

7-7-4-62

7-7-4-62

IMPERIAL OIL LIMITED
PRODUCING DEPARTMENT - WESTERN REGION

Service Report

OPERATIONAL REPORT ON A GRAVITY SURVEY
FORT PROVIDENCE N.W.T.

by

J.T. Hughson

IPRCER-1 S-67

September, 1966

CONFIDENTIAL

EXPLORATION RESEARCH AND SERVICE DEPARTMENT
CALGARY, ALBERTA

IMPERIAL OIL LIMITED
PRODUCING DEPARTMENT - WESTERN REGION

Service Report

OPERATIONAL REPORT ON A GRAVITY SURVEY
FORT PROVIDENCE N.W.T.

by

J.T. Hughson



IPRGER-1 S-67

September, 1966

CONFIDENTIAL

EXPLORATION RESEARCH AND SERVICE DEPARTMENT
CALGARY, ALBERTA

LIST OF ILLUSTRATIONS

Map No.	Description	Scale
1-7	Location Map	1" = 12 Mi.
2-7	Ft. Providence Area Stations, Values, Contours	2" = 1 Mi.
3-7	Ft. Providence Area Stations, Elevations	2" = 1 Mi.
4-7	Falaise Lake Area Stations, Values, Contours	2" = 1 Mi.
5-7	Falaise Lake Area, Stations, Elevations	2" = 1 Mi.
6-7	Horn River Area Stations and Gravity Profile	2" = 1 Mi.
7-7	Horn River Area Stations and Elevations	2" = 1 Mi.

OPERATIONAL REPORT ON A GRAVITY SURVEY

FORT PROVIDENCE N.W.T.

GENERAL REMARKS

The gravity survey of selected areas near Fort Providence was carried out in September 1966. The purpose of the survey was to obtain geophysical information, and also to test the use of gravity as an aid to exploration in the area. Inclement weather, (rain, snow and fog), prevented the completion of the survey. Also, it was not possible to obtain satisfactory axemen for line cutting in the vicinity. For this reason, a bulldozer was used in the later part of the work for line cutting.

Three selected test areas were covered, one near Fort Providence Town, another at Falaise Lake and one on the Horn River north of Fort Providence. Location maps for these surveys are included with this report.

PERSONNEL

The gravity party was composed of a party chief, one gravity observer, two survey crews, line cutters and a bulldozer operator. Transportation was by helicopter. The gravity party, the helicopter pilot and the mechanic were quartered in Fort Providence.

SURVEY PROCEDURE

A Worden Master gravity meter was used for the surveys. Each survey was tied to the Dominion Government pendulum station No. 44 at Ft. Providence. A meter calibration was made between stations 9538 - 59 and 9537 - 59 of the Dominion Government gravity meter network. Each of these stations is located at Fort Providence.

Latitude corrections were made by subtracting 981.00000 gals. from the 1931 International tables. The elevation datum was +1700 feet above sea level to be consistent with Imperial's gravity work in Alberta. A density factor of 0.64 gravity units per foot of elevation was used.

The stations were located by plane table surveying. Each survey line was run out in one direction and then repeated in the reverse direction to ensure accuracy of positions and elevations. Aerial photographs were used as an aid in location of individual survey areas and to relate the survey lines to topography. The elevations were tied to Dominion Government Bench marks close to each area whenever possible.

It was found that two survey parties and two line cutting parties were required for most efficient conduct of the survey. Unfortunately, the line cutting proved to be the most difficult part of the program.

LINE CUTTING

Local Indians were hired for the line cutting, but they did not stay to complete their assignments. It proved to be almost impossible to obtain reliable help in the vicinity of Fort Providence on short notice.

The area contains a fair amount of willow thickets which were very difficult to cut. A bulldozer was finally hired, and proved more satisfactory. Mr. G.H. Weisser, Division Geophysicist for Imperial at Dawson Creek, thinks that bulldozing in the winter when the willows are brittle would be the most efficient way to cut line in the area

RECOMMENDATIONS AND CONCLUSIONS

If gravity surveys are to be carried out in this area in the future, the writer would make the following suggestions:

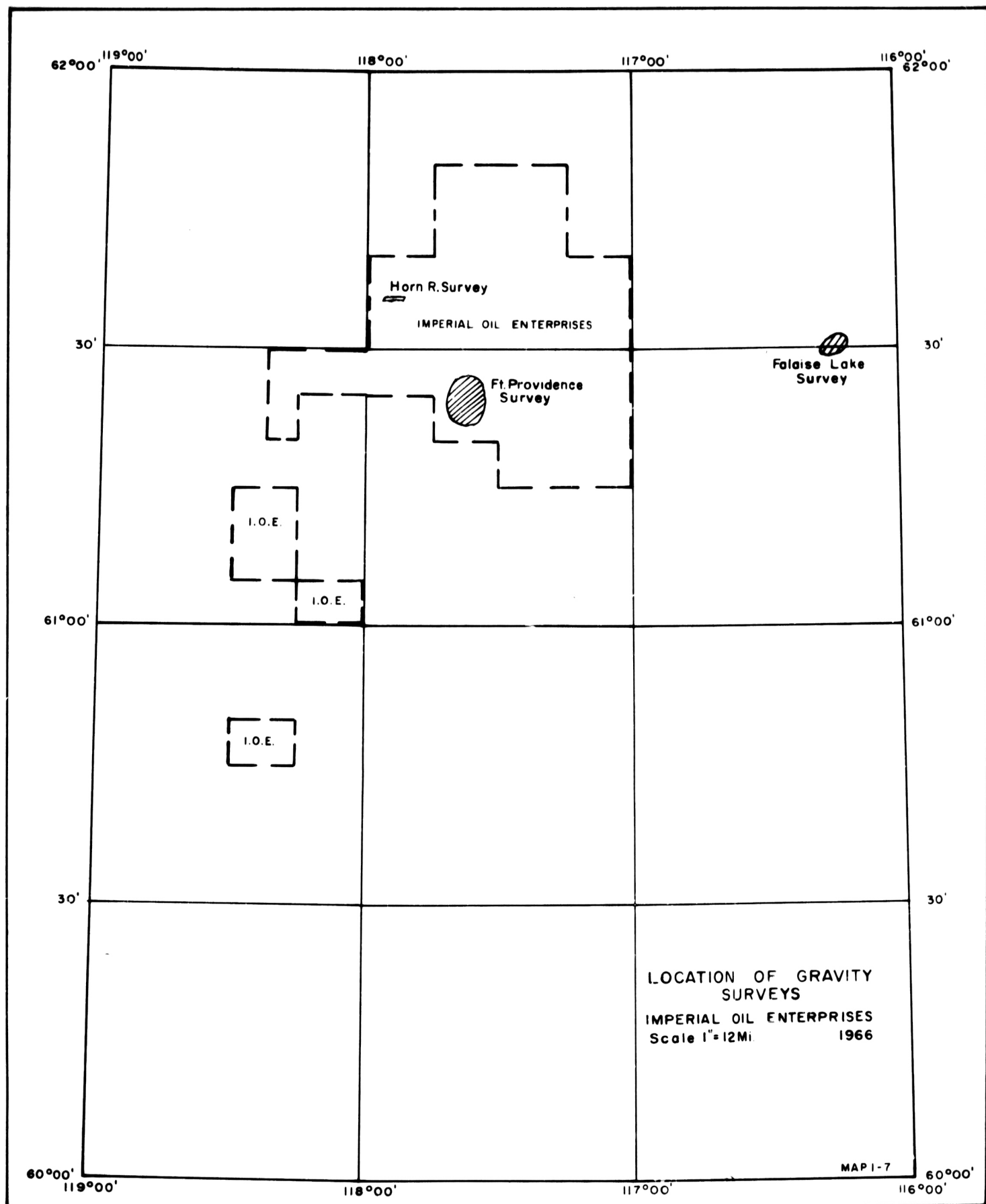
1. The survey should be carried out in June, July or the early part of August. There is a lot of ground fog and bad weather in September.
2. Line cutting should be carried out in the winter using a bulldozer. Hard cutting is too costly and reliable local cutters are not easily found.
3. Gravity surveys could be carried out in conjunction

with seismic work as an additional source of geophysical information. The necessary land surveying would be performed by the seismic personnel. Only a gravity meter, vehicle and operator would be required to obtain gravity information. Unfortunately, the gravity survey would lose its traditional position as a first reconnaissance step in exploration.

4. Gravity surveys in the area, by conventional ground methods, are quite expensive, and perhaps the seismic method, with gravity as an addition, as outlined in (3) above, is the best method for exploration in the area.

ACKNOWLEDGEMENTS

The survey was capably supervised by Mr. John Gay of Imperial's Dawson Creek office. The advice of Mr. G.H. Weisser, Division Geophysicist at Dawson Creek, on conduct of surveys in the area is also acknowledged.

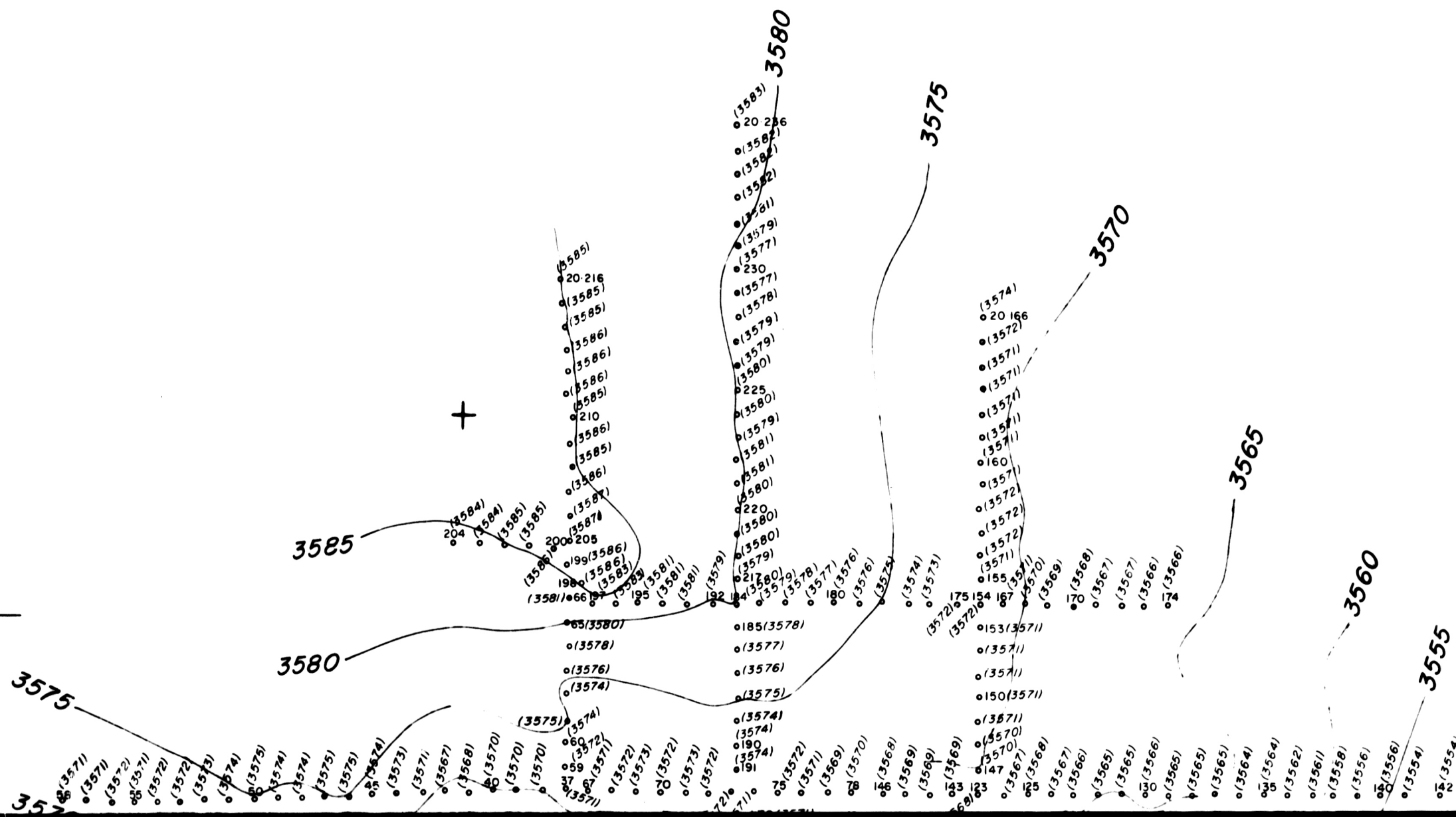


117°45'
61°30'

117°30'
61°30'

61°25'

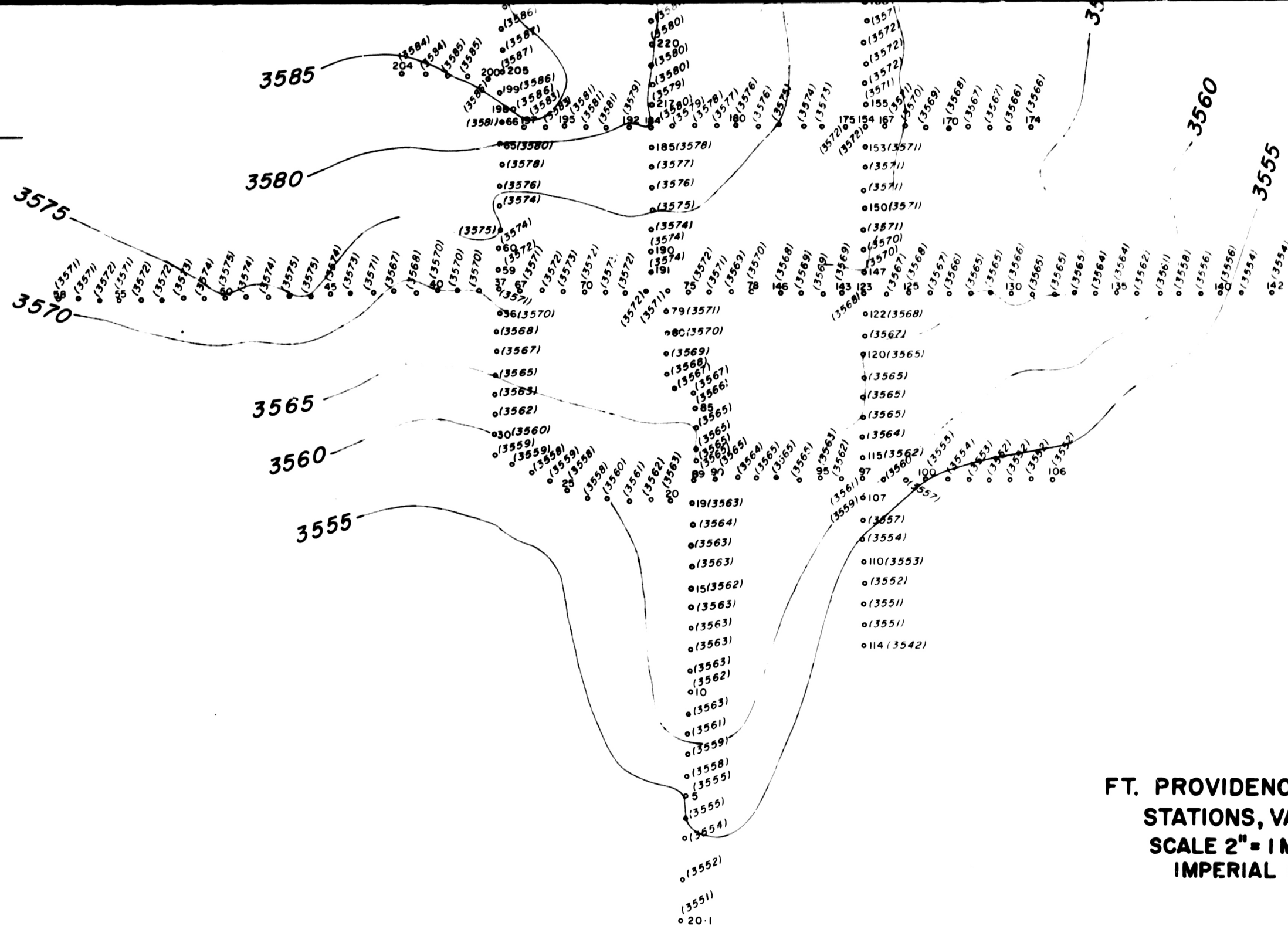
61°25'



11
T

61°25'

61°25'



FT. PROVIDENCE AREA GRAVITY SURVEY
STATIONS, VALUES AND CONTOURS
SCALE 2" = 1 MI. C.I. 5 UNITS
IMPERIAL OIL ENTERPRISES LTD.
1966

61°20'

117°45'

61°20'

117°30'

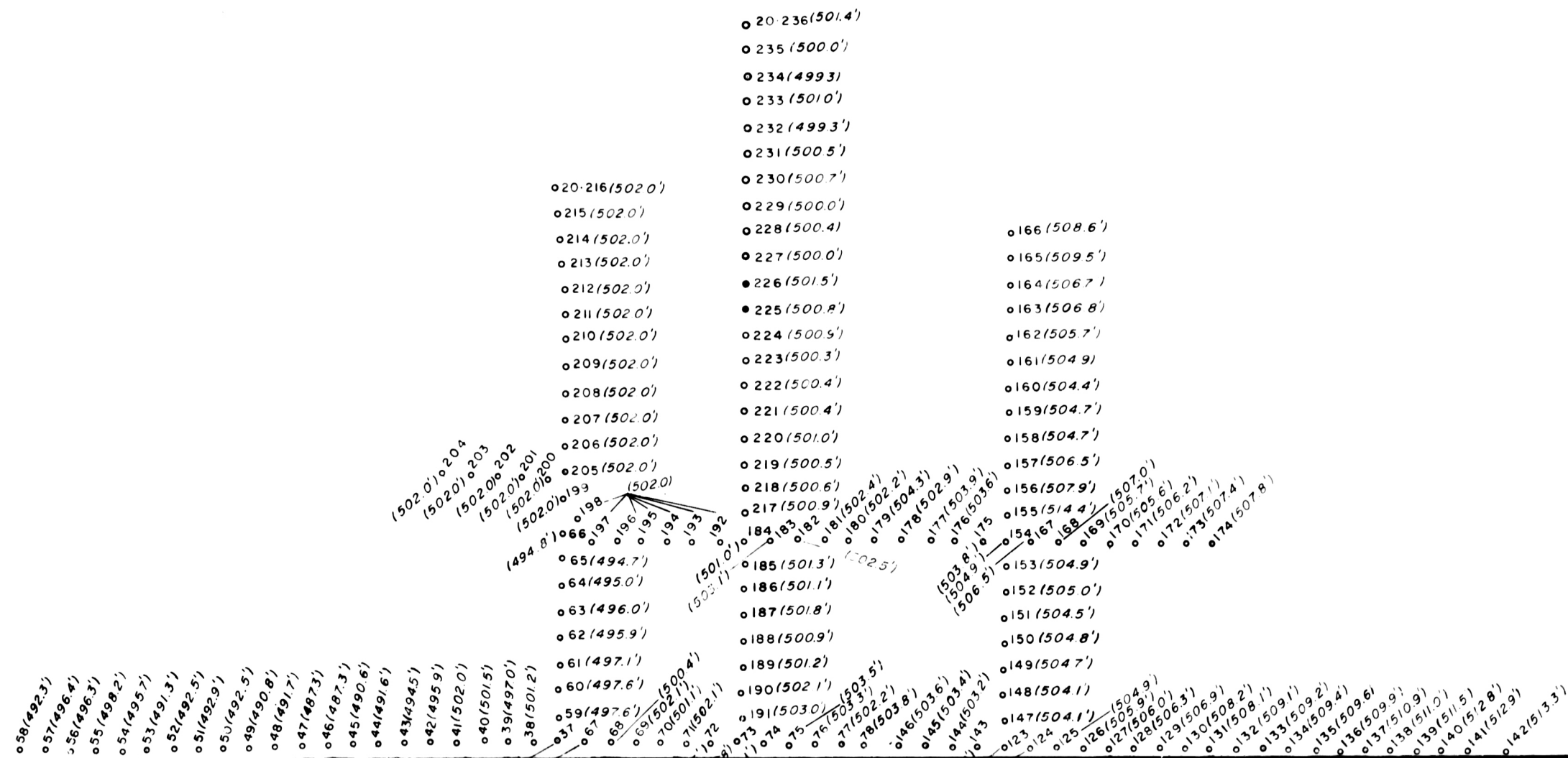
2 of 2

117°45'
61°30'

117°30'
61°30'

61°25'

61°25'



119

T

T

61° 20'  117° 45'

$\begin{array}{c} + \\ \hline \end{array}$
 $61^{\circ}20'$
 $117^{\circ}30'$

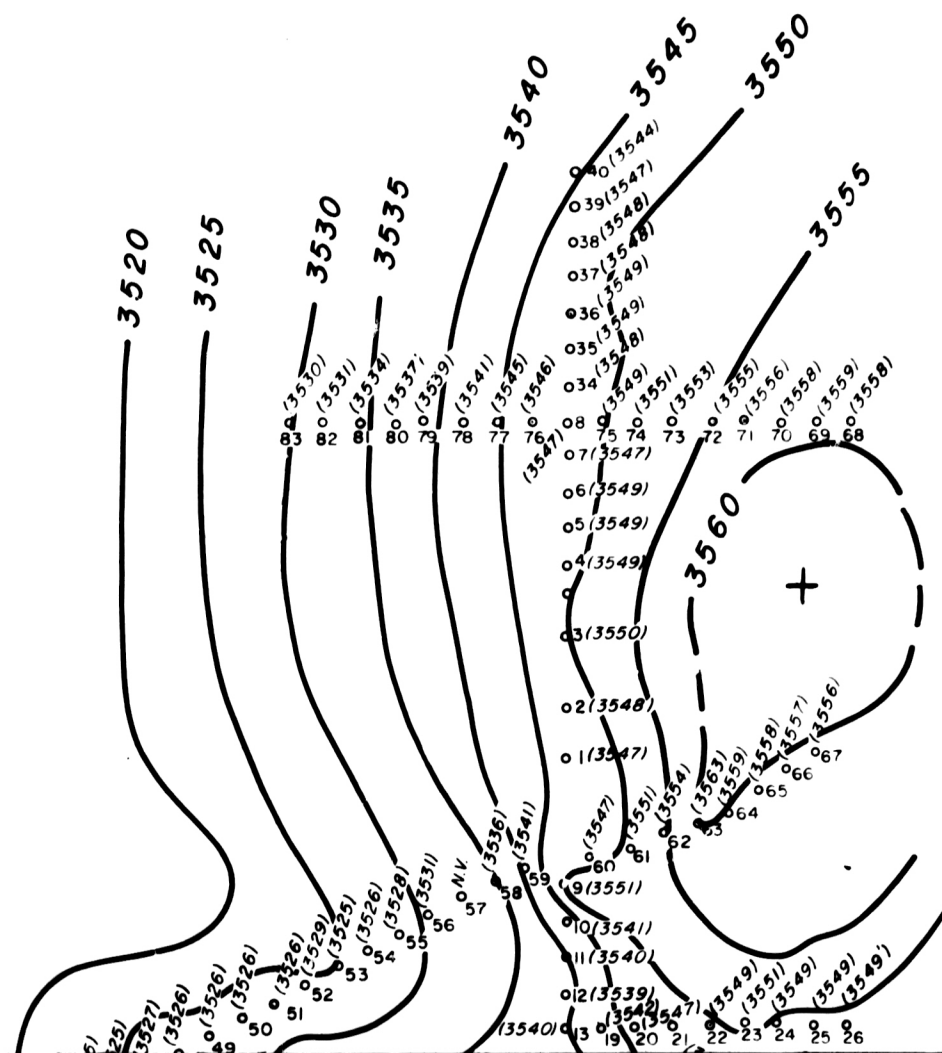
2 of 2

116°22'30"
61°35'

116°15'

116°07'30"
61°35'

61°30'

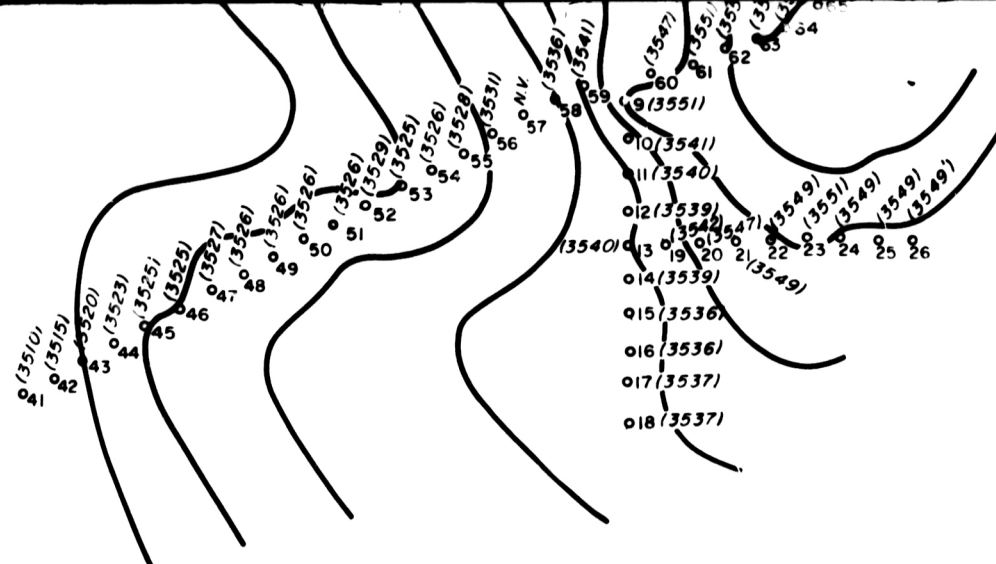


107

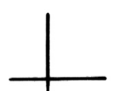
61°30'

61°30'

61°30'



**FALAISE LAKE AREA GRAVITY SURVEY
STATIONS, VALUES AND CONTOURS
SCALE 2" = 1 Mi. C.I. 5 UNITS
IMPERIAL OIL ENTERPRISES LTD.
1966**

61°25' 
116°22'30"

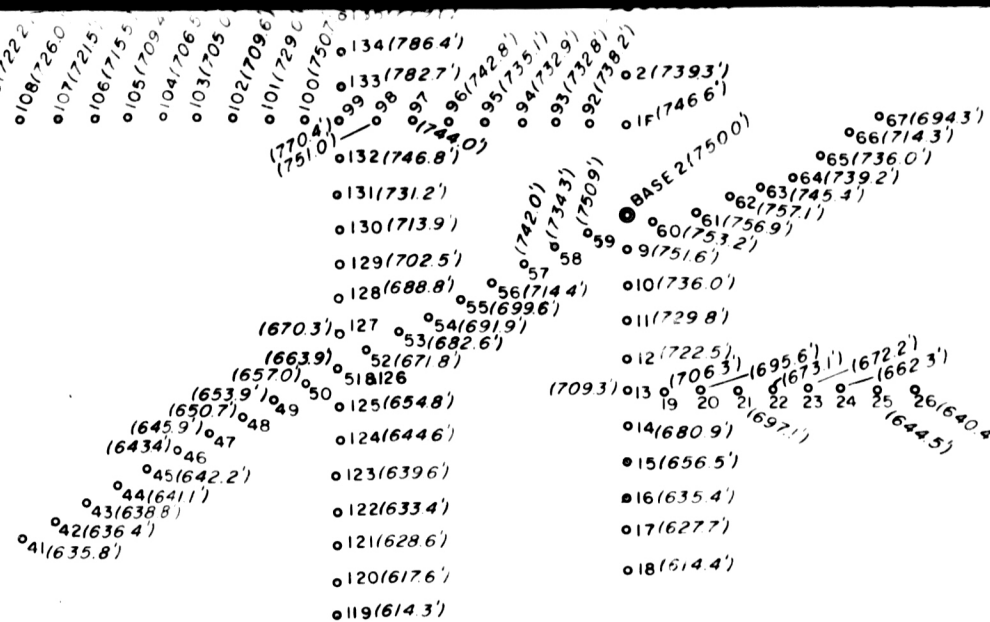
116°15'

2 of 2

 61°25'
116°07'30"

61°30'

61°30'



**FALAISE LAKE AREA GRAVITY SURVEY
STATIONS AND ELEVATIONS
SCALE 2" = 1 Mi.
IMPERIAL OIL ENTERPRISES LTD.
1966**

61°25'

116°22'30"

116°15'00"

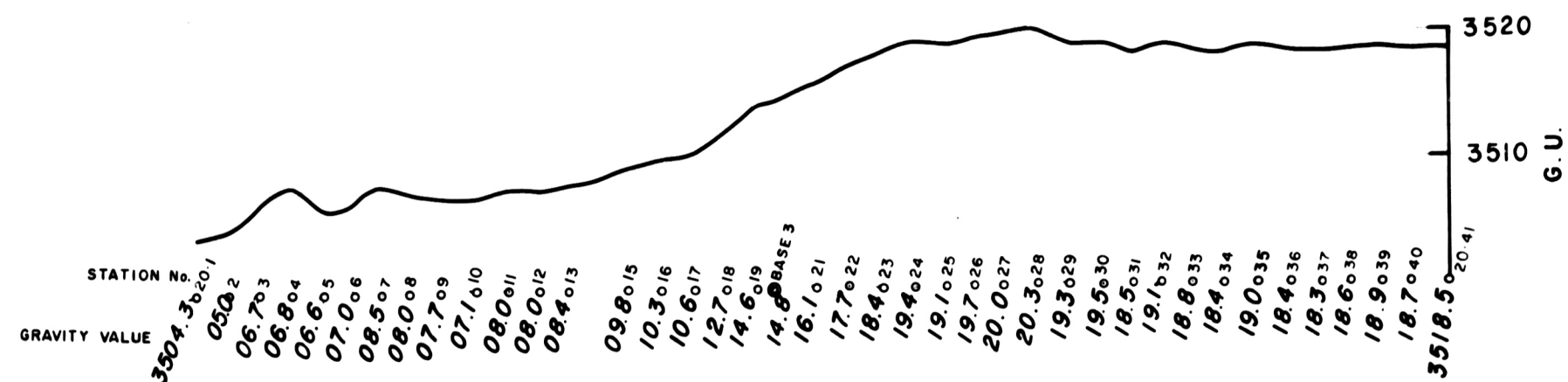
2 of 2

61°25'

116°07'30"

118°00'
61°40'

117°37'30"
61°40'



**HORN RIVER GRAVITY SURVEY
STATIONS AND GRAVITY PROFILE
SCALE 2" = 1 MI.
IMPERIAL OIL ENTERPRISES LTD.
1966**

61°35'
118°00'

117°37'30"
61°35'

61°40' 118°00'

117°37'30" 61°40'

Elevation	Station No.
0201(500.0')	
02(503.5')	
03(517.5')	
04(526.0')	
05(525.5')	
06(521.0')	
07(514.9')	
08(510.5')	
09(508.2')	
10(508.2')	
11(512.8')	
12(519.2')	
13(522.1')	
15(517.9')	
16(515.0')	
17(513.8')	
18(513.3')	
19(513.2')	
21(516.7')	
22(521.1')	
23(523.1')	
24(524.7')	
25(524.2')	
26(524.3')	
27(521.3')	
28(521.4')	
29(520.9')	
30(519.0')	
31(518.1')	
32(516.6')	
33(515.2')	
34(515.4')	
35(520.2')	
36(522.2')	
37(522.2')	
38(521.6')	
39(523.6')	
40(524.6')	
20 41(525.3')	

HORN RIVER GRAVITY SURVEY
STATIONS AND ELEVATIONS
SCALE 2" = 1 MI.
IMPERIAL OIL ENTERPRISES LTD.
1966

61°35' 118°00'

117°37'30" 61°35'