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Reflection Seismograph Survey  
Kilekale Lake, NWT  
Survey by  
WESTERN GEOPHYSICAL COMPANY  
OF CANADA, LTD.  
FOR  
MOBIL OIL CANADA LTD.

Abstracted for  
Geo-Science Data Index  
Date \_\_\_\_\_

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Abstracted for  
Geo-Science Data Index

Date \_\_\_\_\_



Report of Reflection Seismograph Survey

KILEKALE LAKE  
NORTHWEST TERRITORIES

Project: Smith Arm

Permit No: R-1260-29-4

N.T.S. Map No's: 96-J and 96-0

Dates of Shooting

November 7, 1971 thru November 23, 1971  
March 14, 1972 thru April 28, 1972  
Inclusive

For

MOBIL OIL CANADA LTD.

Report by

J.L. Robblee - Party Chief

Party M-85

WESTERN GEOPHYSICAL COMPANY OF CANADA, LTD.

Calgary, Alberta

June, 1972



Abstracted for  
Geo-Science Data Index

Date \_\_\_\_\_

*Western*



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## INTRODUCTION

"Kilekale Lake" is located north of the Smith Arm of Great Bear Lake, approximately 130 miles northeast of Fort Norman, Northwest Territories.

The survey was conducted by Western Geophysical Company of Canada, Ltd., Licence No.'s 0173 and 0208, working on behalf of Mobil Oil Canada Ltd., Permit No. R-1260-29-4.

The work periods were November 7, 1971 thru November 23, 1971, March 14, 1972 thru April 28, 1972 inclusive. There were normally 48 men, including all contractors, stationed in portable camps on the prospect. These men were engaged in field operations. The data preparation group consisted of two men who were located at 530 - 71st Avenue South East, Calgary, Alberta.

The operation was under the supervision of Mr. Bruce McNeely and Mr. E. Kohse of Mobil Oil Canada Ltd. and Mr. G.P. Bates of Western Geophysical Company of Canada, Ltd. The Party Manager in November was Mr. K. Dobson and Mr. D. Holt in March and April.

Bulldozing operations were contracted by MacMillan Construction and were under the supervision of Mr. D. Gardener.

Catering was extended by Western Geophysical Company of Canada, Ltd., who owned the seismic camp.



## LOGISTICS

At the beginning the camp, vehicles, equipment and fuel were taken into the area by barge. A supply dump was established on the north shore of Great Bear Lake (see base camp on shot point map - Plate 3). As the portable camp was moved from place to place on the prospect fuel was hauled from the supply dump using a bulldozer and sleighs. The sleighs carried 500 gallon tanks for hauling diesel fuel as well as a kitchen-diner-sleeper unit and a power plant for use of the fuel haul cat-skinners. They were also equipped with a single sideband two-way radio for communication. The seismic crew eventually reached a point that was too far from the supply to make the fuel haul feasible. Diesel fuel was then brought in from Norman Wells by a DC-3 aircraft. The aircraft carried 750 gallons of diesel per trip in a fuel bladder. The DC-3 required a 3500-foot landing strip to be plowed on approximately 30 inches of good ice. All motorized equipment on the seismic crew and the bulldozing operations were diesel powered and the camps were heated by diesel fuel. Total fuel consumption was approximately 800 gallons per day.

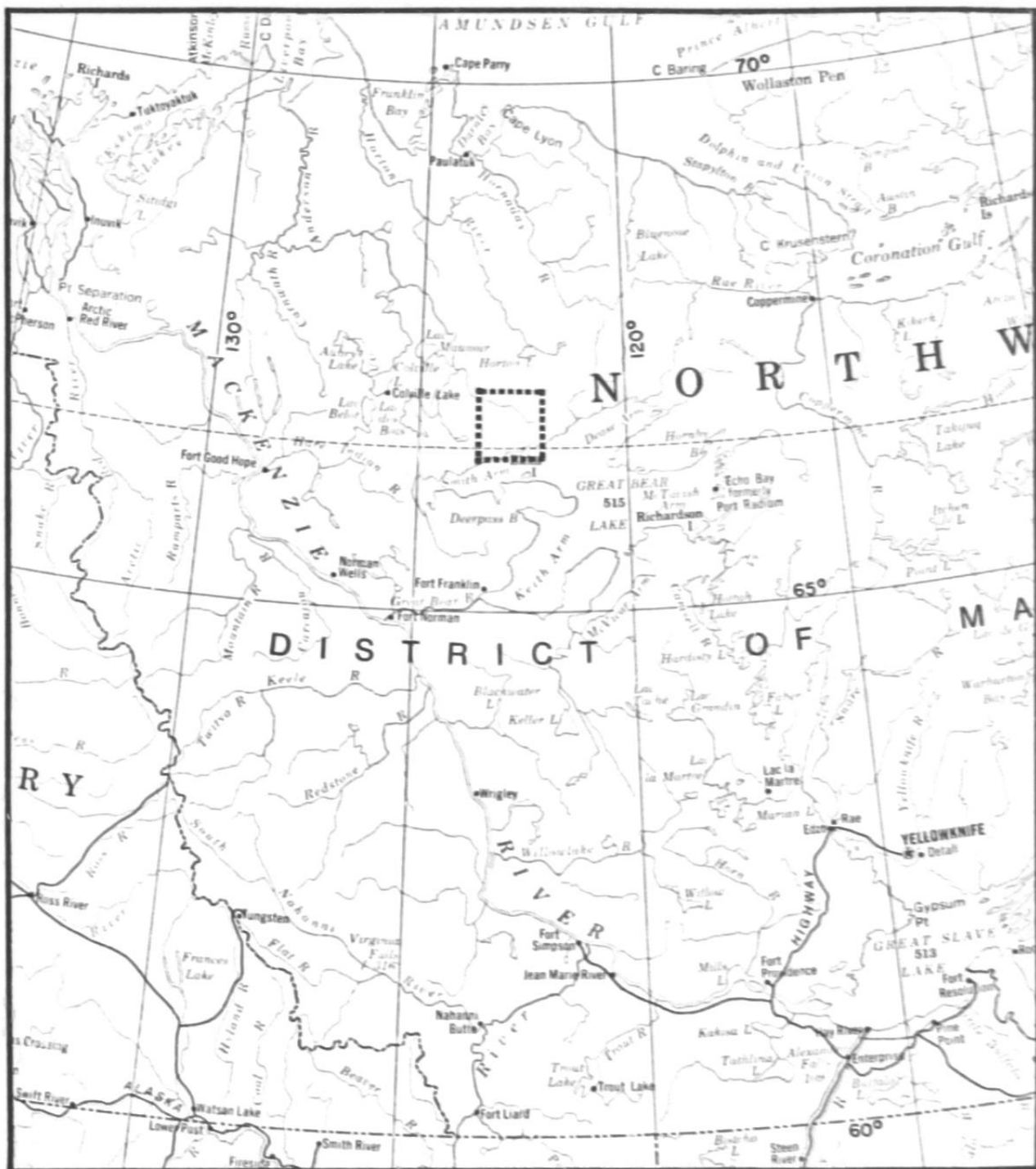
In early November men and groceries were brought to the prospect from Norman Wells by helicopter as the ice on lakes was not thick enough to support an aircraft. After mid-November when the ice became more than eight inches thick a 4-place ski-equipped, Cessna 185 was used to haul groceries and supplies from Norman Wells. Later in the season a 9-passenger twin-engined Islander aircraft was brought in and both aircraft were used but were shared with another crew. These two aircraft were chartered for the



entire winter from Peace Air Ltd. of Peace River, Alberta. The Cessna could carry approximately 1000 pounds of freight while the Islander could carry approximately 2000 pounds. The Islander could not be used until the ice was thick enough to support a bulldozer as airstrips had to be snow-plowed for this wheel-equipped plane. At the beginning of the season groceries and supplies were flown to Norman Wells from Calgary and Edmonton by commercial airlines. This method of transport proved to be very unreliable as there was no regular schedule for freight flights. In order to supply groceries on a regular schedule it was decided to arrange a weekly truck service from Peace River, where groceries were purchased, to Fort Simpson. The Islander would fly from Norman Wells to Fort Simpson and return direct to camp with the groceries. An occasional DC-3 flight was arranged from Norman Wells to Peace River and return when warranted by the volume of freight.

A full time expeditor and helper were maintained in Norman Wells. They were housed in a trailer which was equipped with a telephone and single sideband radio for communication. A crew cab vehicle was supplied for expediting people and supplies. Storage space was rented at the airport from Mid-Arctic Expeditors. An expediting service was also contracted in Peace River for the purpose of buying and expediting groceries and supplies for the truck haul to Fort Simpson and for the occasional aircraft flights to Norman Wells. After completing the winter project the camp and equipment were parked at the base camp on the north shore of Great Bear Lake. From here it could be picked up by barge, after the spring break-up, or left to be available for the following winter season.





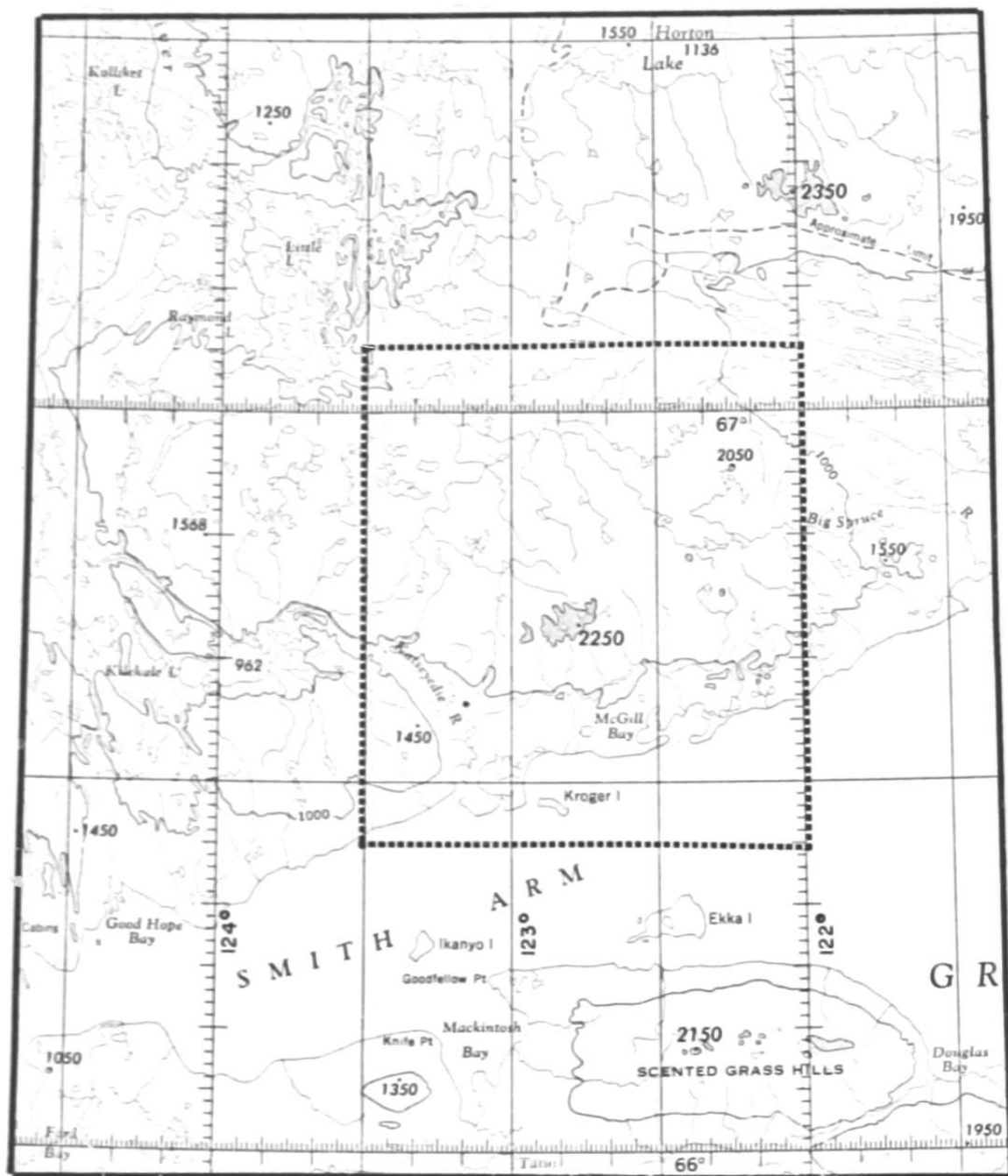
SCALE: 1" = 100 MILES

# KILEKALE LAKE

## SMITH ARM

*Western*





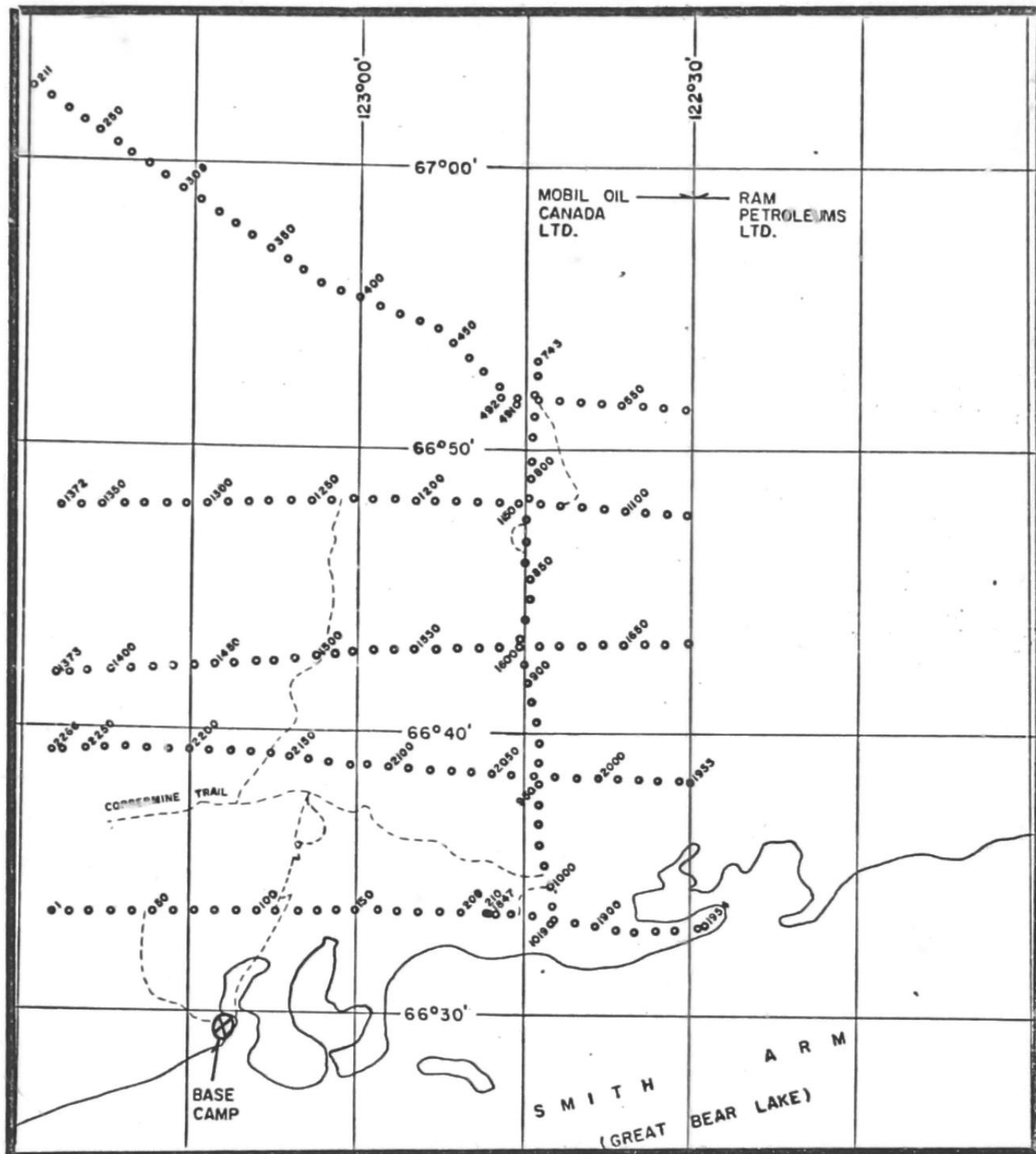
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# **KILEKALE LAKE**

## **SMITH ARM**

*Western*



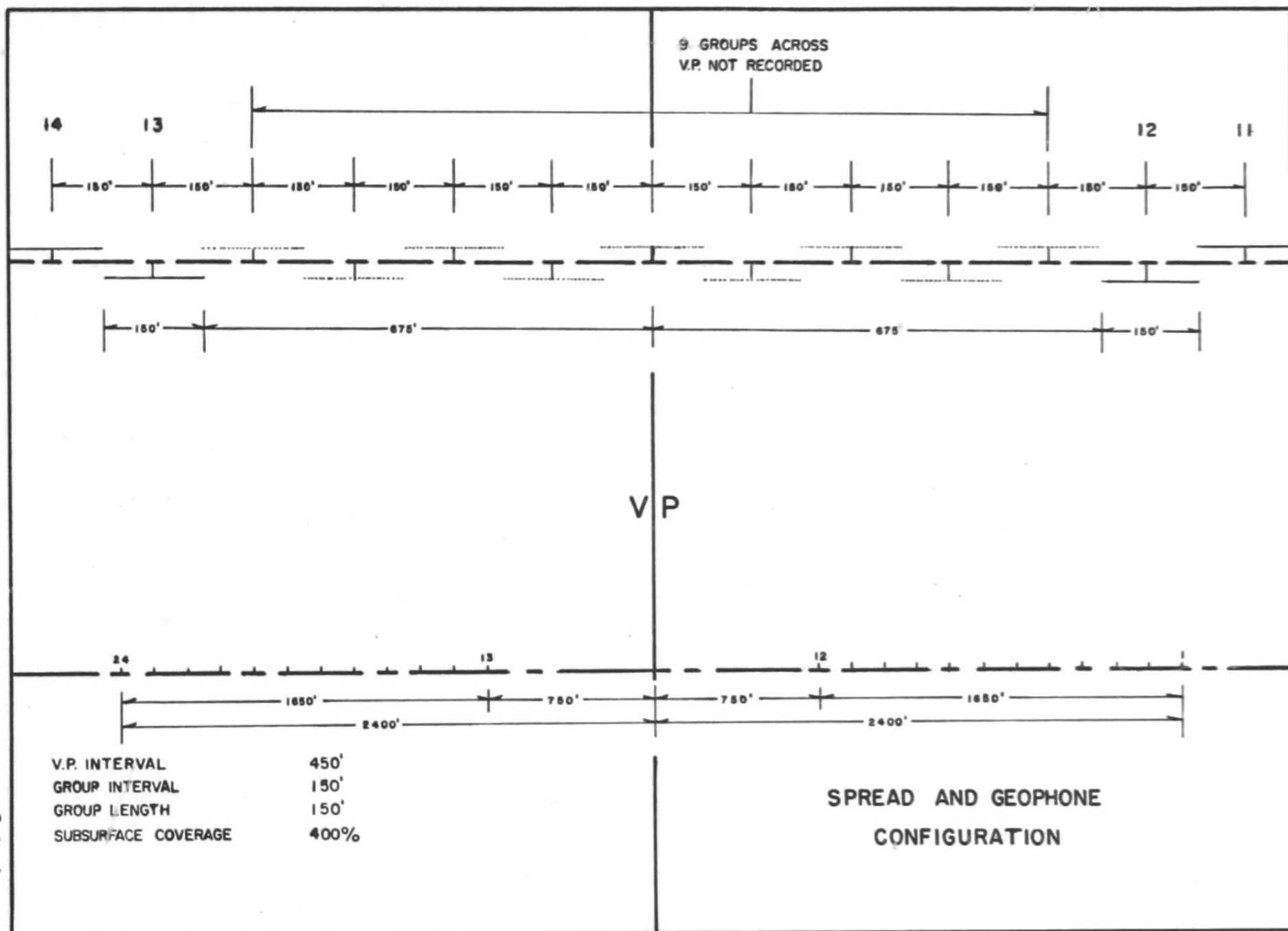


SCALE: 1" = 6 MILES

# **KILEKALE LAKE** **SMITH ARM**

*Western*







## TECHNIQUES

### FIELD:

Sub-surface coverage of 400% was obtained in the field by recording vibrations made at intervals of 450 feet. Recordings from 24 seismometer groups were made for each Vibrator Point. Four vibrators mounted on two Flextrac Nodwells were utilized, using a 64-16 sweep and a 150 foot drag. These were centered on a group, with that group and the four adjacent on either side not being recorded. This yielded a balanced, gapped spread. (See Plate 4 for spread configuration.) The seismometer groups for each profile were laid end to end in a straight line, with 18 seismometers per group spaced evenly over 150 feet. The group interval was 150 feet. The seismometer type was Mark L-10, 14 cycle. The recording instruments were S.D.S. 1010, digital type, with a Potter tape transport and a Western Summing Unit.

Variations in the above procedures may be noted in the following cases. On line 1, V.P.'s 1-210, a 40-10 sweep and a 300 foot drag were used. 18 seismometers were spaced over 300 feet, and the gap was increased from 9 to 11 groups. On line 5, V.P.'s 211-491, a 40-10 sweep and a 300 foot drag were used, 18 seismometers were spaced over 300 feet, but the gap was left at 9 groups.

Intermittent dynamite shots were recorded, utilizing the above spread layout, except that only one group was not recorded at the shot point.



OFFICE:

Data preparation consisted of preparing stacking diagrams, overlays, and shot data sheets, and the plotting of first arrivals. These, along with the field reels and tape header sheets, indicating a correctional velocity of 10,000 feet per second and a datum of 1200 feet above sea level, were forwarded to Mobil.

LITHOLOGY

The average shot hole depth was 45 feet. Gravel was encountered in approximately 60% of the shot holes, ranging from 0 to 30 feet in depth. Below this layer were clay and rocks to the total hole depth. There was an occasional showing of muskeg in the southwest and intermittent findings of limestone and sandstone.

SURVEY AND BULLDOZING

The survey crew utilized 2 Wild T-16 theodolites. The elevations were tied, assuming the elevation of the ice on Great Bear Lake to be 511 feet above sea level. Horizontal control was derived from major topographic features.

All production lines in the prospect were newly bulldozed, and all airstrips were on ice formed on lakes.



## EQUIPMENT

### RECORDING CREW:

26 Men

- 1 - Recording Unit, Flextrac Nodwell, Model FN-110, diesel powered
- 2 - Dual Vibrators, Flextrac Nodwell, Model FN-240, diesel powered
- 2 - Cable Units, Robin Nodwell, Model FN-110, diesel powered
- 1 - Shooting Unit, Flextrac Nodwell, Model FN-110, diesel powered
- 1 - Field Shop Unit, Robin Nodwell, Model FN-110, diesel powered

### DRILLING CREW:

4 Men

- 1 - 1000 Mayhew Air Drill, Robin Nodwell, Model FN-110, diesel powered

### CAMP:

7 Men

- 1 - Party Manager's Unit, Bombardier, diesel powered
- 1 - Supply Unit, Flextrac Nodwell, Model FN-110, diesel powered
- 1 - Kitchen/Diner/Sleeper Combination (6 man), Nodwell Bros., Model FN-110, diesel powered
- 1 - Utility/Sleeper Combination (12 man), Nodwell Bros., Model FN-110, diesel powered
- 1 - Office/Sleeper Combination (16 man), Nodwell Bros. trailer
- 1 - Sleeper (8 man), Nodwell Bros. trailer
- 1 - Shop Unit, Nodwell Bros. trailer
- 1 - Storage Shack, sleigh mounted
- 1 - Fuel Sloop, 2000 gallon capacity
- 1 - Propane Sloop



BULLDOZING CREW:

7 Men

- 1 - D-6 Bulldozer
- 2 - D-7 Bulldozers
- 1 - Kitchen/Diner Combination, sleigh mounted, main camp
- 1 - Kitchen/Diner/Sleeper Combination (4 man), sleigh mounted, fuel haul
- 1 - Sleeper (12 man), sleigh mounted, main camp
- 1 - Power Unit with generator, sleigh mounted, fuel haul
- 1 - Shop Unit with generator, sleigh mounted, main camp
- 1 - Bombardier Personnel Carrier, diesel powered
- 2 - Fuel Sloops, 2000 gallon capacity each

SURVEY CREW:

4 Men

- 1 - Flextrac Nodwell, Model FN-110



# STATISTICS

Production . . . . .	39.75 days
Refraction dynamite shooting . . . . .	13.25 days
Profiles . . . . .	1912
Sweeps . . . . .	78,516
Miles recorded . . . . .	161.699
Coverage per production day (miles). . . . .	4.07
Shots. . . . .	273
Holes drilled. . . . .	241
Footage drilled. . . . .	10,882
Average hole depth . . . . .	45.153
Pounds of dynamite used. . . . .	5465.5
Pounds of dynamite per shot. . . . .	20.02



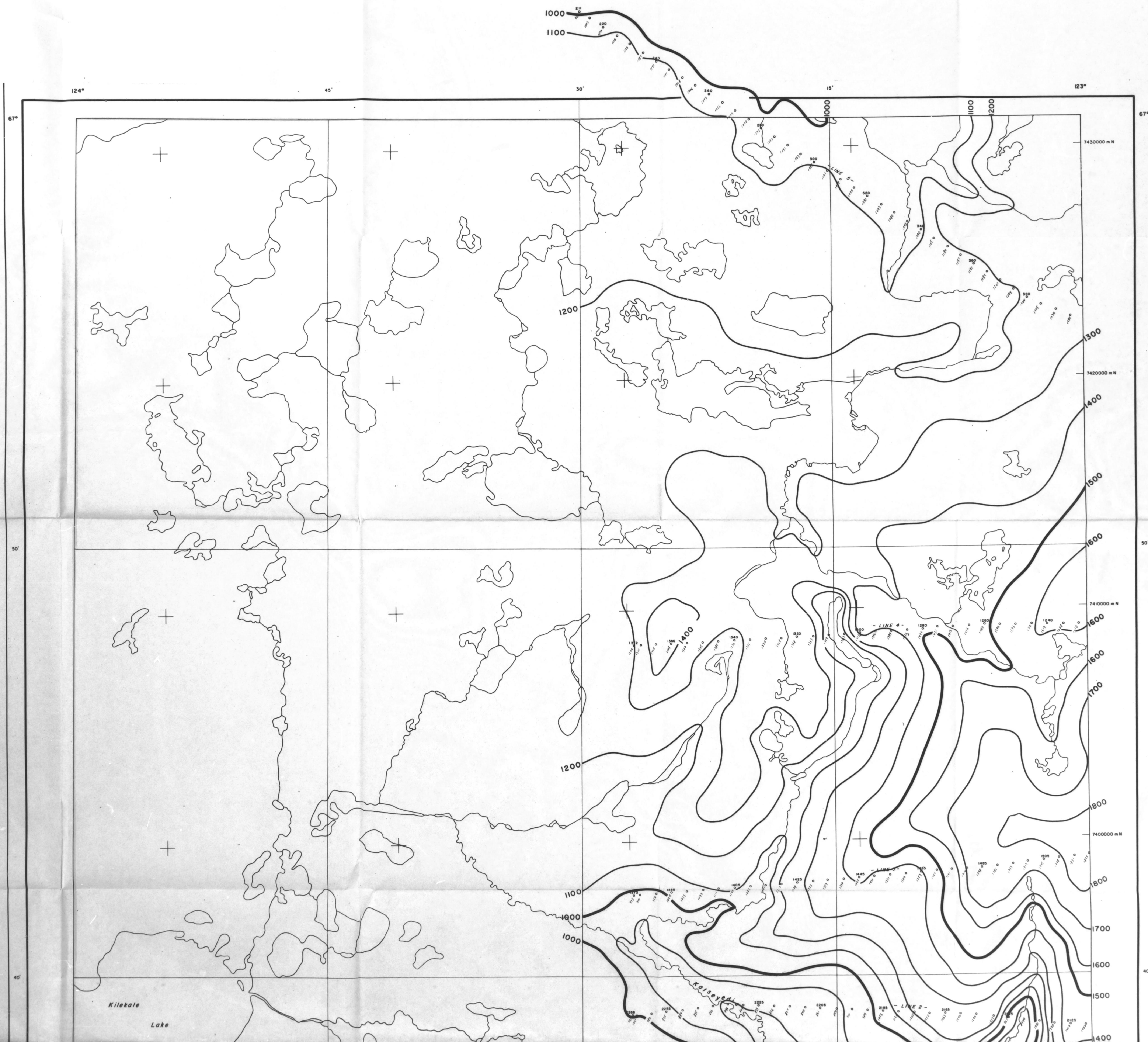
The foregoing report is respectfully submitted by

WESTERN GEOPHYSICAL COMPANY OF CANADA, LTD.

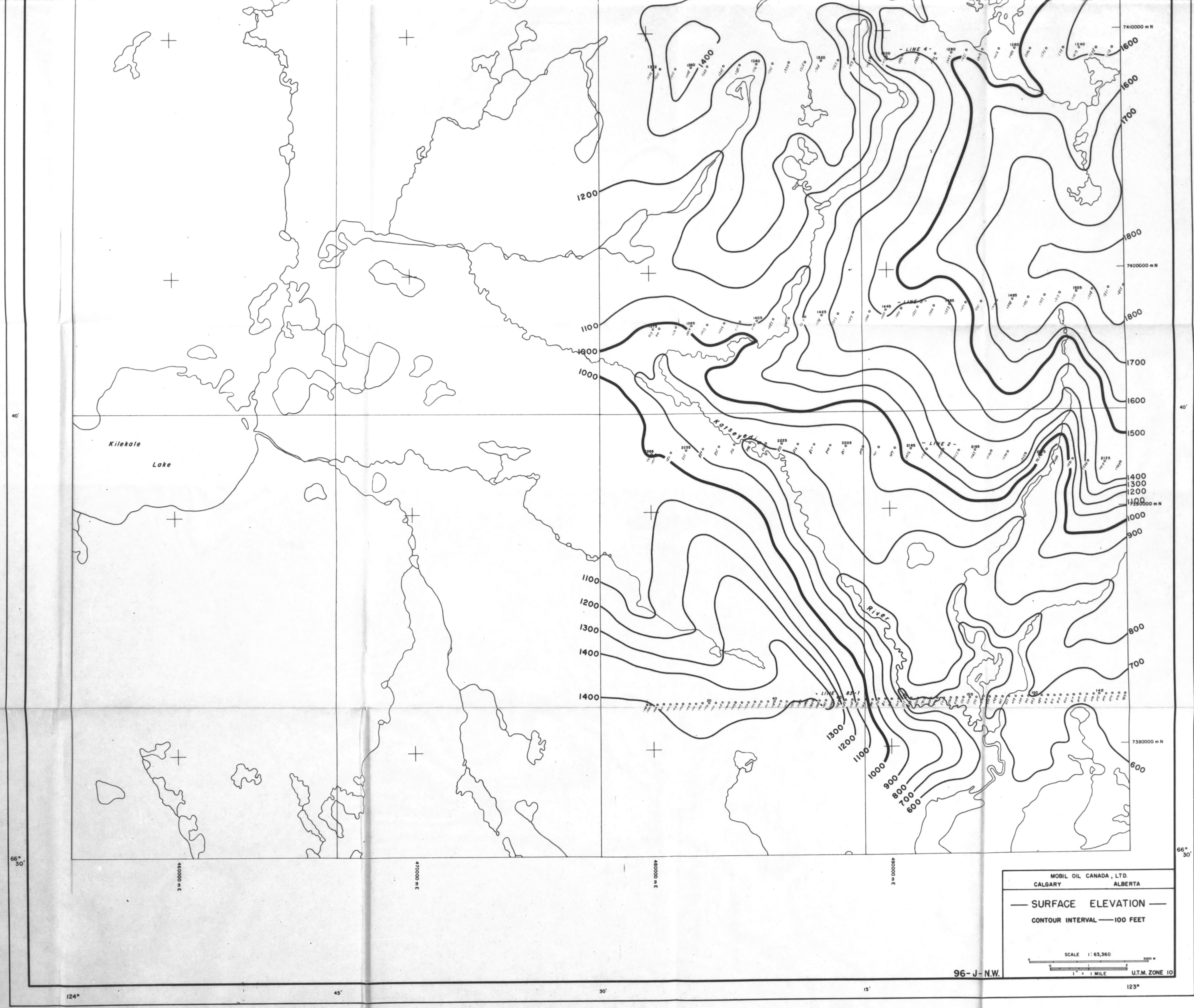
J. L. Robblee  
J.L. Robblee - Party Chief

6-9-72.  
Date









MOBIL OIL CANADA, LTD.  
CALGARY ALBERTA

— SURFACE ELEVATION —  
CONTOUR INTERVAL — 100 FEET

SCALE 1:63,360  
1" = 1 MILE  
UTM ZONE 10



