

**EXPLORATION CONSULTANTS, INC.**

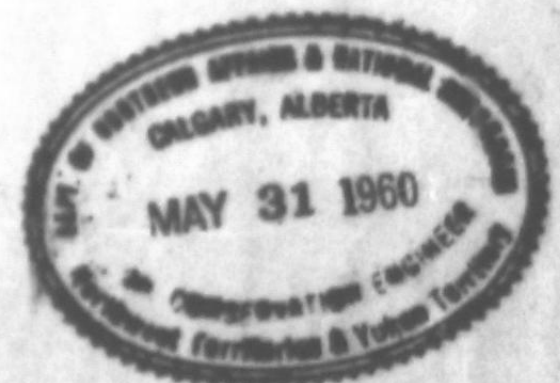
2024 - 5TH AVENUE SOUTH WEST  
CALGARY, ALBERTA

**SEISMIC SURVEY  
of  
TROUT LAKE  
and  
HUKY AREAS  
NORTHWEST TERRITORIES**

by  
**EXPLORATION CONSULTANTS, INC.**

Part 4 of 5

1960



# EXPLORATION CONSULTANTS, INC.

208A - 8TH AVENUE SOUTH WEST  
CALGARY, ALBERTA

## ABSTRACT

This report covers the seismic work conducted in the Trout Lake Area Permit Nos. 1177, 1180, 1311 of the Northwest Territories by Exploration Consultants, Inc. Party No. 5 from December 20th, 1959 to January 26th, 1960.

During this period 1.85 crew months were spent on the prospect and the average production was 5.5 setups per 10 hour shooting day.

The record quality is generally good over most of the area.

The principal objective of the survey was to map the attitude of the Devonian section for possible anomalies. Good continuous reflections were obtained from the top of the Devonian and from a Devonian shale approximately 2000 feet below the top. These identifications were obtained by correlation with records about 30 miles south in the North Petitet Area.

The two most prominent structural features over the area appear as a high at S.P. E-95 and as a fault at S.P. H-76.

There is very little control as to the possible direction that these features might trend.



## LOCATION AND DATE

The area covered by this report is called the Trout Lake Area Permit Nos. 1177, 1180 and 1311 and is located in the Northwest Territories along the Simpson Trail from Longitude  $121^{\circ} 44'$  Latitude  $60^{\circ} 41'$ , north along the Simpson Trail to Cornish Lake then west and north to Longitude  $122^{\circ} 06'$  and Latitude  $60^{\circ} 00'$ .

Exploration Consultants, Inc. Party #7, with C.M. Hayes as Party Manager and E.C. Hillstead as operator did the shooting covered by this report.

Work in the area commenced on December 20, 1959 and terminated January 26th, 1960.

The heaviest shooting was in the North Pettit area about 30 miles to the south. In the Home Oil section of the shooting 188.5 hours were required to shoot 113 holes and a distance of about 25 miles.

Total expenditure for this period on the Home Oil section was \$24,848.67. The cost per shot point was \$219.90 and the cost per drilled foot was \$.495. The crew averaged 6 set ups per 10 hour day.

On the Husky section 196 hours were required to shoot 120 holes and a distance of about 25 miles.

Total expenditure for the Husky portion of the survey was \$25,168.17. The cost per shot point is \$251.40 and the cost per foot drilled is \$.797. The crew spent .95 crew months to complete the prospect and averaged 5 set ups per 10 hour day.

### SURFACE CONDITIONS

The crew operated out of a camp located near the east shore of Curmack Lake.

The surface elevations varied from - 2270 at S.P. E-113 to - 1070 at S.P. E-100. Horizontal control was run in with a transit and vertical control was run in by alidade.

Government bench mark #5 with co-ordinates of Lat.  $60^{\circ} 50' 00''$  long.  $121^{\circ} 38' 09.4''$  with an elevation of 1764 feet near shot point #30 was used as a basis of control for the survey.

All elevations were closed back in to the original B.M. and various polaris shots were taken along the line of traverse. The elevations from S.P. E-113 were tied back to the B.M. near S.P. E-30 with a mistake of - 2.5 ft. The elevations from Husky #100 were tied back to the bench mark with a mistake of - 1.9 ft.

According to a "Position computation, third order triangulation" the maximum possible error in the location of the farthest shotpoint (E-100) is within half a mile in Longitude and 300 feet Latitude. It should also be pointed out here that the government monument used is subject to adjustment and is not binding with respect to any legal surveys.

In most of the area it was found that the optimum shooting depth was about forty feet.

Good record quality was general over most of the area with the exception of a few isolated areas of muskeg.

The main concern of the dozers was to blade a trail over the muskeg smooth enough for the equipment to travel over at a reasonable speed, since the bush is light and was of no great problem to clear. There are approximately five miles of dozing on the Husky block which was not shot.



On a program of this nature there is considerable loss of time in driving, since it was only practical to work out of one location. Much better production would have been obtained without the added drive time on the far ends of this line.

#### SHOOTING AND RECORDING TECHNIQUES

Three-hole patterns shot at about 40 feet produced the best reflections over the area. Nine 28 cycle Electro-Tech geophones, spaced at 20 foot intervals were connected in series parallel to each recording channel. (see diagram at end of report)

A modified Century recording unit with A.V.C. and selective filtering in conjunction with an S.I.E. MR4 magnetic recording system was used for recording in this area. All shots were recorded through a 26-1-120 filter on the field monitor record and the magnetic tape. Each tape was played back through a 32-1-66 filter both straight and mixed. The mixing is a B.A. mix which feeds from the top down on the upper 12 traces and from the bottom up on the lower 12 traces. The top trace or No. 1, is always north or east on the record.

The record sections were constructed from the corrected tapes using an out 1-65 filter, a fast A.V.C. and a 20%-60% - 20% mix.

#### COMPUTING INFORMATION

It was necessary to shoot a long-ender or a spread of 0-2640' at each hole in order to obtain arrivals from the high velocity strata.

A curve path method of computation was used to reduce the uncorrected times to a datum of - 1400 ft.

A refraction method of computation was also employed as an added check of the computing procedure used. The two methods checked reasonably well.

The depth of drift varied over the area from a maximum of about 1000 feet to a minimum of about 150 feet in the northwest portion of the surveyed area. The refraction velocities indicated a 6000  $\frac{\text{ft}}{\text{sec}}$  drift layer with an underlying velocity of 10,000  $\frac{\text{ft}}{\text{sec}}$ . In the northwest portion of the area the second velocity was around 20,000  $\frac{\text{ft}}{\text{sec}}$ . This high velocity might be attributed to a relatively thin layer of very high velocity Paleozoic section near the base of the drift, since it may be too high for the normal Paleozoic section.

### MAPS

Submitted with this report are two horizon maps and one isochron map. These maps were constructed from the 26-1-120 sonar record and represent the following:

- C Top of the Devonian - *Not released*
- D Devonian Shale section - *Not released*
- C-D Isochron

As previously mentioned the C and D were identified by correlation with records in the North Pettit area about 30 miles south.

The regional dip on all horizons is to the south. Considerable thickening of the Devonian section between the C and the D surface is noted in a northerly direction.

Most of the records in the area are suitable for correlation.

In addition to the horizon maps there is an elevation map and a tape-number map included with the report. Record-playback sections (~~-(a) wiggle trace and (b) 1 from 3 composite,)- and normal time sections are also included with the report.~~

### INTERPRETATION

Of primary interest in the area is the Slave Point member of the Devonian section. This particular horizon produced very poor reflections over the area mapped. The D horizon may indicate to some extent the attitude of the Slave Point.



### SURFACE CONDITIONS

The crew operated out of a camp located near the east shore of Cormack Lake.

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The main concern of the dozers was to blade a trail over the muskeg smooth enough for the equipment to travel over at a reasonable speed, since the bush is light and was of no great problem to clear. There are approximately five miles of dozing on the Husky block which was not shot.

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A curve path method of computation was used to reduce the uncorrected times to a datum of - 1400 ft.

A refraction method of computation was also employed as an added check of the computing procedure used. The two methods checked reasonably well.



The depth of drift varied over the area from a maximum of about 1000 feet to a minimum of about 150 feet in the northwest portion of the surveyed area. The refraction velocities indicated a 6000  $\frac{\text{ft}}{\text{sec}}$  drift layer with an underlying velocity of 10,000  $\frac{\text{ft}}{\text{sec}}$ . In the northwest portion of the area the second velocity was around 20,000  $\frac{\text{ft}}{\text{sec}}$ . This high velocity might be attributed to a relatively thin layer of very high velocity Paleozoic section near the base of the drift, since it may be too high for the normal Paleozoic section.

#### MAPS

Submitted with this report are two horizon maps and one isopach map. These maps were constructed from the 25-1-120 sonar record and represent the following:

- C Top of the Devonian - *Not released*
- D Devonian Shale section - *Not released*
- C-D Isochron

As previously mentioned the C and D were identified by correlation with records in the North Pettit area about 30 miles south.

The regional dip on all horizons is to the south. Considerable thickening of the Devonian section between the C and the D surface is noted in a northerly direction.

Most of the records in the area are suitable for correlation.

In addition to the horizon maps there is an elevation map and a tape-sound map included with the report. Record-playback sections (~~-(a) wiggle trace and (b) 1 from 3 composite, and several time sections~~) are also included with the report.

#### INTERPRETATION

Of primary interest in the area is the Slave Point member of the Devonian section. This particular horizon produced very poor reflections over the area mapped. The D horizon may indicate to some extent the attitude of the Slave Point.

The abnormally strong dips below the D horizon from S.P. H-95 to S.P. H-110 appear to be multiples. These south dips are coincident with a rise in surface elevations to the south. The additional dip is the same as the added correction used to correct the surface to datum.

From S.P. H-1 to H-15 and from S.P. H-24 to S.P. H-2 abnormal south dips appear between the C and D horizons. There is no apparent evidence that these reflections are multiples. It is possible that a facies change within this zone might account for these dips.

The most prominent structural feature on the Husky shooting occurs at S.P. H-75 as a fault through the D horizon with a throw of .031 seconds one way time or about 350 feet. This fault does not penetrate the upper Devonian but appears as a fold with about one half the expression as is shown on the D horizon.

Another minor fault occurs at S.P. H-53 with only about 50 feet of throw-up to the west. The direction of these faults is not known since the control is in only one direction.

Although the reflected energy is very poor from the Slave Point zone there are some anomalous north dips in this zone from S.P. H-91 to H-95.

At least two substantial features occur on the Simpson Trail. One of these, near Cormack Lake indicates about 130 feet of north reversal on the D horizon from S.P. H-3 to S.P. H-59. This expression is minimized on the C horizon. A shallow reflection at .150 seconds shows the most relief with about .023 seconds one way time reversal.

The most substantial feature along the Simpson Trail occurs at S.P. H-95 on the D horizon. This feature is shown as a fold or faulted fold with a reversal of about 350 feet. The possible fault dies out at some point between the D and the C horizons and the structural expression diminishes in the shallower horizon.



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There is indication that this area was positive at the time of deposition of some of the shallow horizons since there is considerable pinchout in a zone between .200 seconds and .300 seconds.

#### CONCLUSIONS

Both the last mentioned feature at S.P. E-95 and the fault at S.P. H-95 are good possibilities for a Slave Point test from a structural point of view, providing the D is an indication of structure within the Slave Point.

#### ACTION

Since there is only one line over the area, the true strike of any of these features is not known. Additional control in the areas of both S.P. E-95 and H-75 might locate a more favorable location than is shown at present. There are also several small reversals shown on the map that might prove substantial with further control.

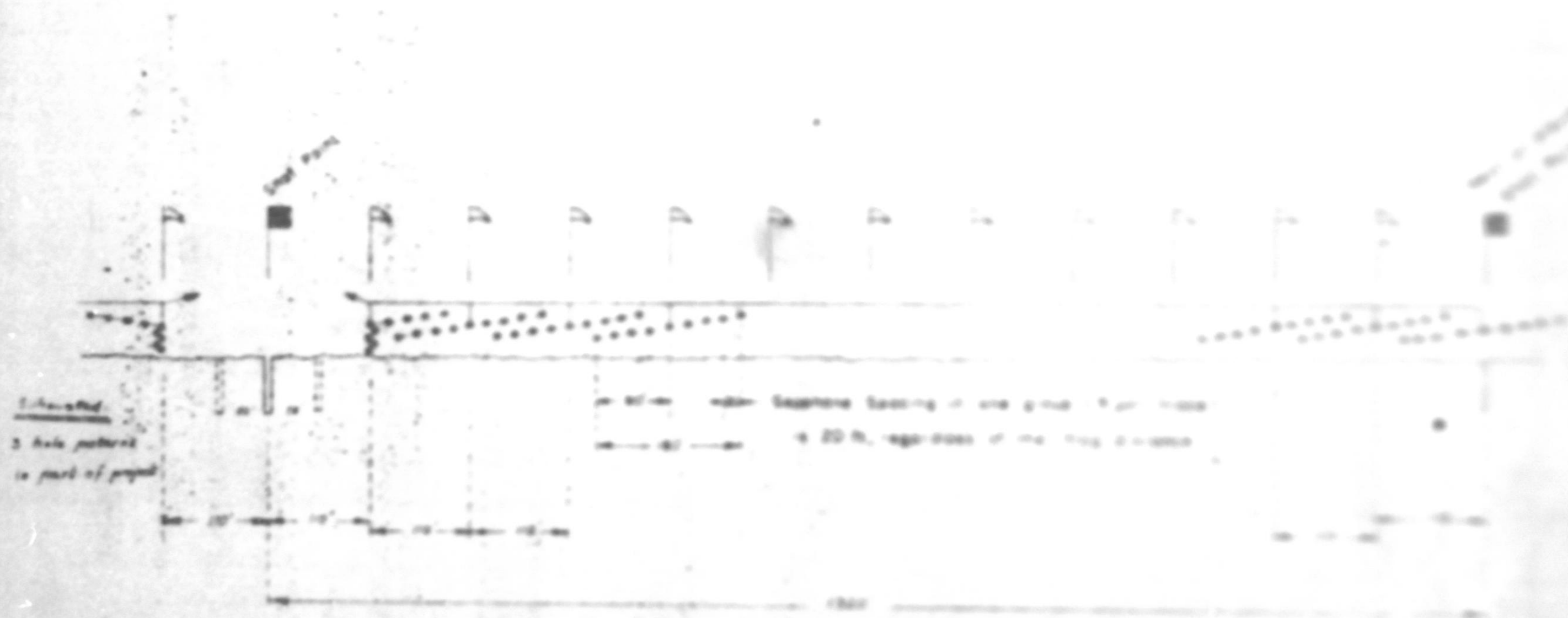
Respectfully submitted,

EXPLORATION CONSULTANTS, INC.

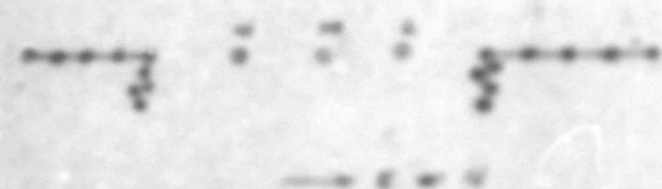
D. A. Schwartz, Party Chief.

H. J. Christie, President.

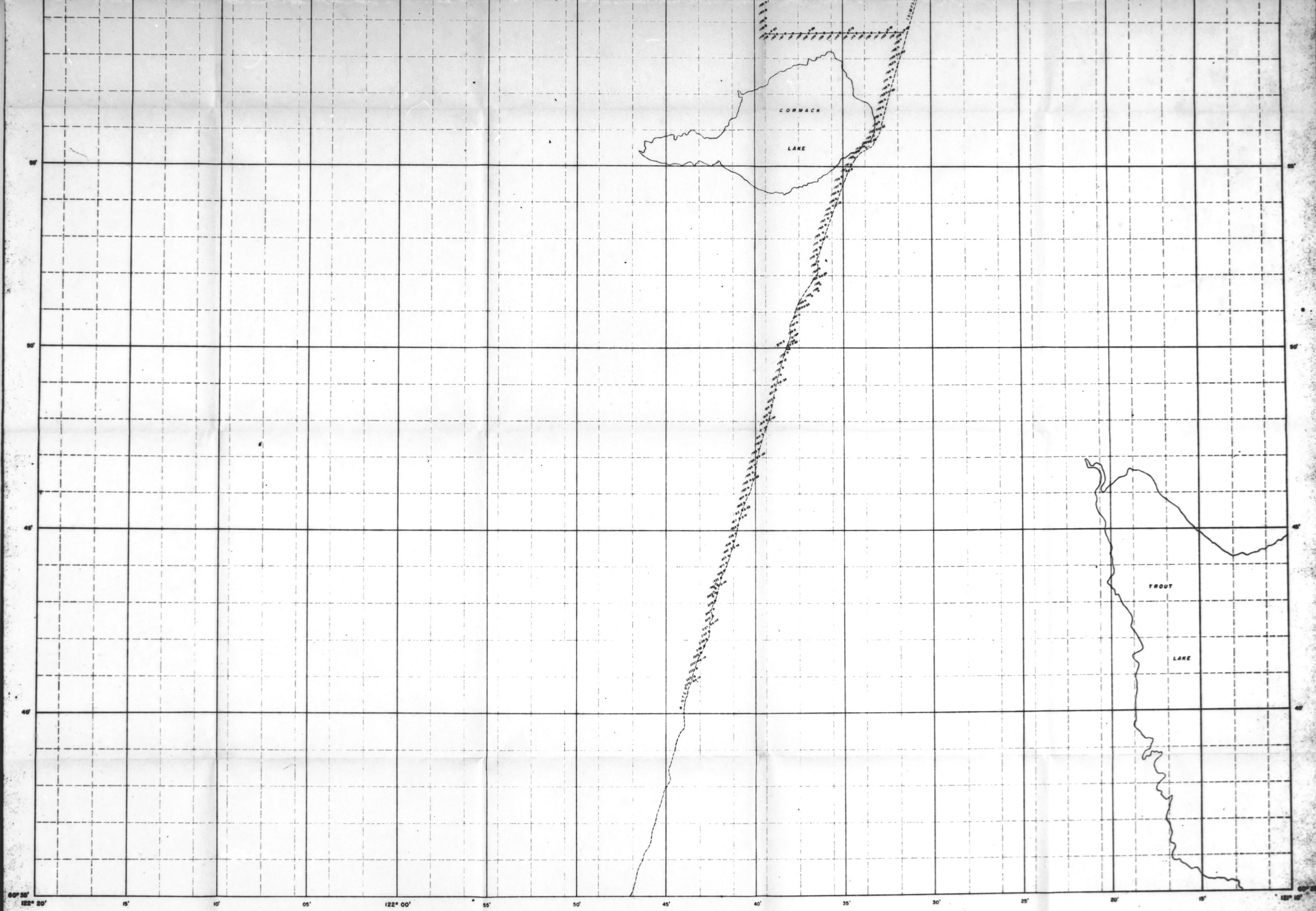
# Geophone arrangement and record type used



## Plot pattern diagram







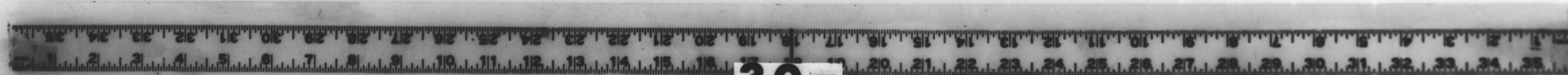
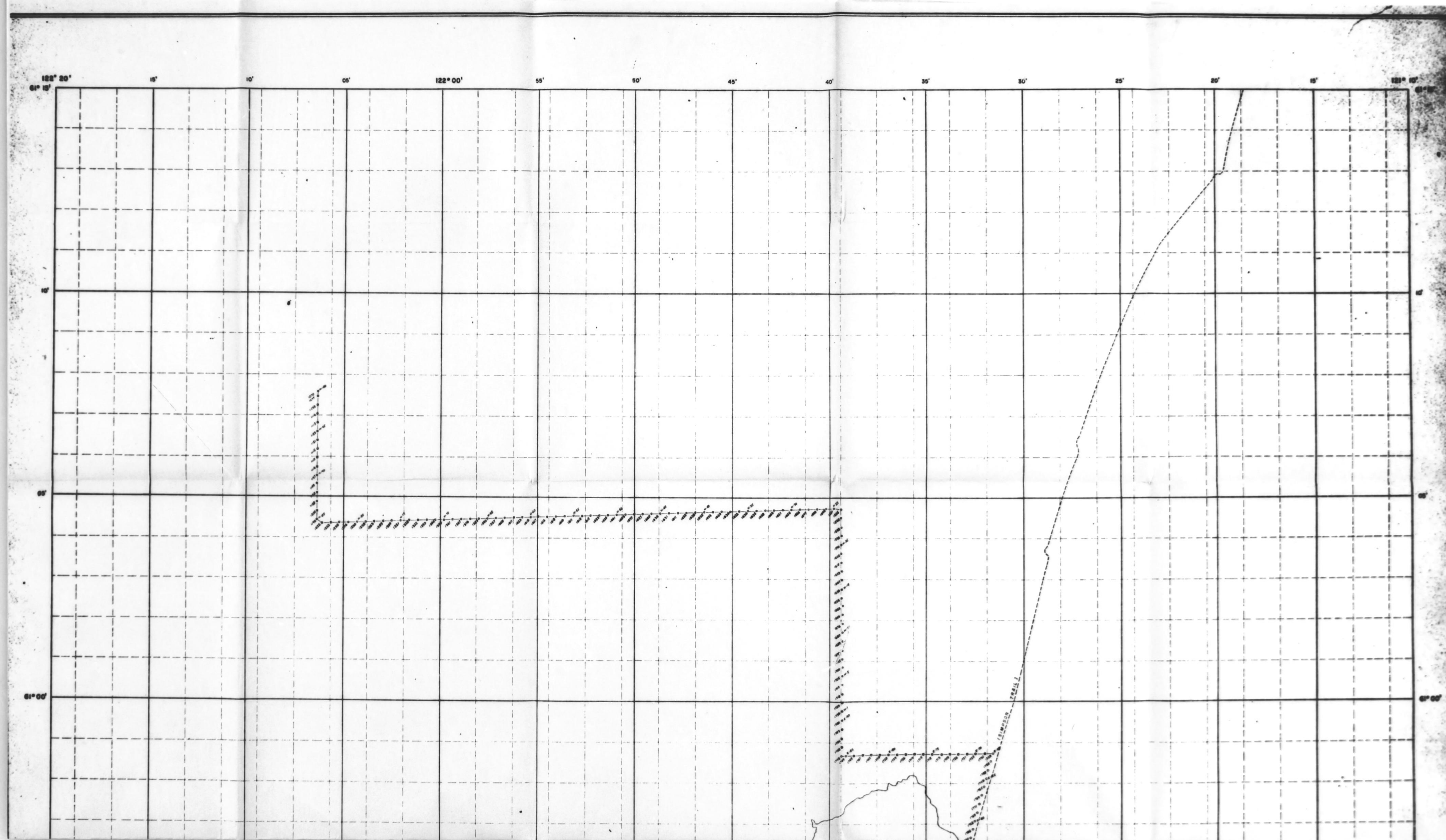
WELL LEGEND

- LOCATION
- OIL WELL
- ⊙ GAS WELL
- ◇ ABANDONED WELL

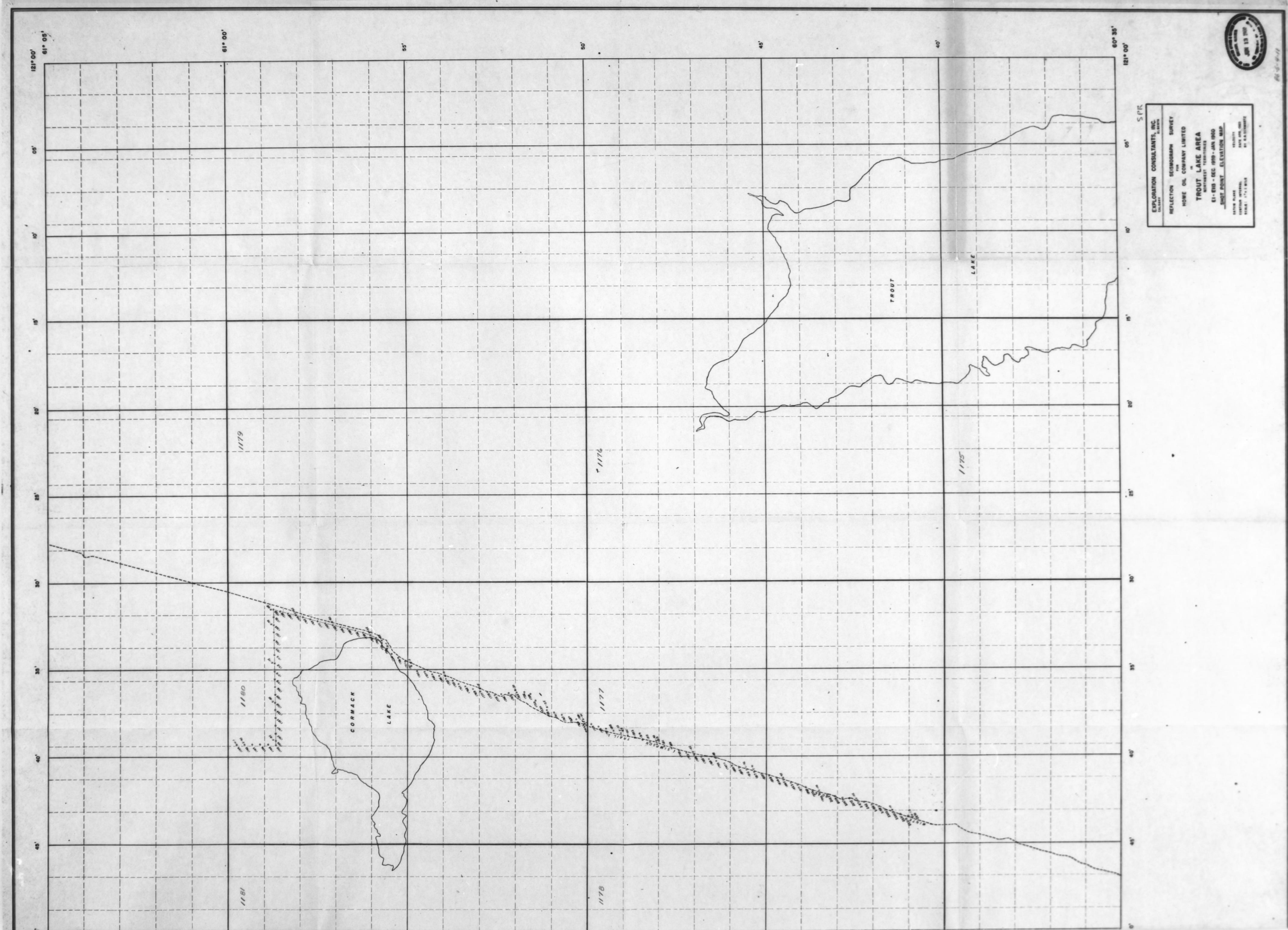
EXPLORATION CONSULTANTS, INC.  
REFLECTION SEISMOGRAPH SURVEY  
FOR  
HUSKY & TROUT LAKE AREA  
NORTHWEST TERRITORIES  
(CROWN LANDS)  
SHOT POINT ELEVATION MAP  
FIELD PLANS  
CONTAINING RECORDS  
SCALE 1" = 1 MILE  
VELOCITY  
AND AIR RESISTANCE  
BY RACINQUET











EXPLORATION CONSULTANTS INC.  
REFLECTION SURVEYING SURVEY  
HOME OIL COMPANY LIMITED  
TROUT LAKE AREA  
E1-103 - DEC 1992 - JAN 1993  
SHEET POINT - ELEVATION MAP  
SCALE: 1:25,000  
DATE: 1993

