

MAR 19550004: BELLIS

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19550004

ECONOMIC MINERALS

FILE REPORT No.

EE-AE-006(01)

VARMAC MINING AND EXPLORATION CO. LTD.

REPORT ON THE BOG IRON DEPOSIT NEAR BELLIS, ALBERTA.

By

John D. Godfrey

VARMAC MINING AND EXPLORATION CO. LTD.

REPORT ON THE BOG IRON DEPOSIT NEAR BELLIS, ALBERTA

Location:

The area examined lies in Section 36 of Township 58, Range 15, West of the 4th Meridian, some 6 miles south of Bellis, which in turn is situated 70 miles NE of Edmonton, Alberta.

General Geology:

In the general area it is believed that the bedrock lies at a depth of 30-70 ft. beneath the later unconsolidated sediments. The bedrock, Ribstone Creek, Grizzly Bear, and Birch formations of Upper Cretaceous age, consists of sand, sandstone, sandy shale, bentonitic shale, shale, and thin coal seams. Overlying these formations are the varied glacial deposits typical of the physiography of the Alberta Plains, ground moraine, terminal moraine, kames, eskers, lake deposits, etc.

GEOLOGICAL EXAMINATION OF THE IRON DEPOSIT

The iron occurrence is of a bog ore type, being present as limonite ($2\text{Fe}_2\text{O}_3, 3\text{H}_2\text{O}$), commonly known as ocher. This type of deposit is formed as a result of precipitation of iron from iron bearing solutions when carried into marshy places. The process being aided by evaporation and the activity of "iron bacteria" which absorbs the iron from solution and deposits it as ferric hydroxide. Consequently, the limonite deposits occupy low, marshy areas into which iron bearing streams have flowed.

Determination of the extent and possible economic importance of this deposit in North Creek was carried out by a programme of systematic surface sampling and varified by drill

hole testing. As can be seen from the results of the surface sampling, (shallow holes dug by spade), recorded on the accompanying map and table, the area of surface exposure is quite limited in extent. Cross-sectional samples were obtained with a view to outlining the lateral extent of the bog iron. A cross-sectional profile of the North Creek Valley shows a relatively steep western slope in the vicinity of the bridge where it is close to the creek, consequently there is little or no iron to be found west of the creek channel. To the north, higher up the valley, the cross-sectional profile becomes a broader feature and hence favourable for a larger extent of bog iron. Repeated cross-sectional sampling to the north was made in order to determine the extent of the deposit progressing towards the head of the valley.

To test the possibility of favourable conditions having existed in the main valley of West Creek for deposition of bog iron, sampling was completed and recorded as shown on the accompanying map and table. This sampling revealed only a limited amount of bog iron, (see analysis Bl6), admixed with the surface loam deposit.

To examine the possibility that the apparent small surface exposure of bog iron on North Creek might be overlapped by later sands and loam, and hence be continuous beneath them as a larger concealed deposit, a number of drill holes were located around the showing. It can readily be seen from a study of the drill hole data that this possibility must be ruled out as holes located just off the surface showing, both higher

up the valley and to the otherwise favourable gently sloping east valley side, give no indication of the deposit continuing into these sands. From the surface sampling data and drill hole data it must be concluded that the surface showing is a maximum extent of the bog iron deposit on North Creek. This represents an approximate area of 300' x 1,000' x 1,250' with a thickness varying from 2 ft. at the creek to 0 ft. at the west, north and east edges, giving a very insignificant tonnage of iron.

Surface sampling of the valley of West Creek indicated that the iron was present only as a mixture in the surface loam layers. Drill hole number 8, taken to a depth of 50 ft., confirmed the belief that no bog iron deposit was to be found in West Creek. As the underlying formations to the glacial cover are of an unconsolidated nature generally, it is difficult to delineate exactly the glacial-bedrock boundary, though it is believed that the finger bit drill penetrated the bedrock horizons in most of the holes.

INTERPRETATION AND CONCLUSIONS

It is thought that the necessary favourable marshy conditions for the deposition of bog iron was created in North Creek by a temporary dam at its lower end at the junction with West Creek. The present road over the bridge may well owe its detailed location to the situation of the remnants of this dam. As would be expected under these circumstances, the finest section of bog iron may be found immediately north of the road, (see table of surface sample descriptions). The erection of this dam may be explained as a valley glacier lateral moraine,

left by the main valley glacier of West Creek. (It is not evident in the field, but examination of the stereoscopic aerial photographs shows that the West Creek valley is a few feet deeper than North Creek valley). An ice remnant in the West Creek valley may also have been effective as a temporary dam at the time of formation of the bog iron deposit.

After penetration of the dam by the North Creek, subsequent erosion of the bog iron enabled some to be transported and redeposited further downstream in the West Creek valley. Thus, we find these creeks coloured the characteristic orange and the surficial mixture of loamy iron downstream from the bridge as a consequence of this re-erosion.

Speculation as to the source of the iron suggests the possibility of leaching of iron compounds, (sulphides, carbonates, and oxides particularly), in the surrounding glacial cover. A principal contributor could well be the ironstone nodules characteristically found in the nearby Edmonton formation.

A study of the table of analyses shows a low iron content for the fairly clean limonite samples collected, (pure limonite contains about 59.8% Fe). This may be accounted for by an unusually high organic content in the samples. Since manganese is also susceptible to a similar mechanism of concentration as that which forms bog iron, two analyses were made, as indicated. The values obtained did not prove to be significant in view of the size of the deposit involved. This deposit is considered to be totally inadequate to support any economic venture.

In the process of sampling both from the surface and from the drill holes, fragments of coal were not uncommon; their origin must be related to the coal seams of the Edmonton, Ribstone Creek, Grizzly Bear, Birch Lake formations.

Several drill holes showed sections of fairly clean coarse sand and gravel, which would seem to be suitable for construction purposes.

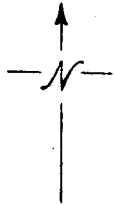
Information received with regard to the drilling of this deposit in 1904/5 must be considered unreliable as no records are available and the great length of time which has lapsed in the meanwhile. Conflicting Statements have been made in connection with the results and activities of this earlier drilling, none of which have been substantiated by the present examination.

It is quite probable that similar geological circumstances have existed in this area and have given rise to bog iron deposits. Since this type of deposit usually has a marked surface expression, exploration for a large commercial sized deposit should not be too difficult and such a deposit lie undetected for any period of time.

Respectfully submitted,


John D. Godfrey.

16th September 1955.



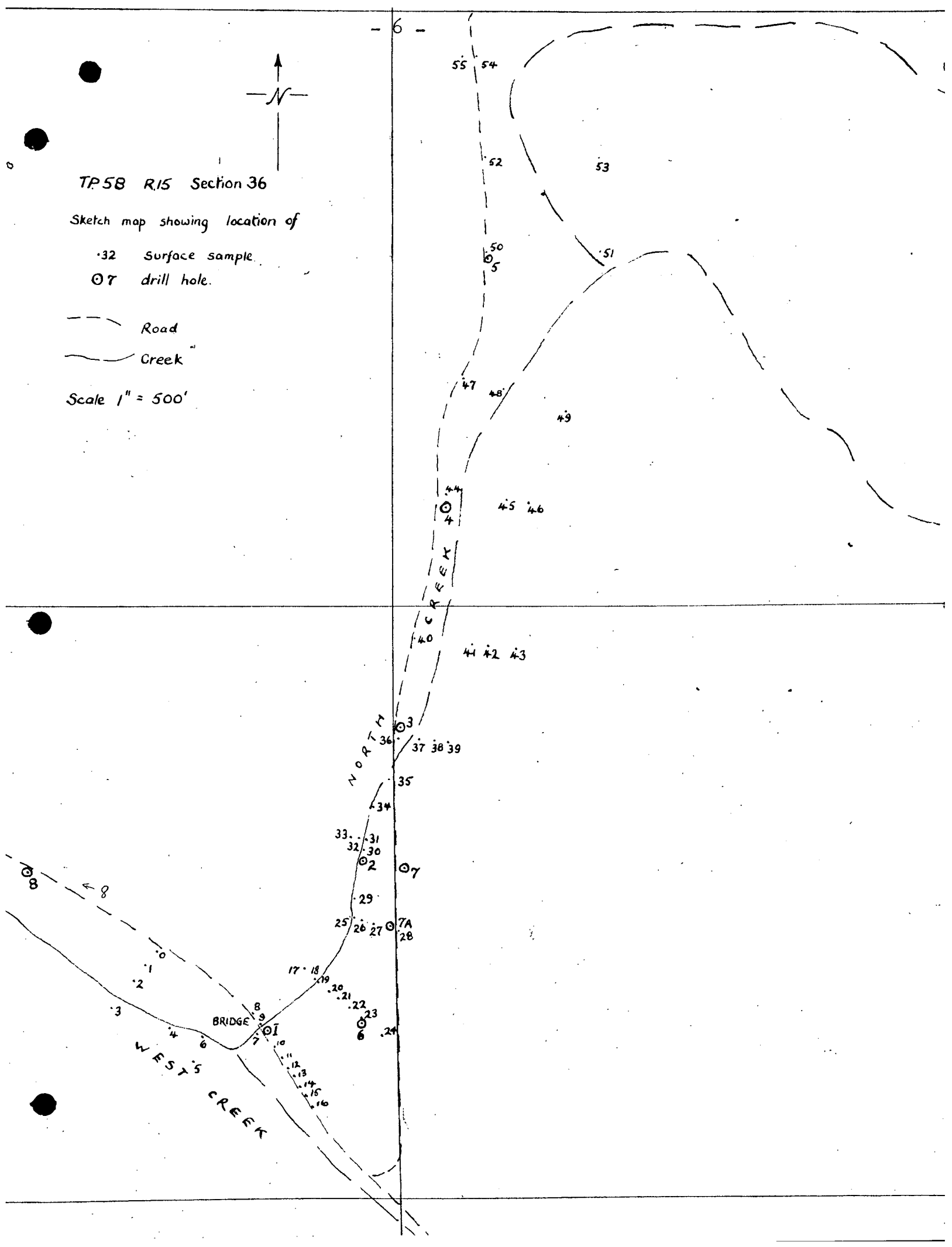
TP58 R.15 Section 36

Sketch map showing location of

- 32 Surface sample.
- ⊙ 7 drill hole.

- - - Road
- ~ ~ ~ Creek

Scale 1" = 500'



GEOLOGICAL DESCRIPTION AND TABLE OF SURFACE SAMPLES.

(S denotes horizon from which the particular sample was taken).

Location No.	Sample No.	Location	Geological Description
0	-	1,000'W along creek from bridge - 300'N	12" mixed loam, sand: trace of iron.
1	-	" - 200'N	2" loam; 18" mixed loam sand, iron; 6"+ mixed loam, sand.
2	B16	" - 100'N	14" mixed loam, iron (S); 6"+ gray clay, with sandy lenses;
3	-	" - 50'S	sandy loam soil.
4	-	520' along creek from bridge.	At creek 18" loamy iron
5	B15	350' " " " 0'E from creek	8" iron, (S); 18" mixed loam, iron; 6"+loam;
6	B14	140'E from creek	12" mixed loam, iron; 12"+ clayey iron, (S)
7	-	20'S along creek from bridge.	Humus, trace of iron.
8	-	At road 60'W of creek.	Sandy soil,
9	-	" 0'W "	loamy, trace of iron.
10	B5	" 100'E "	18" iron (S); 12" mixed sand, iron, loam. 6"+ medium-coarse yellow sand.
11	B6	" 150'E "	20"-24" iron (S); 6"+ sandy loam.
12	B7	" 200'E "	24" iron (S); 12" mixed iron, clay, loam. 6"+ mixed clay, loam.
13	B8	" 250'E "	30" iron (S); 12"+ mixed loam, sand.
14	B9	" 300'E "	12" iron (s); 12"+ sandy loam.
15	-	" 350'E "	12" sandy loam; 6"+ gray clay.
16	-	" 400'E "	24" sandy loam; 12"+ sandy clay.

Location No.	Sample No.	Location	Geological Description
17	-	320'N along creek from bridge. 80'W of creek.	12" loam, 6"+ sand.
18	-	10'W of creek.	12" sandy loam, trace iron.
19	B10	20'E of creek.	12" mixed loam, iron, 6" iron (S); 6"+ clayey loam.
20	B11	70'E of creek.	8" iron (S); 6" mixed iron, loam; 6"+ loam, clay.
21	B12	120'E of creek.	3" loam; 18" iron (S); 6" yellow-gray clay; 6"+ gray loamy clay.
22	-	170'E of creek.	14" loam, trace of iron; 4"+ clay, sand.
23	B13	270'E of creek.	6" loamy iron (S); 6"+ brown sandy clay.
24	-	370'E of creek.	12" loamy fine sand.
25	B2	650'N along creek from bridge. 5'E of creek.	12" iron (S);
26	-	50'E "	6" iron; 6"+ mixed humus, iron; humus.
27	-	100'E "	2" iron; 6"+ sandy loam.
28	-	200'E "	6" sandy loam; 6"+ sand.
29	-	730'N along creek from bridge.	At creek, 12" loam, iron; 20" fine sand.
30	-	950'N " " " " 10'E of creek.	12"+ loamy iron.
31	B3	1,000'N along creek from bridge. 5'E of creek.	30" iron (S); 6"+ sandy yellow clay.
32	-	20'W of creek.	24" iron; 6"+ sandy yellow clay.
33	-	60'W "	6" loam; 6"+ sandy loam (old camp site).
34	-	1,150'N along creek from bridge. 5'E of creek.	24" mixed loamy iron.
35	-	1,250'N along creek from bridge.	At roadside, 12"+ fine sand.

Location No.	Sample No.	Location	Geological Description
36	-	1,450'N along road, 0'E	At roadside, 2" loam; 6" + fine sand.
37	-	" " " 80'E	2" iron; 6" + sandy loam.
38	B4	" " " 170'E	18" mixed loam, iron(S); 6" + loam.
39	-	" " " 230'E	2" iron; 6" + sand.
40	-	1,900'N along road, 0'E	4" mixed loam, iron; 12" + loam.
41	-	" " " 260'E	36" sand; 1" iron, 6" + sand.
42	-	" " " 320'E	6" + sand.
43	-	" " " 470'E	12" + sand.
44	-	2,550'N along road, 40'E	24" sand; 5" loam, iron; 6" + sand.
45	-	" " " 300'E	12" mixed loam, iron.
46	-	" " " 500'E	12" + fine sand.
47	-	3,000'N along road, 0'E	12" + sand.
48	-	" " " 200'E	6" loam; 4" + sand.
49	-	" " " 500'E	12" + loam, sand.
50	-	3,550'N along road, 0'E	12" + fine sand.
51	-	" " " 500'E	6" + sand.
52	-	3,950'N " " 500'E	6" + sand, loam.
53	-	" " " 400'E	6" + sand, loam.
54	-	4,400'N " " 0'E	6" + loam, sand.
55	-	" " " 40'W	6" + loam, sand.

GEOLOGICAL DESCRIPTION AND LOCATION OF DRILL HOLES

DRILL HOLE NO. I

Location: 25'N along creek from bridge, and 25'E of creek.
 Depth: Auger - 11'; Finger Bit - 25'

Sample No.	Depth	Description
WISI	0 - 3'	Loamy iron, with clay lenses.
WISII	3' - 4'	Mixed black loam, iron.
	4' - 5'	Wet black loam, trace of iron.
	5' - 6'	Mixed sand, blue clay.
	6' - 8'	Wet blue clay.
	8' - 9'	Wet sandy blue clay.
WISIII	9' - 10'	Sandy blue clay.
WISIII	10' - 11'	Sandy blue clay.
WISIV	11' - 25'	Sand.

DRILL HOLE NO. II

Location: 900'N along creek from bridge, and 30'E of creek.
 Depth: Auger - 8'; Finger Bit - 60'.

Sample No.	Depth	Description
	0 - 3"	Mixed loam, iron.
	3" - 11"	Brown sandy loam.
	11" - 18"	Sandy clay.
	1'6" - 4'	Tan coloured sand.
W2SI	4' - 39'	Wet gray sand, (sample from top).
W2SII	39' - 45'	Gray - blue clay.
W2SIII	45' - 60'	Gray - blue clay.

DRILL HOLE NO. III

Location: 1,500'N along creek from bridge, and 5'E of creek.
 Depth: Auger - 11'; Finger Bit - 35'

Sample No.	Depth	Description
	0 - 3"	Loam.
	3" - 12"	Tan coloured sand.
W3SI	1' - 2'	Mixed loam, iron.
W3SII	2' - 6'	Mixed clay, loam, iron.
W3SIII	6' - 28'	Gray - blue sand.
	28' - 28½'	Gravel.
	28½' - 35'	Gray clay.

DRILL HOLE NO. IV

Location: 2,500'N along creek from bridge, 40'E of road.
 Depth: Auger - 11'; Finger Bit Drill - 30'.

Sample No.	Depth	Description
W4SI	0 - 8"	Loamy iron.
	8" - 3'	Wet sand.
	3' - 4'	Wet sandy clay.
	4' - 4½'	Wet, fine white - gray sand.
	4½' - 5'	Blue clay.
	5' - 6'	Blue - green clay.
	6' - 7'	Wet, fine - medium sand.
	7' - 11'	Wet, fine - medium sand.
	11' - 30'	Wet, fine - medium gray sand.

DRILL HOLE NO. V

Location: 3,600'N along creek from bridge, at road by old
 drill hole casing.
 Depth: Auger - 10'; Finger Bit Drill - 40'.

Sample No.	Depth	Description
W5SI	0 - 8½'	Dry sand.
	8½' - 40'	Wet gray sand.

DRILL HOLE NO. VI

Location: 300'N along creek from bridge, 250'E of creek.
 Depth: Auger - 11'; Finger Bit Drill - 25'

Sample No.	Depth	Description
W6SI	0 - 1'	Brown sandy loam.
	1' - 1½'	Yellow sandy clay.
	1½' - 3'	Fine, yellow sand, moist.
	3' - 7'	Clean, medium - coarse sand, wet.
	7' - 11'	Medium sand, wet.
W6SII	11' - 25'	Clean, fine - medium sand.

DRILL HOLE NO. VII

Location: 900'N along creek from bridge, 260'E of creek.
 Depth: Auger - 11'

Sample No.	Depth	Description
W7SI	0 - 3"	Loam
	3" - 6 ¾'	Dark brown silty sand.
	6 ¾' - 10½'	Tan coloured sand.
	10½' - 11'	Yellow sand.

DRILL HOLE NO. VII/A

Location: 720'N along creek from bridge, 200'E of creek.
 Depth: Auger - 16'; Finger Bit Drill - 16'

Sample No.	Depth	Description
	0 - 1 $\frac{1}{2}$ '	Fine white sand.
	1 $\frac{1}{2}$ ' - 2'	Fine sand, 3" boulders.
	2' - 3'	Sand, little iron stain.
	3' - 6'	Fine sand, little iron stain.
W7ASI	6' - 6 $\frac{1}{2}$ '	Fine - medium sand, strong iron stain.
	6 $\frac{1}{2}$ ' - 7 $\frac{1}{2}$ '	Fine sand, little iron stain; clean, wet.
	7 $\frac{1}{2}$ ' - 8'	Fine sand, little clay.
	8' - 8 $\frac{1}{2}$ '	Clay, brown colour.
	8 $\frac{1}{2}$ ' - 11'	Mixed coarse gravel -clay, (caved?).
	11' - 16'	Coarse sand, fine gravel.

DRILL HOLE NO. VIII

Location: 1,250'W along road from bridge, 30'S of road.
 Depth: Auger - 11'; Finger Bit Drill - 50'.

Sample No.	Depth	Description
	0 - 6"	Sandy loam.
	6" - 1'	Clay, loam, with $\frac{1}{2}$ " lenses iron.
	1' - 3'	Clay, loam.
	3' - 4'	Heavy yellow-cream coloured clay.
	4' - 6 $\frac{1}{2}$ '	Blue - yellow clay, 3" boulders.
	6 $\frac{1}{2}$ ' - 8 $\frac{1}{2}$ '	Blue - brown clay.
	8 $\frac{1}{2}$ ' - 9 $\frac{1}{2}$ '	Heavy blue clay.
	9 $\frac{1}{2}$ ' - 10 $\frac{1}{2}$ '	Blue clay, wet.
	10 $\frac{1}{2}$ ' - 11'	Sand.
W8SI	11' - 30'	Medium - coarse sand, coal fragments.
W8SII	30' - 50'	Medium - coarse grey sand.

WET CHEMICAL ANALYSES OF BOG IRON SAMPLES

(Provincial Analyst, University of Alberta).

Sample No.	Iron	Manganese
B2	26.02%	
B3	18.90%	0.87%
B4	20.46%	
B5	23.57%	2.14%
B6	18.01%	
B7	23.88%	
B8	29.55%	
B9	30.02%	
B16	12.41%	

IRON PROSPECTING PERMIT No. 6

CANCELLED. *DECEMBER 1955*
VARMAC MINING & EXPLORATION CO. LTD.,

206 QU'APPELLE BLDG.,
EDMONTON, ALBERTA.

DATE OF ISSUE - APRIL 14, 1955.
AREA - 13,360 ACRES.

TP. 60

TP. 59

TP. 58

TP. 57

73I/1

R. 16

R. 15

R. 14

R. 13 W. 4 M.

19550004 #1

20167

Varmac Mining & Exploration Co. Ltd.,
206 Qu'Appelle Building,
Edmonton, Alberta.
December 5th, 1955.

Government of the Province of Alberta,
Department of Mines and Minerals,
Administration Building,
EDMONTON, Alberta.

Dear Sirs:

Re: Iron Prospecting Permit No. 6,
File No. 80167

The following are the expenses incurred:

Geologist Fees ([REDACTED])	225.00
Asst. Geologist	45.00
Sample Bags	3.85
Report Accompanying Specimens	150.00
Typing	<u>2.50</u>
	<u>\$426.35</u>

Drilling Test Holes ([REDACTED])	240.00
Lodgings	15.00
Labor ([REDACTED])	60.00
Transportation	72.00
Assay (University of Alberta)	<u>21.50</u>
	<u>\$408.50</u>

TOTAL \$834.85

We have come to the conclusion that there are no iron deposits that are worthwhile in that area. Therefore we would like to get our \$2500.00 refunded.

Poor Quality
Original

Yours truly,
VARMAC MINING & EXPLORATION CO. LTD.

[REDACTED]
John Kennley, Sec-Treas.

1955004
1590004

DESCRIPTION

IN TOWNSHIP ONE HUNDRED AND TWENTY (120), RANGE TWENTY-ONE (21), WEST OF THE FIFTH (5) MERIDIAN:

Sections Four (4) to Nine (9) inclusive,
Sections Sixteen (16) to Twenty-one (21)
inclusive and Sections Twenty-five (25)
to Thirty-six (36) inclusive;

AND

IN TOWNSHIP ONE HUNDRED AND TWENTY-ONE (121), RANGE TWENTY-ONE (21), WEST OF THE FIFTH (5) MERIDIAN:

Sections One (1) to Thirty-six (36)
inclusive;

AND

IN TOWNSHIP ONE HUNDRED AND TWENTY-TWO (122), RANGE TWENTY-ONE (21), WEST OF THE FIFTH (5) MERIDIAN:

Sections One (1) to Nine (9) inclusive,
Sections Sixteen (16) to Twenty-one (21)
inclusive and Sections Twenty-eight (28)
to Thirty-three (33) inclusive;

AND

IN TOWNSHIP ONE HUNDRED AND TWENTY (120), RANGE TWENTY-TWO (22), WEST OF THE FIFTH (5) MERIDIAN:

Sections One (1), Twelve (12), Thirteen
(13), Twenty-four (24) and Twenty-five
(25) and Sections Thirty-three (33) to
Thirty-six (36) inclusive;

AND

IN TOWNSHIP ONE HUNDRED AND TWENTY-ONE (121), RANGE TWENTY-TWO (22), WEST OF THE FIFTH (5) MERIDIAN:

Sections One (1) to Four (4) inclusive,
Sections Nine (9) to Sixteen (16) inclu-
sive, Sections Twenty-one (21) to Twenty-
eight (28) inclusive and Sections Thirty-
three (33) to Thirty-six (36) inclusive;

IN TOWNSHIP ONE HUNDRED AND TWENTY-TWO (122), RANGE
TWENTY-TWO (22), WEST OF THE FIFTH (5)
MERIDIAN:

Sections One (1) to Four (4) inclusive,
Sections Nine (9) to Sixteen (16) inclu-
sive, Sections Twenty-one (21) to Twenty-
eight (28) inclusive and Sections Thirty-
three (33) to Thirty-six (36) inclusive;

AND

What would be statutory road allowances
if the lands were surveyed pursuant to
The Alberta Surveys Act, lying within
the outer limits of the above described
lands;

containing an area of Eighty-nine Thousand, Seven Hundred
and Eighty-one (89,781) acres, more or less.

