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File

EXPLORATORY PROGRESS REPORT ON CERTAIN NORTHWEST TERRITORIES PERMITS ASSIGNED TO THE CALIFORNIA STANDARD COMPANY.

(Permits 529 to 531 inclusive;
549 to 555 inclusive;
561 to 568 inclusive;
and Permit 592)

BY

E. E. PELZER

DISTRICT EXPLORATION SUPERVISOR

THE CALIFORNIA STANDARD COMPANY

Peace River, Alberta

December, 1955.

INTRODUCTION:

This report is submitted pursuant to Sections 25 and 30 of the Territorial Oil and Gas Regulations (P.C. 1954-1740).

At the present time the California Standard Company holds in good standing nineteen permits in the general Cameron Hills Area, District of Mackenzie, as follows:

Permit No.	529	58,880 acres
"	530	58,880 "
"	531	58,880 "
"	549	61,440 "
"	550	63,360 "
"	551	63,360 "
"	552	63,360 "
"	553	60,540 "
"	554	53,500 "
"	555($W\frac{1}{2}$)	31,680 "
"	561	63,360 "
"	562	63,360 "
"	563	63,360 "
"	564	63,360 "
"	565	63,360 "
"	566	63,360 "
"	567	63,360 "
"	568	63,360 "
"	592	56,320 "

These permits were issued on December 29th, 1952, and were assigned to The California Standard Company on January 8th, 1954. Permits 529 to 531 inclusive were formerly grouped for exploratory purposes into Block "A", East Cameron Hills, and the remainder into Block "B", West Cameron Hills.

TOPOGRAPHY AND ACCESS

Permits 529 to 531 lie largely in the valley of the Hay River, in flat muskeg and bush terrain characteristic of most of the southern part of the District of Mackenzie. The Mackenzie Highway traverses the permits and provides access to them. The Hay River is a barrier worthy of note with respect to access to those portions of the permits lying southeast of it.

The remaining permits, or "West Cameron Hills Block", lie on top of and on the north slope of the Cameron Hills. The Cameron Hills are, strictly speaking, not hills but an escarpment marking the erosional edge of Cretaceous sediments, capped by glacial debris, and lying some 1500 ft. or more above an erosional plaincarved out of Upper Devonian limestones and shales. The

escarpment edge, which faces north, is a formidible barrier to exploration for physical as well as technical reasons. This is especially true immediately south of Tathlina Lake, where the escarpment is very steep and deeply incised by stream valleys. Proceeding westward from Tathlina Lake the escarpment slope becomes somewhat more gentle.

Access to the "West Cameron Hills Block" with motorized equipment can be gained only during the winter months (and then with great difficulty) along bulldozed trails. One of these trails, constructed by this company, leaves the Mackenzie Highway twelve miles north of the Alberta boundary, proceeds north and west some 40 miles to the south shore to Tathlina Lake, and thence proceeds almost due west for another 55 miles before turning due south and climbing the Cameron Hills escarpment.

GEOLOGICAL INVESTIGATIONS:

In a previous progress report dated July 1954 Mr. D. A. Pounder has described this company's continuing program of surface and subsurface geological investigations in the Northwest Territories. Surface work began in the summer of 1949 and is still continuing. Studies up to and including 1953 covered virtually all available outcrop to the east, north, and west of the Cameron Hills. Our work since then has led us much farther afield, but needless to say the regional concepts which are being derived from this work still have considerable bearing on our Cameron Hills permits.

Our subsurface studies in the vicinity of the Cameron Hills, and particularly to the south where considerable information is available from our own drilling activities, have outlined the general geology of the area very well. The results of these studies have been published (Bull. Amer. Assoc. Petroleum Geol. Vol. 39 No. 10 P. 1927-1975) in an attempt to clarify correlations and nomenclature in the area and also to stimulate industry interest in unravelling the exploratory problems peculiar to it.

I will not attempt to repeat here the information set forth in the aforementioned published reference. Suffice to say that the principal geologic objective in the Cameron Hills area is the barrier reef of Elk Point age. This reef trends up-dip and would therefore have to be crossed by tectonic flexures to produce trap conditions. Isolated reefs in front of the main barrier are possible, but would be extremely difficult to locate.

GEOPHYSICAL INVESTIGATIONS:

Our preliminary record quality reconnaissance on the Cameron Hills permits was described in Mr. Pounder's July 1954 progress report. Unfortunately the results of that reconnaissance were so poor as to discourage us from further developments pending possible technical improvements in the seismic method. A

brief review of the statistics of this record quality reconnaissance might be in order:

Number of miles of line shot -	193.98
Number of shot holes drilled -	743
Total footage of shot holes -	27,769
Deep shot holes drilled -	5
Total footage, deep shot holes -	1,353

Although we have undertaken no further on-the-ground operations since completion of this program in mid-April of 1954, considerable time has been spent by our Peace River review staff in analysing the rather large mass of data.

The record quality problems peculiar to the subject permits are of three types, with two of the problems being geographic in distribution and the third universal. The universal problem, of course, is the thick glacial drift with its dispersive characteristics and erratic velocity distribution and thickness.

Considering the area west of the Sixth Meridian an approximate correlation between elevation and record quality can be made:

(1) ≠ 2100 to 2500 = In this zone the Top of Devonian reflection is good, a poor and erratic top Hay River shale reflection is sometimes present, and the critical Top of Middle Devonian is generally masked by "multiples", or reverbrations between Top of Devonian and the surface.

(2) ≠ 1200 to ≠ 2100 = Both Top of Devonian and Top of Middle Devonian reflections are generally observable in this zone, with the latter being subject to distortion by multiples at critical elevations.

(3) ≠ 900 to ≠ 1200 - At these elevations the Top of Devonian is too shallow to be picked, being obscured by "first break" energy. The Top of Mid-Devonian is generally poor and sporadic, probably because of lateral interference along the spread set up by the shallow, high-velocity Upper Devonian limestones.

The two "geographic" problems, then, are multiple reflections at high elevations and lateral interference (similar to the type of problem encountered in the infamous Edwards Plateau of Texas) at low elevations.

Experimental efforts to improve record quality were made in this reconnaissance. These consisted of multiple geophones, inter-trace mixing, and deep shot holes. None of these measures

were particularly effective.

All records are presently being processed on "Strata machines", a device designed and patented by our company. This device removes weathering differentials and normal moveout from the records, thereby facilitating interpretation.

It has not been possible as yet to produce a map on the critical Top of Middle Devonian reflection. Maps on the Paleozoic Unconformity (Top of Devonian) are included with this report. Many of the depth points, especially at lower elevations, are derived from refraction data, reflections being totally absent.

No sand or gravel deposits nor any aquifers worthy of particular mention were encountered in any of the shot-holes drilled.

EXPENDITURES

On August 5th, 1954, a statement of total expenditures of $371,129.52 was submitted to the Department of Northern Affairs and National Resources, Ottawa. Geological costs prior to staking, totalling $15,055.68 were not allowed, giving an approved expenditure of $356,073.84. Bonds in the amount of $10,950.00 are on deposit with the department to cover the deficit with respect to commitments during the first three years of the permits.

Expenditures since our previous submission are indicated on the attached statement. These include the cost of recovering camps and equipment, subsurface geological charges, and district geophysical costs arising from the review of seismic data.

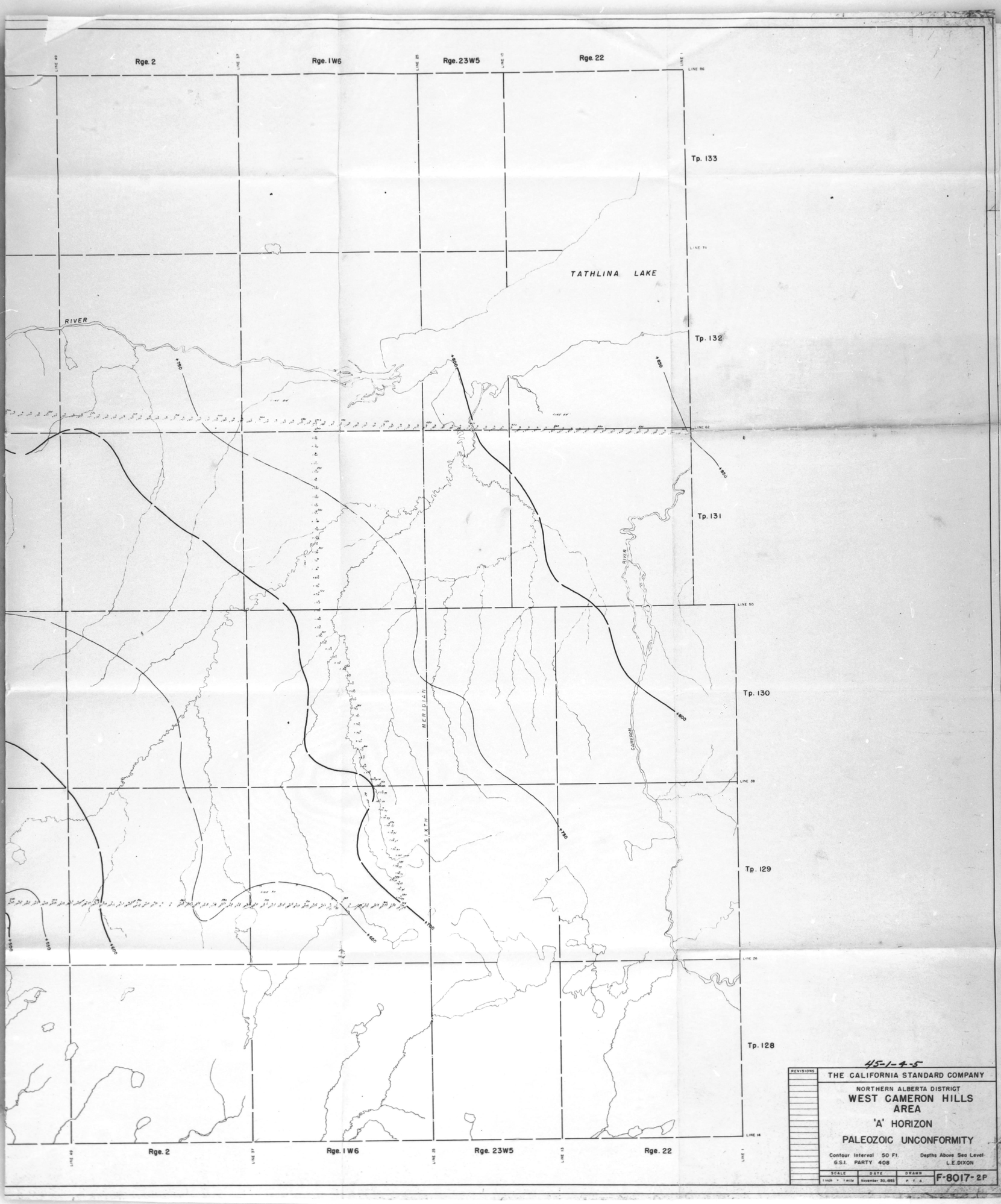
E. B. PELZER

EEP/sl

Rge. 4
Rge. 5
Rge. 6
Rge. 7
Rge. 8
Tp. 133
Tp. 132
Tp. 131
Tp. 130
Tp. 129
Tp. 128
+700
+650
+600
+550
+500
+450
+400
30x

30x

West Canadian Graphic Industries Ltd.



45-1-4-5

REVISIONS	THE CALIFORNIA STANDARD COMPANY

NORTHERN ALBERTA DISTRICT

WEST CAMERON HILLS AREA

'A' HORIZON

PALEOZOIC UNCONFORMITY

Contour Interval 50 Ft. Depths Above Sea Level
G.S.I. PARTY 408 L.E.DIXON

SCALE	DATE	DRAWN	
1 inch = 1 mile	November 30, 1955	P. T. A.	F-8017-2P

6F

Final Report

On

Exploration of P. and N.G. Permits 562, 563, 564, 566 and 568

(Cameron Hills Block)

by

E. E. Pelzer, District Exploration Supervisor
The California Standard Company

Peace River, Alberta

February 19, 1957

Introduction:

This report is submitted pursuant to Sections 25 and 30 of the Territorial Oil and Gas Regulations (P.C. 1954 - 1740).

Permits 562, 563, 564, 566 and 568 were issued on December 29th, 1952 and were assigned to The California Standard Company on January 8th, 1954. The permits are grouped for exploratory purposes and constitute a unit known in our records as the Cameron Hills Block.

These permits were originally contained in a group of 20 permits known as "Cameron Hills Block B". An additional 7 permits were grouped as "Cameron Hills Block A". On June 29th, 1954 a total of $8\frac{1}{2}$ permit areas were surrendered and the residue of $18\frac{1}{2}$ permits was regrouped as the "Cameron Hills Block". This block was further reduced on December 29th, 1955 to the present five permit areas.

This report covers exploratory operations on the subject five permit areas up to December 29th, 1956.

Topography and Access:

The "Cameron Hills Block" lies on the top of and on the north slope of the Cameron Hills. These hills are a topographic feature which mark the erosional edge of Cretaceous sediments, thereby forming a northwardly facing escarpment with total relief of about 1500 ft. This escarpment has been a formidable barrier to exploration for both physical and technical reasons.

Because of the muskeg-and-bush nature of the terrain on the block and on the access routes to it, motorized equipment can be moved into the area only during the winter months, along bulldozed trails.

One such trail, constructed by this company, leaves the Mac-Kenzie Highway twelve miles north of the Alberta boundary, proceeds north and west for some 40 miles to the south shore of Tathlina Lake, and thence proceeds almost due west for another 55 miles before turning due south and climbing the Cameron Hills escarpment.

A second access trail from the Bistcho Lake area leaves the north shore of Bistcho Lake in Tp. 125 R. 5 W. 6 and proceeds due north for about 25 miles into the block.

Geological Investigations:

Surface geological investigations were initiated in the Northwest Territories by this company in 1949 and are still continuing. Studies up to and including 1953 covered virtually all available rock exposures to the east, north and west of the Cameron Hills. Reports covering these field investigations have been previously submitted.

Since 1953 our surface geological studies have led us much farther afield, and the expenditures incurred have not been considered applicable to the Cameron Hills Block. Needless to say, however, the regional concepts

derived from this work have had considerable bearing on our thoughts regarding this block.

Our subsurface studies in this area have been confined largely to information obtained from wells drilled to the south, several of them by our own company. The results of these studies have been published (Bull. Amer. Assoc. Petroleum Geol. Vol. 39 No. 10 P. 1927 -1975) in an attempt to clarify correlations and nomenclature in the area and also to stimualte industry interest in unravelling the exploratory problems peculiar to it.

Reprints of the above-referenced article have been sent to the Petroleum and Natural Gas Conservation Officer with previous progress reports on the area.

Geophysical Investigations:

Early in December 1952, bulldozer and contract survey teams were moved into the Cameron Hills Block to lay the groundwork for a seismic survey. This preparatory bulldozing and surveying continued until mid-March, 1953. During this time 231.14 miles of line were cleared and surveyed. A total of 42.5 miles of this work was done on the permits which are the subject of this report.

In February 1954 Geophysical Service International Party 408 began a seismic survey on our Cameron Hills lands. This crew operated from a portable camp mounted on logging sleighs. Seismic equipment was mounted on Bombardier All-Track vehicles. All of the planned program was completed in mid-April, 1954, including the 42.5 miles of line available on the subject permits.

Because of very discouraging record quality in the original survey, this company was extremely hesitant to proceed with additional seismic work. By the winter of 1955-56, however, we had decided because of technical improvements in seismic instrumentation to try once more to obtain useful seismic data. In February, 1956 bulldozers were sent into the area to establish a seismic grid, and by spring breakup they were successful in clearing 84.5 miles of new line. In March a fleet of Bombardier All-Tracks, fuel and dynamite were trucked into the block and stockpiled for use the following summer.

In July 1956 Delta Exploration Party #5, a seismic crew under contract to this company, was flown into the Cameron Hills block to re-initiate a seismic survey. During July and August this crew, working out of a tent camp and entirely dependent on air transport, operated quite successfully for a total of 31.3 ten hour crew days. During this time the following work was accomplished:

Miles of Line shot -	45.95
No. of shot-holes drilled -	221
Total shot-hole footage drilled -	7633

While this work was an operational success the technical results were somewhat less than good. Definite improvement over previous data was

derived from this work have had considerable bearing on our thoughts regarding this block.

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Miles of Line shot -	45.95
No. of shot-holes drilled -	221
Total shot-hole footage drilled -	7633

While this work was an operational success the technical results were somewhat less than good. Definite improvement over previous data was

noted, but the improvement was not sufficient to give uniformly reliable information at critical depths. For this reason the survey was discontinued.

In December 1956 an agreement was reached to have an Aeromagnetic survey conducted on the block in the hope of detecting gross basement structural features. While this data has been obtained the interpretation of same is as yet in question.

In February 1957, subsequent to surrender of the permits, the tracked equipment and fuel storage tanks which had been used in the operation of the previous summer were recovered, thus concluding the efforts of this Company to explore the Cameron Hills Block for the present time at least.

Exploratory Costs:

A complete statement of costs on these permits to date is not presently possible, inasmuch as the final invoices for some of the work has not as yet been processed. A full notorized account of these expenditures will be forthcoming in due course.

Expenditures on these permits during the first three years were pro-rated from total "Cameron Hills Block B" costs, and approximated the required expenditures of 25 cents per acre.

It appears at the present time that the cost of the bulldozing, seismic work, aeromagnetic survey and recovery of seismic equipment during the fourth year (December 29th, 1955 to December 29th, 1956) of the subject permits will approximate $96,000.00. It should be re-emphasized that this is a purely tentative estimate.

Conclusion:

The California Standard Company respectfully submits that its' efforts to explore the subject permits have been sincere and have fully met with the letter and spirit of the Territorial Oil and Gas Regulations.

It is our sincere regret that technical difficulties beyond our control have prevented our exploration program from being carried through to a successful conclusion.

E E Pelzer.

E. E. PELZER

District Exploration Supervisor
The California Standard Company

EEP/fc

Tp. 133

Tp. 132

Tp. 131

Rge. 22

Rge. 23W5

Rge. 1W6

Rge. 2

Rge. 3

Rge. 4

TATHLINA LAKE

CAMSELL RIVER

KAKISA RIVER

SIXTH MERIDIAN

+700

+800

+900

+1000

+1100

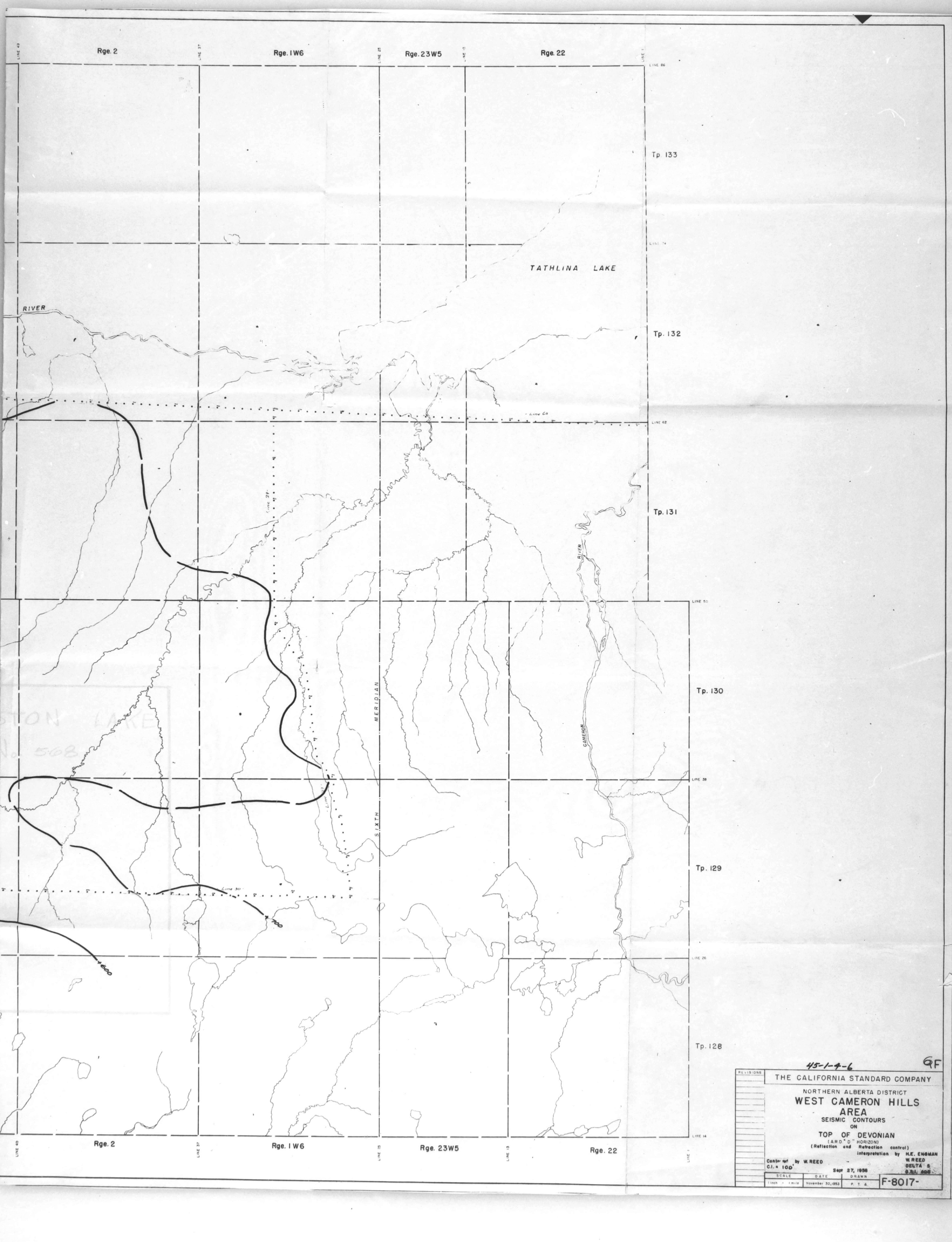
+1200

+1300

+1400

+1500

+1600



Rge. 2
Rge. 1W6
Rge. 23W5
Rge. 22
Tp. 133
Tp. 132
Tp. 131
Tp. 130
Tp. 129
Tp. 128
TATHLINA LAKE
RIVER
CAMERON RIVER
SIXTH MERIDIAN
45-1-4-6
9F
REVISIONS
THE CALIFORNIA STANDARD COMPANY
NORTHERN ALBERTA DISTRICT
WEST CAMERON HILLS
AREA
SEISMIC CONTOURS
ON
TOP OF DEVONIAN
(A.R.D. "D" HORIZON)
(Reflection and Refraction control)
interpretation by H.E. ENGMAN
W. REED
DELTA 5
Contoured by W. REED
C.I. = 100'
Sept 27, 1956
SCALE
1 inch = 1 mile
DATE
November 30, 1953
DRAWN
P. T. A.
F-8017-

Rge. 4 Rge. 5 Rge. 6 Rge. 7 Rge. 8

Tp. 128

Tp. 129

Tp. 130

Tp. 131

Tp. 132

Tp. 133

ISLAND LAKE
PERMIT No. 562

SANDY LAKE
PERMIT No. 564

BERRY LAKE
PERMIT No. 566

BOUVIER LAKE
PERMIT No. 563

Rge. 22 | Rge. 23W5 | Rge. 1W6 | Rge. 2 | Rge. 3 | Rge. 4

Tp. 131

Tp. 132

Tp. 133

SIXTH MERIDIAN

CAMSELL RIVER

KAKISA RIVER

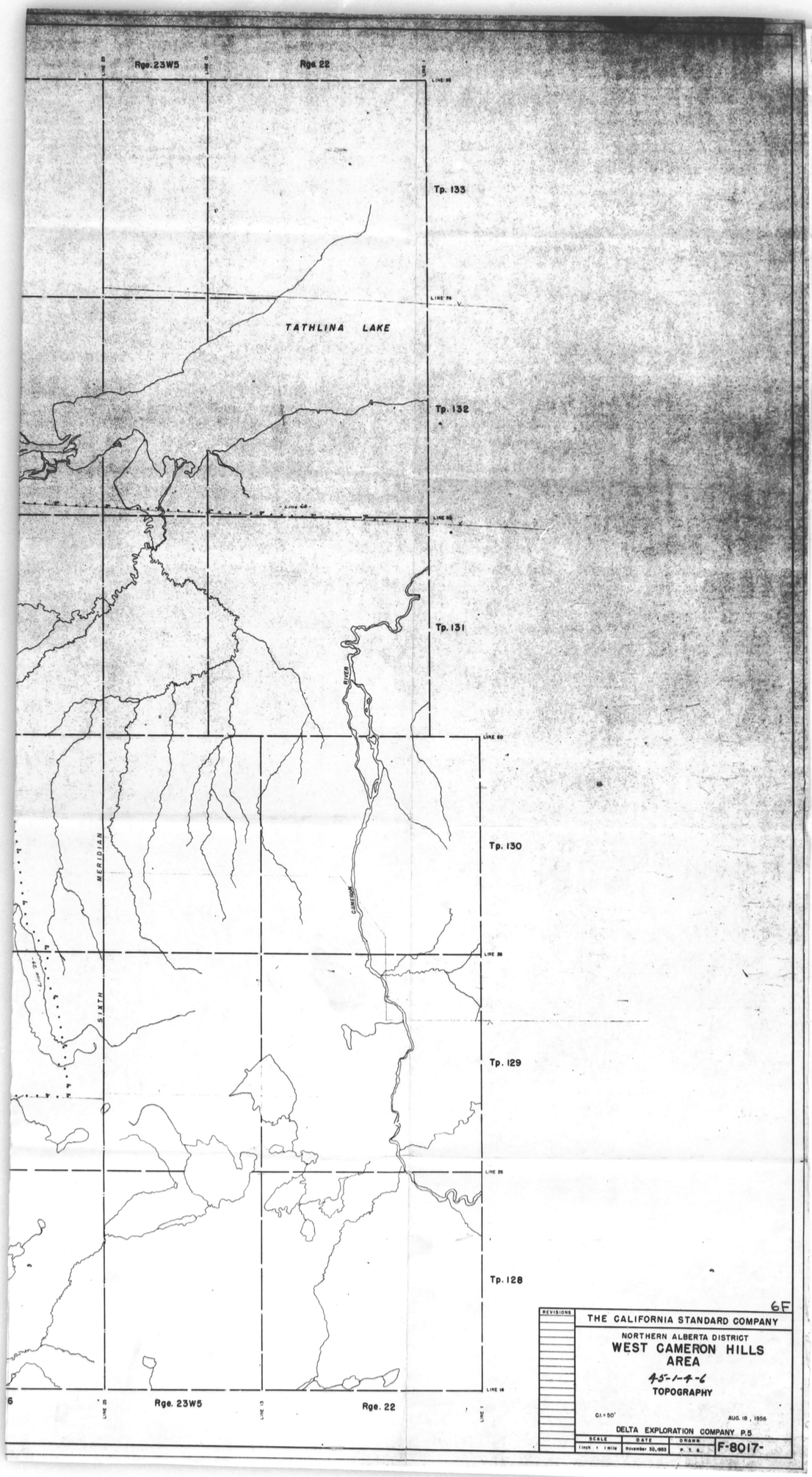
TATHLINA LAKE

BENTLY LAKE
PERMIT No. 566

THURSTON LAKE
PERMIT No. 568

30x

West Canadian Graphic Industries Ltd.



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REVISIONS

THE CALIFORNIA STANDARD COMPANY

NORTHERN ALBERTA DISTRICT

WEST CAMERON HILLS AREA

45-1-4-6

TOPOGRAPHY

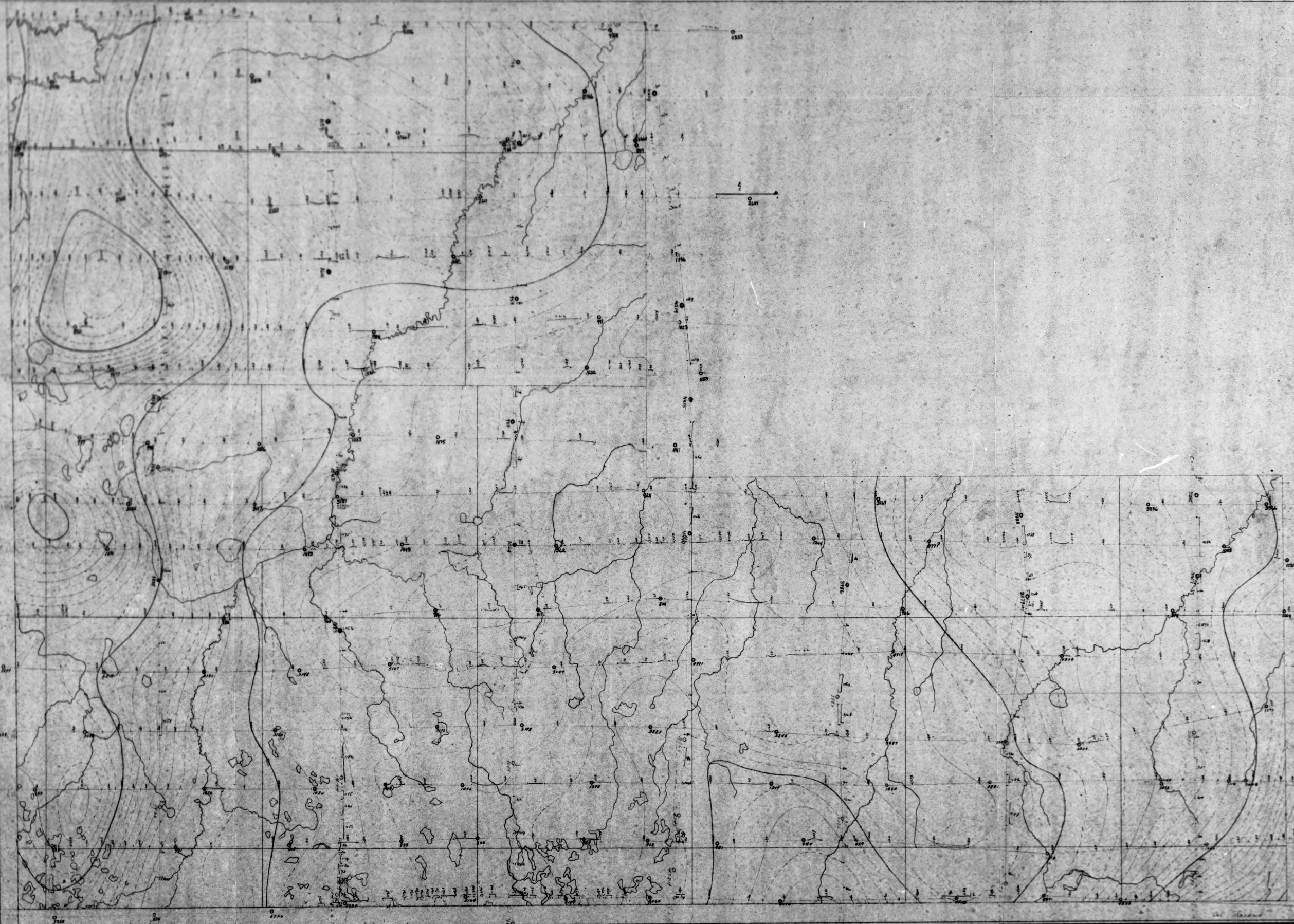
C.I. = 50'

AUG. 18, 1956

DELTA EXPLORATION COMPANY P.S.

SCALE	DATE	DRAWN
1 inch = 1 mile	November 30, 1953	P. T. S.

F-8017-



45-1-4-4