

# MAR 19680032: FOX LAKE

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SHELL CANADA LIMITED  
REPORT  
SULPHUR PROSPECTING PERMIT NO. 14  
FOX LAKE AREA, ALBERTA

ECONOMIC MINERALS

FILE REPORT No.

S-AF-014(1)

Shell Canada Limited is the holder of Sulphur Prospecting Permit No. 14 which is dated November 9, 1967 and consists of 19,840 acres. In compliance with terms 8 and 9 of Agreement dated December 8, 1967, which was issued under Section 14 of Alberta Mines and Minerals Act, 1962, Order in Council dated July 12, 1967 and amendments thereto dated December 5, 1967, we submit the following report and relevant data.

LOCATION:

Sulphur Permit No. 14 is located in Northern Alberta, Twp. 108, Rge. 4 West 5th Meridian and immediately adjacent to the southwest corner of Fox Lake Indian Reserve No. 126.

TOPOGRAPHY:

Permit No. 14 is located on a flat swamp and muskeg plain, south of the Peace River. The average surface elevation of the area is approximately 850 feet above sea level and no severe elevation changes were encountered over the area.

The general drainage pattern is toward the west and north with the small creeks that drain the area flowing into the Mikkwa and Peace Rivers.

Forest cover throughout most of the prospect area graded from very light to medium with some heavy stands of spruce and pine occurring along the main creeks and rivers in the area. The high ground was covered with poplar and scattered stands of spruce and pine, while the lower swamps and muskegs were forested with small spruce, tamarack and willow.

PHOTOGEOLOGICAL STUDY:

A general photogeological study was carried out over the area with detailed mapping done in Twp. 109 and 110, Rges. 5 and 6 W5M, in which our Sulphur Prospecting Permits No. 15, 16 and 17 are located. This study was

conducted in view of locating changes in vegetation growth which could indicate the presence of sulphur rich areas. Enclosure No. 2 (photo-geological map) shows a detailed analysis of the surface of the study area. Very slight topographic differences give rise to different vegetation suites in this swampy environment, but no anomalous suites such as could be expected in sulphurous areas were noted.

#### FIELD OPERATIONS:

Field operations, which were contracted out to Sigma Explorations Ltd., were commenced on the permit area on March 12, 1968, and concluded on March 19, 1968. During this period a total of 2303 feet of core drilling was completed, and 20 miles of existing cut line was snowplowed by the bulldozer.

Exploration programs for other companies were done by Sigma's crew and equipment in the vicinity of the Fox Lake Indian Reserve during the latter part of March. Thus the cost of moving the camp and equipment from Fort Vermilion to Fox Lake and return was divided between the several operating companies.

Bulldozer operations were started March 12 using two Caterpillar D-7-A's. Two bulldozers were operated the first day and one bulldozer completed the rest of the snowplowing the following two days.

No major problems were encountered except on Line 3 where snowplowing and drilling were discontinued north of bore hole no. 110. North and west of this point, several steep, sharp gulleys cut down into the Peace River and made further operations impractical.

#### DRILLING:

Drilling on this prospect was done with Becker Hammer drills, BMT-1 and 508. Rig BMT-1 was operated on a double shift 24 hours a day while rig 508 operated a single shift of 12 hours per day. Drilling operations

were commenced on March 17 and completed March 19.

At the southeast corner of the permit area on Line 1 bedrock was encountered on bore holes 1 through 10. The average depth of this bedrock was approximately 25 feet at its east edge with an apparent gentle westerly dip. The composition of the bedrock appeared to consist of mainly white cemented sandstones. Chip samples of this material were collected at the bottom of each hole. In the north portion of the permit considerable sand was encountered by the drills. This sand was quite clean and well sorted. The balance of the holes were mainly brown clays throughout. There were a few rocks in the clays but no major gravel deposits.

During the period March 17 through March 19, 61 holes were drilled to an average depth of 40 feet except at locations where bedrock was encountered at shallow depth.

The drills averaged 35.0 feet of hole per hour on this prospect including setting up and move 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. As the prime interest was the search for sulphur in the superficial deposits a minimum of time was spent on drilling into the bedrock.

SAMPLING:

An average of 12 samples were taken per hole; at two foot intervals to 15 feet, and at five foot intervals to the bottom of the hole. Appendix No. 1 to this report lists the samples recovered.

Most holes started in brown clay, except in heavy muskeg areas where one to two 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 two to five feet.

ASSAY OF SAMPLES:

Assay of samples for sulphur content was carried out using the Hot Toluene Extraction method by our chemical laboratory personnel. The results are covered in Appendix No. 2 to this report. Accompanying map (Enclosure No. 1) shows the location of bore holes drilled and percentage grade of elemental sulphur in superficial material as assayed.


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 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.



O.L. Slind  
District Geologist  
Northern Plains District  
Southern Division Exploration

APPENDIX NO. 1

LIST OF SAMPLES

FOX LAKE AREA

(Sulphur Permit No. 14)

PERMIT-LINE-HOLE NO.	SAMPLES	DEPTH	
14-1-1	9	2-4-6-8 -10-12-14-15*-20*	Bedrock @ 21'
14-1-2	9	2-4-6-8 -10-12-14*-15*-17	Bedrock @ 17'
14-1-3	8	2-4-6-8 -10*-12*-14-15	Bedrock @15'
14-1-4	10	2-4-6-8 -10-14-15-20*-25*-29*	Bedrock @ 29'
14-1-5	9	2-4-6-8 -10-12-14-15*-20*	
14-1-6	11	2-4-6-10-12-14-15*-20*-25*-30	
14-1-7	11	2-4-6-8-10-12-14-15-20*-25*-29	
14-1-8	11	2-4-6-8-10-12-14-15-20-25*-30*	
14-1-9	12	2-4-6-8-10-12-14-15*-20*-25-30-32	
14-1-10	12	2-4-6-8-10-12-14-15-20-25*-30*-35*	
14-1-11	13	2-4-6-8-10-12-14-15-20-25-30*-35*-39*	
14-1-12	13	2-4-6-8-10-12-14-15-20-25-30*-35*-40	
14-1-13	13	2-4-6-8-10-12-14-15-20-25-30-35*-40*	
14-1-14	13	2-4-6-8-10-12-14-15*-20*-25-30-35-40	
14-1-15	13	2-4-6-8-10-12-14-15-20-25-30*-35*-40	
14-1-16	13	2-4-6-8-10-12-14-15-20-25-30-35*-40	
14-1-17	13	2-4-6-8-10-12-14-15-20*-25*-30*-35*-40	
14-1-18	13	2-4-6-8-10-12-14-15-20-25-30*-35*-40*	
14-1-19	12	2-4-6*-8-10-14-15-20-25*-30-35-40	
14-1-20	13	2-4-6-8-10-12-14-15-20-25*-30*-35-40	
14-1-21	13	2-4-6-8-10-12-14-15-20-25-30-35*-40*	
14-1-22	13	2-4-6-8-10-12-14-15-20*-25*-30*-35-40	
14-1-23	11	2-4-6-8-10-12-14-15-20*-25*-30	
14-1-24	12	2-4-6-8-10-12-15-20-25*-30*-35-40	
14-1-25	13	2-4-6-8-10-12-14-15-20*-25*-30-35-40	
14-1-26	13	2-4-6-8-10-12-15-20-25*-30*-35-40	
14-2-27	13	2-4-6-8-10-12-14-15-25*-30*-35*-40*	
14-2-28	13	2-4-6-8-10-12-14-15-20-25-30-35*-40*	
14-2-29	13	2-4-6-8-10-12-14-15-20-25-30-35*-40*	
14-2-30	13	2-4-6-8-10-12-14-15-20-25-30*-35*-40	
14-2-31	13	2-4-6-8-10-12-14-15-20-25-30-35*-40*	
14-2-32	13	2-4-6-8-10-12-14-15-20-25-30-35*-40*	
14-2-33	7	14-15-20-25-30-35*-40*	
14-2-34	13	2-4-6-8-10-12-14-15-20-25-30-35*-40*	
14-2-35	13	2-4-6-8-10-12-14-15-20-25*-30*-35*-40*	
14-2-36	13	2-4-6-8-10-12-14-15-20-25-30*-35*-40	
14-2-37	13	2-4-6-8-10-12-14-15-20-25*-30*-35*-40*	
14-2-38	12	2-4-6-8-10-12-14-15-20-25-30*-35*	
14-2-39	13	2-4-6-8-10-12-14-15-20-25-30*-35*-40	

## PERMIT-LINE-HOLE NO.

## SAMPLES

## DEPTH

14-2-40	11	2-4-6-8-10-12-15-25-30-35*-40
14-2-41	11	2-4-6-8-10-12-15-20-25-30*-40*
14-2-42	10	2-4-6-8-10-12-15-20-25*-30*
14-2-43	No Hole Drilled	
14-2-44	12	2-4-6-8-10-12-15-20-25-30*-35*-40
14-2-45	12	2-4-6-8-10-12-15-20-25-30*-35*-40
14-2-46	11	2-6-8-10-12-15-20-25-30*-35*-40
14-2-47	No Hole Drilled	
14-2-48	No Hole Drilled	
14-2-49	12	1-2-3-4-5-6*-7-8-9*-10-11-12
14-2-50	12	1-2-3-4-5-6*-7-8-9*-10-11-12(missing 6 & 9)
14-3-100	13	1-2-3-4-5-6-7-8-9-10*-11*-12*-13
14-3-101	13	1-2-3-4-5-6-7-8-9-10*-11*-12*-13
14-3-102	13	1-2-3-4-5-6-7-8-9-10-11*-12*-13*
14-3-103	13	1-2-3-4-5-6*-7-8-9-10-11-12*-13*
14-3-104	13	1*-2-3-4-5-6-7-8-9-10-11*-12-13
14-3-105	13	1-2-3-4-5-6-7-8*-9*-10*-11-12-13
14-3-106	12	1-2-3-4-5-6-7-8*-9*-10-11*-12-13
14-3-107	13	1-2-3-4-5-6-7-8-9-10-11-12*-13*
14-3-108	13	1*-2*-3-4-5-6-7-8-9-10-11-12-13
14-3-109	13	1-2-3-4-5-6-7-8-9-10-11*-12*-13
14-3-110	13	1-2-3-4-5-6-7-8-9-10-11-12*-13*
14-3-111	12	1-2-3-4-5-6-7-8*-9*-10-11-12
14-3-112	No Hole Drilled	
14-3-113	12	1-2-3-4-5*-6-7-8-9-10*-11*-12
14-3-114	No Hole Drilled	
14-3-115	12	1-2-3-4-5-6-7-8-9-10*-11*-12*

Samples taken by Sigma Exploration personnel. \*Samples assayed in Shell's Calgary Chemical Lab.

APPENDIX NO. 2

SULPHUR ANALYSIS BY HOT TOLUENE EXTRACTION

FOX LAKE AREA

<u>SAMPLE NO.</u> <u>(PERMIT-LINE-HOLE NO.)</u>	<u>DEPTH</u>	<u>TOTAL DEPTH</u> <u>OF HOLE</u>	<u>% WATER</u>	<u>% SULPHUR</u>	<u>AVERAGE %</u> <u>SULPHUR IN HOLE</u>
14-1-1	15		13.5	0.0	
14-1-1	20	20	10.8	0.2	0.05
14-1-2	14		9.6	0.2	
14-1-2	15	17		0.3	0.04
14-1-3	10		17.1	8.4	
14-1-3	12	15	13.5	0.0	1.12
14-1-4	20		4.2	0.0	
14-1-4	25		16.7	0.1	
14-1-4	29	29	2.5	0.0	0.01
14-1-5	15		7.8	4.3	
14-1-5	20	20	11.3	0.0	0.21
14-1-6	15		6.6	0.0	
14-1-6	20		3.9	0.2	
14-1-6	25	30	2.1	0.2	0.06
14-1-7	20		13.5	0.0	
14-1-7	25	29	10.8	0.0	
14-1-8	25		12.9	0.0	
14-1-8	30	30	1.5	0.0	
14-1-9	15		13.5	0.3	
14-1-9	20	32	14.4	0.0	0.01
14-1-10	25		14.7	0.2	
14-1-10	30		9.6	0.0	
14-1-10	35	35	2.8	0.0	0.03
14-1-11	30		11.4	0.0	
14-1-11	35		4.8	0.0	
14-1-11	39	39	0.7	0.0	
14-1-12	30		11.4	0.0	
14-1-12	35	40	13.4	0.0	
14-1-13	35		11.3	0.0	
14-1-13	40	40	13.6	0.0	
14-1-14	15		14.4	0.2	
14-1-14	20	40	12.6	0.0	



14-1-15	30		9.5	1.4	
14-1-15	35	40	12.7	0.0	0.17
14-1-16	35		16.4	0.0	
14-1-16	40	40	10.5	0.0	
14-1-17	25		13.0	0.2	
14-1-17	30		14.4	0.0	
14-1-17	20		14.1	0.0	
14-1-17	35	40	13.3	0.2	0.05
14-1-18	30		17.6	0.6	
14-1-18	35		14.3	0.0	
14-1-18	40	40	Missing	Missing	0.07
14-1-19	6		12.8	0.5	
14-1-19	25	40	Missing	Missing	0.02
14-1-20	25		13.7	0.1	
14-1-20	30	40	13.6	0.0	Tr.
14-1-21	35		13.4	0.6	
14-1-21	40	40	8.2	0.0	0.07
14-1-22	20		13.3	0.3	
14-1-22	25		Missing	Missing	
14-1-22	30	40	12.9	0.6	0.11
14-1-23	20		13.9	0.3	
14-1-23	25	30	14.4	0.9	0.2
14-1-24	25		14.2	0.2	
14-1-24	30	40	12.7	0.7	0.11
14-1-25	20		16.1	0.4	
14-1-25	25	40	11.3	0.5	0.11
14-1-26	25		14.1	0.2	
14-1-26	30	40	12.0	0.5	0.08
14-2-27	25		16.7	0.1	
14-2-27	30		13.5	0.0	
14-2-27	35		18.8	0.4	
14-2-27	40	40	17.2	0.6	0.13
14-2-28	35		11.3	0.7	
14-2-28	40	40	9.8	0.0	0.08
14-2-29	35		13.6	2.6	
14-2-29	40	40	13.0	1.5	0.5
14-2-30	30		10.3	2.7	
14-2-30	35	40	6.9	3.4	0.75
14-2-31	35		11.9	2.3	
14-2-31	40	40	14.3	0.7	0.37

14-2-32	35		9.4	5.8	
14-2-32	40	40	9.5	4.2	1.2
14-2-33	35		4.0	0.5	
14-2-33	40	40	11.2	1.5	0.25
14-2-34	35		4.7	2.2	
14-2-34	40	40	8.5	3.5	0.8
14-2-35	25		5.8	2.7	
14-2-35	30		9.0	0.1	
14-2-35	35		10.0	0.3	
14-2-35	40	40	14.5	0.6	0.46
14-2-36	30		13.2	1.0	
14-2-36	35	40	10.9	1.8	0.3
14-2-37	25		16.8	0.7	
14-2-37	30		16.1	0.3	
14-2-37	35		11.0	0.7	
14-2-37	40	40	14.7	0.2	0.24
14-2-38	30		12.5	0.2	
14-2-38	35	35	14.6	0.3	0.07
14-2-39	30		14.2	1.3	
14-2-39	35	40	13.3	0.7	0.25
14-2-40	35		14.8	1.0	
14-2-40	40	40	14.0	1.6	0.3
14-2-41	30		13.0	1.3	
14-2-41	40	40	14.8	0.9	0.38
14-2-42	25		12.9	0.9	
14-2-42	30	30	17.5	0.0	0.15
14-2-44	30		15.3	0.4	
14-2-44	35	40	13.7	0.0	0.05
14-2-45	30		11.6	1.9	
14-2-45	35	40	4.0	0.0	0.2
14-2-46	30		9.4	0.0	
14-2-46	35	40	2.9	0.0	
14-2-49	6		17.7	0.0	
14-2-49	9		9.6	0.0	
14-2-50	6	Missing		Missing	
14-2-50	9	Missing		Missing	
14-3-100	10		15.2	0.0	
14-3-100	11		12.8	0.0	
14-3-100	12	13	17.2	0.0	

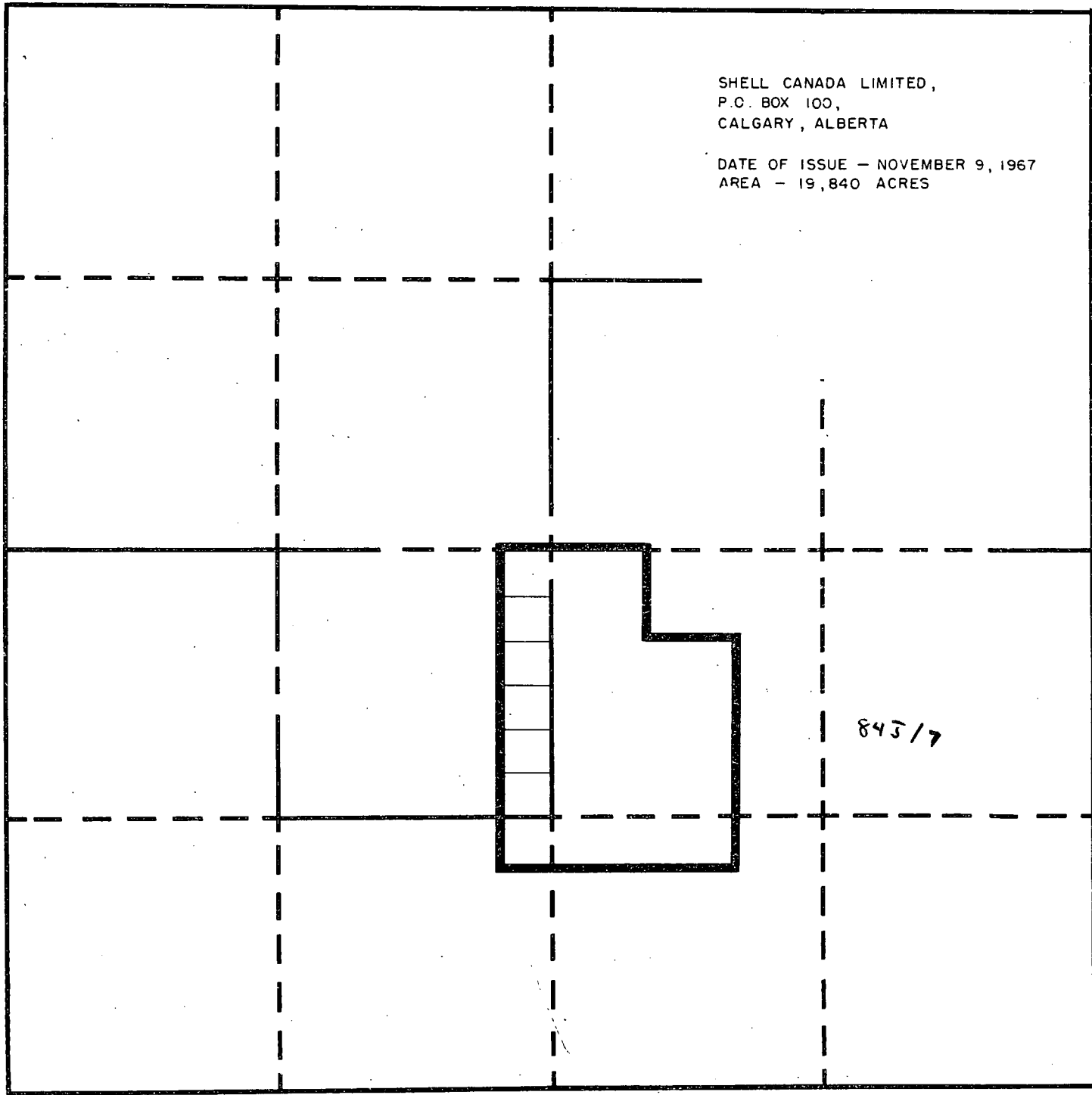
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14-3-102	11		23.1	8.1	
14-3-102	12		15.0	0.0	
14-3-102	13	13	16.8	0.0	0.62
14-3-103	6		27.1	0.0	
14-3-103	12		12.3	3.7	
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14-3-104	1		19.3	0.0	
14-3-104	11	13	11.7	0.0	
14-3-105	8		7.9	11.4	
14-3-105	9		21.7	0.0	
14-3-105	10	13	17.8	0.0	0.87
14-3-106	8		25.3	0.0	
14-3-106	9		19.8	0.0	
14-3-106	11	13	16.6	0.0	
14-3-107	12		14.7	0.3	
14-3-107	13	13	16.3	0.0	0.02
14-3-108	1		7.0	0.0	
14-3-108	2	13	19.3	0.0	
14-3-109	11		13.7	0.0	
14-3-109	12	13	15.8	0.0	
14-3-110	12		26.0	0.2	
14-3-110	13	13	14.0	0.3	0.04
14-3-111	8		8.8	0.0	
14-3-111	9	12	9.5	0.0	
14-3-112	9		Missing	Missing	
14-3-112	10		Missing	Missing	
14-3-113	5		8.3	0.0	
14-3-113	10		13.4	0.2	
14-3-113	11	12	8.1	0.0	0.01
14-3-114	10		Missing	Missing	
14-3-114	11		Missing	Missing	
14-3-115	10		5.6	0.1	
14-3-115	11		6.9	0.0	
14-3-115	12	12	15.3	0.5	0.05

19680032

# SULPHUR PROSPECTING PERMIT No. 14

SHELL CANADA LIMITED,  
P.O. BOX 100,  
CALGARY, ALBERTA

DATE OF ISSUE - NOVEMBER 9, 1967  
AREA - 19,840 ACRES



TP. 108

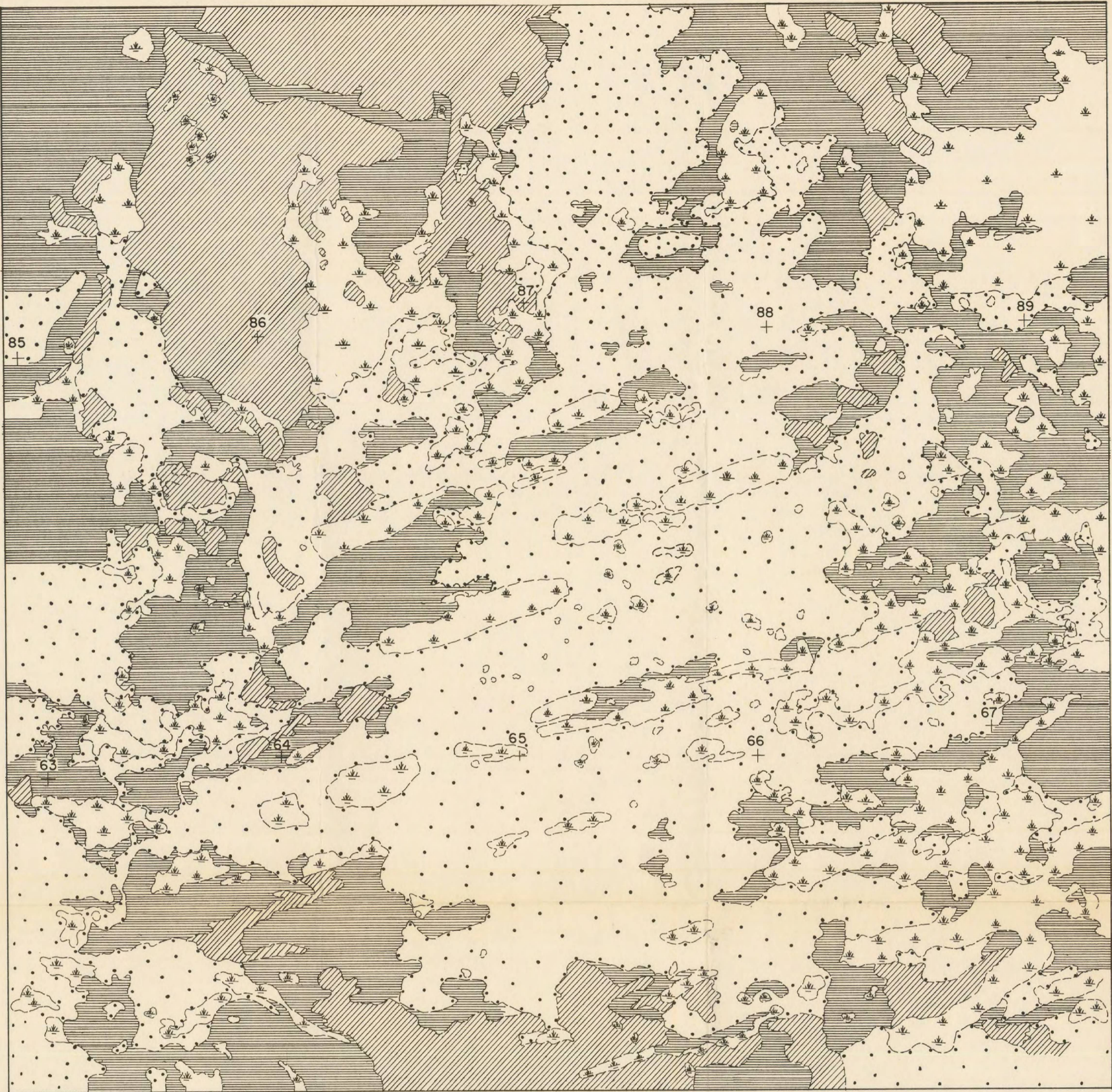
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TP. 107

R. 5

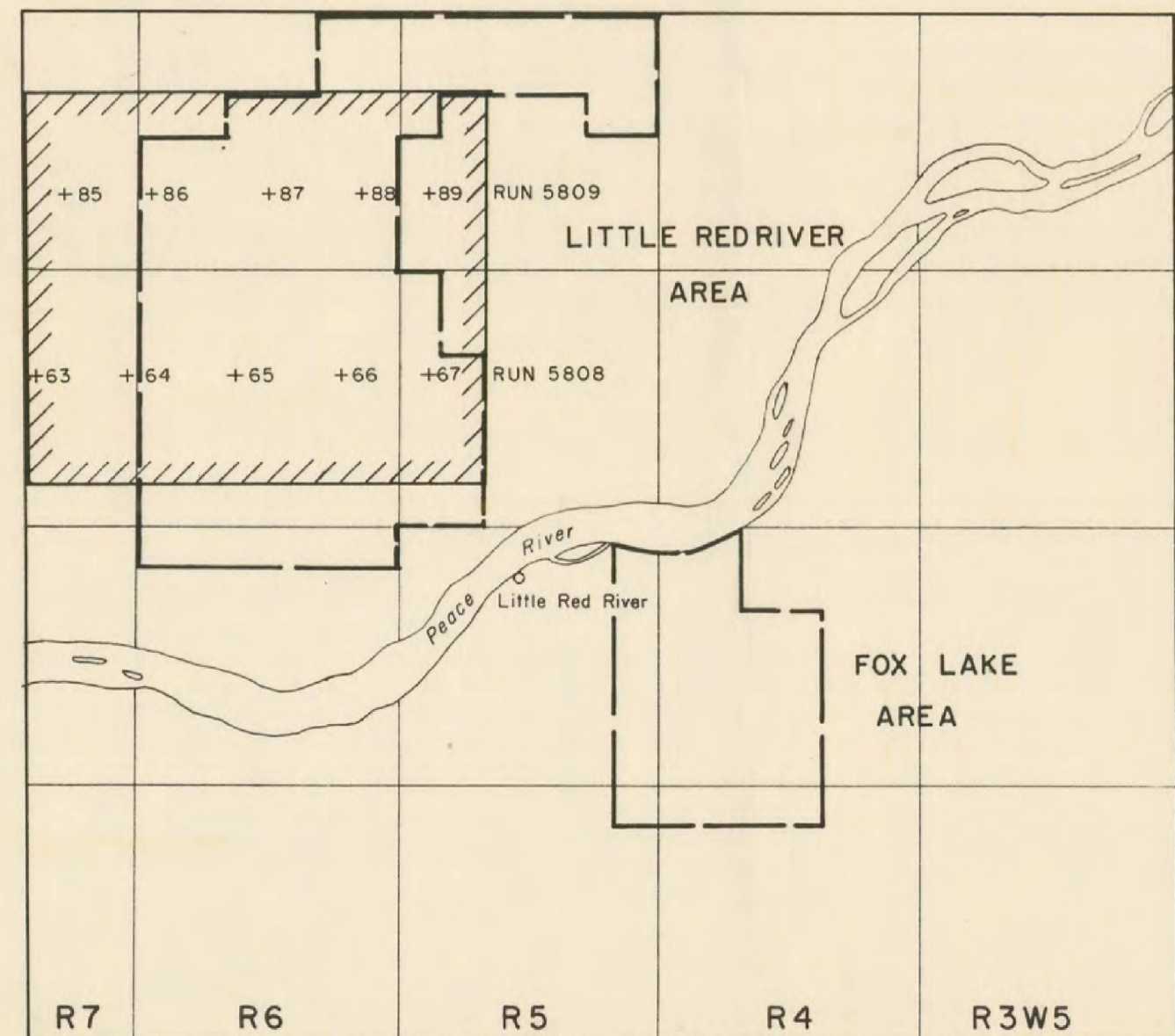
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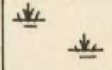
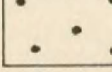
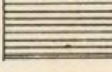
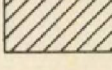
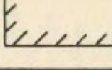


RUN 5809

RUN 5808



**LEGEND**

-  SWAMP
-  ± 2' SWAMP
-  ± 4' above SWAMP
-  > 5' above SWAMP
-  PHOTOGEOLOGIC AREA

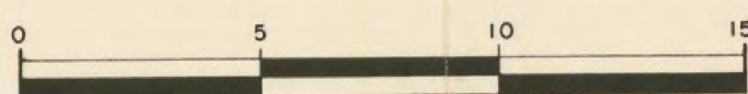
Tp. 110

Tp. 109

Tp. 108

Tp. 107

INDEX MAP—SCALE IN MILES



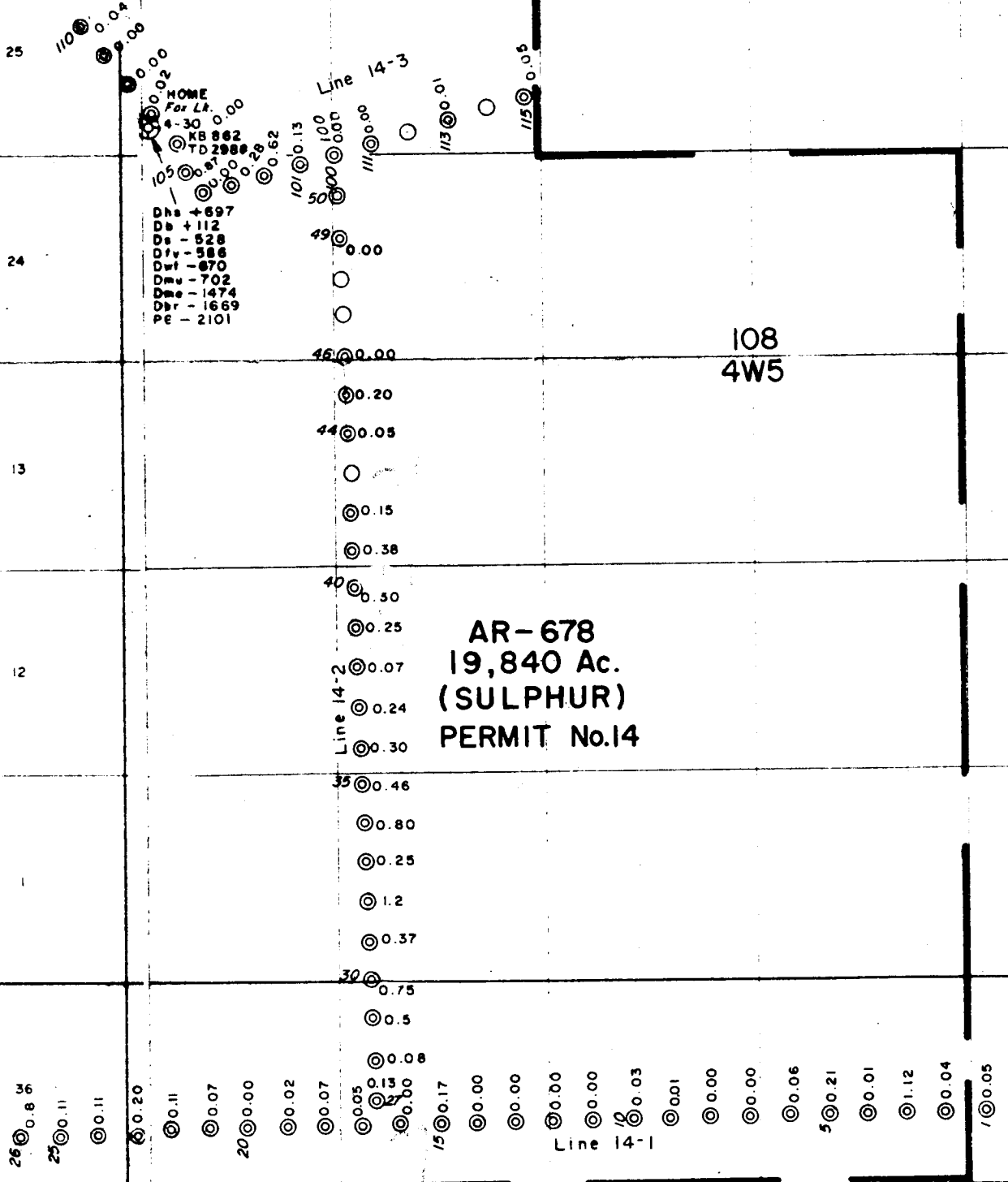
SHELL CANADA LIMITED	EXPLORATION & PRODUCTION	SOUTHERN EXPLORATION DIV.
LITTLE RED RIVER & FOX LAKE AREA ALBERTA		
<b>PHOTOGEOLOGIC MAP</b>		
CONTOUR INT.:		SCALE.:
Section: PHOTOGEOLOGICAL		Date: OCTOBER 1968
Author: J. C. ALBRECHT		Enclosure No: 2
Grid: A J		Drawing No: P-153

PEACE

# FOX LAKE AREA

108  
4W5

AR-678  
19,840 Ac.  
(SULPHUR)  
PERMIT No.14



107  
4W5

SHELL CANADA LIMITED		EXPLORATION & PRODUCTION	SOUTHERN EXPLORATION DIV
<b>FOX LAKE AREA</b> ALBERTA			
PERCENTAGE GRADE OF ELEMENTAL SULPHUR IN SUPERFICIAL MATERIAL AS ASSAYED FOR BORE HOLES DRILLED IN 1968			
CONTOUR INT		SCALE 1" = 4000'	
Section GEOLOGICAL		Date OCTOBER, 1968	
Author A.H. SIKANDER		Enclosure No. 1	
Grid: AJ		Drawing No P-153	
To Accompany Report on Sulphur Prospecting Permit No. 14			

19680032

H.W.M