MILLS LAKE

RIVER

MACKENZIE

MILLS LAKE

LINE - 11X

LINE - 32Y

LINE - 28Y

LINE - 7X

LINE - 5X

SIXTH MERIDIAN

118° 30'

61° 30'

61° 25'

61° 20'

61° 15'

61° 10'

61° 05'

MACKENZIE

LINE - 32Y

LINE - 28Y

LINE - 7X

LINE - 19X

LINE - 41X

LINE - 24Y

BRIGGS
N.E. Reddit Lake

BRIGGS
CACTUS LAKE
No. 1

64-Y

61° 15'
61° 10'
61° 05'
61° 00'
119° 00'
118° 55'
118° 50'
118° 45'
118° 40'
118° 35'
118° 30'
118° 25'
118° 20'
118° 15'
118° 10'
118° 05'
118° 00'
59° 55'
59° 50'

FOR INDEX OF BASE MAPS IN THIS AREA SEE F-8787-2-1

REVISIONS

THE CALIFORNIA STANDARD COMPANY

MILLS LAKE AREA

STRUCTURE

SLAVE POINT

Contr. Int. 66.6 acs. Surv. Int. 10 ft. contours

DATUM PLANE 7250 Corporation Elevation

SCALE	DATE	DRAWN	F-9504-1
1 INCH = 1 MILE	MAR. 27, 1953	L. A. S.	

MILLS LAKE

RIVER

MILLS LAKE

MACKENZIE

LINE - 11X

LINE - 32Y

LINE - 7X

LINE - 19Y

LINE - 28Y

SIXTH MERIDIAN

118°00' 118°55' 118°50' 118°45' 118°40' 118°35' 118°30' 118°25' 118°20' 118°15' 118°10' 118°05' 118°00'

61°30' 61°25' 61°20' 61°15' 61°10' 61°05'

440 435 430 425 450 455 465 460 440 425 430 435 440 445 470 475 480 485 490 495 500 445

MACKENZ

61°15'

61°10'

61°05'

61°00'

118°00' 118°55' 118°50' 118°45' 118°40' 118°35' 118°30' 118°25' 118°20' 118°15' 118°10' 118°05' 118°00'

59°55'

59°50'

LINE - 32Y

LINE - 7X

LINE - 28Y

LINE - 19X

LINE - 41X

LINE - 21Y

LINE - 35X

465 460 440 425 430 435 440 445 470 475 480 485 490 495 500 445 440 435 430 425 495 500 490 485 480 475 470 465 460 455 450 445 440 435 430 425

BRIGGS NE. RIDGE FLD.

BRIGGS

FOR INDEX OF BASE MAPS IN THIS AREA SEE F-6791-E-1

REVISIONS

THE CALIFORNIA STANDARD COMPANY

MILLS LAKE AREA

STRUCTURE

PINE POINT

MILLS LAKE

RIVER

MACKENZIE

MILLS LAKE

LINE - 11X

LINE - 32Y

LINE - 28Y

LINE - 19X

LINE - 7X

SIXTH MERIDIAN

118°00' 118°55' 118°50' 118°45 118°40' 118°35' 118°30' 118°25' 118°20' 118°15' 118°10' 118°05'

61°30' 61°25' 61°20' 61°15' 61°10' 61°05'

3111 3110

*300' *325' *500' *525' *550' *575' *600' *625' *650' *675' *700' *725' *750' *775' *800' *825' *850' *875' *900'

1 OF 2

MACKENZIE

LINE-32Y

LINE-28Y

LINE-7X

LINE-19X

LINE-41X

LINE-2Y

SIXTH

61°15'

61°10'

61°05'

61°00'

119°00'

118°55'

118°50'

118°45'

118°40'

118°35'

118°30'

118°25'

118°20'

118°15'

118°10'

118°05'

59°55'

59°50'

FOR INDEX OF BASE MAPS IN THIS AREA SEE F-6797-6-J

REVISIONS	THE CALIFORNIA STANDARD COMPANY
	MILLS LAKE AREA
	SURFACE ELEVATION MAP
	SCALE: 1 INCH = 1 MILE; DATE: MARCH, 1963; DRAWN: A. K. M.; F-9350

GEOLOGICAL & EVALUATION
RESEARCH DIVISION
SEP 9 19
OTTAWA, CANADA
Dept. of Northern Affairs & National Resources

SUMMARY OF EXPLORATION

MILLS LAKE BLOCK, SOUTH GROUP (GROUP B)

Covering Territorial P&NG Permits
3110 and 3111

By: E. A. Brownless
Formation Evaluation Geologist
The California Standard Company

Calgary, Alberta. August, 1963.

****

Mr. E. A. Brownless is a graduate of the University of Toronto with a B.A. Sc. (Geology) degree, and this report has been prepared under my supervision.

John R Clive

J. R. OWER, Professional Geologist (Alta.)
Division Exploration Superintendent

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Mills Lake Area - Surface Elevation Map by E.C.I.

Mills Lake Area - Isochron - Pine Point to "X" Horizon by E.C.I.

Mills Lake Area Structure - Slave Point by R.W. Cowden E.C.I.

GENERAL

Territorial P. & N.G. Permits 3110 and 3111 were issued to the California Standard Company on September 15, 1960.

These permits are known and referred to in our records as the Mills Lake Block; this block is part of the South Group (Group B) of Territorial permits being explored by the California Standard Company.

It will be noted that the three year term of these permits will expire on September 15, 1963. This progress report is intended, therefore, to comply with Section 54-1(a) of the Canada Oil and Gas Land Regulations (1961). The necessary geological and geophysical reports will accompany this summary.

TOPOGRAPHY

The area is 12 miles south of Mills Lake which is a widening in the MacKenzie River approximately 30 miles downstream from the Great Slave Lake. To the South is Kakisa Lake which drains to the east into the MacKenzie River. Generally the area is flat and swampy, sloping gently toward the MacKenzie River. The elevation in the southeastern corner of Permit 3110 is 800 feet and the elevation of Mills Lake is 473 feet. The village of Mills Lake is four miles west of the area, situated on the banks of the MacKenzie River. The topography of the area is shown on National Topographic System Sheet No. 85.

ACCESS

The Mills Lake area is about 40 miles west northwest of the MacKenzie Highway. Hay River, 42 miles east, at the northern extremity of the MacKenzie Highway is the nearest town of any size. A bush road, serviceable in the winter extends from the MacKenzie Highway west-northwest to the village of Mills Lake and passes through permits 3110 and 3111. This winter road is approximately 4 miles north of the Alexandra Falls.

SUMMARY OF WORK PERFORMED 1960-1963

During the initial three years of these Permits, a seismic survey was conducted in the area from March 8, 1962 to March 26, 1962. This survey was carried out by Exploration Consultants Incorporated Crew No. 1 under contract to the California Standard Company. Two drilling rigs were employed, one a standard Maybew 1000 and the other a combination "air and water" Failing 1500. The recording unit was a 24 channel

modified Century 501X integrated with a Fortune model 3 (buffer type) magnetic tape system and 3-18 cycle S.I.E. geophones per station. A total of 72 miles were shot using this equipment.

A detailed report of this operation prepared by Exploration Consultants accompanies this report.

FUTURE PLANS

It is our intention to carry out a geophysical survey in the immediate area to the south of Permits 3110 and 3111. It is hoped that this new survey will supply us with additional data which will assist us in further evaluation of the Mills Lake Block.

E. A. Brownless

EAB:jg

SEISMIC REPORT

of

MILLS LAKE AREA

for

THE CALIFORNIA STANDARD COMPANY

by

EXPLORATION CONSULTANTS, INC.

EXPLORATION CONSULTANTS, INC.

209A-6TH AVENUE SOUTH WEST
CALGARY, ALBERTA

SEISMIC REPORT

of

MILLS LAKE AREA

for

THE CALIFORNIA STANDARD COMPANY

by

EXPLORATION CONSULTANTS, INC.

INTRODUCTION

The Mills Lake area is located in the Northwest Territories. It extends south from the MacKenzie river to Lat. 59°55' and west from the 6th meridian to Long. 118°35'.

Field work commenced March 8th, 1962, and the survey was completed March 26th, 1962.

A new California Standard mobile camp was moved into the area to accommodate the crew.

PURPOSE OF SURVEY

The objective of the survey was to map the top of the middle Devonian carbonates in search of possible isolated reefs.

SURFACE CONDITIONS

The southern part of this area is lightly wooded with spruce and some birch. The northern part consists mostly of open muskeg.

There is very little soil covering the limestone on lines 64Y, 35A, 2Y and north on line 19X to shot point 12.

Quite a number of old bulldozed lines exist in this project and a large percentage of the work was programmed to follow these lines thus minimizing the dozing costs.

FIELD PROCEDURE

Surveying

Survey control was carried with a transit. Ties were made to two bench marks along the 6th meridian and also to Foetus Lake and N.E. Rabbit Lake test locations.

Bulldozing

Two D-7 dozers cleared snow from the old trails and cut some new line. A drag was pulled behind one of the dozers when moving from one camp location to another in order to obtain a smoother surface along the main access roads and cut down driving time for the seismic crew.

Drilling

Single holes were drilled at each location to an average depth of 60'. Two drills, one a standard Mayhew 1000 and the other a combination "air and water" Failing 1500 were used for this part of the operation. Double shifts were run on both of these drills for six of the 26 days.

Recording

The recording unit was a 24 channel modified Century 501A integrated with a Fortune model 3 (buffer type) magnetic tape system and 3-16 cycle S.I.E. geophones per station.

Wherever possible the following spread layout was used:

1. Distance between shot points - 2050'.
2. Number of traces - 24.
3. Trace interval - 150'.
4. Seis. interval - 10'.
5. Gap to stations near shot points - 200'.
6. Distance between up-hole phone and Sp. - 10'.

Monitor records were recorded on a wide band filter setting of 26-2-120 at 100% gain control. Playbacks were made on 26-2-66 at from 15 to 25% gain.

Charge size varied from a maximum of 5 to 10 lbs. while shooting in the limestone formation down to 5/32 lb. in the shale area. The optimum shooting depth averaged 35'.

COMPUTATIONS AND PRESENTATION OF DATA

Weathering and drift control sections were constructed on all lines and corrections applied to a datum of +750' at a replacement velocity of 10,000'/sec. to traces 1-12-13 and 24 on the plotted horizon.

In the southern part of the prospect, where limestone or limy shale was at the surface, the record times were corrected to the base of the limestone @ 15,000'/sec. and to the base of the limy shale at 11,000'/sec.

Static corrections were made on a flattened horizon for record sections which were made by the Chevron playback system in Calgary. The playback settings for these sections were as follows:

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Static corrections were made on a flattened horizon for record sections which were made by the Chevron playback system in Calgary. The playback settings for these sections were as follows:

Gain control	-	R
Type of mix	-	Straight @ 24/1
Cam number	-	J-4
Initial shift	-	0 to + .090
Filter setting	-	LC-30K; HC-92 MK (except on lines 2Y and 41X)
Filter setting	-	LC-60K; HC-92MK (lines 2Y and 41X)

Condensed, hand traced, structural sections were flattened on a datum of -750' using the summation 24/1 trace of the record sections.

The following maps were submitted:

Slave Point	-	Structure
Pine Point	-	Structure
Pine Point to "X" horizon	-	Isochron
Surface elevations		

RESULTS

Record quality ranged from good to poor. Ground roll and Rayleigh waves distorted the reflected energy in many cases making it impossible to obtain accurate end trace ties. Continuity was based mainly on character on the near traces and the summation trace of the record sections.

Both the Pine Point and Slave Point structure maps indicate a positive area in the northern part of the prospect. The Slave Point builds up slightly more than the Pine Point on line 19X north from shot point 17, but appears to be more of a gradual stratigraphic change rather than a reef buildup.

The Pine Point to "X" horizon converges into one leg at Shot point No.1 on line 19X which could mean a shale-out at this point.

A graben may possibly exist between Sps. 663 and 12-line 19X as the condensed structure sections seem to indicate. However, this could not be confirmed on the original field records and was mapped as a fairly strong syncline. This low trend or graben isolates the Foetus Lake high from the southwest nosing trend in the northern half of the project.

The contractor is indebted to Mr. Duncan McCaskill of California Standard for his suggestions and cooperation during the course of the field survey and subsequent interpretation.

Respectfully submitted,

EXPLORATION CONSULTANTS,INC.

R.W. Cowden, Party Chief

Norman J. Christie, President

STATISTICS MILLS LAKE

Recorder

Drive time	79	hrs. (54 hrs. Dix-Mills-Calgary)
Field time	172.5	hrs.
Total time	251.5	hrs.
Profiles	183	
Refraction Profiles	172	
No. miles shot	72	miles
Dynamite	1967.81	lbs.
Caps	641	
No.of shots	583	
Average dynamite per shot	3.38	lbs.

Drills

Drive time	183	hrs.
Field time	498	hrs.
Total time	681	hrs.
No. holes drilled	187	
Footage drilled	12,040	feet
Mud	6,150	lbs.
Bran	6,500	lbs.
Rock bits	43	
Insert bits	149	

Spare Water Truck

Total hours	238.5	hrs.


118°00'
118°55'
118°50'
118°45'
118°40'
118°35'
118°30'
118°25'
118°20'
118°15'
118°10'
118°05'
118°00'
61°30'
61°25'
61°20'
61°15'
61°10'
61°05'
MILLS LAKE
RIVER
MACKENZIE
MILLS LAKE
61°20'
015
010
020
025
030
035
LINE - 11X
MERIDIAN
THICK
LINE - 32Y
010
015
020
025
THICK
LINE - 28Y
LINE - 7X
035
SIXTH
61°15'
61°05'

1 OF 2

MACKENZ

61°15'
61°10'
61°05'
61°00'
118°00'
118°55'
118°50'
118°45'
118°40'
118°35'
118°30'
118°25'
118°20'
118°15'
118°10'
118°05'
118°00'
59°55'
59°50'

LINE - 41X
LINE-2Y
LINE-19X
LINE-28Y
LINE-32Y
LINE-7X
010
015
020
025
030
035
THICK
BRIGGS
35X
64Y

FOR INDEX OF BASE MAPS IN THIS AREA SEE F-5791-E11

REVISIONS

THE CALIFORNIA STANDARD COMPANY

MILLS LAKE AREA

ISOCHRON

PINE POINT to "K" HORIZON

CONT. INT. 005 sec.
DATUM PLANE
SCALE: 1 INCH = 1 MILE
DATE: MARCH, 1958
DRAWN: L. P. L.

F-9354

2 of 2

Exploratory Progress Report

to accompany

Application to Surrender

Territorial Permits

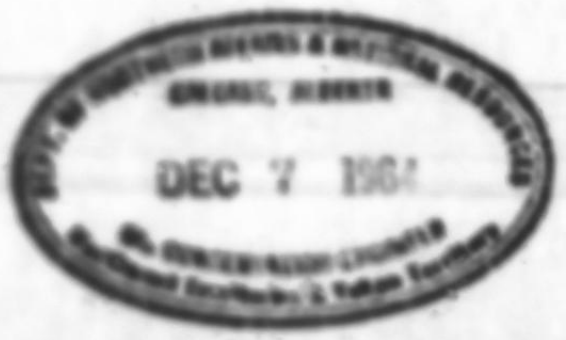
Nos. 3261, 3262, 3263 and 3264

FORT KIAPUSK BLOCK

GROUP 94

N.W.T.

The California Standard Company



Summary of Exploration

Fort Simpson Block - Group 94

Covering Territorial Permits

No.'s 3241, 3242, 3243 and 3244

By: E. A. Brownless
Formation Evaluation Geologist,
The California Standard Company

Calgary, Alberta November, 1964

Mr. E. A. Brownless is a graduate of the University of Toronto with a B.S. Sc. (Geology) degree, and this report has been prepared under my supervision.

C. Dahlstrom, Professional Geologist
(Alberta)
District Exploration Superintendent



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Fort Simpson Stratometer Survey 1962

General

Territorial P. and N.G. Permits 3241 to 3244 inclusive were issued to the California Standard Company on November 30, 1964.

These Permits make up the Fort Simpson Block which forms part of Group 94 of Territorial permits being actively explored by The California Standard Company.

It will be noted that the primary term of these permits expires on November 30, 1964. This report is intended to comply with Section 54 1(a) of the Canada Oil and Gas Land Regulations (1960).

Summary of Work Performed

There has been no geological field work done within the area of these permits nor in the vicinity of them by The California Standard Company during their initial term.

A reconnaissance geophysical program was carried out along the MacKenzie River adjacent to these permits. This work was an attempt to evaluate this acreage. Approximately 72 miles of the MacKenzie River between Fort Simpson and Campbell Bend was surveyed by Accurate Exploration's Stratometer during the period July 17 to July 19 inclusive.

The results of this survey were very disappointing and no attempt was made to map the data resulting from the survey.

A report of this survey and the reasons for the poor results are included in the attached Geophysical Report by Mr. H. E. Engman.

Future Plans

No further work is planned in this area and it is our intention to surrender these permits.

E C Brownlee

MEMORANDUM

October 24, 1962

E. E. PELZER:

Re: Stratometer Survey of the Fort Simpson Area

Approximately 72 miles of the MacKenzie River between Fort Simpson and Campsell Bend was surveyed by Accurate Exploration's Stratometer in the period from July 17 to 19. The work was originally contracted by Imperial Oil and we were a one-third participant. Thus, for approximately $3000 we obtained first hand experience with this potentially valuable reconnaissance tool and had hopes for structural information pertaining to our Fort Simpson project.

The Stratometer Method

The Stratometer is a modification of Accurate's earlier Sparker method. Two gas exploders have been substituted for the electrical spark as a source in an effort to improve the signal to noise ratio. The recording array consists of a six geophone pattern, inline and ten feet apart, towed 450 ft. behind the source. The gas guns were fired every four seconds and recorded for 0.920 secs. This gives traces about every 30 ft. which are recorded on a horizontal scale of about 1150 ft./inch. The record section is compressed relative to the vertical scale by about 2 to 1.

Horizontal control was maintained with the aid of a sextant and aerial mosaics (scale: 1" approx. 2500 ft.). An accuracy of ±200 ft. by this method was claimed. No elevation measurements were made.

The precision of all of the foregoing scales is dependent upon uniform current flow and accurate time recordings. All measurements are referenced to times recorded about every six minutes. No errors serious enough to bother a reconnaissance type survey are expected to result from this factor but any attempt at quantitative analysis will be hampered, e.g. apparent velocity measurements.

Results

The results of the survey are very disappointing. The main problem is generally poor signal to noise ratio. Very few coherent alignments are present and correlation and identification of those that are present is difficult. The main source of noise was the boat engine which had to be in operation much of the time to control the boat in "tricky currents and whirlpools". A probable contributing factor is the thick drift (200 ft. - 1100 ft. according to wells) in the vicinity of the MacKenzie River.

Several additional problems further downgraded the survey. The first breaks have very erratic arrival times, partly because the cable was

deliberately pulled in and let out periodically to check for multiples (not an effective method in this area because of inadequate velocity contrast above the top of carbonate), and partly because the "tricky current" appears to have changed the source to receiver distance frequently. This disturbs shallow alignments to the detriment of reflection quality.

Cross control is probably desirable to check for reflected refractions which must be expected in a river valley. Refraction spreads should be shot periodically (twice a day) to provide drift and velocity control that would assist in reflection identification in remote areas such as this one.

Conclusions:

This survey gave us some new drift control in the area. Because of the foregoing problems no other information could be extracted and even the drift interpretation is doubtful. The Stratometer is therefore considered to have failed as a reconnaissance tool in the Fort Simpson area. We see little hope that it can be successful in other areas more than rarely unless;

1. A relatively noiseless power source is found (or areas of optimum river current are worked).

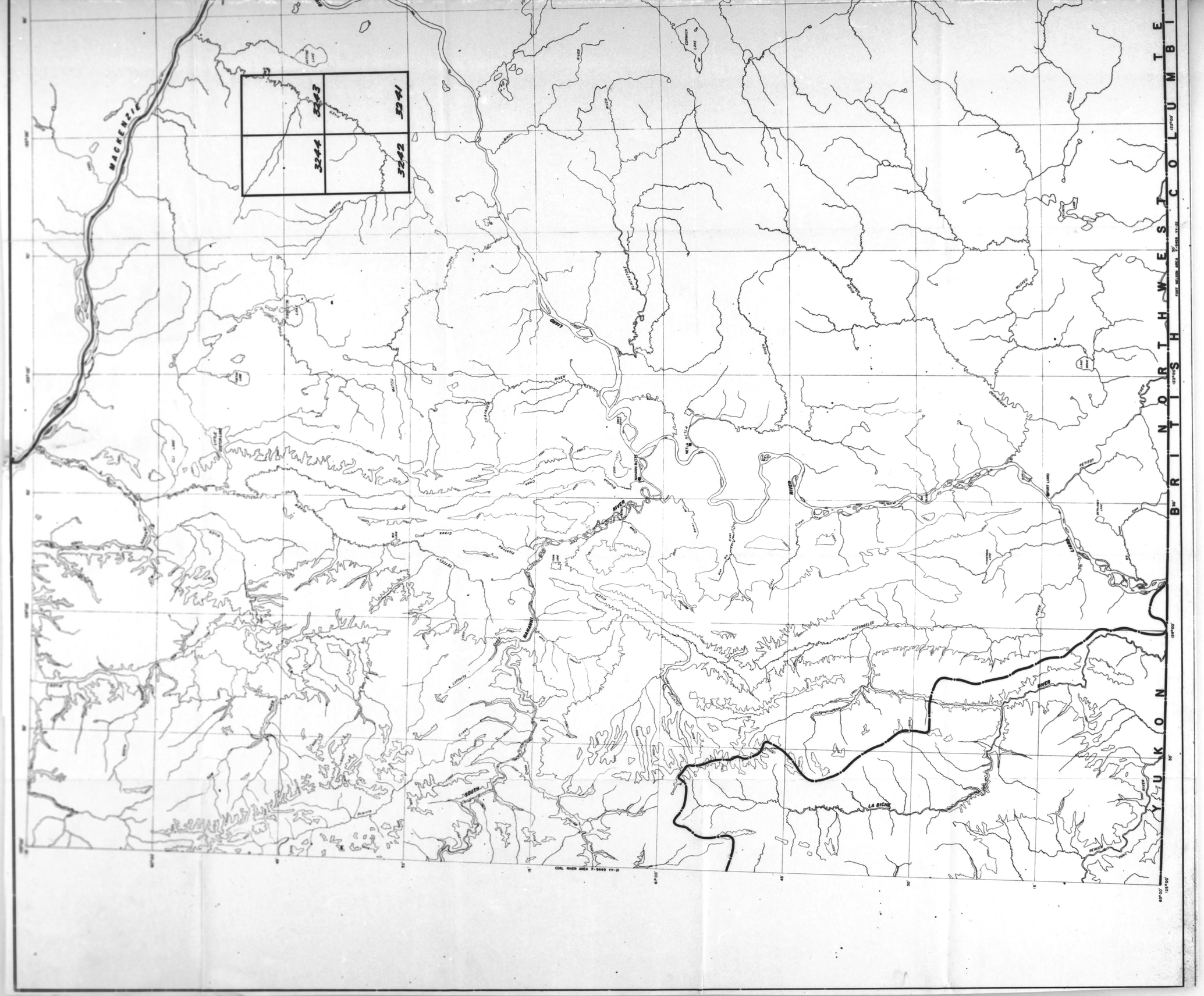
2. The drift configuration is thinner and less erratic than in this area.

3. Additional control such as cross spreads and inline refractions are obtained.

Since Accurate Exploration have themselves lost most of their enthusiasm for the Stratometer survey method, and since (1) and (2) above are really formidable problems, I don't think we can expect the Stratometer to help us very much in our N.W.T. reconnaissance work.

H. E. Engman

hee/sl
c.c. T.O. May



30x
. West Canadian Graphic Industries Ltd.

THE CALIFORNIA STANDARD COMPANY

NWT

LIARD RIVER AREA
FORT SIMPSON
STRATOMETER
SURVEY
1962

SCALE	DATE	DRAWN
1: 250,000	DECEMBER 1961	R.G.

F-9447A

REVISIONS

DEC 7 1961

