122°30'

122°15'

122°00'

62°30'

62°20'

8

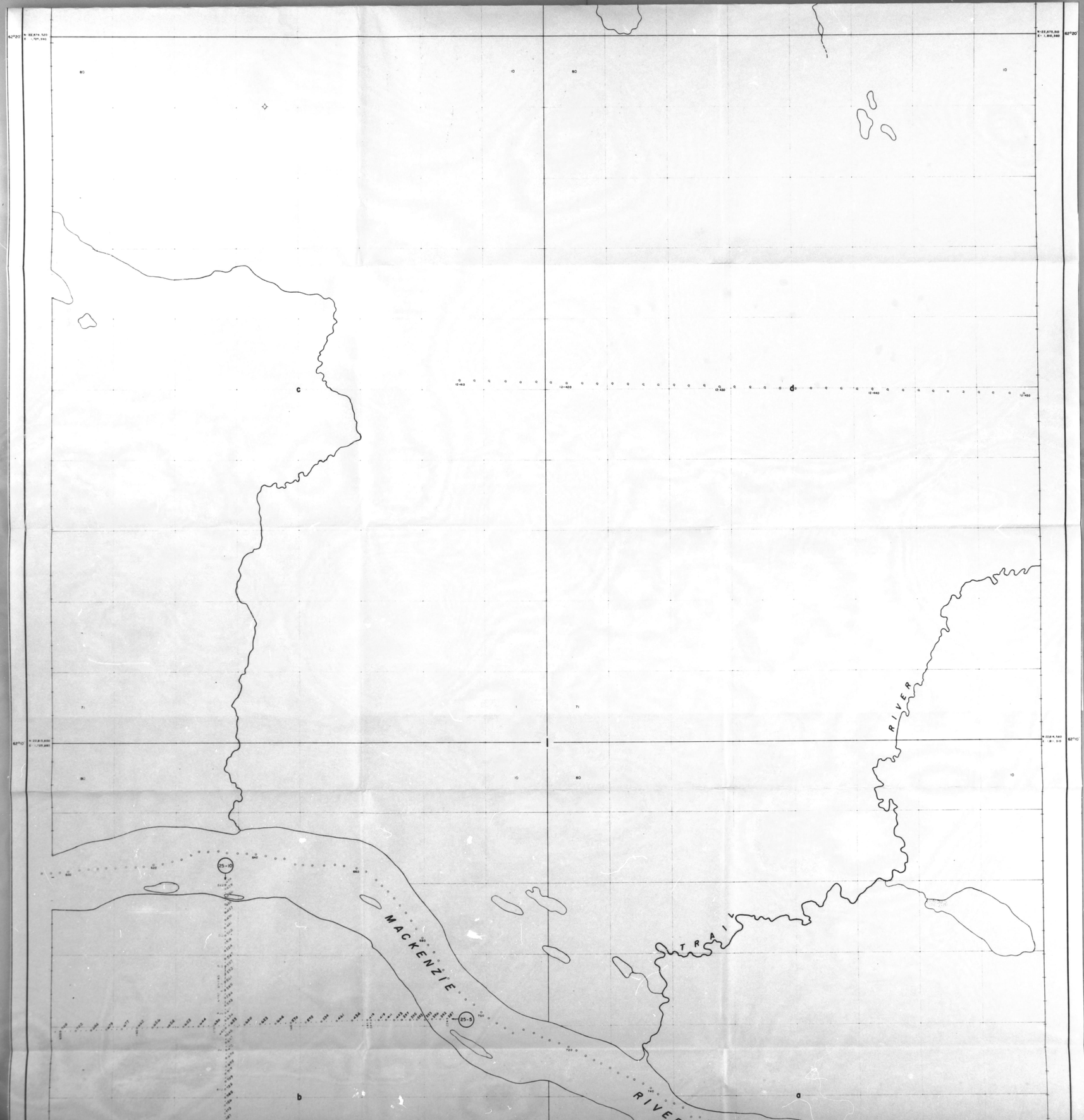
80

10

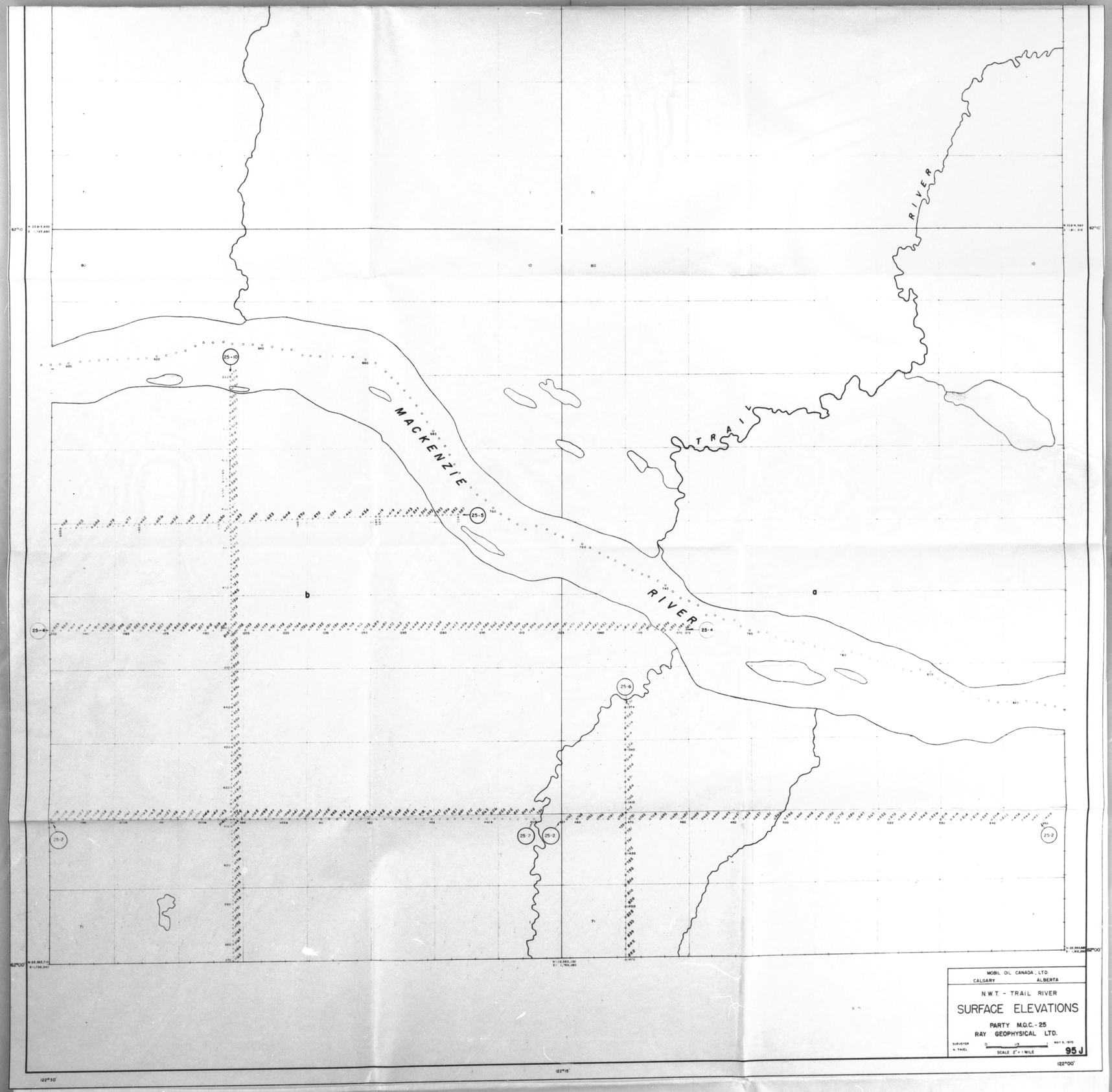
b

a

1 of


62°20'
62°10'
80
10
71
c
d
b
a
12-410
12-420
12-430
12-440
12-450
25-10
25-9
MACKENZIE
RIVER
TRAIL
RIVER

2



MOBIL OIL CANADA, LTD.
CALGARY ALBERTA

N.W.T. - TRAIL RIVER

SURFACE ELEVATIONS

PARTY M.G.C. - 25
RAY GEOPHYSICAL LTD.

SURVEYOR N. TAGEL

SCALE 2" = 1 MILE

MAY 3, 1970

95 J

3 of 3

OIL & GAS OPERATIONS UNIT
Oil and Mineral Division
SEP 11 1970
OTTAWA; CANADA
Dept. of Indian Affairs & Northern Development

OPERATIONS REPORT

of

Reflection Vibroseis Survey

Fort Simpson Area

Northwest Territories

for

M O B I L O I L C A N A D A, L I M I T E D

Ray Geophysical Limited

Division of

Mandrel Industries, Inc.

Calgary, Alberta

Canada

INDEX

	Page
OPERATING CONDITIONS	1
SURVEYING	2
DRILLING	3
RECORDING	4
COMPUTING	7
INTERPRETATION AND RESULTS	10
RECOMMENDATIONS AND CONCLUSIONS	12
APPENDIX A - STATISTICAL SUMMARY	14
APPENDIX B - EQUIPMENT	15
APPENDIX C - TRANSMITTAL OF DATA	16
FIGURES 1 - 9	

16 ENCLOSURES: HUME FORMATION
ACCESS ROAD MAP
SURFACE ELEVATION MAP
SURVEY TIE MAP

MAP AREAS: MARTIN RIVER
TRAIL RIVER
LONE MOUNTAIN
SIBBESTON LAKE

OPERATING CONDITIONS

The prospect was located in the Northwest Territories, approximately 35 miles west of Fort Simpson. The prospect area was bounded by the Mackenzie River in the north and Martin Hills in the south (to $61^{\circ}50'$ N Latitude) and between $122^{\circ}00'$ E and $122^{\circ}45'$ E Longitude (Figure 1).

The area is covered entirely with forest and muskeg. Access to the prospect area was along a bulldozed trail from Fort Simpson. Three bulldozers were used initially for clearing lines for seismic operations. After all the lines had been cut only one bulldozer was kept with the crew for snow-plowing and assisting vehicles in the hills.

Camps were moved frequently in order to minimize the driving time. There were four camp locations which are indicated on the Access Road Map.

The seismic data was obtained by a combination of vibroseis and shooting methods concurrently. Vibroseis technique was employed for obtaining reflection data, while conventional shooting furnished information primarily for weathering computations.

The weather was generally mild.

SURVEYING

Two Wild T1A Theodolites were in use by the crew for maintaining vertical and horizontal control.

The entire survey has been tied to seismic lines shot and surveyed the previous year, which in turn was based on the Monument 63-A-195, Map Sheet 95-G-16 (Martin River), Zone 10, Department of Mines and Technical Surveys.

Elevations were double-run when necessary and vertical control was kept within less than three feet. Horizontal control was maintained by frequent Polaris observations.

Shotpoint locations were computed by Latitude and Departure Method and plotted on the base maps supplied by Mobil Oil Canada, Limited. Map scale was 2 inches to 1 mile.

Geophone stations at 110 and 220 feet intervals were laid out with 220-foot long metal chain.

To check the accuracy of the survey, vertical and horizontal loop closure maps (designated "Survey Tie Map") have been compiled and are submitted with this report.

Highest elevation surveyed in the area was 2295.2 feet between SPs. 2020 and 2021, Line 25-7. Lowest elevation was 384.4 feet at SP 1371, Line 25-4.

DRILLING

One conventional and one Sewell drill were employed initially to drill kelly depth (20 ft.) holes for weathering shots. The holes were preloaded with 5 lb. of dynamite.

Additional single holes were drilled to a depth of 55 feet at the west end of Line 25-1 and also at the east end of Line 25-1, from SP 162 to SP 246, and shot with reflection spreads for comparison purposes. These holes were preloaded with $2\frac{1}{2}$ pounds of dynamite.

An extra six holes were drilled to record a reverse refraction profile.

Drilling conditions for the first 20 feet were good as muskeg, clay or gravel with rocks and boulders, some shale, were found near the surface. Occasional hard layers were encountered in Martin Hills and on eastern portions of Lines 25-11, 25-12 and 25-13.

Two drills were able to stay ahead of the recording crew and the conventional drill was released on March 16. It is important, however, that the drills have a head start on the shooting crew. Otherwise three drills would be needed, especially if the reflection-vibroseis and the weathering crew work independently.

RECORDING

1. Reflection

Split spread with Common Depth Point (CDP) recording method was employed throughout the prospect. Spread length was 1430-220-0-220-1430 on Line 25-1 with a sweep point (SP) interval of 440 feet and geophone stations at 110 feet (Figure 2). Offset distance was increased to 330 feet at the east end of Line 25-2, from SP 550-457, increasing the spread length to 1540 feet (Figure 3). CDP coverage for the above mentioned lines was 300% (3-fold) (Figures 4 and 5). All the other lines were vibrated with 2640-220-0-220-2640 spread length, with SP interval of 660 feet and geophone stations at 220 feet (Figure 6). CDP coverage in this case was 400% (4-fold) (Figure 7).

A 24-channel Mandrel SUM-IT Digital Recorder, with field summing capabilities on a 9 track, $\frac{1}{2}$ inch tape, and auxiliary Techno tape system for monitoring purposes was used.

For energy source three WABCO vibrators, applying 32 sweeps over a 220 foot distance, were used. Sweep frequency was 14-56 cycles. Recording filter was OUT-60 cycle High-Cut, record length was 13 seconds, sweep length 7 seconds, sample rate 0.004 seconds.

A total of 96 strings of 18 geophones per string were employed, with a maximum geophone spread of 204 feet (Figure 2). Geophone type was EV-20A, 27 cycles.

Record quality was generally fair to good.

2. Weathering

Shallow, single holes at one quarter mile spacing were shot for weathering control. Spread length was 2640-220-0-220-2640 feet throughout the prospect (Figure 6). At places where weathering was suspected to be deeper, single enders, one mile long, were shot.

MFR-11 instruments with Geospace 111 amplifiers and remote firing system were used.

Analog tapes with record length of 7 seconds, filter setting of 20-60 and EV-20A geophones were used in recording the data.

Record quality was generally fair to good for picking the first breaks and also for mapping the Hume reflection. However, sudden variations in weathering depth were observed from the data, mostly in the Martin Hills (south end of Line 25-6, portion of Line 25-7) and on Lines 25-11, 25-12 and 25-13. In these areas a spread length of one mile, shot in both directions, would be required as the high speed layer (approximately 11,000 ft/sec) was not reached with the shorter spread. Invariably the record quality also deteriorated in the same areas.

3. Refraction

One reversed, in-line refraction profile, two miles long, was shot on Line 25-1, between SP 187 to 211. Geophone station interval was 220 feet. Three holes, 50 feet deep, at each end of the profile were utilized for the refraction shooting. First breaks on the refraction records were good.

4. Noise Spread

A noise spread was laid out on Line 25-1, between SPs 90C to 97C, total length was 3120 feet. Fourteen vibrating points were used at 240 ft. interval.

First part of the noise spread was vibrated employing 24 channels and single geophones (7.5 cps) at 10 foot intervals (Figure 8). Second part of the noise spread was vibrated using 8 channels and 18 geophones per station, station interval 30 feet (Figure 9). Geophone strings were stretched out for maximum distance.

Normal noise pattern was present on the correlated records and it does not seem that any major noise problem exists in the area.

5. Experimental

The following tests were made at the beginning of the program in order to determine the best field operating parameters:

32 sweeps, vibrated across 220 feet
16 sweeps, vibrated across 220 feet
32 sweeps, vibrated across 110 feet
16 sweeps, vibrated across 110 feet
8 sweeps, vibrated across 110 feet
32 sweeps, vibrated across 220 feet, offset distance 660 feet.

The best results were obtained by using 32 sweeps over 220 feet, offset distance 220 feet.

Several attempts were made at different places in the prospect area to vibrate the weathering spreads instead of shooting. The results were not satisfactory as the first breaks of the correlated records were poor or undetermined.

COMPUTING

Writing of Tape Data Sheets, Tape Data Header Sheets, Stacking Diagrams, Tape Lists, Computing of Weathering and Plotting of Shot Points on the maps were done according to the instructions from the Geophysical Department of Mobil Oil Canada, Limited.

First arrivals were plotted and weathering corrections were computed on the weathering sections.

The following formulae were used to obtain total corrections to Datum Plane:

T_c (Total correction) = $W_x + E_c$

W_x (Weathering correction) = $-\left[(d/V_1 - d/V_c) + (d_o/V_o - d_o/V_c)\right]$

E_c (Datum correction) = $\frac{DP - EL}{V_c}$, where

DP - Datum Plane (1000 feet above sea level)

EL - Surface Elevation

V_c - Correctional velocity (11,000 ft./sec.)

d - Thickness of V_1 material (distance from bottom of V_o material to top of V_2 material)

d = (factor) x $\triangle t_i$, where

factor = $\frac{V_1}{2 \cos \alpha \times \cos i_c}$ (from tables supplied by Geophysical Department, Mobil Oil Canada, Limited)

α - dip angle of $V_1 - V_2$ interface

i_c - $\sin^{-1} \frac{V_1}{V_2}$ (critical angle)

$\triangle t_i$ - difference between V_1 and V_2 time intercepts

V_2 - velocity of sub-weathering material (from first arrival plots)

V_1 - velocity of weathered layer (from first arrival plots)

V_o - velocity of near surface material = 2000 ft./sec. (assumed)

d_o - depth from surface to bottom of near surface low velocity material

$d_o = \frac{t_i}{2} \times V_o$ where t_i = time intercept (V_1)

Where no V_1 appears, weathering correction is as follows:

$d_1 = V_o' \times \frac{t_i'}{2}$, where

d_1 - depth to V_2 layer

V_o' - assumed sub-surface velocity (4000 ft./sec.)

t_i' - time intercept (V_2), then

$t_1 = \frac{d_1}{V_o'}$

$t_2 = \frac{d_1}{V_c}$

and $W_x = -(t_1 - t_2)$

It was noted from the first arrival plots that the velocities varied considerably over the whole area. The low velocity varied from approximately 4500 ft./sec. to 9500 ft./sec. Where no low velocity was present, the only velocity observed was from 11,000 ft./sec. upwards. In some instances no break-over occured and thus no high velocity was evident on the plot. In such cases a V_2 was extrapolated from the end point of the spread, resulting in a minimum weathering correction. This change in velocities was most pronounced in the east-central part of the prospect, in the vicinity of Lines 25-12, [illegible]-13 and also on Line 25-7.

The weathering correction (one way time) was entered on the Tape Data Sheets in Columns 44 to 47. It was also entered in columns 61 and 62 (without the sign).

INTERPRETATION AND RESULTS

One horizon map, designated Hume Formation, is submitted with this report. Horizon values with total corrections applied have been picked from the seismic records, except on poor record areas and on the east end of Line 25-2, where correlated records were utilized instead. Previous year's data have been adjusted and incorporated with this season's work.

The reflection of the Hume Formation is the main strong event on the records. There appeared to be other reflections deeper in the section which could be mapped after Normal Move-Out, stacking and filtering have been applied to the data.

Poor record quality of the Hume reflection at places could be associated with deep weathering problems which in turn could be caused by faulting. Therefore the indicated fault on the east side of the prospect is conjectural. However, the fault cut, observed on the correlated record sections at SP 222 - 223, Line 25-1, is fair. The fault is down-thrown to the southeast. Two other possible faults are shown, one near the north end of Line 25-3 and the other on Line 25-3A. Both are down-thrown to the south.

The major feature of the prospect area is the anticlinal ridge, along the up-thrown side of the indicated fault. The ridge trends in northeast - southeast direction, plunging to the southwest and culminating at SP 511, Line 25-2, where a closed high is delineated.

On the north side of this anticlinal ridge the strike of the Hume formation is approximately northsouth and dip to the west. On the south side of the ridge the strike changes to the northeast-southwest, dip to the southeast.

A major synclinal entry, trending east-west, enters at the intersection of Lines 25-3 and 25-4. This syncline separates two east-west striking high noses with high closures delineated on these noses.

Another re-entrant is shown at the east end of Line 25-13, which could be partly due to a weathering problem. A low entry from the southwest is also seen at the intersection of Lines 25-10 and 25-1. A high area appears to be developing south of SPs 1930 to 2199, Line 25-7.

Apparent change of reflection character of the Hume reflector was observed on the correlated record section of Line 25-1, between SP 70 and 79, which could be associated with reefing.

RECOMMENDATIONS AND CONCLUSIONS

The results obtained with the combination vibroseis-conventional shooting technique were very encouraging and the data can be considered good. However, in the opinion of the writer, further improvement could be achieved by completely separating vibrating operations from the weathering shooting.

The reasons are both operational and economical. Each operation would be more simple as there would be less interference between the two methods. Weathering shooting would be also more flexible in case re-shooting were required due to rapidly changing weathering conditions or if any refraction shooting were contemplated. Only a small recording crew would be required for weathering shooting, and this crew could utilize portable cables and single refraction geophones. It is believed that overall production would increase with subsequent reduction of cost per mile.

Some good promising anomalies have been delineated on the Hume horizon. The best prospect appears to be centered at SP 511, Line 25-2, however, north closure is conjectural at the present time. Another area of interest, associated with the high ridge, is bounded approximately by Lines 25-10, 25-12, 25-6 and 25-11. It appears to be a flat plateau with small local highs. Further high closures have been delineated on the eastwest trending anticlinal ridges on the northern part of the prospect. One such closure is situated between Lines 25-1 and 25-2, west of Line 25-10, the other is on Line 25-4, west of Line 25-10. Another area of interest is indicated at the west end of Line 25-13, where high closures have been delineated.

Additional detail geophysical work is recommended in the area to define more accurately the anomalies outlined on the Hume horizon map.

Respectfully submitted

Hillar Anton

RAY GEOPHYSICAL LIMITED

APPENDIX A

STATISTICAL SUMMARY

Crew	MOC # 25 (Ray 854)
Period of Survey	January 10 to April 5, 1970

RECORDING

Vibrating

Vibrating Points	1551	
Number of Profiles	1544	
Miles of Line	173.191	
Weathering Profiles	14	
Weathering Miles of Line	3.5	

Shooting

Number of Shots	661	
Number of Profiles	643	
Miles of Line	160.750	
Dynamite Used	4040	lbs.
Caps Used	860	
Dynamite Per Shot	6.1	lbs.
Reversed Refraction Profile	2	miles
Recording Hours	700.25	
Driving Hours (Field)	139.0	
Days Operating	68	
Days Travel	10	

DRILLING

Holes Drilled	705	
Footage Drilled	14,203	ft.
Average Hole Depth	20.15	ft.

BULLDOZING

Hours Operating	1853.5
Miles of Line Cut	85

APPENDIX B

EQUIPMENT

Recording Instruments

Vibrating

Amplifier Type - Fortune T-4 SUM-IT (Mandrel)
Tape System - Ampex TM-7
Geophones - 96 strings of 18 geophones each, type EV-20A, 27 cps.
Cables - 24 Geospace CDP cables, 36-pair conductors
Techno Tape System - for Techno tape
Vibroseis Magnetic Correlator - (Applied Magnetics Corp.) and SIE PRO-11 Camera

Shooting

Amplifier Type - Geospace 111
Tape System - MFR-11
Motorola and Motrac Radios
Mandrel OPC and SPC remote firing units
Blaster - ETL, Model BC-8A

Vehicle Equipment

1 Recording Truck - International R192 A
3 Vibrators - 5 ton Wabco Y600B, mounted on International R190
1 Vibrator Support Truck - Dodge W300
1 Party Manager's Car - Travelall 4 x 4, International 1100
2 Reel Trucks - Dodge Power Wagon, W300
1 Shooting Truck - International 1200
2 Survey Trucks - Dodge Power Wagon 100
1 Supply Truck - Mercury 500

Drilling Equipment

1 Failing 1500 Holemaster - Sando Drilling Co.
1 Sewell Drill - Sando Drilling Co.
1 Water Truck - Sando Drilling Co.

Bulldozing Equipment

1 D6C Bulldozer - Estabrook Construction Ltd., Grimshaw, Alberta
2 D60E Bulldozers- Estabrook Construction Ltd., Grimshaw, Alberta

APPENDIX C

Transmittal of Data

All digital field tapes, all MFR-11 analog tapes, Vibroseis correlated records, seismic records (weathering, reflection, refraction), Weathering sections of Lines 25-1, 2, 3, 3A, 4, 5, 6, 7, 9, 11, 12, 13, OB reports, Shooter's reports, Drill logs, Survey Notes, Horizontal Traverse Computations, Observations of Polaris and the following maps have been submitted to the Geophysical Department of Mobil Oil Canada, Limited:

Base Maps 5 (Mylar)

Hume Formation - Sepia

Access Road Map - Sepia

Surface Elevation Map - Sepia

Survey Tie Map - Sepia

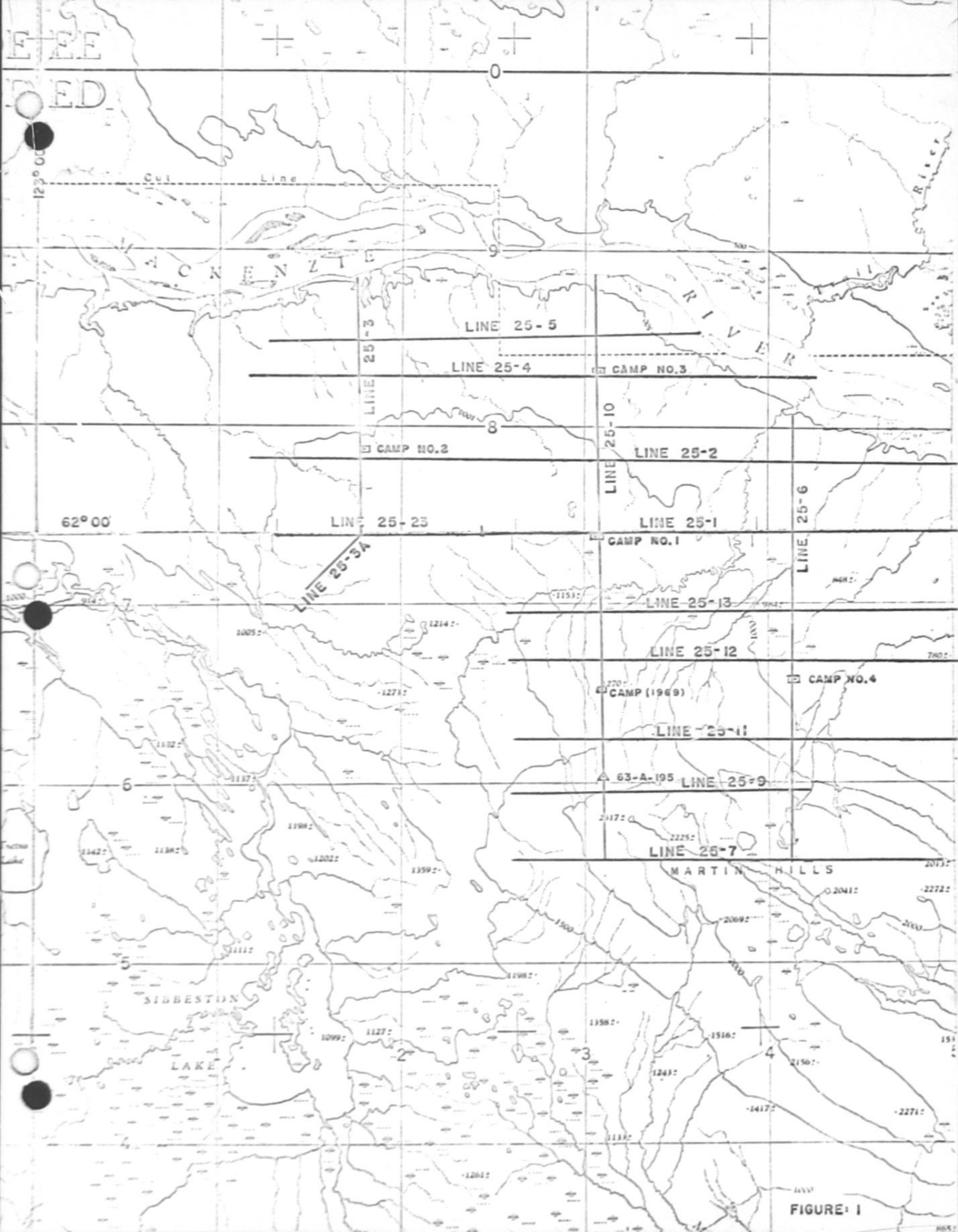
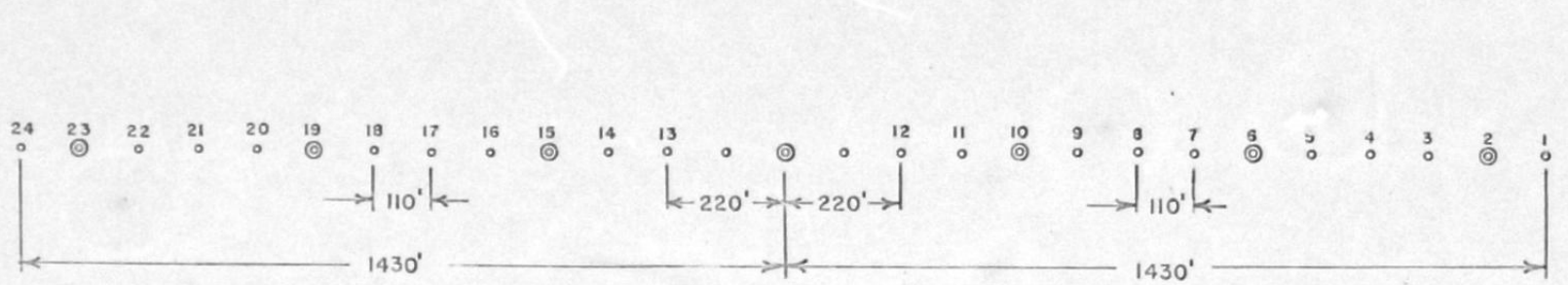

0
9
8
7
6
5
4
3
2
1
123° 00'
62° 00'
Cut Line
LINE 25-5
LINE 25-4
LINE 25-3
LINE 25-2
LINE 25-1
LINE 25-10
LINE 25-6
LINE 25-23
LINE 25-3A
LINE 25-13
LINE 25-12
LINE 25-11
LINE 25-9
LINE 25-7
CAMP NO.1
CAMP NO.2
CAMP NO.3
CAMP NO.4
CAMP (1969)
63-A-195
MACKENZIE
RIVER
MARTIN HILLS
SIBBESTON
LAKE

FIGURE 1

SPREAD AND GEOPHONE LAYOUT



GEOPHONE STATION

18 GEOPHONES AT 12 FT.

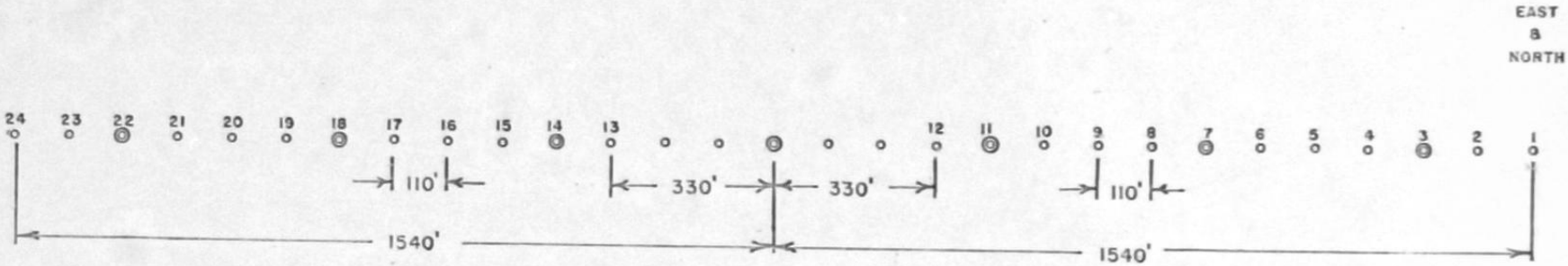
° GEOPHONE STATION

O VIBRATING POINT

• GEOPHONE

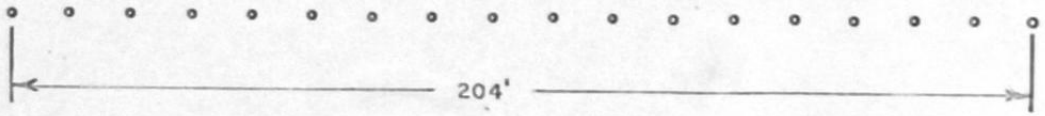
FIG. 2

SPREAD AND GEOPHONE LAYOUT



GEOPHONE STATION

18 GEOPHONES AT 12 FT.



∘ GEOPHONE STATION

O VIBRATING POINT

∘ GEOPHONE

FIG. 3

300 % CDP COVERAGE

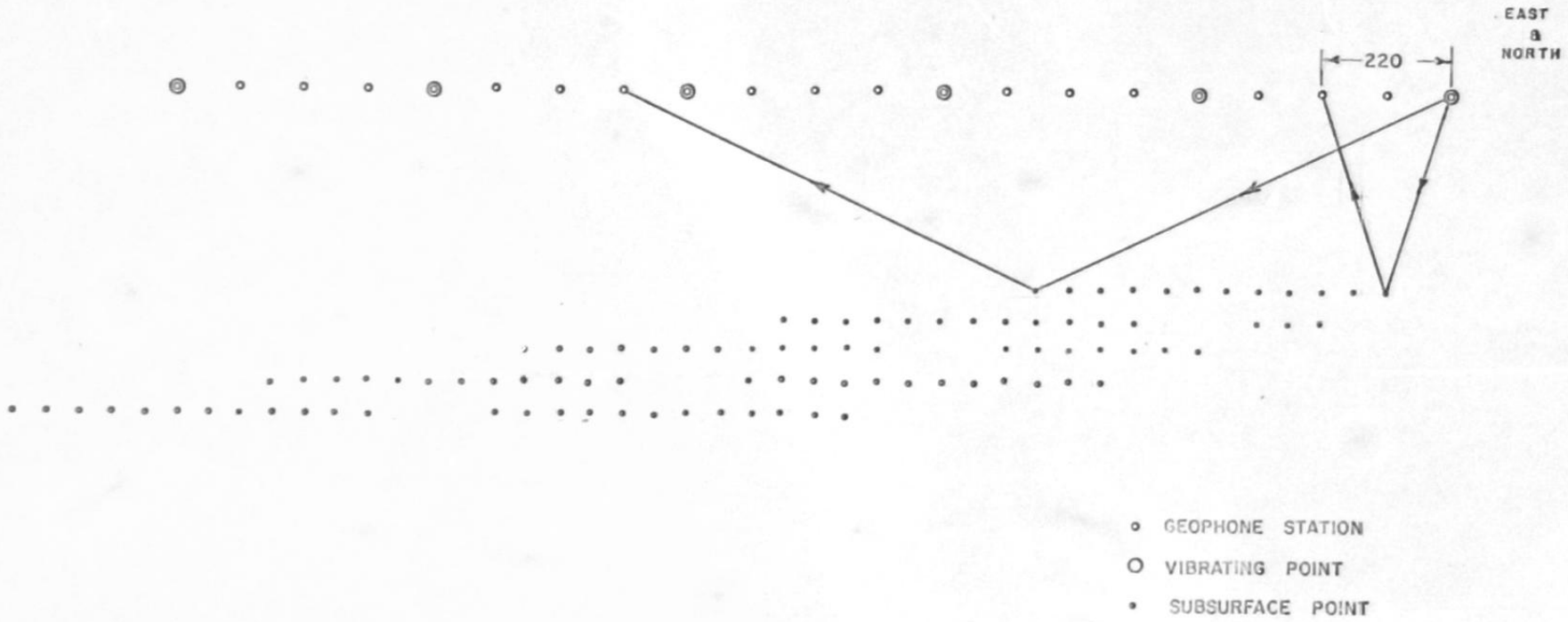


FIG. 4

300 % CDP COVERAGE

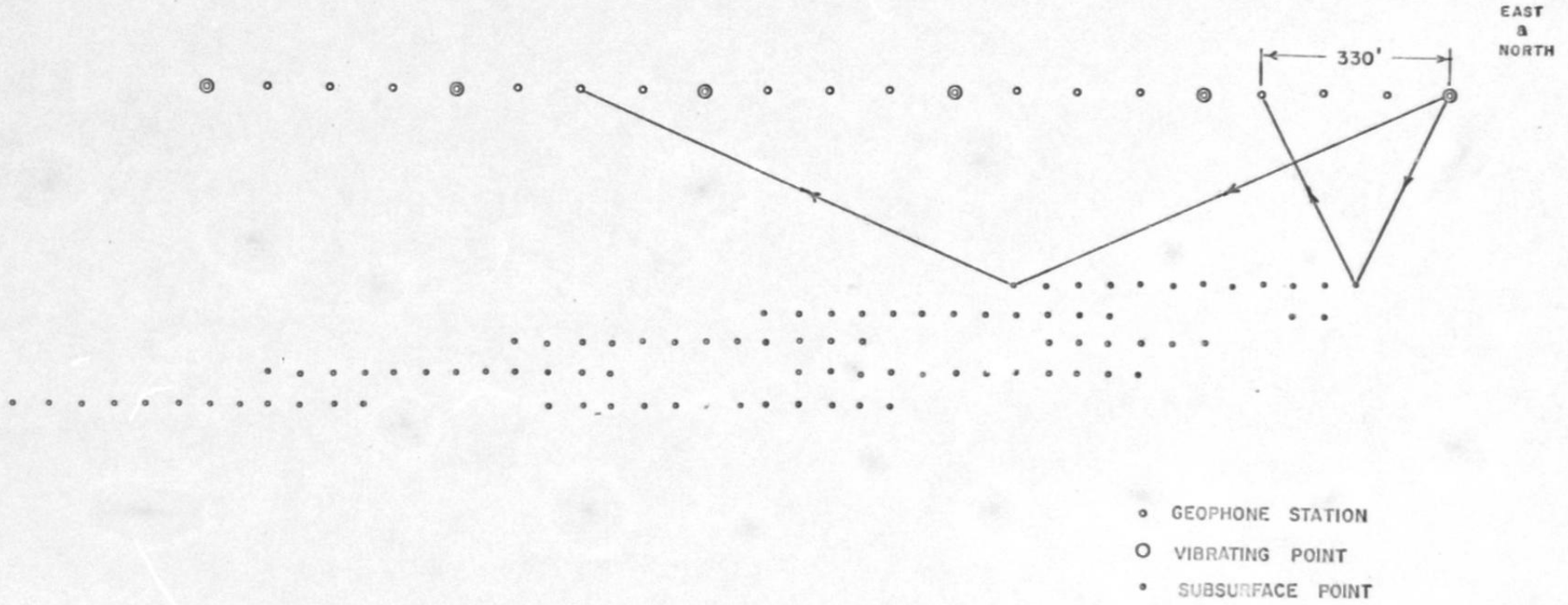
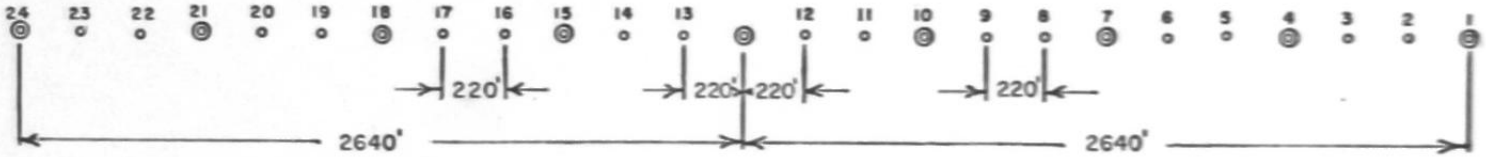


FIG. 5

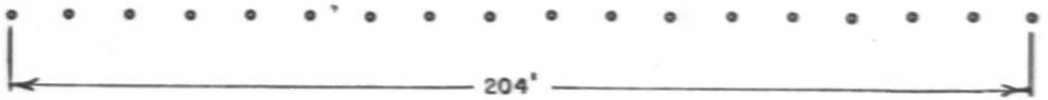
SPREAD AND GEOPHONE LAYOUT

EAST
&
NORTH



GEOPHONE STATION

18 GEOPHONES AT 12 FT.



- ∘ GEOPHONE STATION
- O VIBRATING POINT
- • GEOPHONE

FIG. 6

400% CDP COVERAGE

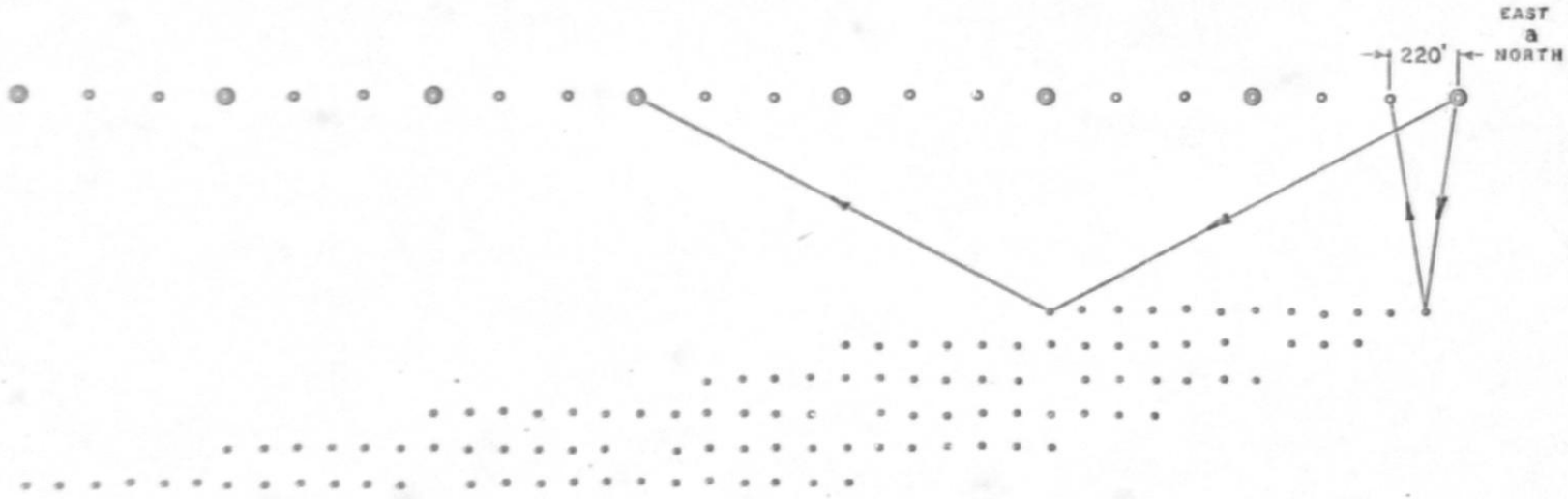
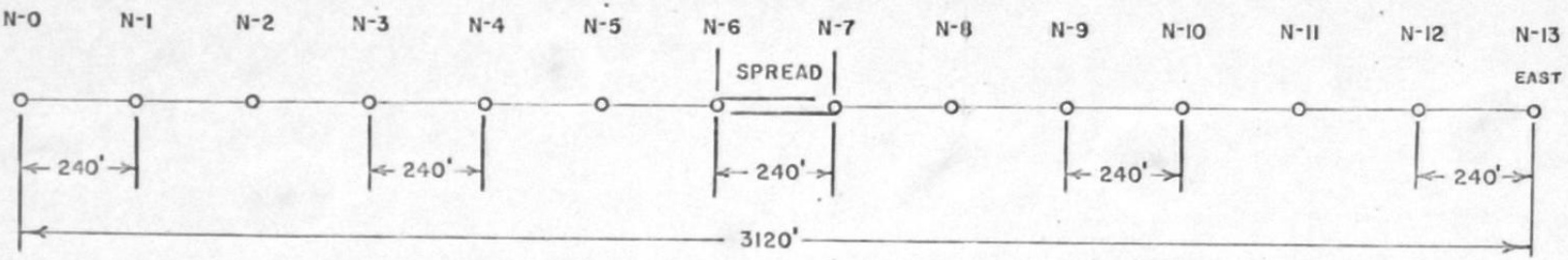


FIG. 7

NOISE SPREAD

SINGLE PHONES



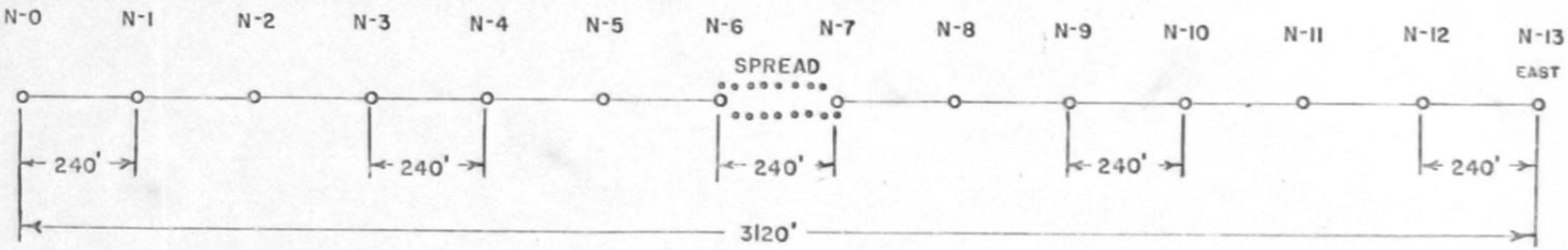
o VIBRATING POINT

——— GEOPHONE STATIONS 10' APART

FIG. 8

NOISE SPREAD

MULTIPLE PHONES



o VIBRATING POINT

• GEOPHONE STATIONS AT 30' APART
18 PHONES/STATION AT 204'

FIG. 9

1 of 1

MACKENZIE RIVER

TRAIL RIVER

2

MACKENZIE RIVER

TRAIL RIVER

25-10

25-5

25-4

25-6

25-2

25-2

25-2

25-2

71

80

10

71

80

10

71

62°10'

62°00'

122°30'

122°15'

122°00'

A SURVEY TIE POINT

MOBIL OIL CANADA, LTD.
CALGARY ALBERTA

N.W.T. - TRAIL RIVER

SURVEY TIE MAP

PARTY M.O.C.-25
RAY GEOPHYSICAL LTD.

SURVEYOR
M. THIEL
MAY 5, 1970

SCALE: 2" = 1 MILE

95 J

3 of 3

123°00'

122°45'

122°30'

62°30'

62°20'

7

80

10

71

b

a

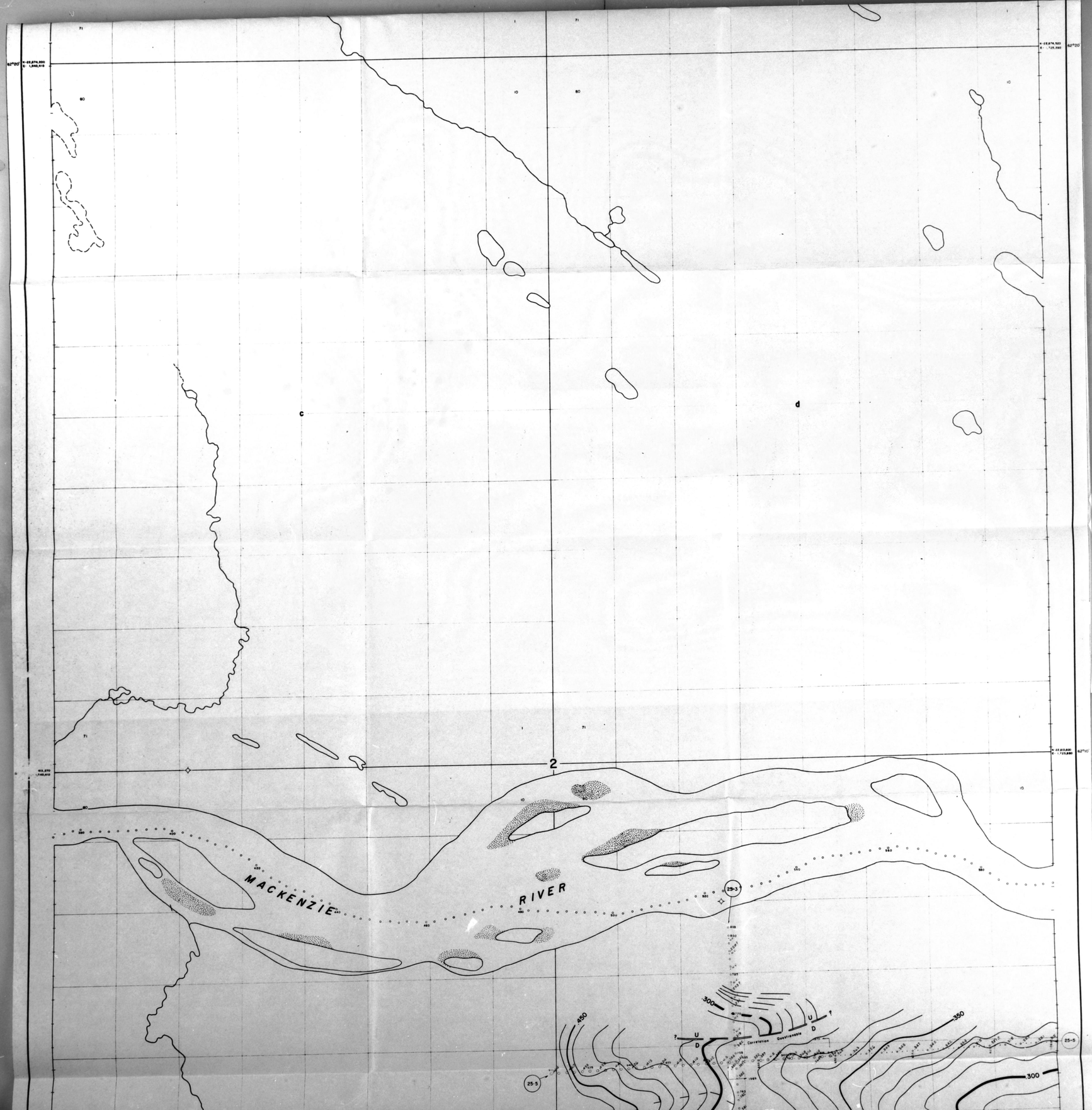
c

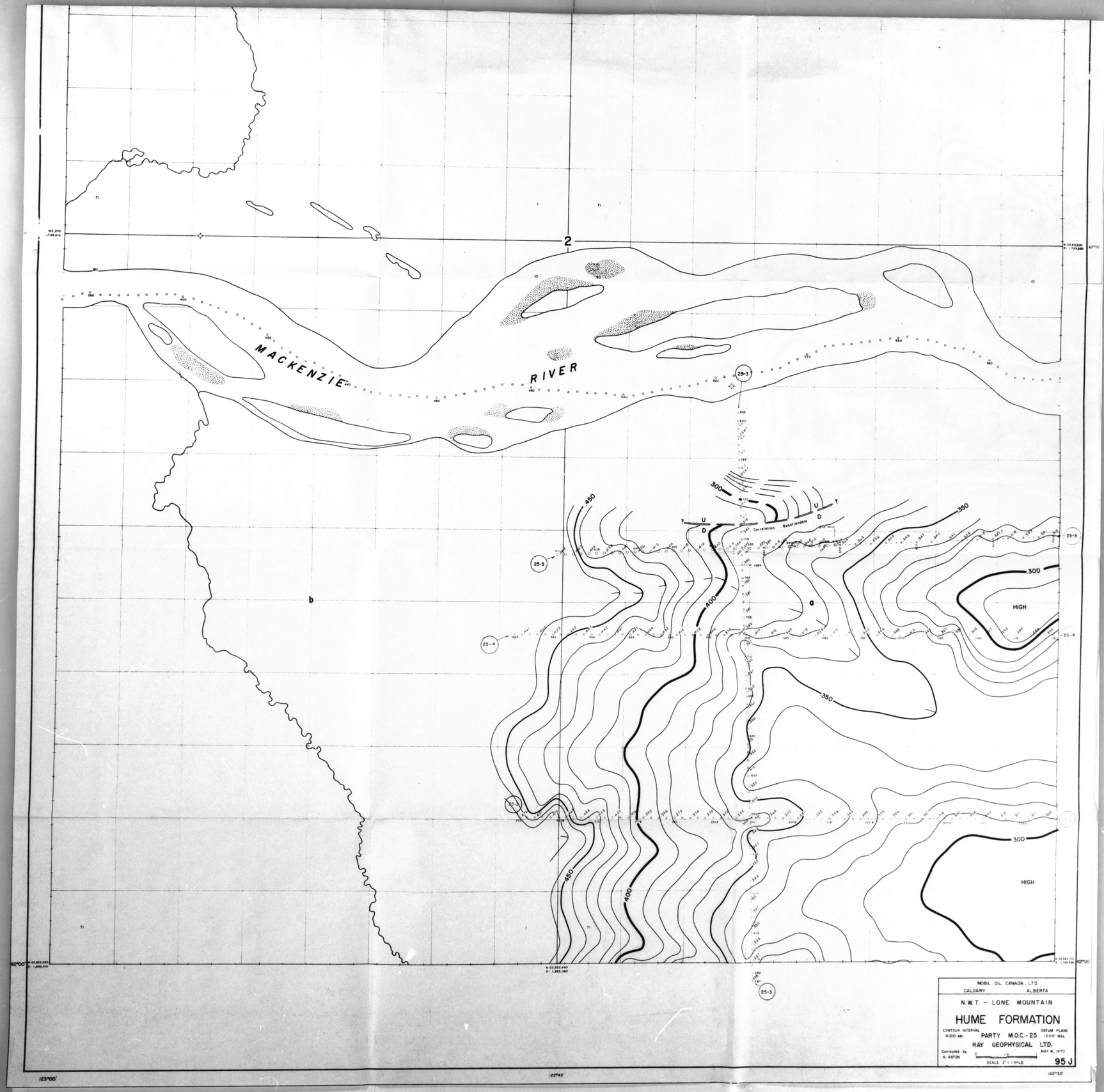
d

55-450

55-476

1 of


MACKENZIE
RIVER
2
25-3
25-5
300
350
450
Correlation Questionable
U
D



MOBIL OIL CANADA, LTD.
CALGARY ALBERTA

N.W.T. - LONE MOUNTAIN

HUME FORMATION

CONTOUR INTERVAL 0.010 sec. DATUM PLANE 1000 MSL

PARTY M.O.C.-25

RAY GEOPHYSICAL LTD.

Contoured By H. ANTON

MAY 8, 1970

SCALE 2" = 1 MILE

95 J

122°30'

122°15'

122°00'

62°30'

62°20'

8

a

b

c

d

1 of

c

d

MACKENZIE RIVER

TRAIL RIVER

HIGH

HIGH

U D

?

300

350

250

25-10

25-5

25-4

25-7

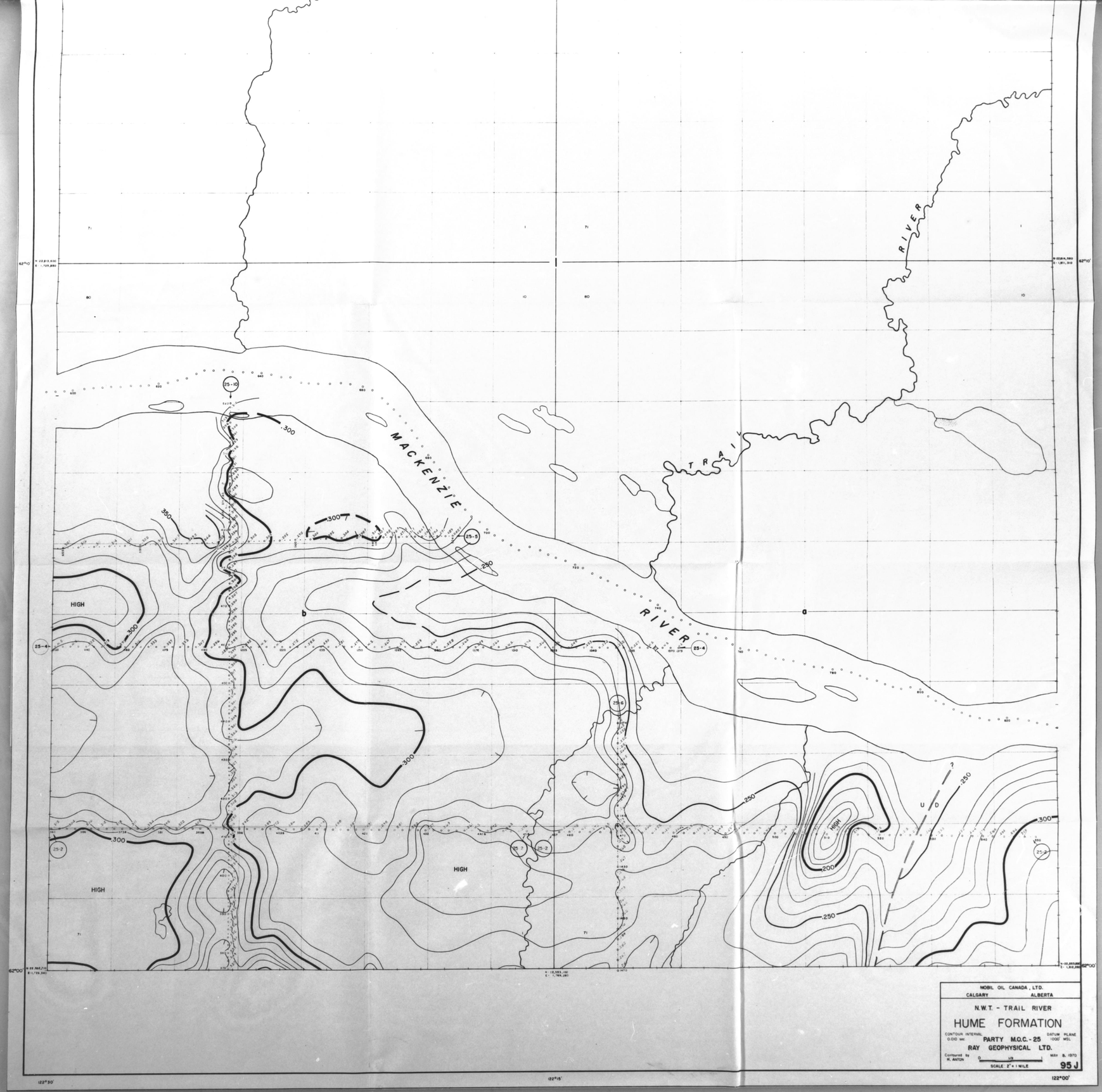
25-6

25-2

b

a

2



MOBIL OIL CANADA, LTD.
CALGARY ALBERTA

N.W.T. - TRAIL RIVER

HUME FORMATION

CONTOUR INTERVAL 0.010 sec | DATUM PLANE 1000' MSL

PARTY M.O.C. - 25
RAY GEOPHYSICAL LTD.

Contoured by H. ANTON | MAY 8, 1970

SCALE: 2" = 1 MILE

95 J

122°00'

122°40'

122°20'

62°20'

62°20'

J

7

80

10

80

10

b

a

55-430

440

450

55-440

55-470

71

71

80

10

80

10

d

1 of

MACKENZIE RIVER

c

d

2

b

a

25-2

25-3

25-4

25-5

CAMP SITE NO. 2

SEC.
T. 51 R. 25 W6M

2

MACKENZIE RIVER

MAIN ACCESS ROAD

CAMP SITE NO. 2

25-2 25-3 25-4 25-5

29-3

T.151 R.25 W6M

123°00' 122°45' 122°30'

LEGEND

NEW LINES CUT

OLD LINES PLOUGHED AND IMPROVED

OLD LINES PLOUGHED FOR ACCESS & SURVEY TIES

PRIOR I.O.L. PROGRAM

COMPILED BY K. THIEL — APRIL 1970

MOBIL OIL CANADA, LTD.
CALGARY ALBERTA

N.W.T. - LONE MOUNTAIN

ACCESS ROAD MAP

PARTY M.O.C.-25
RAY GEOPHYSICAL LTD.

SCALE 2" = 1 MILE

95 J

3 of 3

122°30'

122°45'

123°00'

62°00'

62°30'

TSETSO
LAKE

SIBBESTON
LAKE

25-3A

25-23

10

1 of

SIBBESTON

LAKE

b

a

c

d

MATOU

2

MATOU RIVER

MOBIL OIL CANADA, LTD.
CALGARY ALBERTA

N.W.T. - SIBBESTON LAKE

HUME FORMATION

CONTOUR INTERVAL 0.010

PARTY M.O.C.-25

DATUM PLANE 1000' MSL

RAY GEOPHYSICAL LTD.

CONTOURED BY H. ANTON

MAY 8, 1970

SCALE: 2" = 1 MILE

95 G

3 of 3

122°15'

122°00'

HIGH

300

350

250

a

b

c

d

1 of

HIGH?

MARTIN

2

MARTIN

RIVER

c

d

8

MOBIL OIL CANADA, LTD
CALGARY ALBERTA

N.W.T. - MARTIN RIVER

HUME FORMATION

CONTOUR INTERVAL 0.005 sec

PARTY M.O.C. - 25

RAY GEOPHYSICAL LTD.

DATUM PLANE 1000 MSL

CONTOURED BY HAMILTON

MAY 8, 1970

SCALE 2" = 1 MILE

95 G

122°30'

122°15'

122°00'

3 of 3

123°00'

122°45'

122°30'

62°00'

25-1

25-23

25-3A

80

10

c

d

TSETSÒ

LAKE

62°50'

SIBBESTON

1 of

SIBBESTON

LAKE

MATOU

a

b

c

d

MATON RIVER

MOBIL OIL CANADA, LTD.
CALGARY ALBERTA

N.W.T. - SIBBESTON LAKE

SURFACE ELEVATIONS

PARTY M.O.C.-25
RAY GEOPHYSICAL LTD.

SURVEYOR K. THIEL

SCALE 2" = 1 MILE

MAY 8 1970

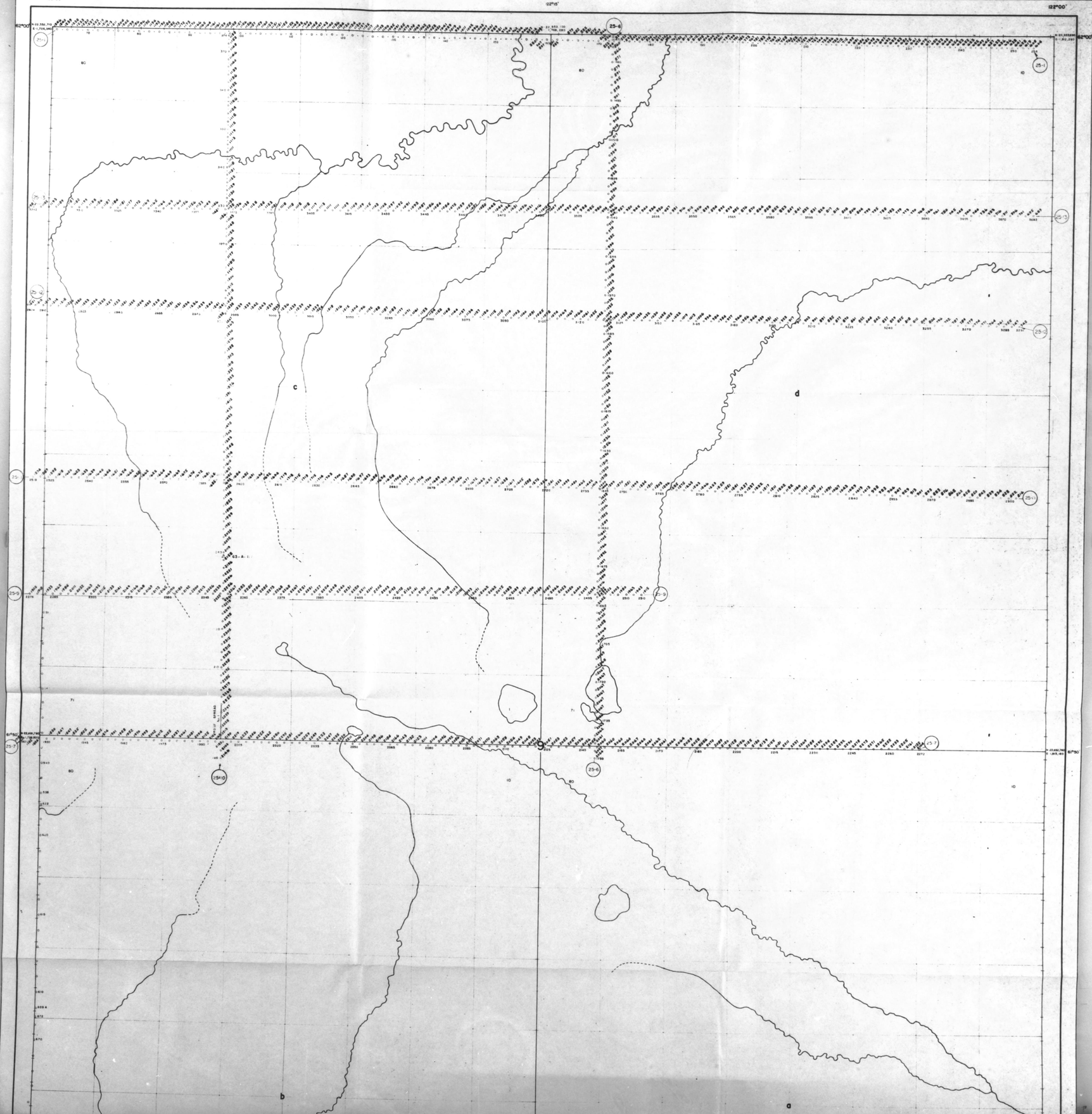
95 G

3 of 3

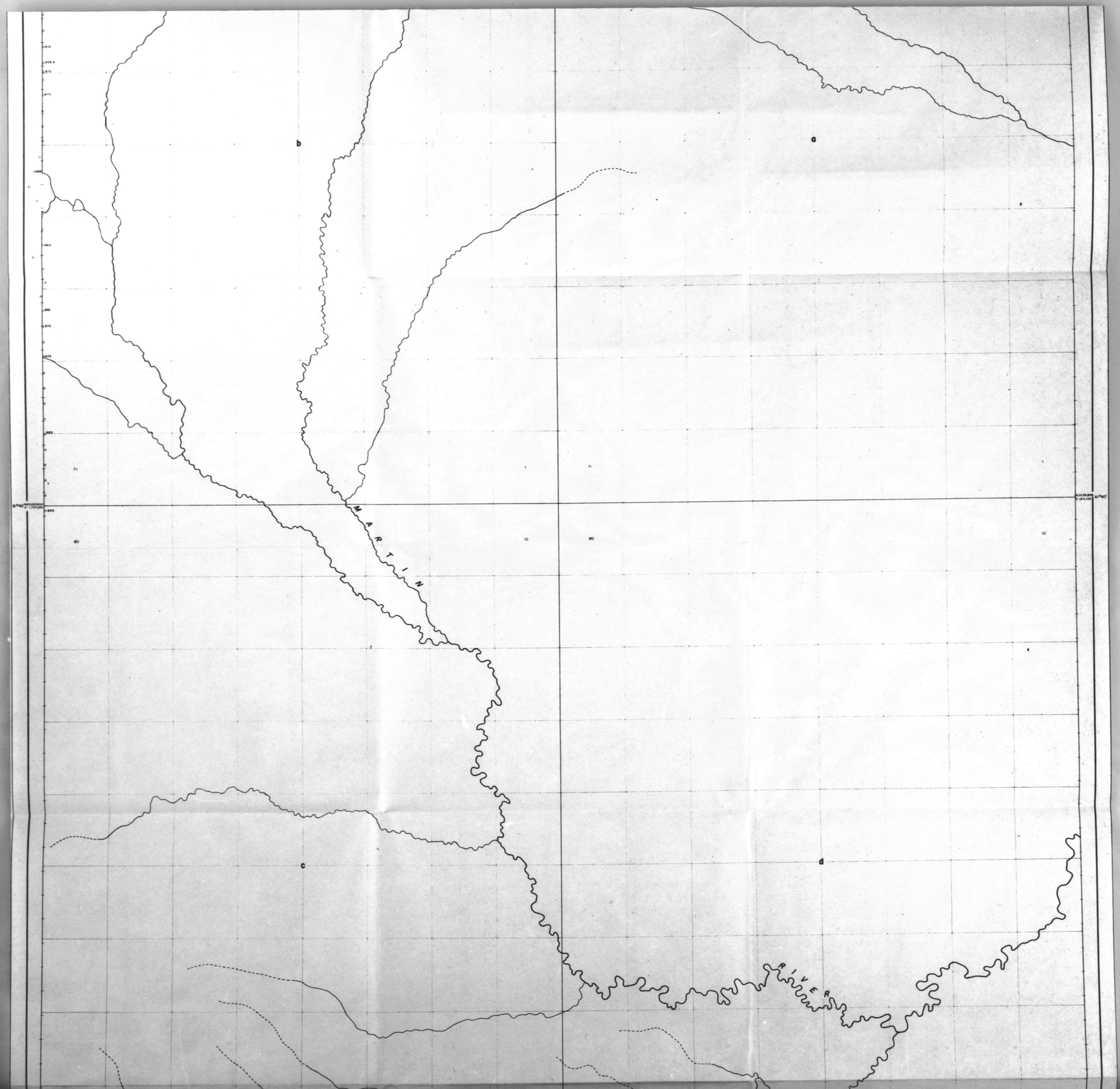
22°30'

22°15'

22°00'



1 of


MARTÍN
PÍVER

MARTIN

RIVER

MOBIL OIL CANADA, LTD.
CALGARY ALBERTA

N.W.T. - MARTIN RIVER

SURFACE ELEVATIONS

PARTY 1400 C. - 25
RAY GEOPHYSICAL LTD.

SURVEYOR K. THIEL

SCALE: 2" = 1 MILE

MAY 8, 1970

95 G

122°30'

122°15'

122°00'

3 of 3

122°30'

122°15'

122°00'

62°30'

62°20'

8

b

a

1 of

c

d

a

b

MACKENZIE RIVER

TRAIL RIVER

CAMP SITE NO. 3

25-10

25-9

25-4

25-6

71

80

10

2

MACKENZIE RIVER

TRAIL RIVER

25-10

25-5

25-4

25-6

25-7

25-2

CAMP SITE NO. 3

WATER ROAD

62°10'

62°00'

122°30'

122°15'

122°00'

LEGEND

NEW LINES CUT

OLD LINES PLOUGHED AND IMPROVED

OLD LINES PLOUGHED FOR ACCESS & SURVEY TIES

PRIOR I.O.L. PROGRAM

COMPILED BY K.THEIL — APRIL 1970

MOBIL OIL CANADA, LTD.
CALGARY ALBERTA

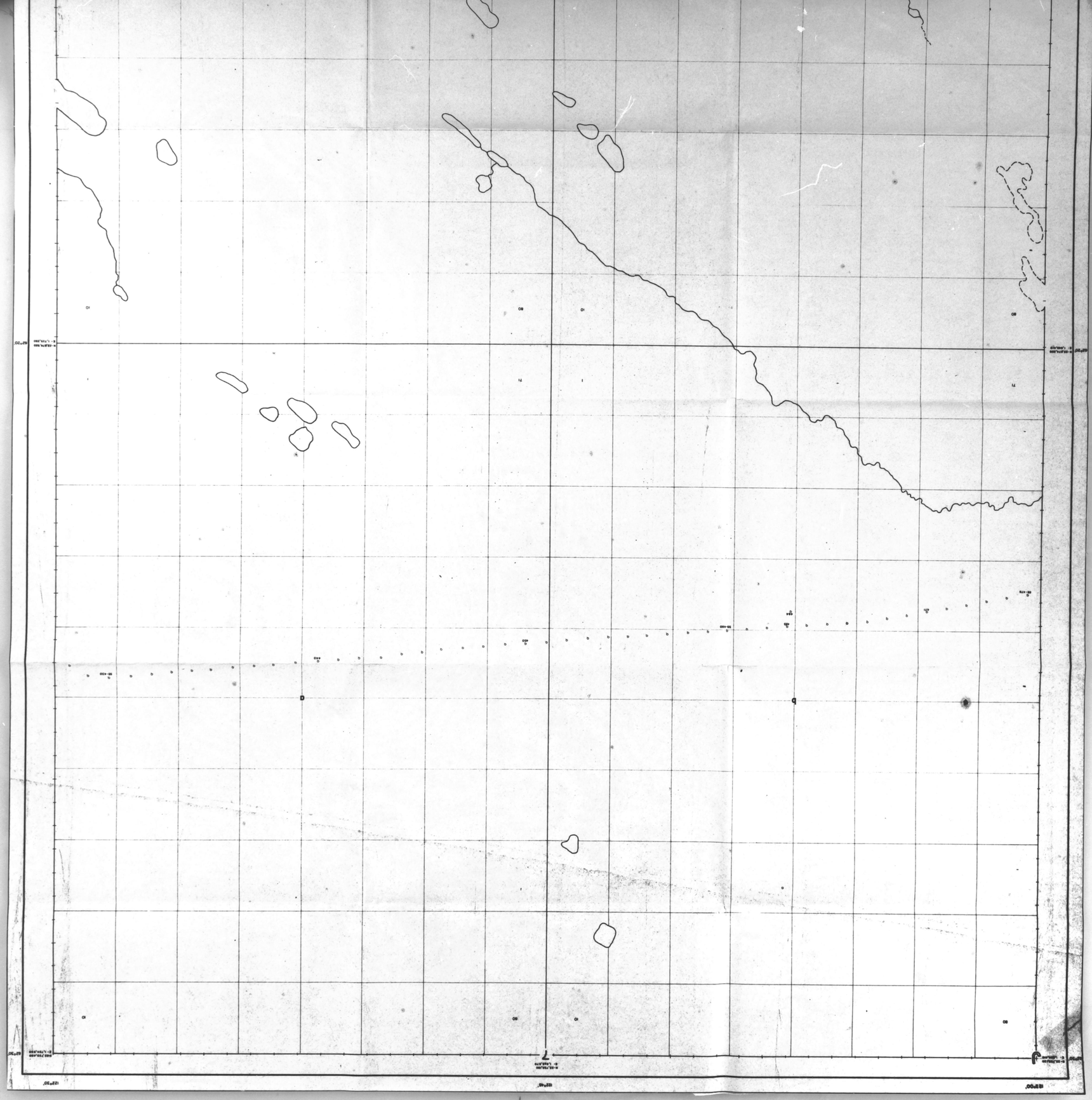
N.W.T. - TRAIL RIVER

ACCESS ROAD MAP

PARTY M.O.C.-25
RAY GEOPHYSICAL LTD.

SCALE 2" = 1 MILE

95 J



MACKENZIE RIVER

2

29-3

25-5

25-4

25-2

c

d

b

a

MACKENZIE RIVER

25-3

25-5

25-4

25-2

25-6

MOBIL OIL CANADA, LTD.
CALGARY ALBERTA

N.W.T. - LONE MOUNTAIN

SURFACE ELEVATIONS

PARTY M.O.C.-2D
RAY GEOPHYSICAL LTD.

SURVEYOR K. THIEL

SCALE: 2" = 1 MILE

MAY 6, 1970

95 J

123°00'

122°45'

122°30'

62°00'

3 of 3

123°00'

122°45'

122°30'

62°00'

25-1

25-23

25-3A

MAIN ACCESS ROAD

TSETSO LAKE

SIBBESTON

10

62°00'

SIBBESTON

LAKE

b

a

c

d

MATOU

MATOU

RIVER

LEGEND

NEW LINES CUT

OLD LINES PLOUGHED AND IMPROVED

OLD LINES PLOUGHED FOR ACCESS & SURVEY TIES PRIOR I.O.L. PROGRAM

COMPILED BY K.THIEL — APRIL 1970

MOBIL OIL CANADA, LTD.
CALGARY ALBERTA

N.W.T. - SIBBESTON LAKE

ACCESS ROAD MAP

PARTY M.O.C.-25
RAY GEOPHYSICAL LTD.

SCALE: 2" = 1 MILE

95 G

3 of 3

122°30'

122°15'

122°00'

CAMP SITE NO. 1

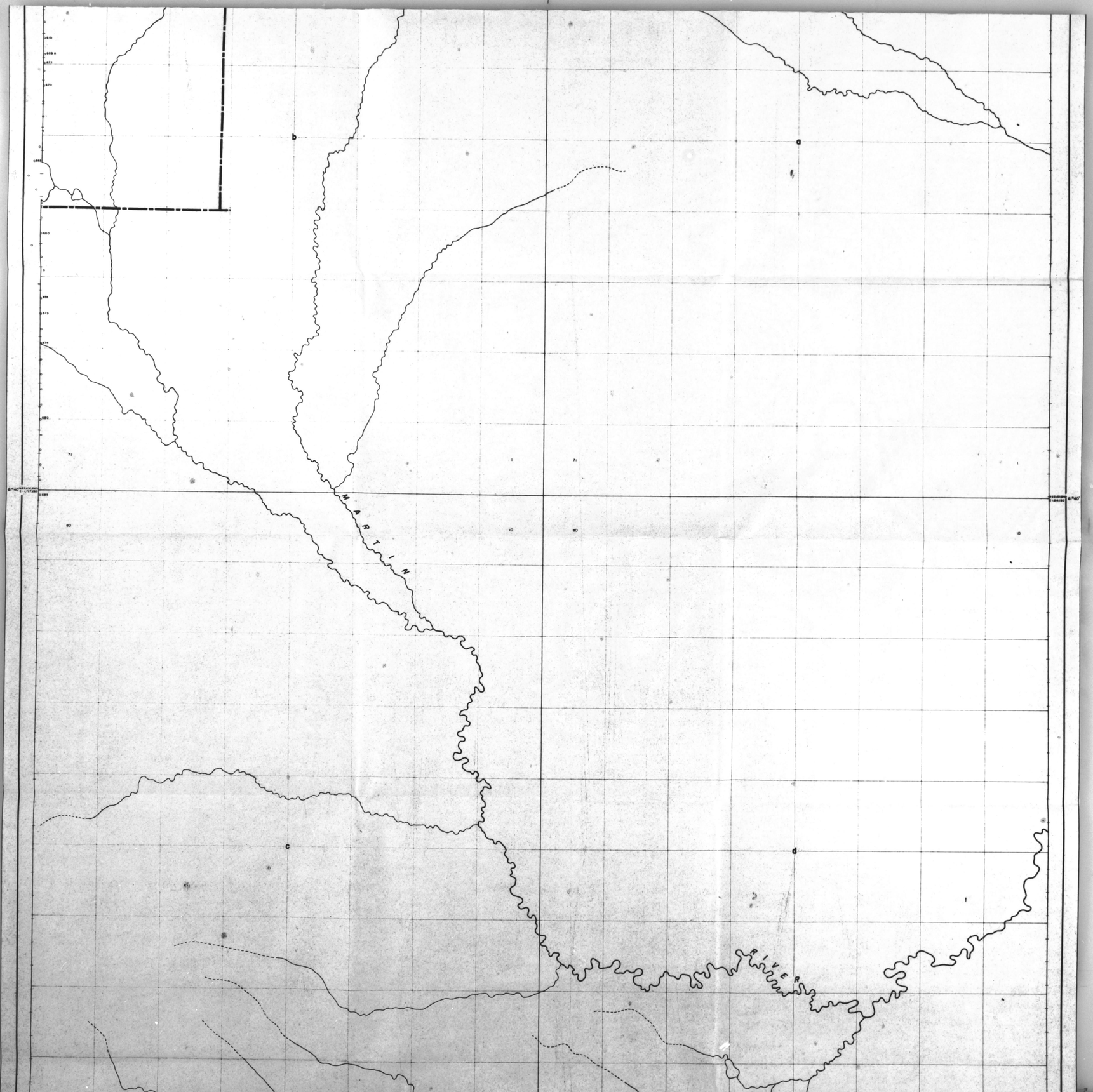
CAMP SITE NO. 4

MAIN ACCESS ROAD

To Fort Simpson

NOT SHOT — NO DETOUR INFORMATION AVAILABLE FOR THIS SECTION OF LINE

1 of


MARTIN
RIVER

MARTIN

RIVER

LEGEND

NEW LINES CUT

OLD LINES PLOUGHED AND IMPROVED

OLD LINES PLOUGHED FOR ACCESS & SURVEY TIES PRIOR I.O.L. PROGRAM

COMPILED BY K.THIEL — APRIL 1970

MOBIL OIL CANADA, LTD.
CALGARY ALBERTA

N.W.T. - MARTIN RIVER

ACCESS ROAD MAP

PARTY #O.C.-25
RAY GEOPHYSICAL LTD.

SCALE: 2" = 1 MILE

9/16

959

3 of 3

123°00'

122°45'

122°30'

62°00'

62°00'

25-1

25-23

25-3A

TSETSO

LAKE

SIBBESTON

LAKE

10

a

b

c

d

61°30'

61°30'

1 of

SIBBESTON

LAKE

b

a

c

d

71

80

10

2

c

d

HATOU

RIVER

7

SURVEY TIE POINT

MOBIL OIL CANADA, LTD.
CALGARY, ALBERTA

N.W.T. - SIBBESTON LAKE

SURVEY TIE MAP

PARTY M.O.C.-25

SURVEYOR
K. THIEL
MAY 6, 1970

RAY GEOPHYSICAL LTD.

SCALE: 2" = 1 MILE

95 G

123°00'

122°45'

122°30'

3 of 3

122°30'

122°15'

122°00'

62°00'

62°50'

25-1

25-6

25-13

25-12

25-11

25-9

25-7

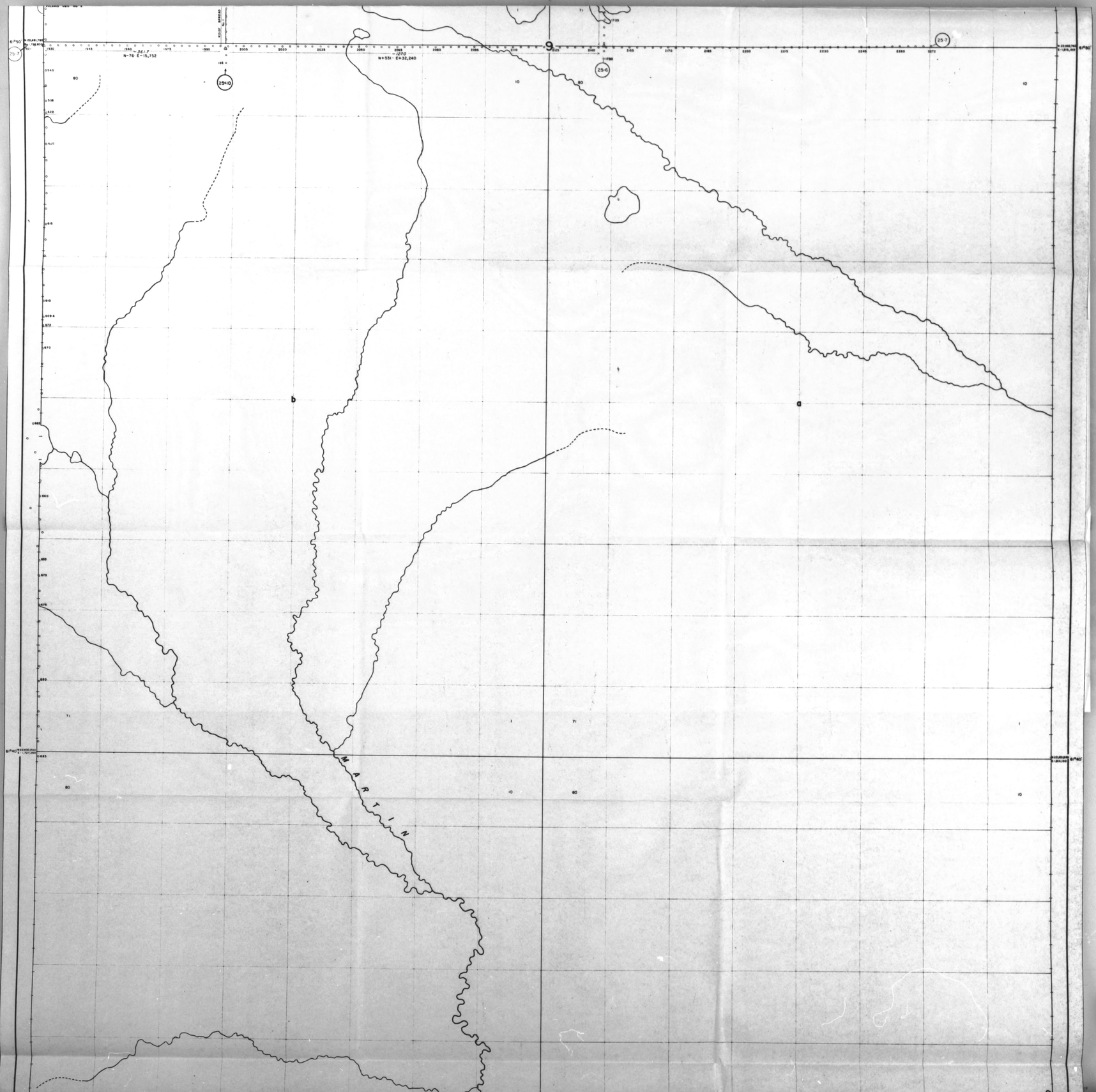
25-10

9

c

d

1 of


MARTIN

MARTIN

RIVER

MOBIL OIL CANADA, LTD.
CALGARY ALBERTA

N.W.T. - MARTIN RIVER

SURVEY TIE MAP

PARTY 140 C. - 25

SURVEYOR RAY GEOPHYSICAL LTD.

K. FAIEL

MAY 6, 1970

SCALE: 2" = 1 MILE

95 G

△ SURVEY TIE POINT

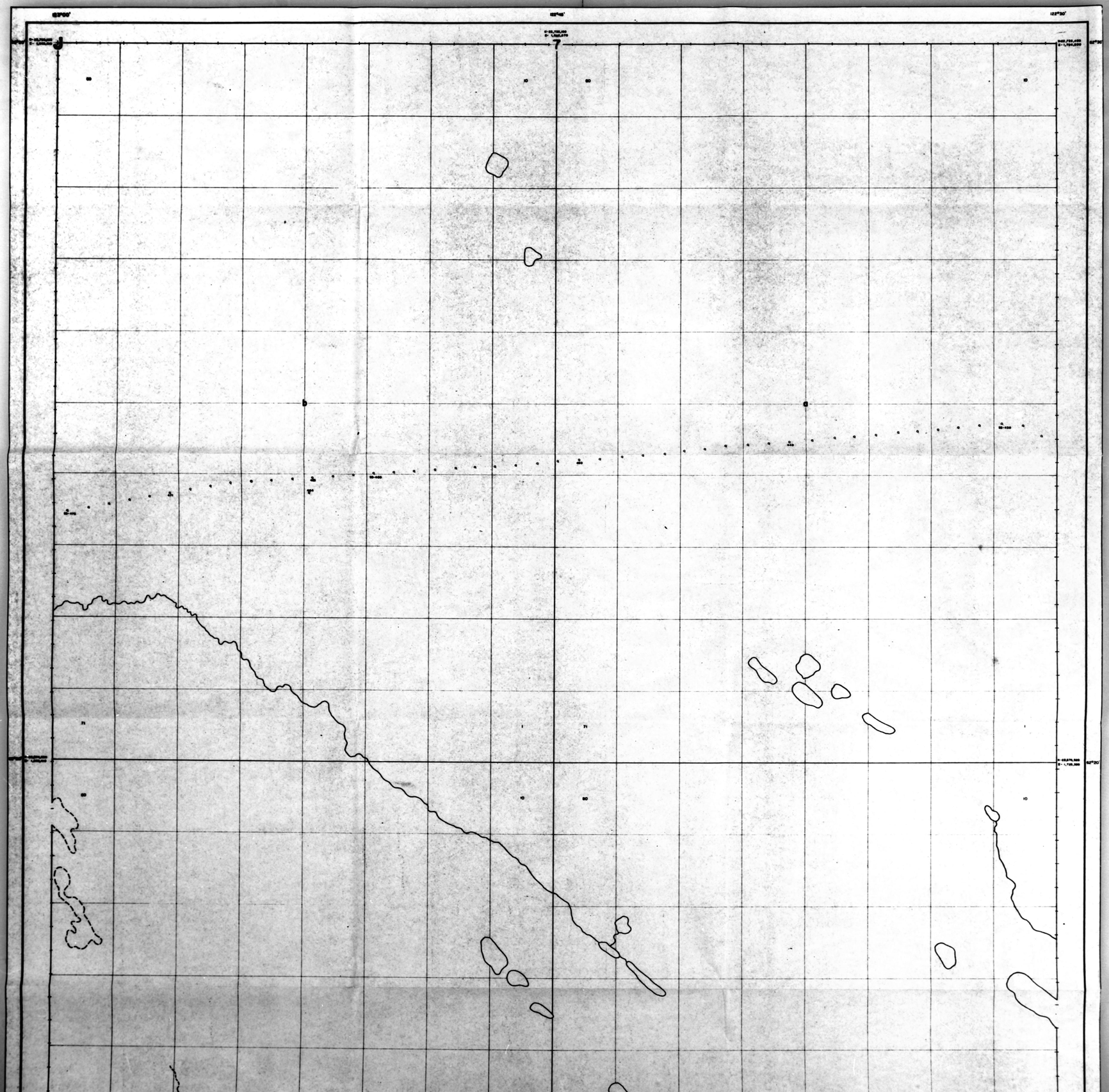
122°30'

122°15'

122°00'

3 of 3

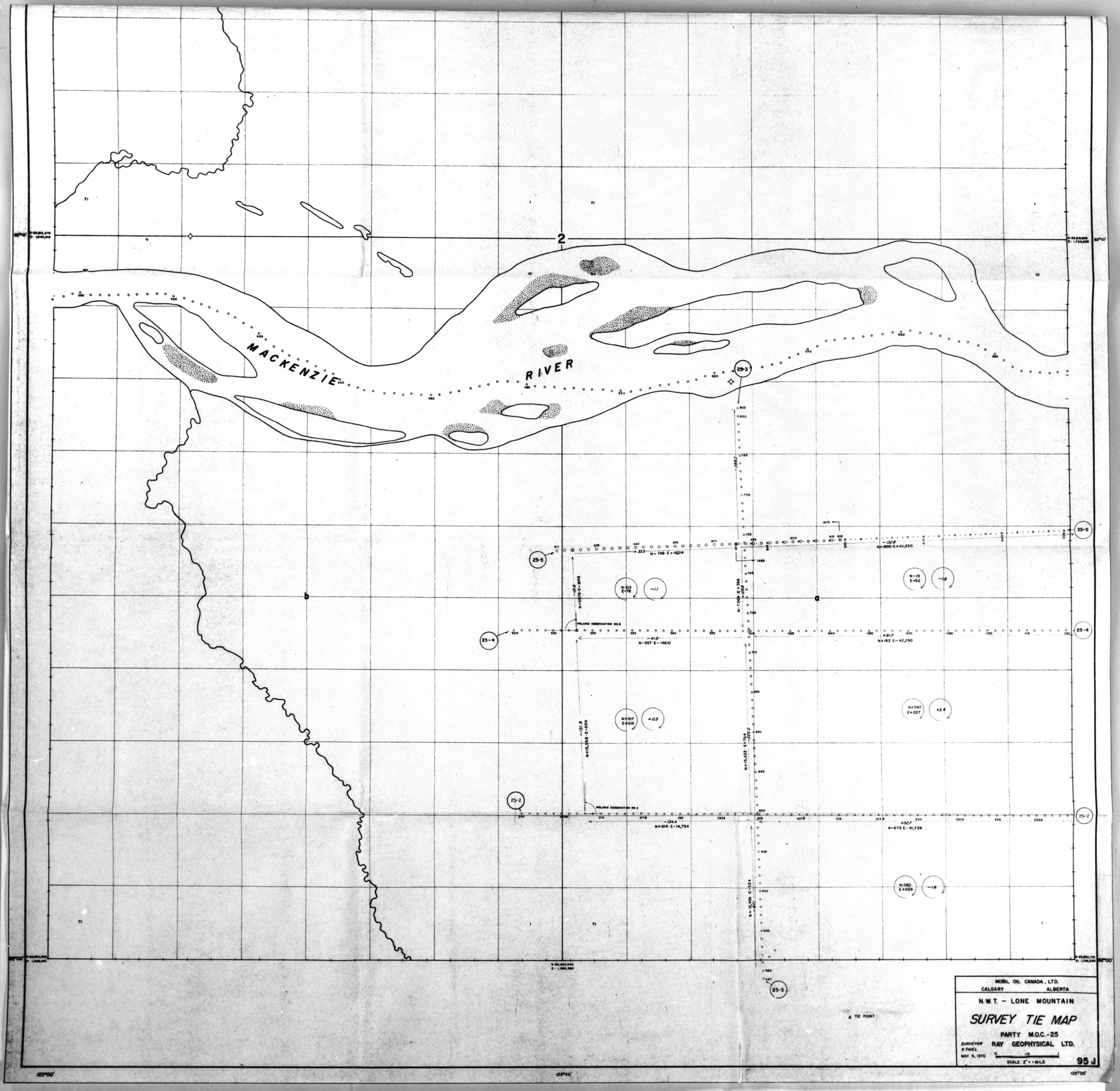
SURVEY



MACKENZIE RIVER

2

2


MACKENZIE RIVER
25-5
25-4
25-3
25-2
POLARIS OBSERVATION NO 3
POLARIS OBSERVATION NO 2
N+748 E+16214
N-057 E-14610
N+014 E-14,754
N-673 E-41,728
N+182 E-42,290
N+1900 E+42,550
TIE POINT
MOBIL OIL CANADA, LTD.
CALGARY ALBERTA
N.W.T. - LONE MOUNTAIN
SURVEY TIE MAP
PARTY M.O.C.-25
SURVEYOR R.THIEL
RAY GEOPHYSICAL LTD.
MAY 11, 1970
SCALE 2" = 1 MILE
95 J
123°00'
122°45'
122°30'
62°00'

3 of 3