 70.5 - 73	5251	2%	70.5	73.0	2.5					
74.5	80.5	Highly sheared chlorite schist - shearing 45 degrees to core										
80.5	119	Grey altered andesite tuff - 40% quartz-feldspar Carbonate well banded										
119	148	Dark grey Andesite with 2% brown iron carbonate grains - 8" quartz vein at 124										
148	199	Grey andesite tuff interbanded with chlorite schist										
199	203	Uniform grained grey Andesite flow										
	203	END OF HOLE										

EM. 6-1168

LANGRIDGE LIMITED,

→ North



DDH #1

Iron Formation

70
73

203

- Quartz Vein, Iron Formation
- Andesite Tuffs, Flows



HANNA MINES
 Summers, W.H.

DRILL HOLE SECTIONS

Scale 1" = 400 ft
 Date 3 April 1981 Geol. W.H. HIGGINS

DIAMOND DRILL RECORD

NAME OF PROPERTY HANNA MINES
 HOLE NO. 2 LENGTH 182 feet
 LOCATION T.B. 4805
 LATITUDE 49 degrees 46'N DEPARTURE 87 degrees 59' W
 ELEVATION _____ AZIMUTH N3degreesW DIP -45 degrees
 STARTED Oct. 24, 1980 FINISHED Oct. 30, 1980

FOOTAGE	DIP	AZIMUTH	FOOTAGE	DIP	AZIMUTH

HOLE NO. 2 SHEET NO. 1

REMARKS _____

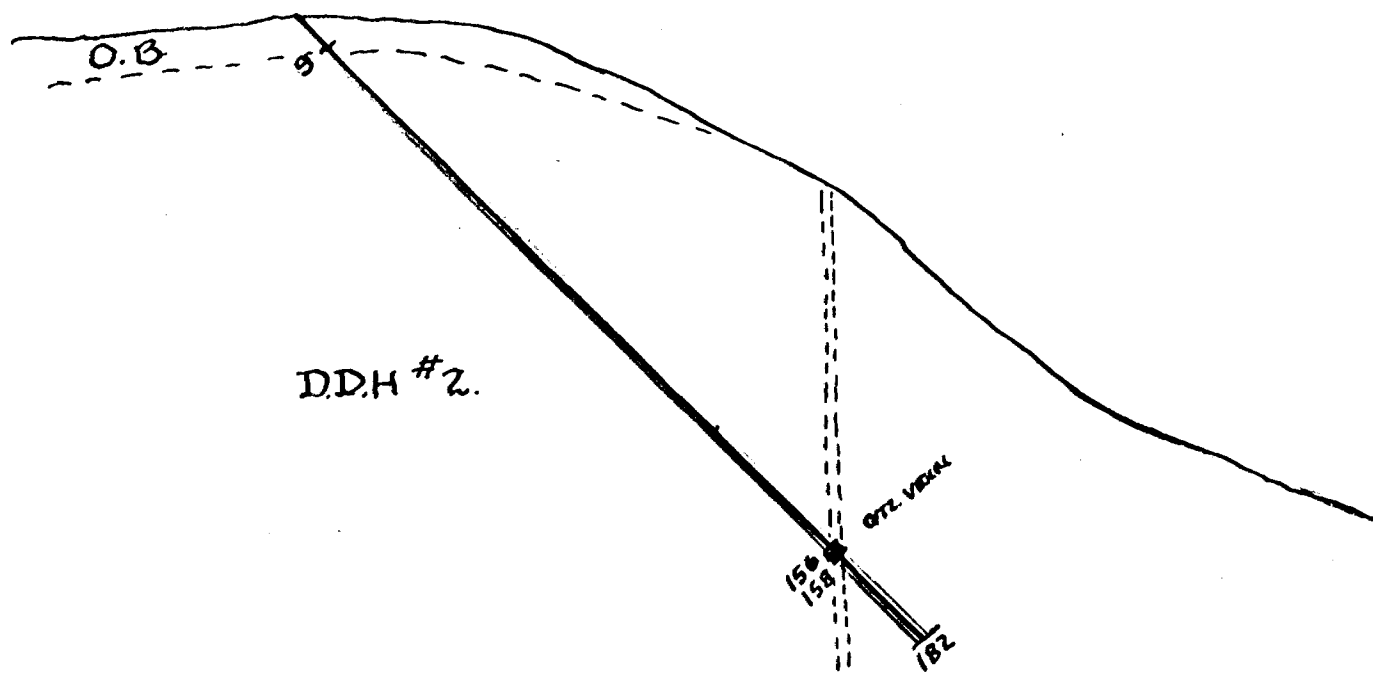
LOGGED BY W.H. Higgins

FOOTAGE		DESCRIPTION	SAMPLE				ASSAYS			
FROM	TO		NO.	% SULPHIDES	FOOTAGE		%	%	OZ/TON	OZ/TON
					FROM	TO				
0	9	Overburden								
9	24	Grey-green Andesite Tuff with narrow quartz-carbonate bands 48 degrees to core - 1% Pyrite								
24	53	Pale green medium grained Andesite Tuff - minor shearing 50 degrees to core - altered zone at 24 - 25 with 5% pyrite and minor epidote								
53	72	Green fine grained Andesite - less banding								
72	156.5	Banded altered Andesite Tuff - 3" quartz stringer at 88.5, 4" qtz vein at 112								
156.5	158	Quartz vein with 2% Pyrite, Arsenopyrite	5252	2	156.5	158	1.5			
158	182	Medium grained Andesite								
	182	END OF HOLE								

EM. 6-1168

LANGRIDGE LIMITED,

→ North ●



Quartz Vein



Andesite Tuffs, Flows



HANNA MINES

Summers Tp

DRILL HOLE SECTIONS

Scale 1" = 400ft

Date 3 April 1981

Geol. W.H.HIGGINS

DIAMOND DRILL RECORD

NAME OF PROPERTY HANNA MINES
 HOLE NO. 3 LENGTH 288 feet
 LOCATION McComber Tp - Claim T.B. 506623
 LATITUDE 49degrees36'52" DEPARTURE 87degrees51'45"
 ELEVATION _____ AZIMUTH True North DIP -45degrees N.
 STARTED Nov. 10, 1980 FINISHED November 14, 1980

FOOTAGE	DIP	AZIMUTH	FOOTAGE	DIP	AZIMUTH

HOLE NO. 3 SHEET NO. 1

REMARKS _____

LOGGED BY W.H. Higgins

FOOTAGE		DESCRIPTION	SAMPLE				ASSAYS				
FROM	TO		NO.	% SULPHIDES	FOOTAGE			%	%	OZ/TON	OZ/TON
					FROM	TO	TOTAL				
0	9	Overburden									
9	13	Andesite Flow (Greenstone) - Dark grey flow with small less than 1 m.m. Xls of feldspar - shear planes 45 degrees to core									
13	62	Andesite Tuff (Greenstone) - pale greenish tuff altered to chlorite, carbonate, sericite - cut by numerous quartz-calcite veinlets - occasional irregular vuggy fractures parallel to core									
62	68	Carbonate vein composed of Carbonate (60%), Quartz (30%) and Sericite (10%)									
68	165	Andesite Tuff - pale green tuff with numerous calcite stringers 50 degrees to core. 1 % Pyrite - at 92 feet there is sphalerite in 1/2 " stringer									
165	186	Andesite Tuff - dark green with fairly high chlorite content (60%) - minor epidote development - 1" quartz stringers at 169, 173 - low less than 1% sulfides									
186	217	Greenish Grey Andesite Flow - few quartz carbonate stringers									
217	288	Dark Green Andesite Tuff - high chlorite content approaching chlorite schist - shearing 45 degrees to core - epidote zone 236 - 238 - 1% Pyrite									
288		END OF HOLE									

EM. 6-1168

LANGRIDGE LIMITED,

DIAMOND DRILL RECORD

NAME OF PROPERTY HANNA MINES
 HOLE NO. 1 LENGTH 203
 LOCATION T.B. 4805
 LATITUDE 49 degrees 46' N DEPARTURE 87 degrees 59' N
 ELEVATION _____ AZIMUTH N 20 W DIP -45 degrees
 STARTED Oct. 19, 1980 FINISHED Oct. 22, 1980

FOOTAGE	DIP	AZIMUTH	FOOTAGE	DIP	AZIMUTH

HOLE NO. 1 SHEET NO. 1

REMARKS _____

LOGGED BY _____

FOOTAGE		DESCRIPTION	SAMPLE			ASSAYS					
FROM	TO		NO.	% SULPHIDES	FOOTAGE		%	%	OZ/TON	OZ/TON	
					FROM	TO	TOTAL				
0	7	Overburden									
7	41.5	Grey-green Andesite Tuff - chlorite 30%, Carbonate 20%, Feldspar 40%, Sericite 10% - well banded parallel to shearing (40 degrees to core) with narrow white qtz-feldspar bands - 1% sulfides									
41.5	54	Pale green and fairly massive Andesite Flow - no shearing or banding									
54	65	Dark green to black chlorite schist									
65	74.5	Grey Andesite Tuff - band of Iron formation with quartz stringers 70.5 - 73	5251	2%	70.5	73.0	2.5				
74.5	80.5	Highly sheared chlorite schist - shearing 45 degrees to core									
80.5	119	Grey altered andesite tuff - 40% quartz-feldspar Carbonate well banded									
119	148	Dark grey Andesite with 2% brown iron carbonate grains - 8" quartz vein at 124									
148	199	Grey andesite tuff interbanded with chlorite schist									
199	203	Uniform grained grey Andesite flow									
	203	END OF HOLE									

EM. 6-1168

LANGRIDGE LIMITED,

DIAMOND DRILL RECORD

NAME OF PROPERTY HANNA MINES
 HOLE NO. 2 LENGTH 182 feet
 LOCATION T.B. 4805
 LATITUDE 49 degrees 46' N DEPARTURE 87 degrees 59' W
 ELEVATION _____ AZIMUTH N3degreesW DIP -45 degrees
 STARTED Oct. 24, 1980 FINISHED Oct. 30, 1980

FOOTAGE	DIP	AZIMUTH	FOOTAGE	DIP	AZIMUTH

HOLE NO. 2 SHEET NO. 1

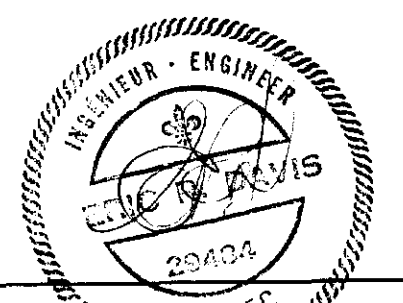
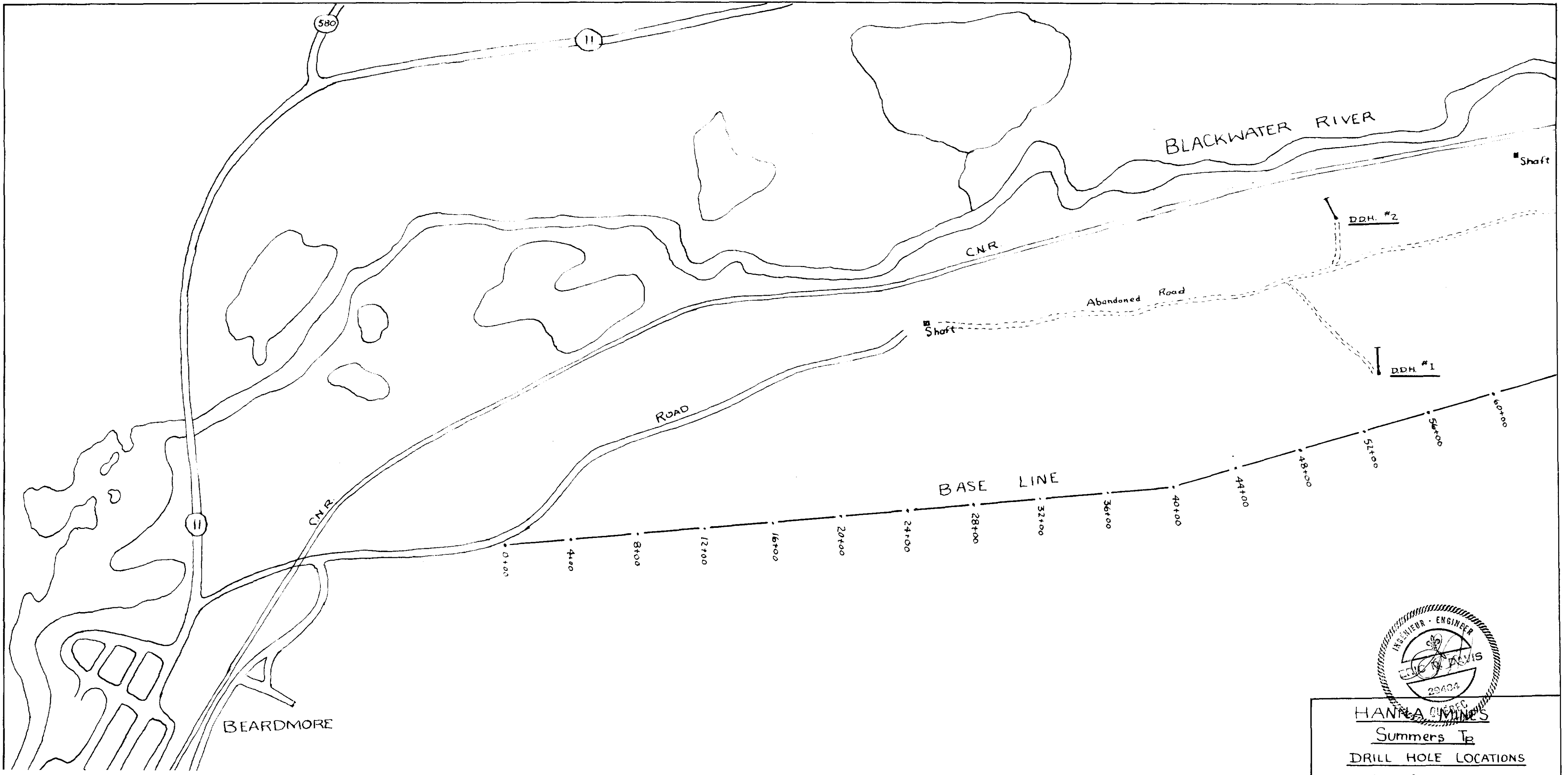
REMARKS _____

LOGGED BY W.H. Higgins

FOOTAGE		DESCRIPTION	SAMPLE				ASSAYS				
FROM	TO		NO.	% SULPHIDES	FOOTAGE			%	%	OZ/TON	OZ/TON
					FROM	TO	TOTAL				
0	9	Overburden									
9	24	Grey-green Andesite Tuff with narrow quartz-carbonate bands 48 degrees to core - 1% Pyrite									
24	53	Pale green medium grained Andesite Tuff - minor shearing 50 degrees to core - altered zone at 24 - 25 with 5% pyrite and minor epidote									
53	72	Green fine grained Andesite - less banding									
72	156.5	Banded altered Andesite Tuff - 3" quartz stringer at 88.5, 4" qtz vein at 112									
156.5	158	Quartz vein with 2% Pyrite, Arsenopyrite	5252	2	156.5	158	1.5				
158	182	Medium grained Andesite									
	182	END OF HOLE									

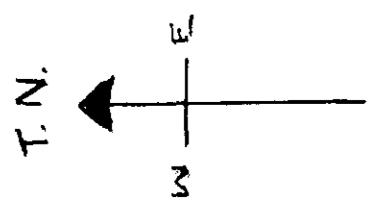
EM. 6 - 1168

LANGRIDGE LIMITED,

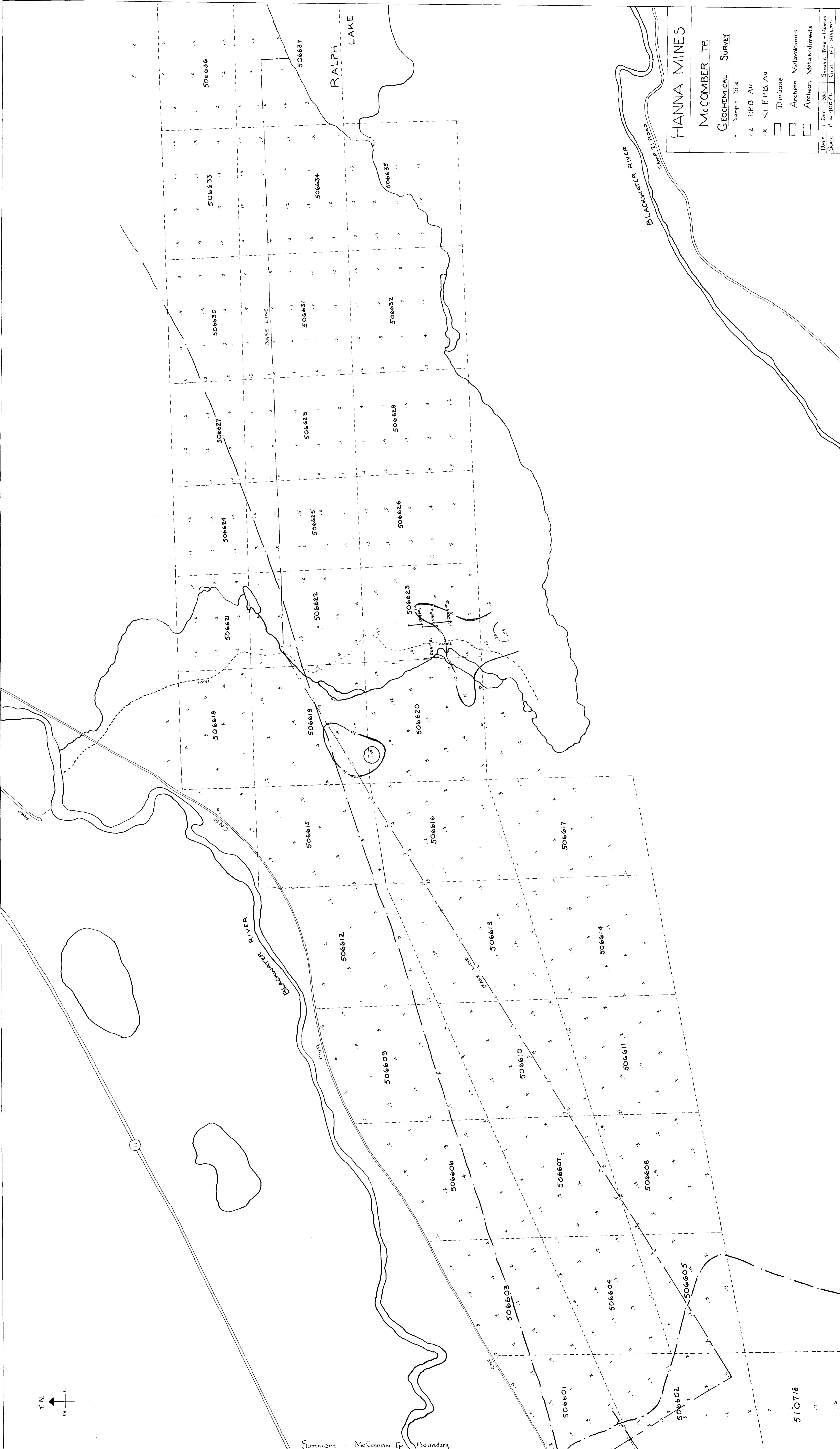


HANNA MINES
Summers I₂
DRILL HOLE LOCATIONS
 Scale 1" = 400ft
 Date 2 April 1981 Geol. W. H. HIGGINS





Summers - McComber Tp Boundary



HANNA MINES

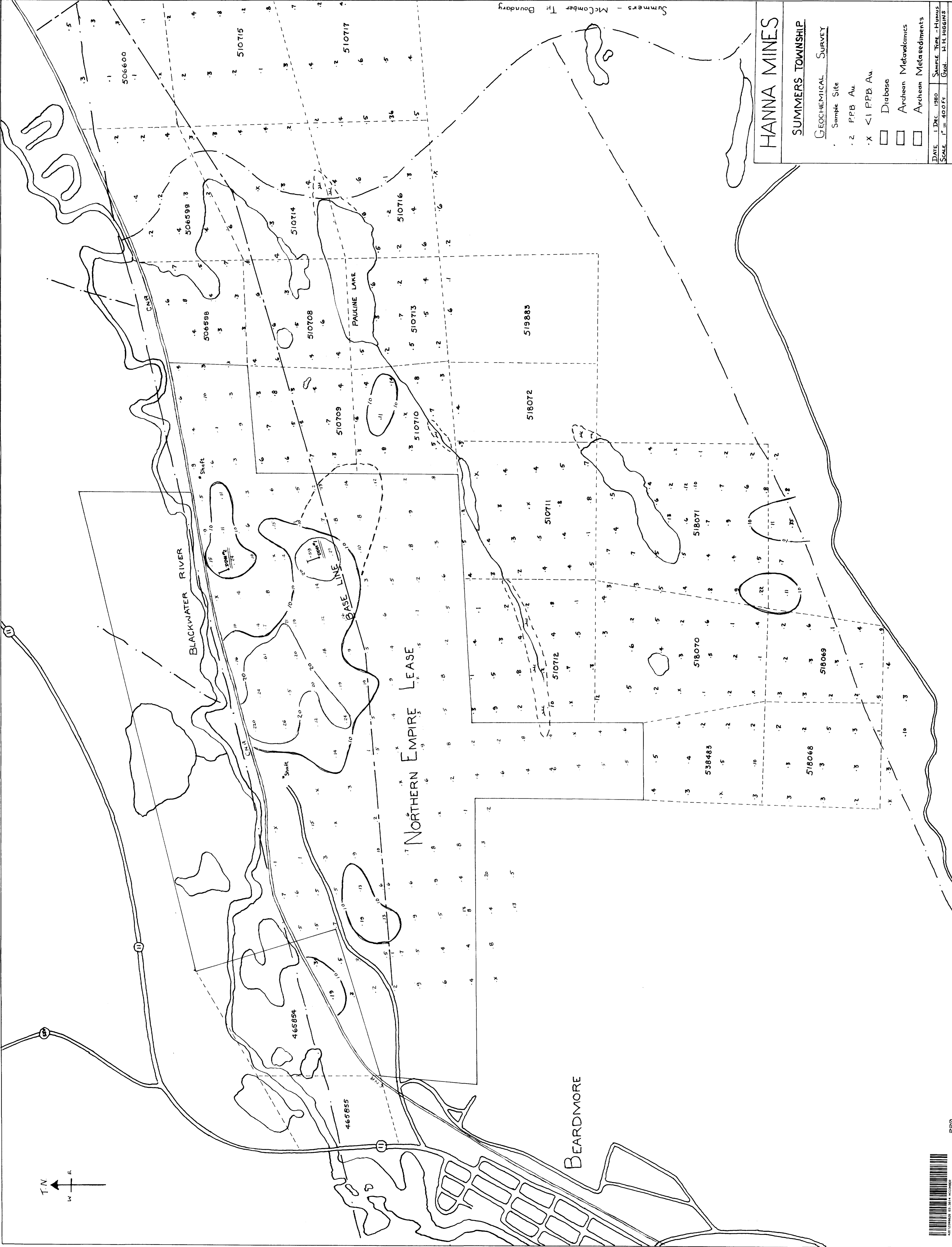
McCOMBER TP

GEOCHEMICAL SURVEY

- Sample Site
- 2 PPB Au
- X <1 PPB Au
- Diabase
- Archean Metavolcanics
- Archean Metasediments

Date: 1 Dec. 1980
 Sample Type: Hannas
 Scale: 1" = 400 Ft.
 Geol. M.H. Williams





HANNA MINES

SUMMERS TOWNSHIP

GEOCHEMICAL SURVEY

Sample Site

. 2 P.P.B. Au.

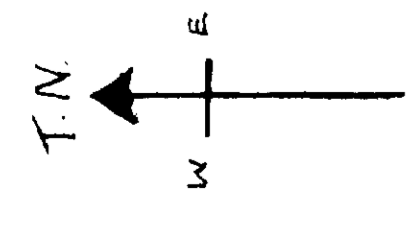
. X < 1 P.P.B. Au.

Diabase

Archean Metasediments

Archean Metasediments

DATE	1 Dec 1980	Sample Type	Hanna
SCALE	1" = 400 FT	Geol.	M.H. HIGGINS



NORTHERN EMPIRE LEASE

BEARDMORE

Summers - McComber Tr. Boundary

