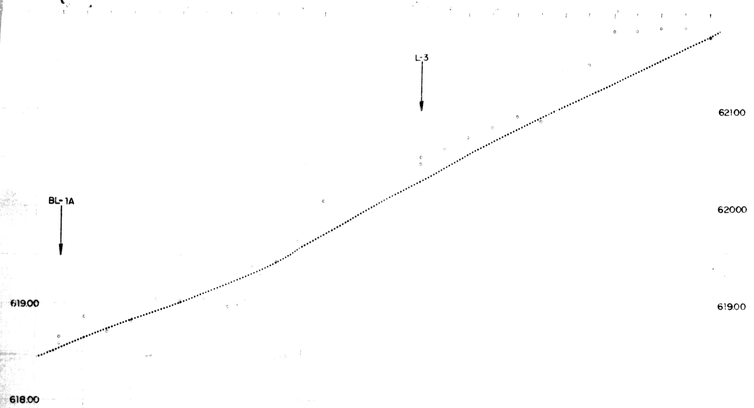
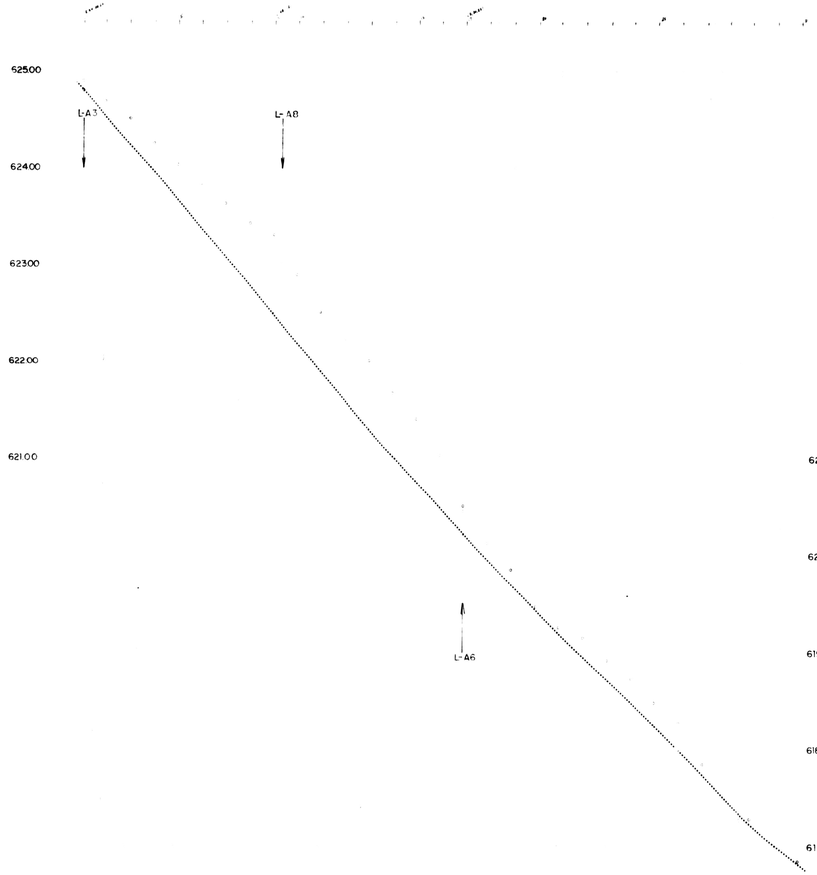
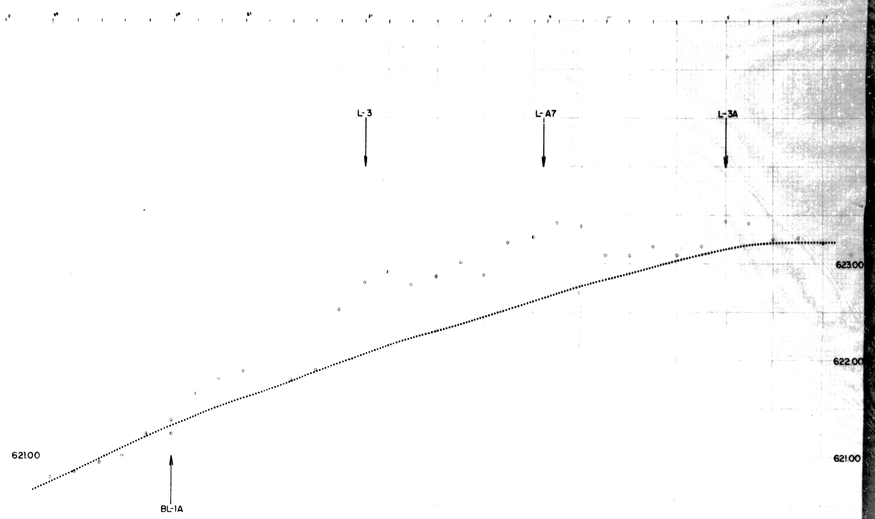
KELLER L. EXT
LINE A-6

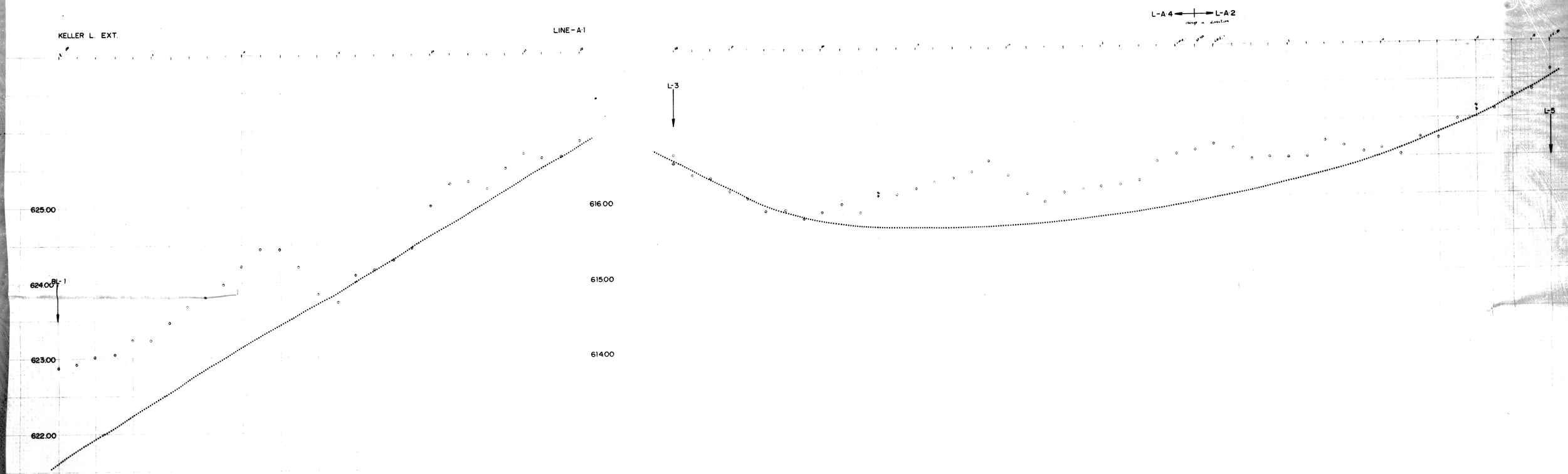


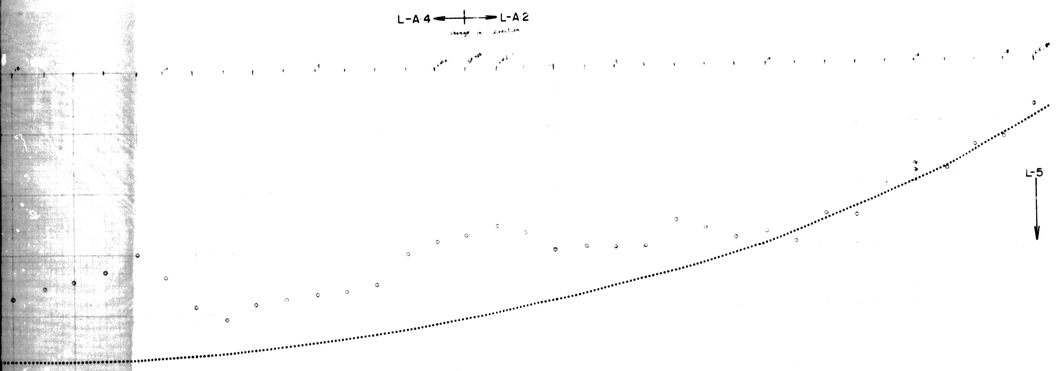
LINE A-7

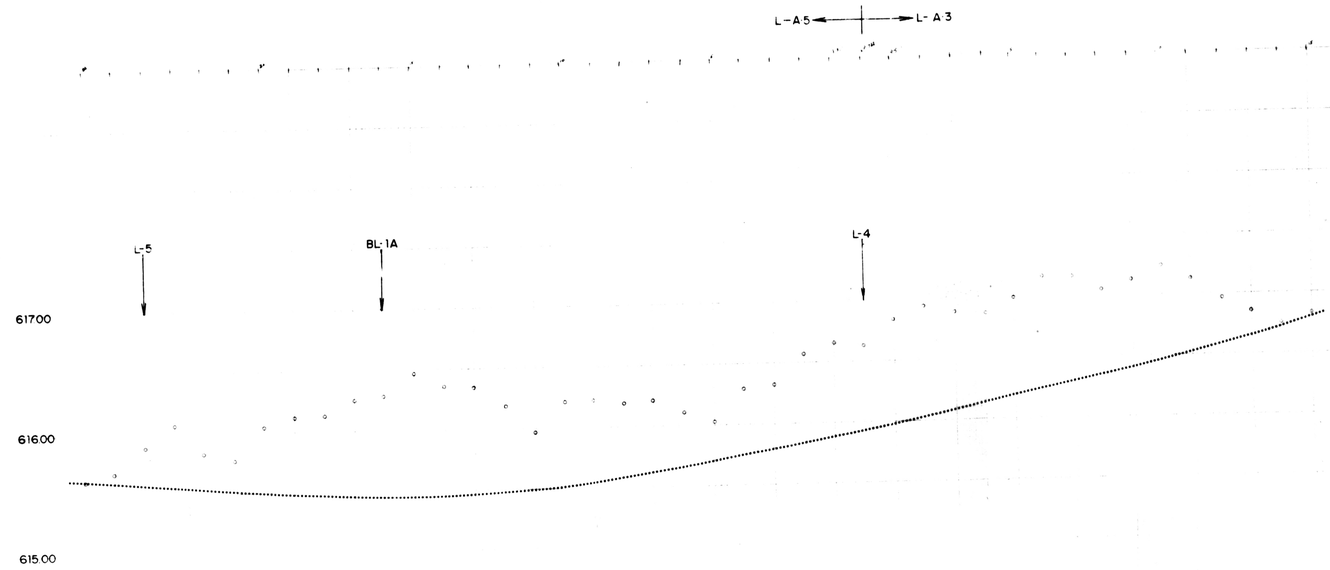


LINE A8




KELLER L. EXT.
LINE-A-1
L-A-4
L-A-2
change in direction
L-3
L-5
BL-1
625.00
624.00
623.00
622.00
616.00
615.00
614.00


L-A 4
L-A 2
L-5


L-A 5
L-A 3
L-5
BL-1A
L-4
617.00
616.00
615.00

DETAILED GRAVITY SURVEY

KELLER LAKE AREA, N. W. T.
FOR
CANADIAN RESERVE OIL AND GAS LTD.
BY:
OVERLAND EXPLORATION
SERVICES (1969) LTD.

GRAVITY SURVEY

KELLER LAKE AREA, N.W.T.

DETAILED

GRAVITY SURVEY

in the

KELLER LAKE AREA, N.W.T.

for

CANADIAN RESERVE OIL and GAS LTD.

by

OVERLAND EXPLORATION
SERVICES (1969) LTD.

INTRODUCTION

In late September and early October of 1970, Overland Exploration Services (1969) Ltd., conducted a detailed gravity survey northwest of Keller Lake, N.W.T., for Canadian Reserve Oil and Gas Ltd. This survey was designed to detail three gravity anomalies which appear on the original Keller Lake Gravity Survey (Map Sheet No. 2) and labelled anomalies "A", "C" and "G".

The Overland crew camped on a lake adjacent to Base Line 1-A at the edge of anomaly "C". A fixed-wing aircraft moved the tent camp to this position from Yellowknife and started to supply them with helicopter fuel and food. However, an early freeze-up of this lake (three days after move in) prohibited further flights to this lake and a second base had to be established on Keller Lake. Helicopter fuel and food were placed on the shore of this larger lake and

ferried to the No. 1 Campsite by the helicopter. This early freeze-up and the consequent use of the helicopter to supply the camp nearly doubled the estimated helicopter costs for this program.

The line cutters and survey crew were moved from camp to the work area in the morning and from work point to camp at night by the helicopter.

Towards the completion of the job the entire Overland camp was moved to Keller Lake. This was done so that when it became obvious that Keller Lake itself would soon freeze the crew could call for an aircraft and be removed by a float-equipped aircraft rather than by helicopter.

SURVEY & FIELD PROCEDURE

The lines were tied to the initial project both horizontally and vertically using the same perameters of closure and adjustment as were used in the original work. The gravity work was similarily tied to the original work and used those stations which could be found at line intersections, thus insuring an integration between both surveys.

INTERPRETATION

"A" ANOMALY

The extension work done on the "A" anomaly has confirmed it to be an isolated gravity high which reaches a magnitude of 0.70 milligals. As in the original work we are using the basic assumption that the gravity highs seen in the "A" and "C" anomalies are topographic highs on the top of the dense Devonian carbonate section. By using a moderate density contrast between the Devonian carbonates and the overlying shale we calculate that the total anomalous mass is in the order of 300 to 400 feet thick. The depth-to-source of the excessive mass forming the anomaly is a maximum of 2,600 feet below surface and by removing half the mass thickness we find that the depth-to-top of the anomaly should be about 2,400 feet below surface. All of these depth calculations are made using maximum conditions, which generally means that if the actual depth differs from the calculations it is usually found to be shallower. We estimate that

the depth to the top of the Devonian of the "A" anomaly will be somewhere between 2,000 and 2,400 feet below surface.

The detailed worked out on the "C" anomaly shows that this gravity positive feature is really two gravity highs which are separated by a saddle. The individual highs attain a magnitude of 0.80 and 0.90 milligals. We find almost identical results from the model studies conducted on the "C" anomaly as those we obtained from the "A" anomaly. The only varience is that the "C" anomaly calculates to be 200 feet shallower and slightly thicker. Until physical investigation has been undertaken on these anomalies we have to say that the attitudes of both causative masses are very similar and are probably sourced from similar causes.

The short line run across the central area of the "G" anomaly east of Base Line No. I has been most helpful in outlining the features of this gravity positive. The cross lines on the "G" anomaly from the original

work (Lines No.'s 7 and 8) both appear to be in a flank position on the anomalies. The new line crosses the "G" anomaly where it attains its greatest magnitude and clearly defines its western flank. We now confidently say the "G" anomaly is sourced at 1,200 feet below surface and is quite possibly a topographic feature on top of the dense limestone of the Devonian section.

The current detail work suggests that the gravity anomalies which we have seen in the deeper part of the section ("A", "B", "C", "D", etc.) are probably much smaller in areal extent than originally shown on the reconnaissance work. The detail lines have cut the "A" and "C" anomalies into small positive features which are probably 1 to 2 square miles in area. If these anomalies relate to reef build-up on the Devonian, we can expect to encounter pinnacle-like targets, which probably have no connection.

Further work must be done along the west side of the mapped area where a suspected reefal front was encountered in the original work. The continuance of the main gravity positive from line to line in this area leads us to believe that it is indeed a continuous density feature which is the causative mass. However, intermediate lines must be run between the lines run in the winter of 1969 in order to prove this fact. If drilling is to be done in this area we feel that the test hole should be placed on the "G" anomaly. Such a hole would have to be only 1,000 to 1,200 feet deep in order to test the top of the Devonian. The cost of such a hole would be quite minimal compared to the information such a hole would provide if reef build-up were encountered.

Respectfully submitted by:

OVERLAND EXPLORATION
SERVICES (1969) LTD.

Pact.

W.T. SALT

WTS/jp

AFTER 5 DAYS RETURN TO
SUN OIL COMPANY
AT POINT OF MAILING

911-60

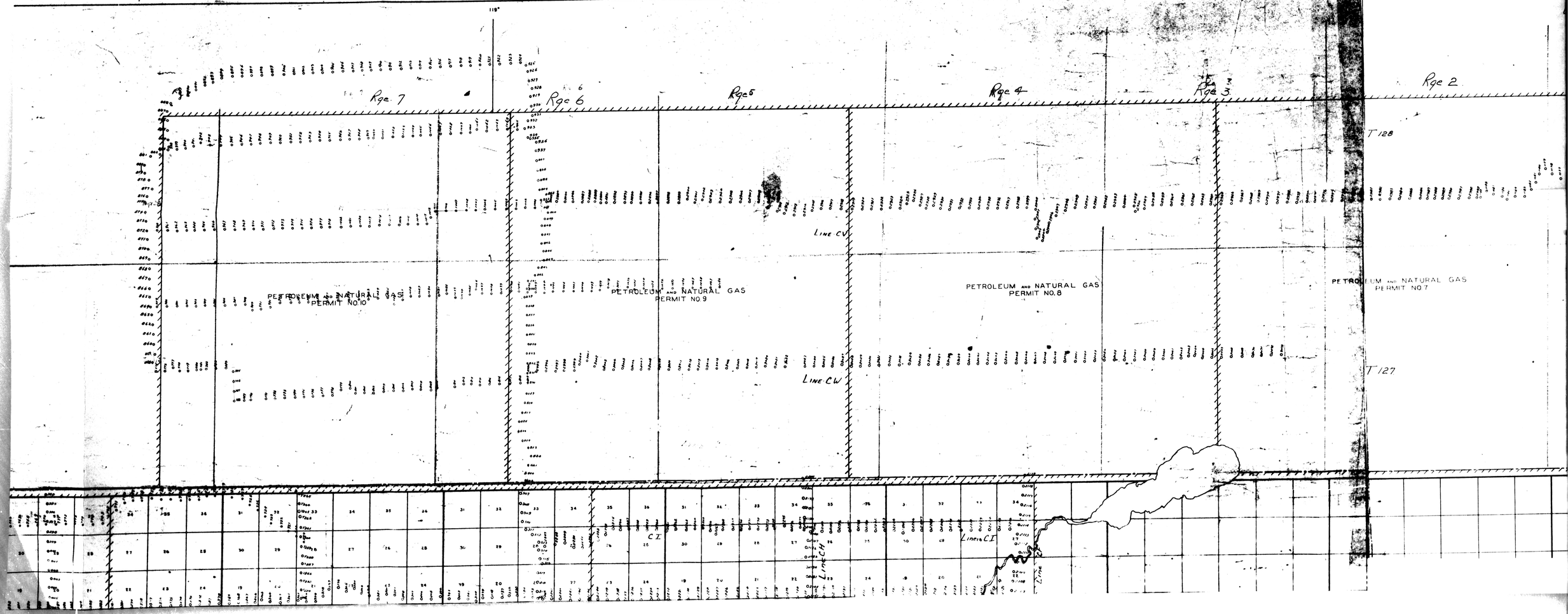
file 55840

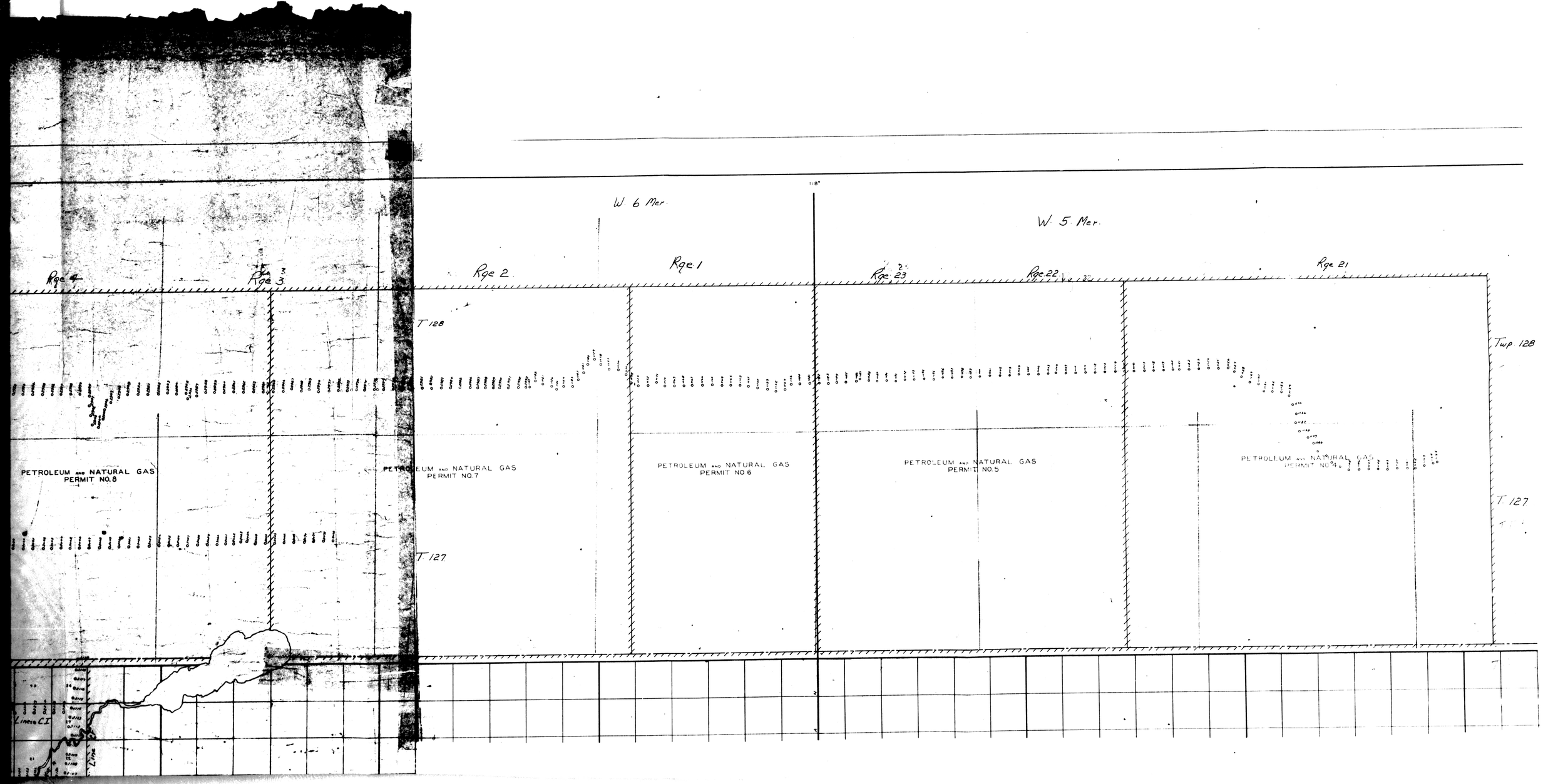
Sun Oil.

MR. C. K. Le CAPELAIN,
CHIEF, LANDS DIVISION,
DEPARTMENT OF NORTHERN AFFAIRS AND NATURAL RESOURCES,
OTTAWA, ONTARIO.

REGISTER

R CALGARY, ALBERTA No 47 274


Rge 7
Rge 6
Rge 5
Rge 4
Rge 3
Rge 2
T 128
T 127
PETROLEUM AND NATURAL GAS
PERMIT NO. 10
PETROLEUM AND NATURAL GAS
PERMIT NO. 9
PETROLEUM AND NATURAL GAS
PERMIT NO. 8
PETROLEUM AND NATURAL GAS
PERMIT NO. 7
LINE CV
LINE CW
LINE CI
LINE CH
LINE CI


W. 6 Mer.
W. 5 Mer.
118°
Rge 4
Rge 3
Rge 2
Rge 1
Rge 23
Rge 22
Rge 21
T 128
Twp. 128
T 127
T 127
PETROLEUM AND NATURAL GAS PERMIT NO. 8
PETROLEUM AND NATURAL GAS PERMIT NO. 7
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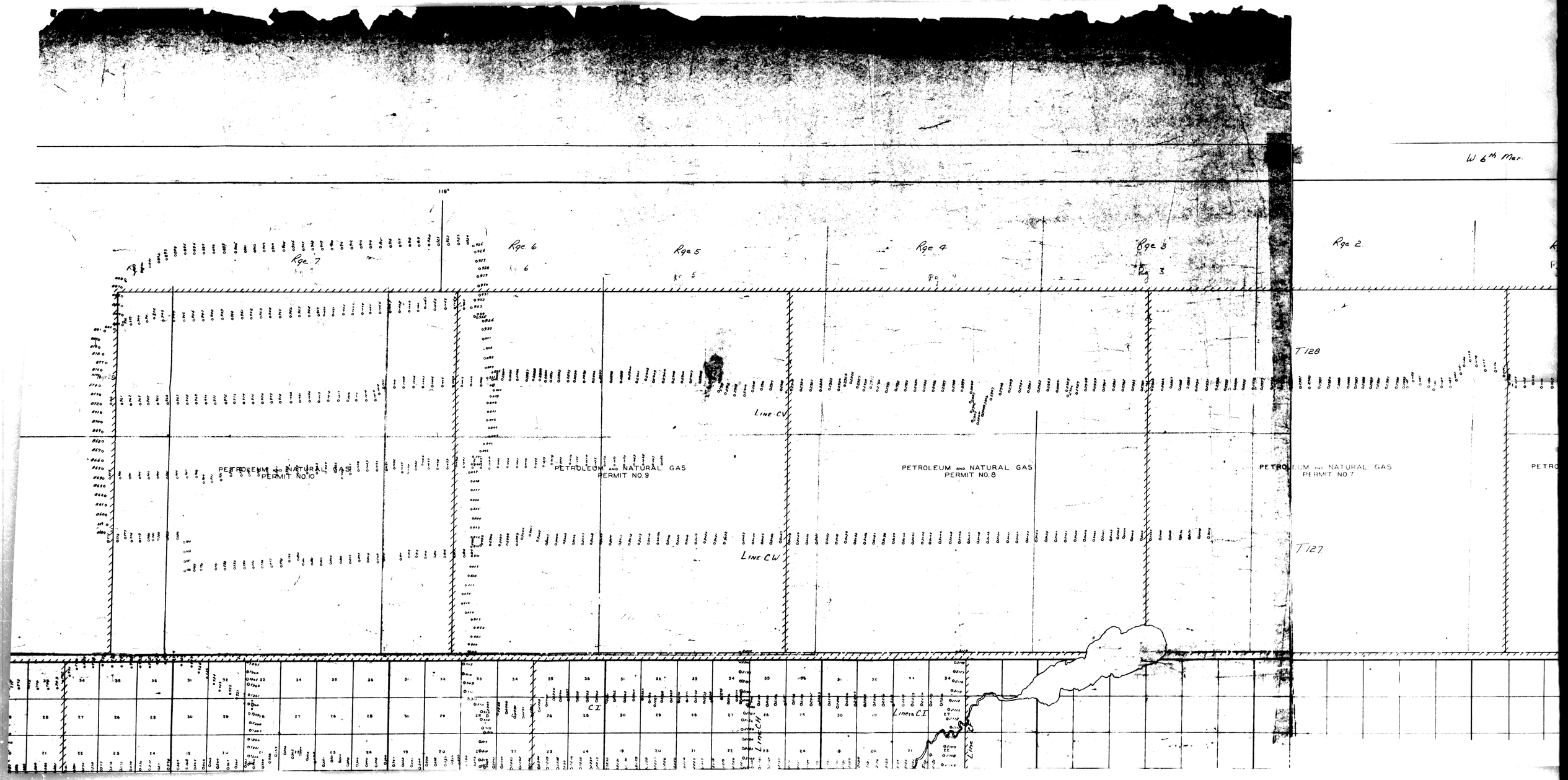
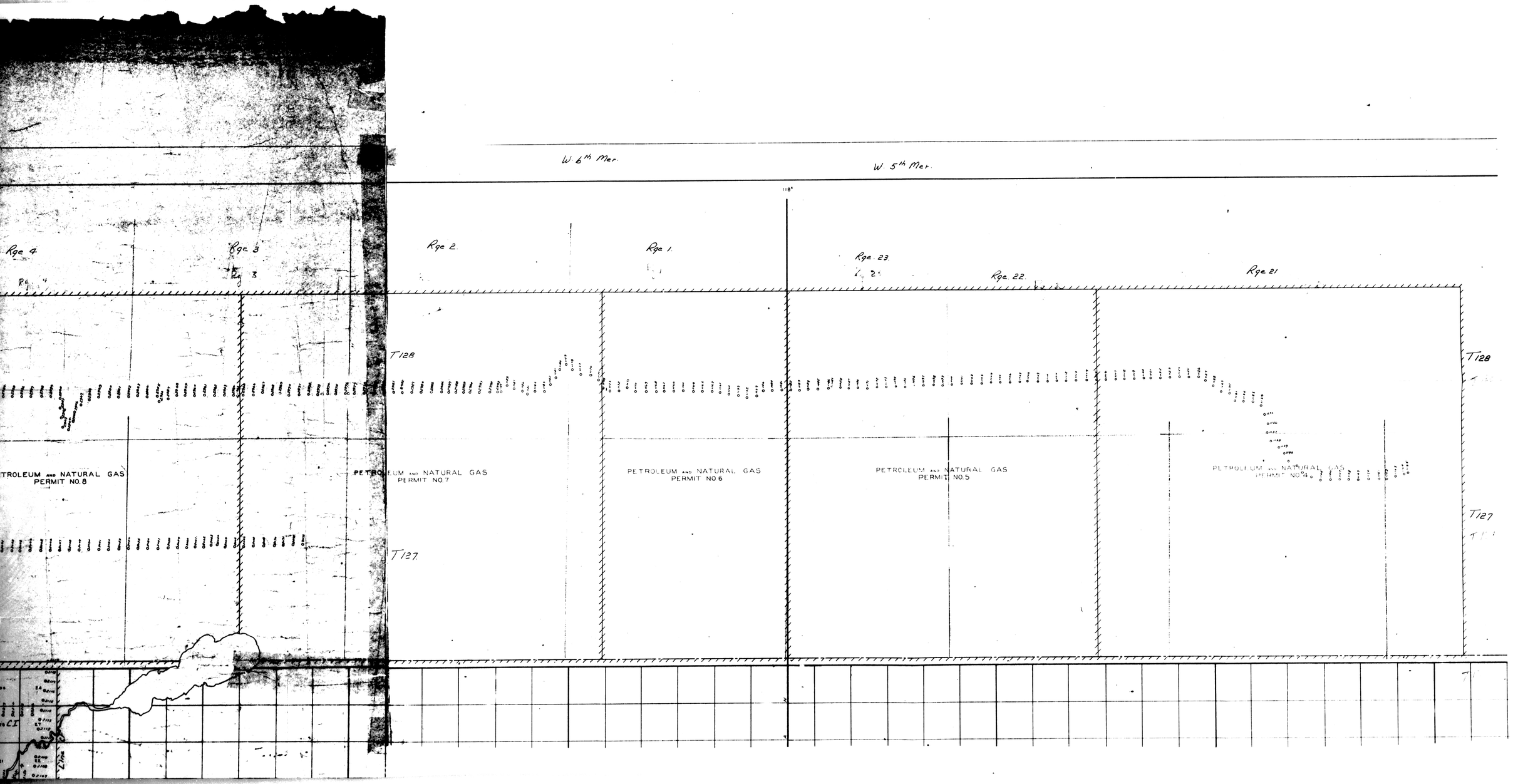
Lineas C.I.


W. 6th Mer.
Rge. 7
Rge. 6
Rge. 5
Rge. 4
Rge. 3
Rge. 2
T128
T127
Line CV
Line CW
Line CI
Line CH
PETROLEUM AND NATURAL GAS
PERMIT NO. 10
PETROLEUM AND NATURAL GAS
PERMIT NO. 9
PETROLEUM AND NATURAL GAS
PERMIT NO. 8
PETROLEUM AND NATURAL GAS
PERMIT NO. 7


W. 6th Mer.
W. 5th Mer.
118°
Rge. 4
Rge. 3
Rge. 2.
Rge. 1.
Rge. 23.
Rge. 22.
Rge. 21
T128
T127
TROLEUM AND NATURAL GAS
PERMIT NO. 8
PETROLEUM AND NATURAL GAS
PERMIT NO. 7
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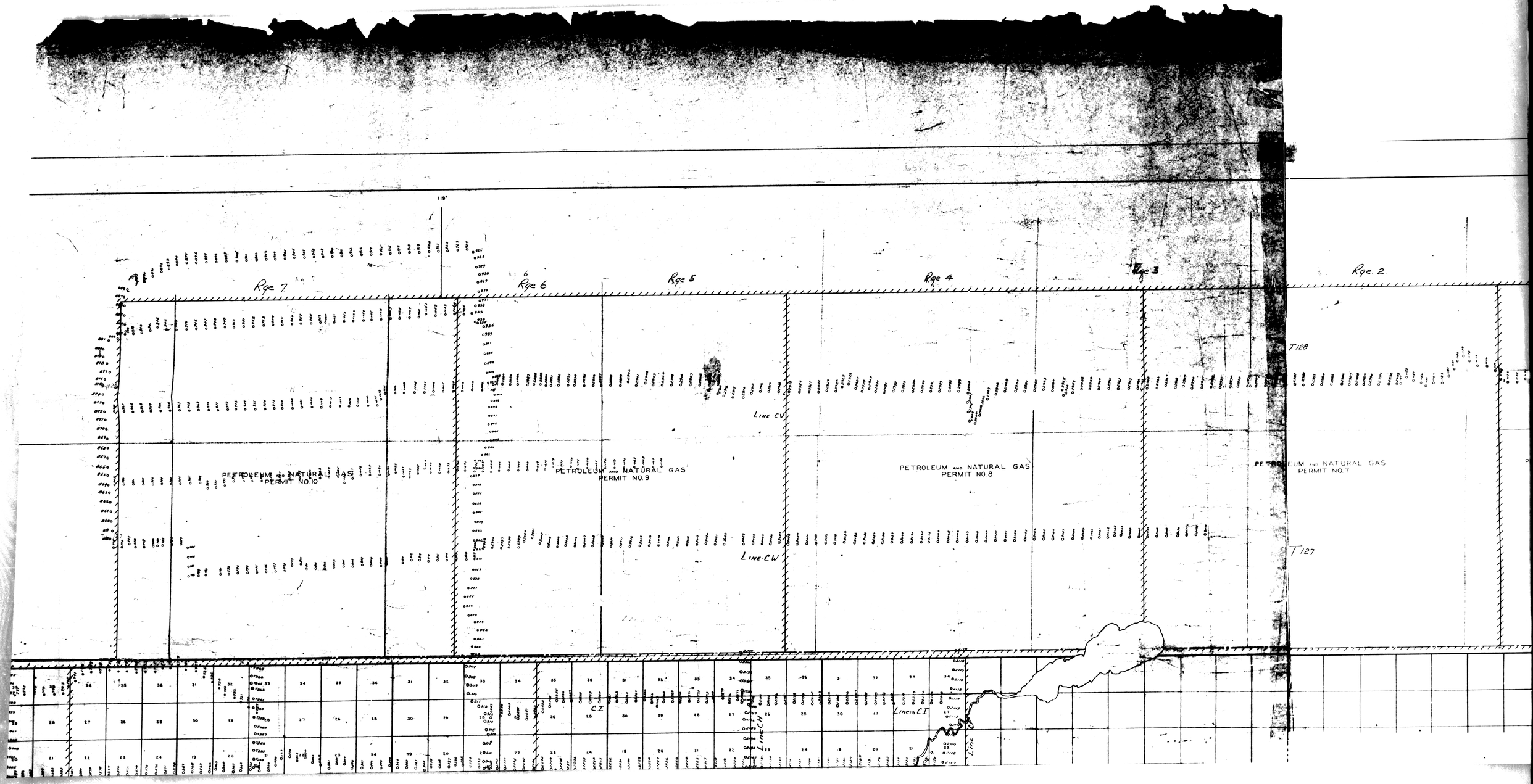
PERMIT NO. 6
PETROLEUM AND NATURAL GAS
PERMIT NO. 5
PETROLEUM AND NATURAL GAS
PERMIT NO. 4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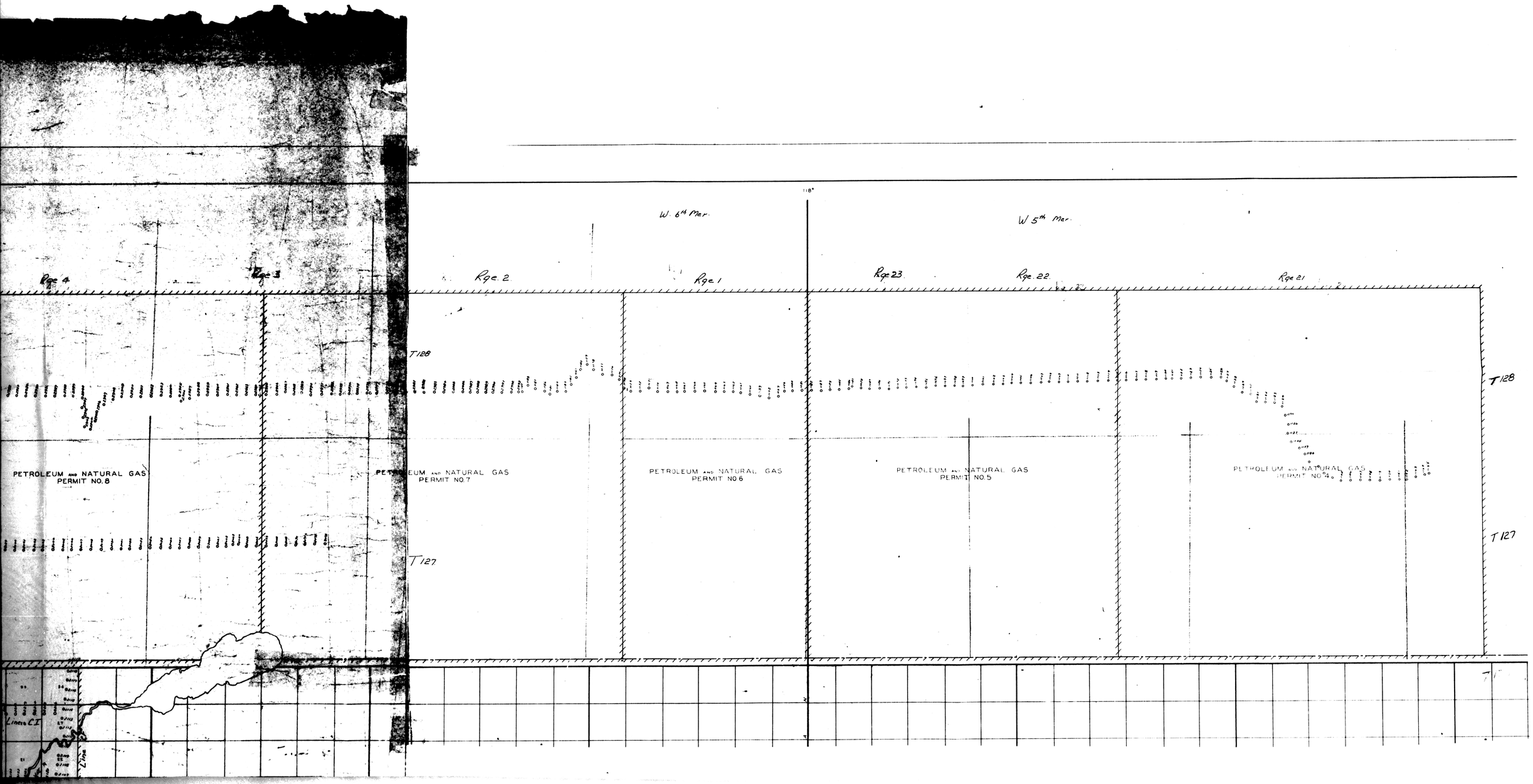
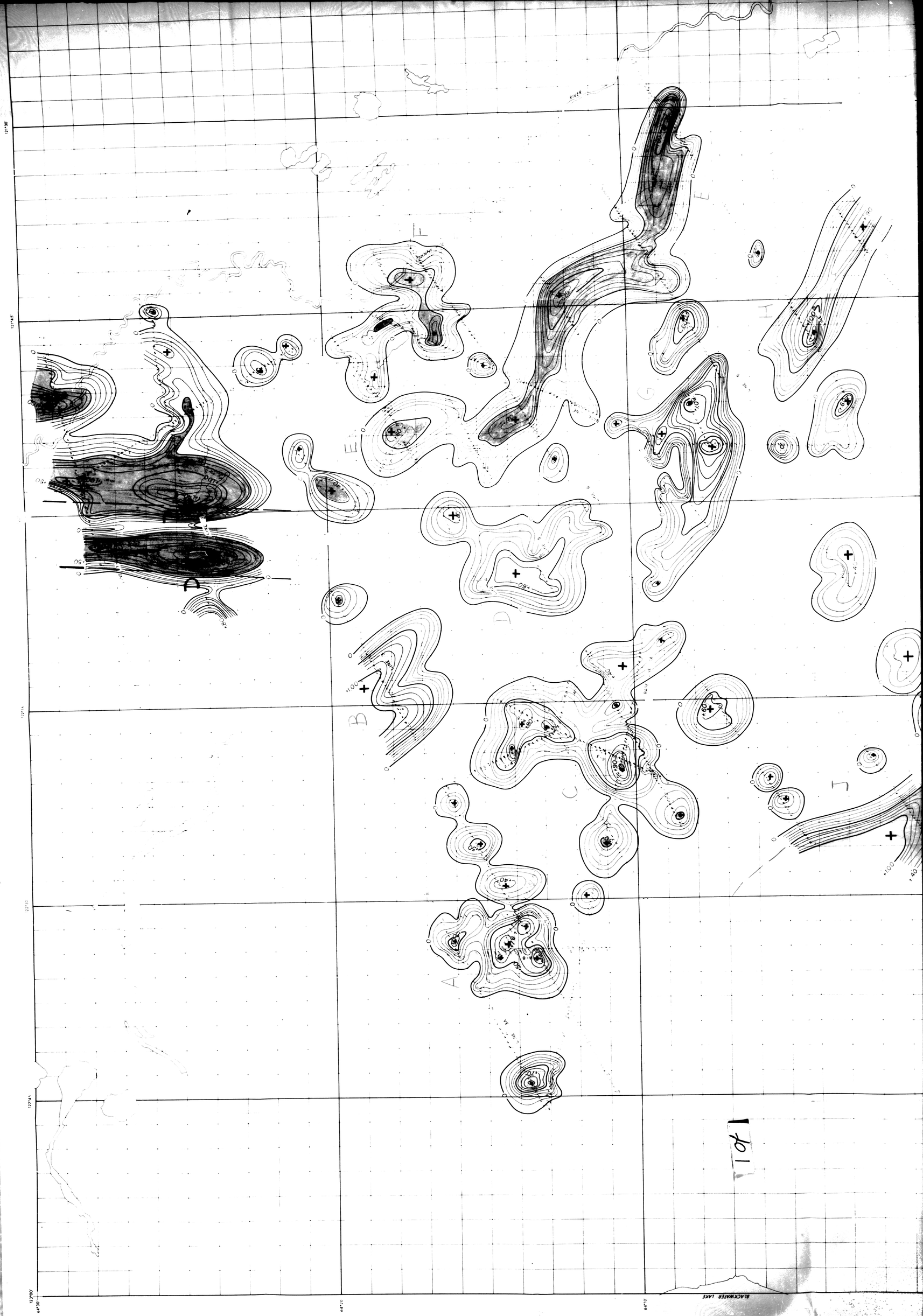
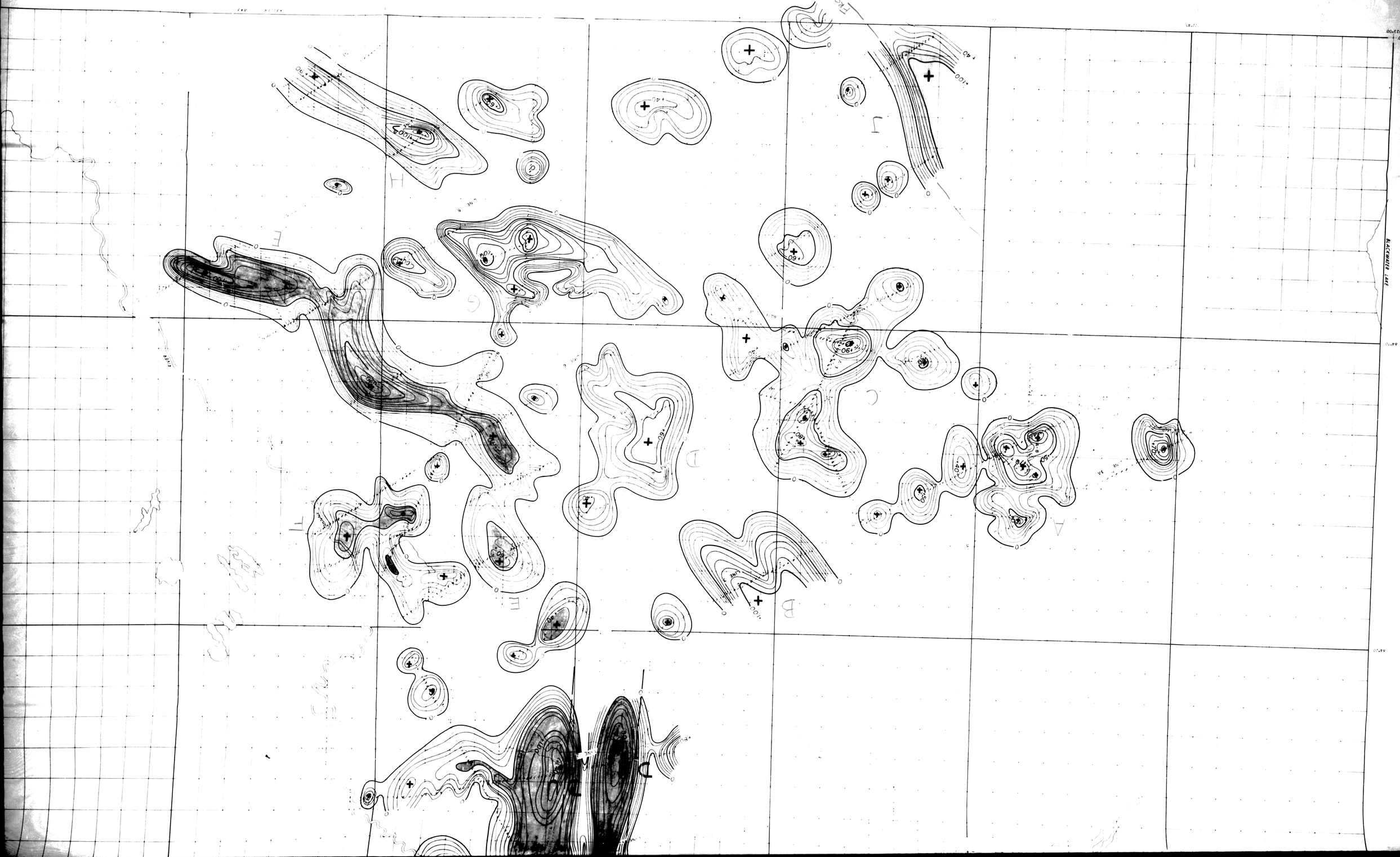
Rge 6
Rge 5
Rge 4
Rge 3
Rge 2
T128
T127
PETROLEUM AND NATURAL GAS
PERMIT NO.10
PETROLEUM AND NATURAL GAS
PERMIT NO.9
PETROLEUM AND NATURAL GAS
PERMIT NO.8
PETROLEUM AND NATURAL GAS
PERMIT NO.7
Line CV
Line CW
Line CI
Line CH
Line CI

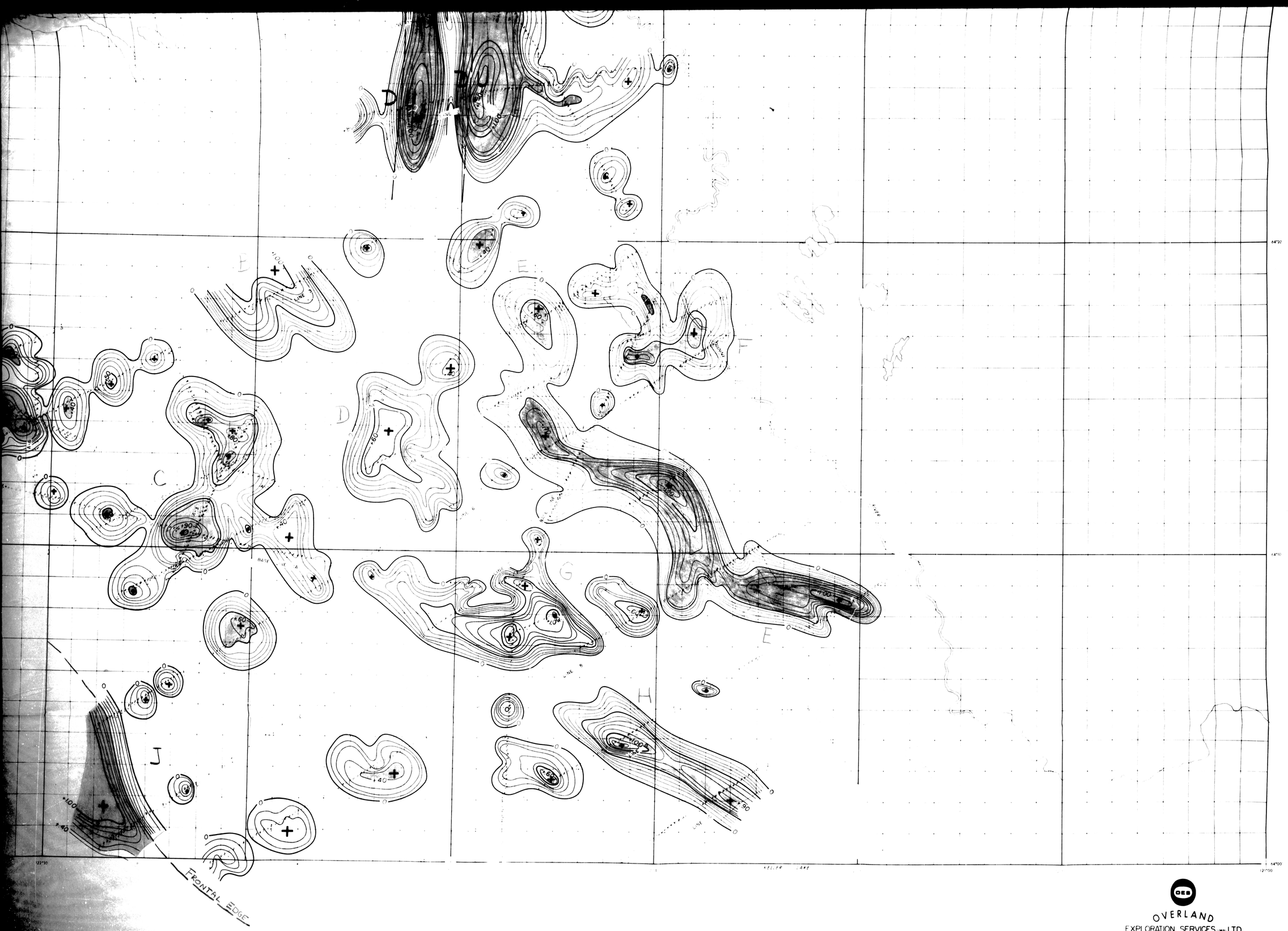

W. 6th Mer.
W 5th Mer.
118°
Rge. 4
Rge. 3
Rge. 2
Rge. 1
Rge 23
Rge. 22
Rge 21
T128
T127
PETROLEUM AND NATURAL GAS
PERMIT NO. 8
PETROLEUM AND NATURAL GAS
PERMIT NO. 7
PETROLEUM AND NATURAL GAS
PERMIT NO. 6
PETROLEUM AND NATURAL GAS
PERMIT NO. 5
PETROLEUM AND NATURAL GAS
PERMIT NO. 4
Lines C.I


RIVER
BLACKWATER LAKE
A
B
C
D
E
F
G
H
I
J
1 of 1

122°30'
122°15'
121°45'
121°30'
121°15'
121°00'
64°30'
64°20'
64°10'
A
B
C
D
E
F
G
H
J
LINE A
LINE B
LINE 8
+100
+90
+80
+60
+40
0
1204


64°20'
64°10'
64°00'
123°00
122°45
BLACKWATER LAKE
A
B
C
D
E
F
G
H
J
+100
+90
+80
+70
+60
+40
LINE
RIVER
FRONTAL EDGE

34



OVERLAND
EXPLORATION SERVICES (1969) LTD.

FOR

CANADIAN RESERVE OIL AND GAS LTD.

RESIDUAL GRAVITY MAP

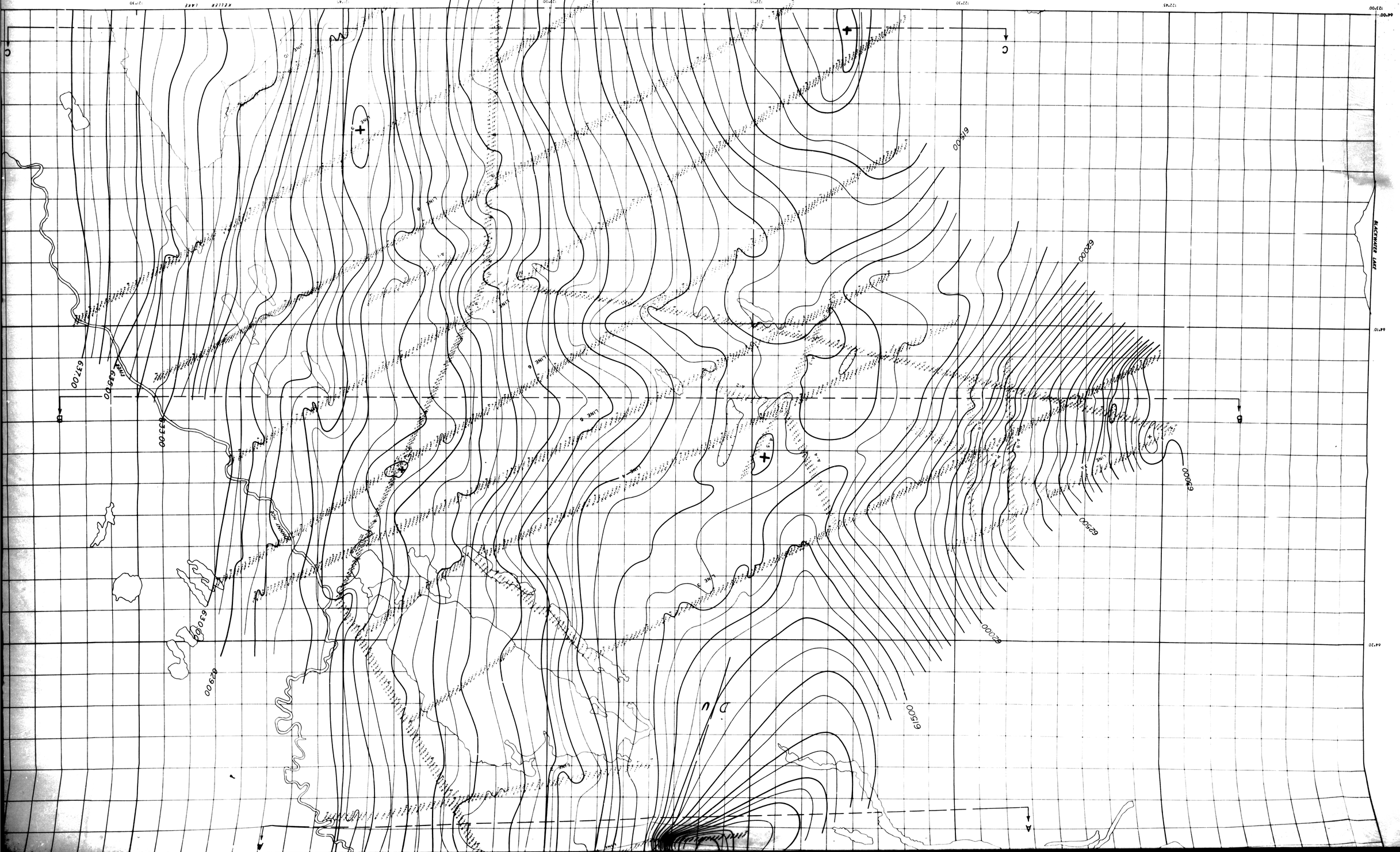
Scale: 1" = 1 MILE

4 of 4

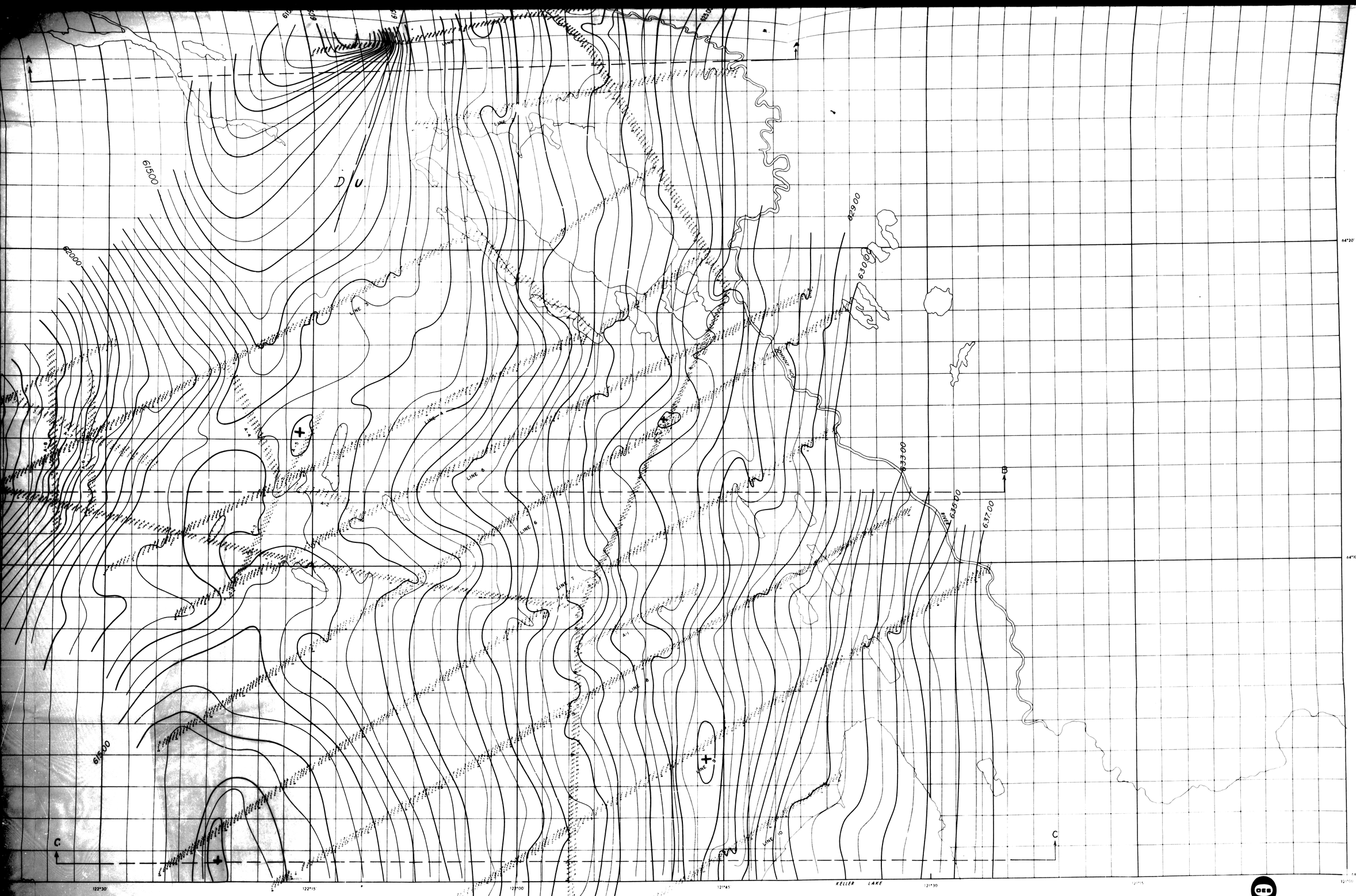
123°00'
122°45'
122°30'
122°15'
122°00'
121°45'
121°30'
64°30'
64°20'
64°10'
A
B
D U
610.00
609.00
615.00
620.00
625.00
629.00
630.00
633.00
635.00
637.00
615.00
620.00
625.00
630.00
LINE 1
LINE 2
LINE 3
LINE 4
LINE 5
LINE 6
LINE 7
LINE 8
LINE 9
BLACKWATER LAKE
RIVER

10

122°30'
122°15'
122°00'
121°45'
121°30'
121°15'
121°00'
64°30'
64°20'
64°10'
610.00
609.00
615.00
620.00
625.00
61500
62000
62900
630.00
633.00
635.00
637.00
D U
D U
LINE 1
LINE 2
LINE 3
LINE 4
LINE 5
LINE 6
LINE 7
LINE 8
LINE 9
A
B
A-1
A-4
SUMMIT HOT
12 a


A
A
D/U
61500
62000
62500
63000
62900
63000
LINE 3
LINE 4
LINE 5
LINE 6
LINE 7
LINE 8
LINE 9
LINE 10
JOHNNY HOE
B
B
63300
63500
63700
62000
61500
C
C
64°20'
64°10'
64°00'
BLACKWATER LAKE
123°00'
122°45'
122°30'
122°15'
122°00
121°45
KELLER LAKE
121°30

3 of



OVERLAND
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FOR
CANADIAN RESERVE OIL AND GAS LTD

BOUGUER GRAVITY MAP

Scale
C.I. 0.50 mgl.

404