

MAR 19680041: FOX LAKE

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19680041

ECONOMIC MINERALS
FILE REPORT No.
S-AF-029(L)

REPORT ON FIELD WORK

OF CORE DRILLING

IN THE

FOX LAKE SULPHUR PROSPECT AREA

OF

ALBERTA, CANADA

FOR

IMPERIAL OIL ENTERPRISES

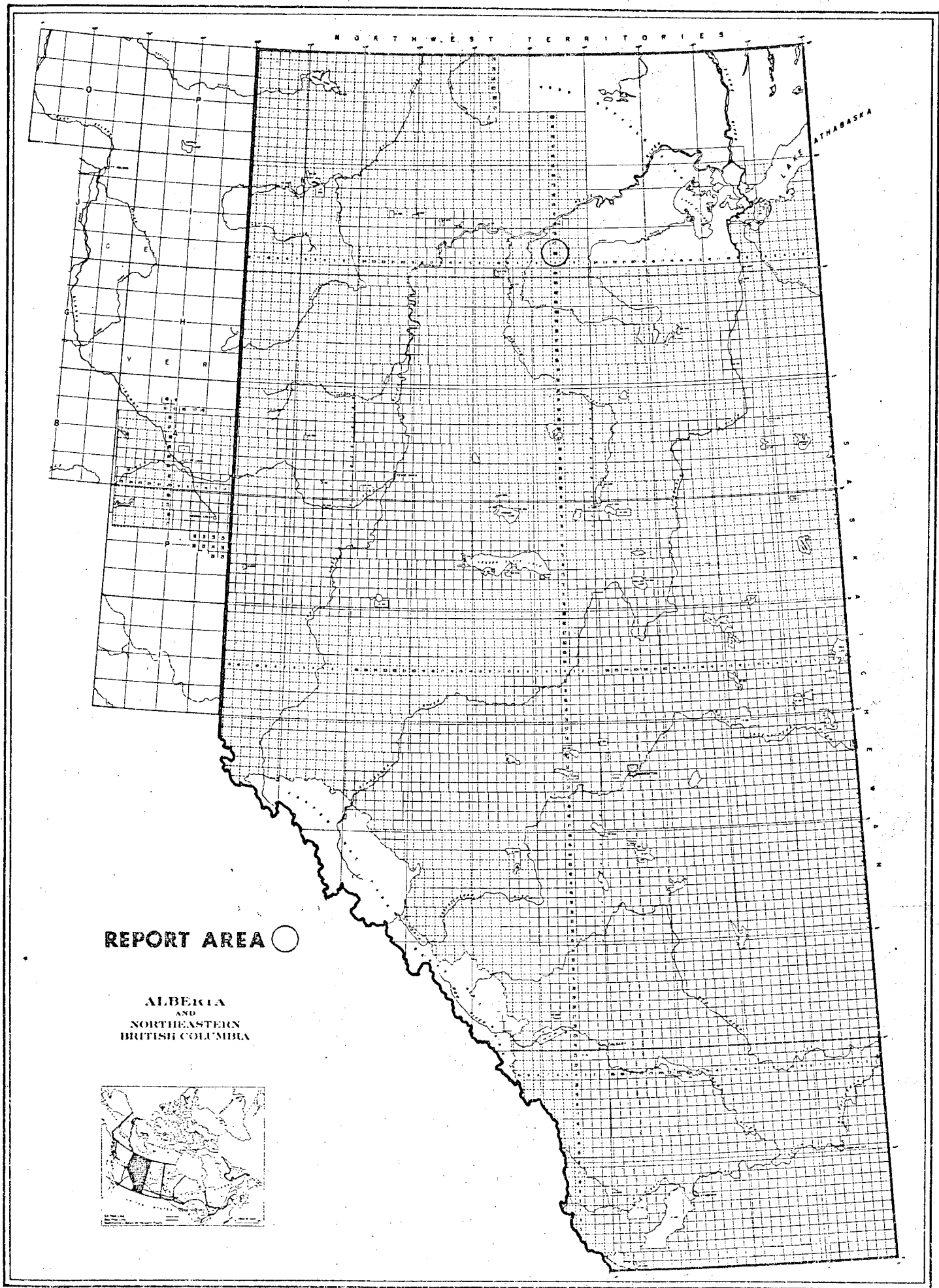
BY

SIGMA EXPLORATIONS LTD.

PROJECT NO. 29

Calgary, Alberta, Canada

April, 1968



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2	MAP SHOWING INITIAL ASSAY VALUES

LOCATION OF AREA

The Sulphur Permit is located in Northern Alberta, Twp. 105 - 107, Rge. 3 - 5 W.5M, approximately 18 miles west of Wood Buffalo National Park, 15 miles south of the Fox Lake Indian Reserve No. 126 and 55 miles east southeast of the Village of Fort Vermilion.

Topography

Permit Number 29 is located on a very flat swamp and muskeg plain, south of the Peace River. The average surface elevation of the area is approximately 950 feet above sea level and no severe elevation changes were encountered over the area.

The general drainage pattern is toward the northeast. Harper Creek drains the south half of the permit, with Lamberta Creek flowing north northeast through the extreme southeast portion of the permit. Two small lakes are located in the north half of the area.

Forest cover throughout most of the prospect area graded from very light to medium with some heavy stands of spruce and poplar occurring along the main creeks. The high ground in the area was covered with poplar while the lower swamps and muskegs were forested mainly with small spruce, tamarack and willow. No

timber of commercial size or quality was noted anywhere in the area.

Access

Access to the area was gained by a winter road running east from Fort Vermilion along the south bank of the Peace River to the Fox Lake Indian Reserve Settlement. From the settlement southward, old seismic cut lines were used to travel into the permit area. The access road crossed two major rivers, the Wabasca River some 29 miles east of Fort Vermilion and the Mikkwa River 65 miles east. Crossings of these rivers were made on the ice. This road is not useable during the summer months.

A small airstrip is located at the Fox Lake Settlement and was used by chartered aircraft to deliver some supplies during the field operations.

Weather

The weather conditions encountered during the field operation were unseasonably warm with day temperatures of +40° to +50° general in the area. Thus some difficulty was encountered by vehicles travelling on roads and trails during this time and great care had to be taken with heavy equipment at all ice crossings.

FIELD OPERATIONS

Field operations were commenced on the permit area on February 26, 1968, and concluded on March 11, 1968. During this period a total of 4102 feet of core drilling were completed and some 50 miles of line cleaned or cleared by bulldozers.

Other exploration programs were done by the crew and equipment in the vicinity of the Fox Lake Indian Reserve during the latter part of March. Thus the costs of moving the camp and equipment from Fort Vermilion to Fox Lake and return was divided between the operating companies.

Bulldozer operations were started on February 26 using a single Caterpillar D-7-A. Two shifts were operated continuously to clean new lines and snowplow existing lines.

No major problems were encountered except the bulldozer broke through creek ice just south of Hole No. 90 on Line No. 4. The existence of this branch of Harper Creek was not obvious to the operator as the banks were very low and gentle sloping. The bulldozer had made three previous passes across this location and broke through on the fourth pass while being walked back to camp after completing the program. An additional bulldozer had to be transported to the permit area to remove the cat from the creek.

During this period a total of 18 miles of new line were cut and cleared and 31.5 miles of existing line were snowplowed. A total of 192.5 bulldozer hours were utilized on this permit with the bulldozer averaging 7.3 hours per mile of new line cut and 1.9 hours per mile of snowplowing.

Drilling

The Becker Hammer Drill BMT-1 arrived in camp on February 29, 1968, and drilled one hole this day. Regular drilling operations were commenced on March 1 on a single shift basis. A night shift was added on March 7 and continued until March 9 when mechanical difficulty on the drill caused a temporary delay in operations. The drill program was completed on March 11.

Near the northeast corner of the permit area on Line 1 and Line 2 bedrock was encountered at depths of between six and 15 feet. The near surface bedrock seemed to correspond to the poplar covered ridges in the area. This bedrock appeared to be mostly a light-coloured, well-cemented sandstone lying directly under the clay. No evidence of hard shales were found in this area. South and west of this point glacial material consisting of clay and soft shale were encountered in most holes. There were a few rocks in the clay but no major gravel deposits. Very little surface sand was encountered anywhere on the prospect.

It was impossible to complete the drilling program south of Drill hole 90 in Twp. 105, Rge. 4 due to the dangerous ice conditions on Harper Creek. The budget limitations precluded any additional expenditure for bridging the creek at this time.

During the period March 1 to March 11, 171 holes were drilled to an average depth of 25 feet, except where bedrock was encountered above this depth.

The drill averaged 30.9 feet of hole per hour on this project including setting up and moving time. No difficulties were encountered in completing holes except where hard bedrock was encountered. At these locations a few chip samples were taken from the top of the bedrock and drilling suspended. In order to complete as much of the program as possible, a minimum of time was spent on drilling into the bedrock.

Sampling

An average of four samples were taken per hole at depths of two feet, five feet, 15 feet and 25 feet, with clean, representative samples being obtained from each hole.

Most holes started in brown clay, except in heavy muskeg areas where one foot to three feet of muskeg was overlying the clay. Very few problems were encountered in getting samples in any of these materials except in some of the heavily water-soaked clays.

which appeared to stick to the sides of the drill stem and came out of the discharge hose in lengths of five to eight feet. Fortunately very little of this material was encountered. Results of the assays, the majority of which were taken at five feet, are contained in the back of this report.

Plugging

Holes were plugged with metal Trojan hole plugs or four foot wooden hole plugs in accordance with the required geophysical regulations.

Surveying

No vertical control was carried over the permit area, but horizontal control was maintained by chaining. A transit was used to turn off angles for the new cut lines and to check angles at intersections of existing lines. Control was established from maps made from aerial surveys showing existing seismic cut lines or identifiable topographic features on the ground.

Bore hole locations were permanently marked by blazing trees a few feet from the cut-line and marking the hole number on the tree with ink pens and metal tapes nailed to the tree. Thus each of the hole locations could be easily re-established for future reference.

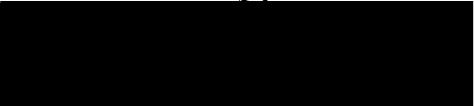
RESULTS & RECOMMENDATIONS

From the initial assay results of samples, an area of interest is indicated in the southwest corner of Twp. 107, Rge. 3 W.5M., and the southeast corner of Twp. 107, Rge. 4 W.5M. These assays were done on samples from the five foot level of each bore hole, unless otherwise indicated.


As a second set of assays are required to complete the terms of the project, it is recommended that all additional samples in bore holes 29-4-52, 29-4-53 and 29-4-54 be assayed for sulphur content. Assays should also be done on bore holes 29-2-39, 29-3-162 and 29-3-159 in an effort to determine the thickness of the sulphur bodies present in each of these locations.

If the values in these additional samples show indications of sulphur in these areas, then additional drilling and sampling should be considered to delineate the extent of the deposit and if possible determine the source of the elemental sulphur.

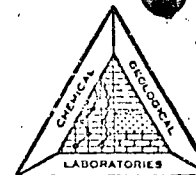
Respectfully submitted,


James D. Fowlie
Supervisor

Approved:


W. N. Rabey, P. Eng.

CHEMICAL & GEOLOGICAL LABORATORIES LTD.

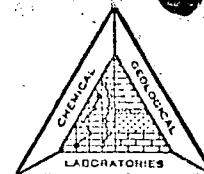


OPERATOR: SIGMA EXPLORATIONS LTD.
 KIND OF SAMPLE: Soils
 Date Received: March 6, 1968

REPORT NUMBER: C68-3392
 Date Reported: March 19, 1968
 #2 - 5' Depth.

<u>SAMPLE NUMBER</u>	<u>ELEMENTAL SULPHUR (% by Weight)</u>	<u>SAMPLE NUMBER</u>	<u>ELEMENTAL SULPHUR (% by Weight)</u>
29-1-1 #2	Trace	29-2-30 #2	1.82
29-1-2 #2	0.39	29-2-31 #2	0.86
29-1-3 #2	Trace	29-2-32 #2	Traces
29-1-4 #2	Trace	29-2-33 #2	Traces
29-1-5 #2	0.93	29-2-34 #2	0.53
29-1-6 #2	1.86	29-2-35 #2	1.30
29-1-7 #2	3.03	29-2-36 #2	0.81
29-1-8 #2	2.84	29-2-37 #2	0.95
29-1-9 #2	1.66	29-2-38 #2	3.04
(1) 29-1-10 #3	1.98	29-2-39 #2	5.10
(2) 29-1-10 #2	Traces	29-2-40 #2	1.70
29-1-11 #2	1.65	29-4-41 #2	3.48
29-1-12 #2	1.48	29-4-42 #2	1.91
(1) 29-2-14 #1	Traces	29-4-43 #2	1.61
(2) 29-2-14 #2	Traces	29-4-44 #2	0.89
29-2-15 #2	Traces	29-4-45 #2	1.47
29-2-16 #2	1.87	29-4-46 #2	4.06
29-2-17 #2	0.76	29-4-47 #2	4.00
29-2-18 #2	4.47	29-4-48 #2	7.43
29-2-19 #2	1.02	29-4-49 #2	Traces
29-2-20 #2	1.10	29-4-50 #2	0.58
29-2-21 #2	Traces	29-4-51 #2	0.95
29-2-22 #2	Traces	29-4-52 #2	Traces
29-2-23 #2	0.63	29-4-53 #2	1.71
29-2-24 #2	0.79	29-4-54 #2	0.84
29-2-25 #2	0.88		
29-2-26 #2	0.87		
29-2-27 #2	0.78		
29-2-28 #2	Traces		
29-2-29 #2	Traces		

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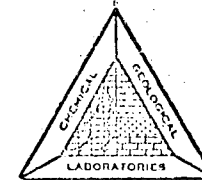
OPERATOR: Sigma Explorations Ltd.
 KIND OF SAMPLE: Soils
 Well: #29.
 Batch No. 2.

REPORT NUMBER: C68-3407
 Date Reported: March 19, 1968
 Date Received: March 11, 1968

<u>SAMPLE NUMBER</u>	<u>ELEMENTAL SULPHUR (% by Weight)</u>
29-4-55 #2	Traces
29-4-56 #2	1.35
29-4-57 #2	1.86
29-4-58 #2	2.79
29-4-59 #2	Traces
29-4-60 #2	Traces
29-4-61 #2	1.04
29-4-62 #2	1.41
29-4-63 #3	1.56
29-4-64 #2	1.06
29-4-65 #2	0.72
29-4-66 #2	3.00
29-4-67 #2	3.77
29-4-68 #3	1.00
29-4-69 #2	Traces
29-4-70 #2	2.82
29-4-71 #2	Traces
29-4-72 #2	Traces

<u>SAMPLE NUMBER</u>	<u>ELEMENTAL SULPHUR (% by Weight)</u>
29-4-73 #2	Traces
29-4-74 #3	Traces
29-4-75 #2	0.92
29-4-76 #2	0.52
29-4-77 #2	2.22
29-4-78 #2	0.40
29-4-79 #2	1.81
29-4-80 #2	1.07
29-4-81 #2	0.40
29-4-82 #2	1.00
E ₁	2.64
E ₂	0.70
Fox Lake Res. Sample #1	Traces

CHEMICAL & GEOLOGICAL LABORATORIES LTD.



OPERATOR: Sigma Explorations Ltd.
 KIND OF SAMPLE: Soil
 Batch 4 27 Samples.

REPORT NUMBER: C68-3428
 Date Reported: March 25, 1968
 Date Received: March 15, 1968

SAMPLE NUMBER ELEMENTAL SULPHUR
 (% by Weight)

29-4-83	#2	Traces
29-4-84	#2	Traces
29-4-85	#2	1.67
29-4-86	#2	2.44
29-4-87	#2	Traces
29-4-88	#2	1.98
29-4-89	#2	0.69
29-4-90	#2	1.01
29-5-114	#2	1.55
29-5-115	#2	Traces
29-5-116n	#2	Traces
29-5-117	#3	1.34
29-5-118	#2	Traces
29-6-100	#2	1.59
29-6-101	#2	Trace
29-6-102	#2	Trace

SAMPLE NUMBER ELEMENTAL SULPHUR
 (% by Weight)

29-6-103	#2	Trace
29-6-104	#2	Trace
29-6-105	#2	0.22
29-6-106	#2	Trace
29-6-107	#2	0.32
29-6-108	#2	Trace
29-6-109	#2	1.39
29-6-110	#2	1.07
29-6-111	#2	Traces
29-6-112	#2	Traces
29-6-113	#2	Traces

CHEMICAL & GEOLOGICAL LABORATORIES LTD.



OPERATOR: Sigma Explorations Ltd.
 KIND OF SAMPLE: Soil
 27 Samples.

REPORT NUMBER: C68-3421
 Date Reported: March 22, 1968
 Date Received: March 15, 1968

<u>SAMPLE NUMBER</u>	<u>ELEMENTAL SULPHUR (% by Weight)</u>
29-5-119 #2	Trace
29-5-120 #2	Trace
29-5-121 #2	Trace
29-5-122 #2	0.22
29-5-123 #2	1.67
29-5-124 #2	0.76
29-5-125 #2	Trace
29-5-126 #2	1.28
29-5-127 #2	0.32
29-5-128 #2	Trace
29-5-129 #2	1.06
29-5-130 #2	Trace
29-5-131 #2	2.25
29-5-132 #2	0.71
29-5-133 #2	Trace
29-5-134 #2	0.56
29-5-135 #2	1.51

<u>SAMPLE NUMBER</u>	<u>ELEMENTAL SULPHUR (% by Weight)</u>
29-5-136 #2	1.65
29-5-137 #2	0.86
29-5-138 #2	0.93
29-5-139 #2	Trace
29-5-140 #2	0.41
29-5-141 #2	Trace
29-5-142 #2	1.03
29-5-143 #2	0.37
29-5-144 #2	0.48
29-5-145 #2	3.31

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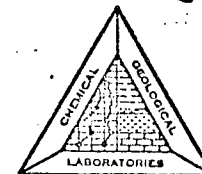


OPERATOR: Sigma Explorations Ltd.
 KIND OF SAMPLE: Soil
 Permit No. 29 Line 3
 Batch 5 35 Samples

REPORT NUMBER: C68-3441
 Date Reported: March 27, 1968
 Date Received: March 19, 1968

<u>SAMPLE NUMBER</u>	<u>ELEMENTAL SULPHUR (% by Weight)</u>	<u>SAMPLE NUMBER</u>	<u>ELEMENTAL SULPHUR (% by Weight)</u>
29-3-153 #2	Trace	29-3-171 #2	2.18
29-3-154 #2	1.90	29-3-172 #2	1.28
29-3-155 #2	Trace	29-3-173 #2	2.35
29-3-156 #2	Trace	29-3-174 #2	1.66
29-3-157 #2	Trace	29-3-175 #2	Trace
29-3-158 #2	Trace	29-3-176 #2	0.30
29-3-159 #2	3.48	29-3-177 #2	Trace
29-3-160 #2	Trace	29-3-178 #2	Trace
29-3-161 #2	Trace	29-3-180 #2	Trace
29-3-162 #2	7.82	29-3-182 #2	0.44
29-3-163 #2	1.03	29-3-184 #2	Trace
29-3-164 #2	Trace	29-3-186 #2	1.04
29-3-165 #3	Trace	29-3-188 #2	1.22
29-3-166 #2	Trace	29-3-190 #2	0.67
29-3-167 #2	Trace	29-3-192 #2	1.98
29-3-168 #3	Trace	29-3-194 #2	1.97
29-3-169 #2	0.95	29-3-198 #2	1.84
29-3-170 #2	2.71		

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OPERATOR: SIGMA EXPLORATIONS LTD.

REPORT NUMBER: C68-3603

KIND OF SAMPLE: Soil

DATE RECEIVED May 7, 1968

DATE REPORTED May 16, 1968

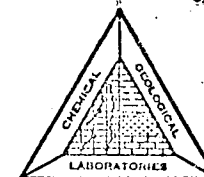
Permit No. 29

Depth in Feet: #1 - 2'; #3 - 15'; #4 - 25'.

<u>SAMPLE NUMBER</u>		<u>ELEMENTAL SULPHUR</u> (% by Weight)
29-4-46	#1	4.75
29-4-46	#3	0.98
29-4-46	#4	1.64
29-4-47	#1	1.88
29-4-47	#3	1.46
29-4-47	#4	0.68
29-2-39	#1	2.76
29-2-39	#3	0.64
29-2-39	#4	0.55

<u>SAMPLE NUMBER</u>		<u>ELEMENTAL SULPHUR</u> (% by Weight)
29-3-162	#1	3.05
29-3-162	#3	1.00
29-3-162	#4	1.32
29-4-48	#1	2.01
29-4-48	#3	1.20
29-4-48	#4	0.68
29-3-159	#1	2.10
29-3-159	#3	0.43
29-3-159	#4	Trace Only

CHEMICAL & GEOLOGICAL LABORATORIES LTD.



OPERATOR: SIGMA EXPLORATIONS LTD.

REPORT NUMBER: C68-3603

KIND OF SAMPLE: Soil

DATE RECEIVED May 7, 1968

DATE REPORTED May 16, 1968

Permit No. 29

Depth in Feet: #1 - 2'; #3 - 15'; #4 - 25'.

SAMPLE NUMBER		ELEMENTAL SULPHUR (% by Weight)
29-4-46	#1	4.75
29-4-46	#3	0.98
29-4-46	#4	1.64
29-4-47	#1	1.88
29-4-47	#3	1.46
29-4-47	#4	0.68
29-2-39	#1	2.76
29-2-39	#3	0.64
29-2-39	#4	0.55

SAMPLE NUMBER		ELEMENTAL SULPHUR (% by Weight)
29-3-162	#1	3.05
29-3-162	#3	1.00
29-3-162	#4	1.32
29-4-48	#1	2.01
29-4-48	#3	1.20
29-4-48	#4	0.68
29-3-159	#1	2.10
29-3-159	#3	0.43
29-3-159	#4	Trace Only

TRANSMITTAL SHEET

SIGMA EXPLORATIONS LTD.

613, 309 - 8TH AVENUE S. W.

CALGARY 2 ALBERTA

To Imperial Oil Limited

Date May 30, 1968

~~500 - 6th Avenue S. W.~~

Sent By Hand

Calgary 1, Alberta

Attention: Mr. D. Layer

Description of Data:

Sulphur Exploration Program

3 copies assay sheets

Remarks:

Above Data Received By D.R. Layer of Date May 31/68

Please Sign and Return One Copy To - SIGMA EXPLORATIONS, LTD.



19680041

SULPHUR PROSPECTING PERMIT NO. 29

WESTERN LAND SERVICES LTD.,
214 CENTENNIAL BUILDING,
EDMONTON, ALBERTA

DATE OF ISSUE - DECEMBER 7, 1967
AREA - 99,840 ACRES

CORRECTION LINE

TP. 107

845/127,8

TP. 106

TP. 105

R. 5

R. 4

R. 3

R. 2 W. 5 M.

Rge. 5

Rge. 4

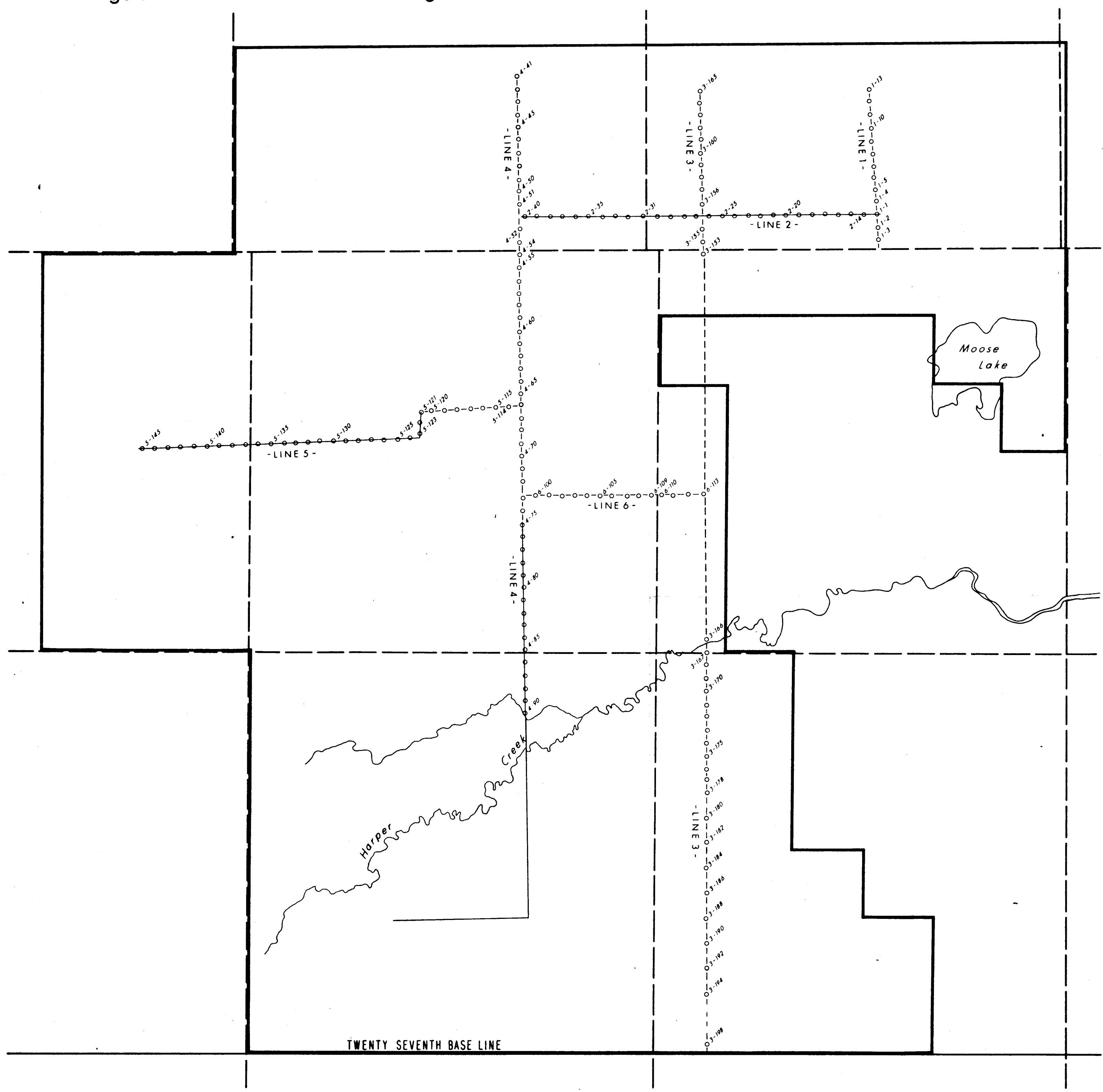
Rge. 3

W.5 M.

Twp. 107

Twp. 106

Twp. 105



- LEGEND**
- PERMIT OUTLINE
 - NEW LINE CUT & DRILLED
 - EXISTING LINE DRILLED
 - - - EXISTING ACCESS LINES
 - LINES CLEANED BUT NOT DRILLED

19680041
Map No. 1

SIGMA EXPLORATIONS LTD.
 309 8th Ave. SW. Calgary, Alberta Phone 264-7865

SULPHUR EXPLORATION PROGRAM
PERMIT No. 29

SCALE: 1" = 1 Mile MARCH/1968

Rge. 5

Rge. 4

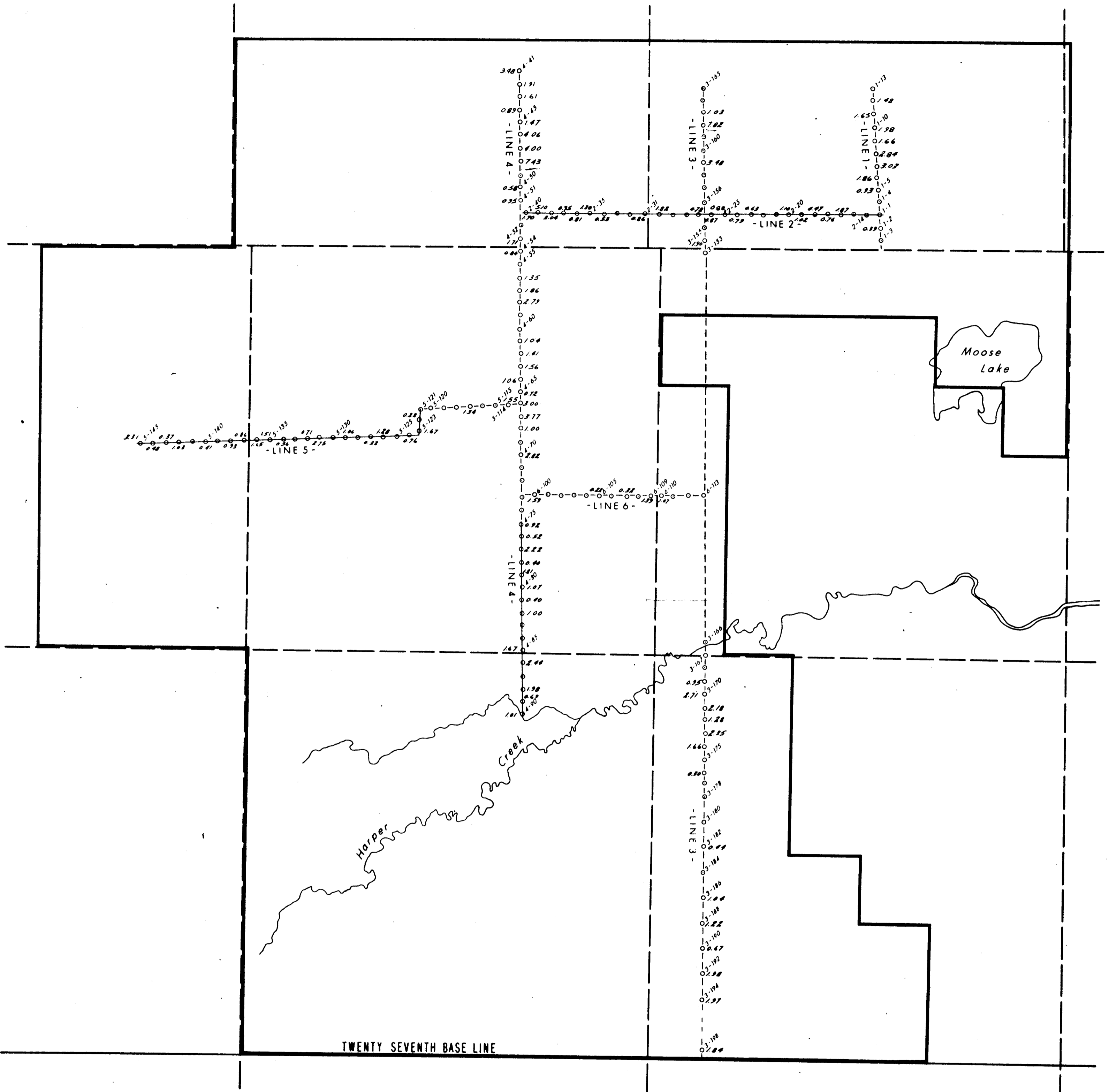
Rge. 3

W. 5 M.

Twp. 107

Twp. 106

Twp. 105



LEGEND

- PERMIT OUTLINE
- NEW LINE CUT & DRILLED
- EXISTING LINE DRILLED
- EXISTING ACCESS LINES
- Samples Showing Only Traces of Sulphur

19680041

Map No. 2

SIGMA EXPLORATIONS LTD.
 308 8th Ave SW Calgary, Alberta Phone 264-7885

SULPHUR EXPLORATION PROGRAM
 PERMIT No. 29
 % SULPHUR at 5 FOOT LEVEL
 SCALE: 1" = 1 Mile MARCH/1968