

GEOLOGICAL AND GEOPHYSICAL
REPORT - CAT GROUP CLAIMS
8 Miles WSW - CRANBROOK, B.C.
49° 115° NW - PLACID OIL COMPANY
JUNE - OCTOBER 1966

J.S. Scott, P.Eng. 829/5W
R.A. Buckley, B.Sc., M.Sc.

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CAT GROUP CLAIMS
CRANBROOK, BRITISH COLUMBIA

PLACID OIL COMPANY
CALGARY, ALBERTA

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December 14, 1966

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BRITISH COLUMBIA

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GEOLOGICAL AND GEOPHYSICAL REPORT

CAT GROUP CLAIMS

CRANBROOK, BRITISH COLUMBIA

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CAT GROUP CLAIMS

CRANBROOK, B.C.

INTRODUCTION

The Cat Group comprises 23 claims in Forst Steele Mining Division. Cat M.C.'s 1 - 19 were staked December 15 & 16, 1965, by Mr. D. J. Fulton of Cranbrook for Mr. James S. Scott of Vancouver, and recorded December 20, 1965. Cat M.C.'s 20 - 23 inclusive were staked October 21 & 22, 1966, by James S. Scott, and recorded October 25, 1966. The group is held under option by Placid Oil Company of Calgary, which carried out an exploration program consisting of line-cutting, a magnetometer survey, and geological mapping in the period June to October 1966. This exploration program was undertaken to determine the stratigraphic position of the outcropping Aldridge formation and to relate this formation to known intrusives in the area. A review of the literature and examinations of known ore deposits and mineral showings are combined, with a view to using these data and theories in the search for orebodies on the Cat Claims of the Sullivan type.

LOCATION AND ACCESSIBILITY

The Cat Group of Claims is located 8 miles WSW of Cranbrook, B.C. West of Kiakho Creek, on Palmer Creek. The property may be reached by a logging road which leaves the abandoned settlement of Lumberton and proceeds up the west bank of Kiakho or Fish Creek, through the property and eventually to a fire tower immediately north of the Claim Group.

TOPOGRAPHY AND CLIMATE

The claims lie along the valley of Palmer Bar Creek and on the ridge between Palmer Bar and Kiskho Creeks. The elevation varies from 3500 above sea level in the creek beds to 5300 feet in the highest portion of the claim block. Slopes in the area vary from gentle to locally sheer cliffs 100 - 200 feet high. Palmer Bar Creek banks are especially steep.

The area has been logged in past years, leaving some stands of fir and tamarack. The steep slopes are covered with poplar and low bush.

The summer temperatures and rain fall are ideal for field work. The temperature varies from 70 to 95 degrees. Rain fall is light, the field party losing only one-half day during the period June 26 to August 29th due to rain.

OUTLINE OF WORK

The field party consisted of 6 university and pre-university students and the author. A total of 129 man days of work was performed on this property, further broken down into 118 man days in the field, 11 man days interpreting the results in the office.

Access was gained to the property over existing logging and forestry roads using a Ford Econoline Van. Transportation to the less accessible areas was by means of two "Tote-Goats", an off-the-road type of motor scooter which proved very effective in moving personnel, chain saws, gasoline and associated field equipment.

Using a transit, a base line was laid out on an azimuth of $280^{\circ}30'$ true and driven from a known point on Highway 95 for a total distance of 18,750 feet of which 6,380 feet of line was on the Cat claims. The base line was cleared wide enough to allow transit shots up to 500 feet to be made. In areas of extreme topography, shorter transit shots were necessary.

Picket lines were turned off normal to the base line at 500 foot intervals and driven up to a maximum of 4400 feet from the base line. These lines were projected by means of aligning a minimum of three pickets. They were cleared of small trees and overhanging underbrush with chain saws, then chained and flagged every 100 feet with poly flagging in preparation for a detailed magnetometer survey. A total of 69,650 feet of picket line was cut.

The survey on the Cat Group was tied in regionally with the granite intrusion to the north as well as the Jim Group of Claims (owned 100% by Placid Oil Company) to the East. The additional geophysical survey used for tie-in purposes pro-rated to the Cat claim group is as follows:

SUMMARY OF LINES CUT AND MAGNETOMETER SURVEY COMPLETED - CAT GROUP

| | <u>Picket Line</u> | <u>Baseline</u> | <u>Magnetometer Stations</u> |
|---------------------|--------------------|-------------------|------------------------------|
| On Cat Claim Group | 51,150 feet | 6,380 feet | 451 |
| For Tie-in Purposes | 18,500 feet | 820 feet | 255 |
| T O T A L | <u>69,650 feet</u> | <u>7,200 feet</u> | <u>706</u> |

MAGNETOMETER SURVEY

The Magnetometer Survey was conducted by the author using the Type 46-65 Jalander Electronic Fluxgate Magnetometer, (Serial No. 7255). This instrument has a range of 10 - 250,000 gammas in five sensitivity ranges, with a maximum sensitivity of 10 gammas. The manufacturer is Optillinen Tehdas Oy, Helsinki, Finland.

Magnetic readings were taken at 100 foot intervals along the base line and the picket lines. Associated Diurnal readings were recorded and taken into account in the map interpretation.

GEOLOGICAL MAPPING

One and one-half days during the month of June was spent with Mr. J. S. Scott (Consultant) on a reconnaissance survey of the region. Two additional days in August were spent mapping and examining the lithology in more detail. The period October 24, 25, 1966, was spent on more detailed examination of the lithology and in the collection of rock specimens to be used in obtaining various magnetic parameters. In addition, the granite intrusion one quarter of a mile north of the Cat Group, and the exploration adit immediately adjacent to the property above Fish Creek was examined.

In total, 7 man days were spent on Geological Mapping in connection with this property.

REGIONAL GEOLOGY

The Cranbrook Area has received considerable attention by the Geological Survey of Canada, prospectors and mining companies for many years. The first maps and reports were made by Dawson 1886, Schofield 1915 and Rice 1938, with more detailed work being done by Ressor 1954, and Leech 1960.

This prospect lies within the Rocky Mountain Area of the Eastern system of the Canadian Cordillera. A thick group of sediments was deposited within the original synclinal trough of the Cordillera in late Pre-Cambrian time. These sediments are divided into the Windermere and Purcell Series. The Purcell series has an estimated thickness of up to 37,000 feet divided as follows:

| | |
|-------------|--------------------|
| Fort Steele | 6,000-7,000 feet |
| Aldridge | 12,000-16,000 feet |
| Creston | 5,000-7,000 feet |
| Kitchener | 6,000-7,000 feet |

These formations are fine grained argillites, dolomitic argillites, and argillaceous quartzites and quartzites. They are believed to have been deposited under shallows, fresh water conditions in a large basin not connected with the sea (Rice). Rice, Leech, Ressor of the G.S.C. recognized the importance of stratigraphy as a guide to exploration and divided the Aldridge into three divisions on the basis of lithology. The pattern of exploration has followed these divisions with emphasis on the lower division. The lowest division occurs on the property and is approximately 4,500 feet thick (Rice) and consists of a rusty weathered assemblage of impure grey quartzites with fine dark laminations, scour channels, ripple marks and cross-bedding. Intraformational conglomerates are fairly common near the top. Freeze (1966) states that the intraformational conglomerate can be traced laterally up to three miles before pinching out, and is known to attain a thickness of approximately 1,000 feet. He suggests that the origin can be ascribed to violent submarine slides.

The Middle division is 10,000 feet thick and consists of cleaner massive light colored quartzites with argillaceous partings. The minor rusty weathering is confined to relatively thin argillaceous zones. The transition to the upper division is difficult to recognize in the field, but is marked by an increase in rust on an outcropping section. The Upper Section is 1,300 feet thick and is characterized by an increase in thinly laminated argillite and argillaceous quartzite.

STRUCTURAL GEOLOGY

The Cat Group of Claims is on the west limb of a large north-east trending fold, known as the Moyie Lake anticline. The outcropping Aldridge formation strikes NW and dips 10-15 degrees to the NE. The stratigraphic position of the outcropping Aldridge is placed as Middle Aldridge, or most probable on the top of the lower division. The latest regional map (Leech 1959) indicates a large fold, with its axis passing through the village of Moyie and NE towards the village of Fort Steele, is cut and modified by several regional faults. The Moyie fault, the largest, is a reverse fault striking approximately N45E with a steep dip NW. It faults the Aldridge on to the Kitchener Formation. Leech (1959) believes this fault to be an oblique thrust whose hanging wall moved relatively upward and northeastward. The Cranbrook fault, less than one mile north of the Cat Group, strikes approximately EW and dips 65 degrees north. The movement on the Cranbrook fault has been such that the younger Creston Formation has down faulted on the north of the fault plane and the Cat Group of claims. This fault has a good surface expression east of the Cat Group, north of Jim Smith Lake, where 30 feet of white to reddish-pink massive vein quartz along the fault plane crops out.

The Purcell intrusives are dioritic in composition, sillor dyke in habit and intrude all formations of the lower Purcell series. The larger sills are more prominent in Fort Steele and Aldridge formations. The Purcell extrusives are interbedded with Siyeh Strata and were extruded under water. A little alteration accompanies the intrusion of the Purcell sills and usually takes the form of biotite development in a narrow zone.

Granodiorite plugs and syenite dykes and sills of late Cretaceous to early Tertiary age are common in lower Purcell rocks. A number of granodiorite outcrops between St. Mary River and Mather Creek in the trench are known (from Aeromagnetics) to be part of a larger body some 4-5 miles in diameter. A second body a mile in diameter outcrops at the south end of Kiakho Lake. These bodies become more numerous westerly in the St. Mary River drainage. Syenites are frequently associated with the granodiorites and are considered a late phase. These intrusives are magnetically high and are readily mapped by airborne magnetometers.

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TABLE OF FORMATIONS

The following table of formations is pertinent to the area, although only rocks of the Late Pre-Cambrian appear as bedrock in the vicinity of the claims:

| <u>PERIOD</u> | <u>AGE</u> | <u>FORMATION OR ROCK TYPE</u> |
|---------------------------------------|---|--|
| CENOZOIC | Recent | Sands, gravels, river wash. |
| | Pleistocene | Glacial drift, tills, boulder clay, gravels. |
| | - - - - - Unconformity - - - - - | |
| | Miocene | St. Eugene silts. |
| | - - - - - Unconformity - - - - - | |
| | Early Tertiary or Late Cretaceous | Granodiorite stocks Syenite dykes. |
| - - - - - intrusive contact - - - - - | | |
| PALEOZOIC | | Eager. |
| | Lower Cambrian | - - - disconformity(?) - - Cranbrook. |
| | - - - - - Unconformity - - - - - | |
| | Upper Purcell | Gateway. |
| PRE-CAMBRIAN | | Purcell igneous rocks - - - intrusive contact - - Siyeh vivid colored dolomitic argillite. |
| | Lower Purcell | Kitchener - buff weathering Creston - green, purple, white, argillaceous gtzites. Aldridge - grey, rusty argillite, argillaceous gtzite. Fort Steele - banded, black to light argillite, dolomitic argillite and gtzite. |

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| Leech, G.B. | 1958 | Fernie Map Area, West Half, British Columbia, Geol. Serv., Canada, Paper 58-10. |
| | 1959 | The Southern Part of the Rocky Mountain Trench, Bull. Can. Inst. Min. Met. Vol. 52 No. 565 pp 327-333. |
| Rice, H.M.A. | 1937 | Cranbrook Map Area, B.C. Geol. Serv., Canada, Mem 207. |
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DISCUSSION OF MAGNETOMETER RESULTS

The Aldridge quartzites that crop out on the Cat Group of claims is remarkably homogeneous. It consists of a thick series of massive and argillaceous quartzites striking NW and dipping 10-15 degrees NE. Purcell intrusives of dioritic composition intrude the Aldridge along the bedding planes. These sills vary in thickness from 50 to 200 feet. Four separate sills were mapped geologically on the property.

Since the quartzites are so homogeneous very little variation in magnetic intensity was observed with the ground magnetometer. Because there was very little variation in the vertical magnetic field, it was decided to outline only the high magnetic trends rather than attempt to conventionally contour the data. The results (Enclosure #2) shows elongated magnetic highs which follow the surface expression of the diorite sills. These magnetic trends on the map appear to curve. This curvature is due to the extreme topographical variation caused by the deeply incised stream beds. The magnetometer survey and the Geological Map are in close agreement. One-half mile north of the property a very strong magnetic feature is noted. This feature is due to the underlying granite plug. (See magnetic profile 60+00W and profile 55+00W). These lines were run to tie in the known granite plug and the surrounding country rock underlying the Cat Group of claims. These two lines, although not on the Cat Group, are necessary for the proper interpretation of the data recorded on the claim group.

One anomaly occurs on the property which warrants additional exploration. The anomaly is located 500 feet north of the base line on picket line 95+00W and trends NW. It is mapped again on line 100+00W, 800 feet north of the base line, then trends along the picket line in a northerly direction.

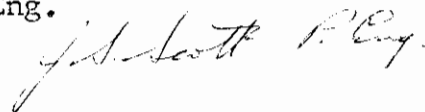
CONCLUSIONS AND RECOMMENDATIONS

The ground magnetometer survey has mapped the Purcell dioritic sills, the granite intrusive and the homogeneous nature of the Aldridge quartzites. More detailed surveys using Induced Polarization, Geochemistry and diamond drilling would locate and evaluate any base metal deposits.

It is recommended that additional work be conducted on the property with special attention being paid to the anomaly mapped on lines 95+00W and 100+00W.

Respectfully submitted,

J. S. Scott, P.Eng.



R. A. Buckley, B.Sc., M.Sc.

December 14, 1966.

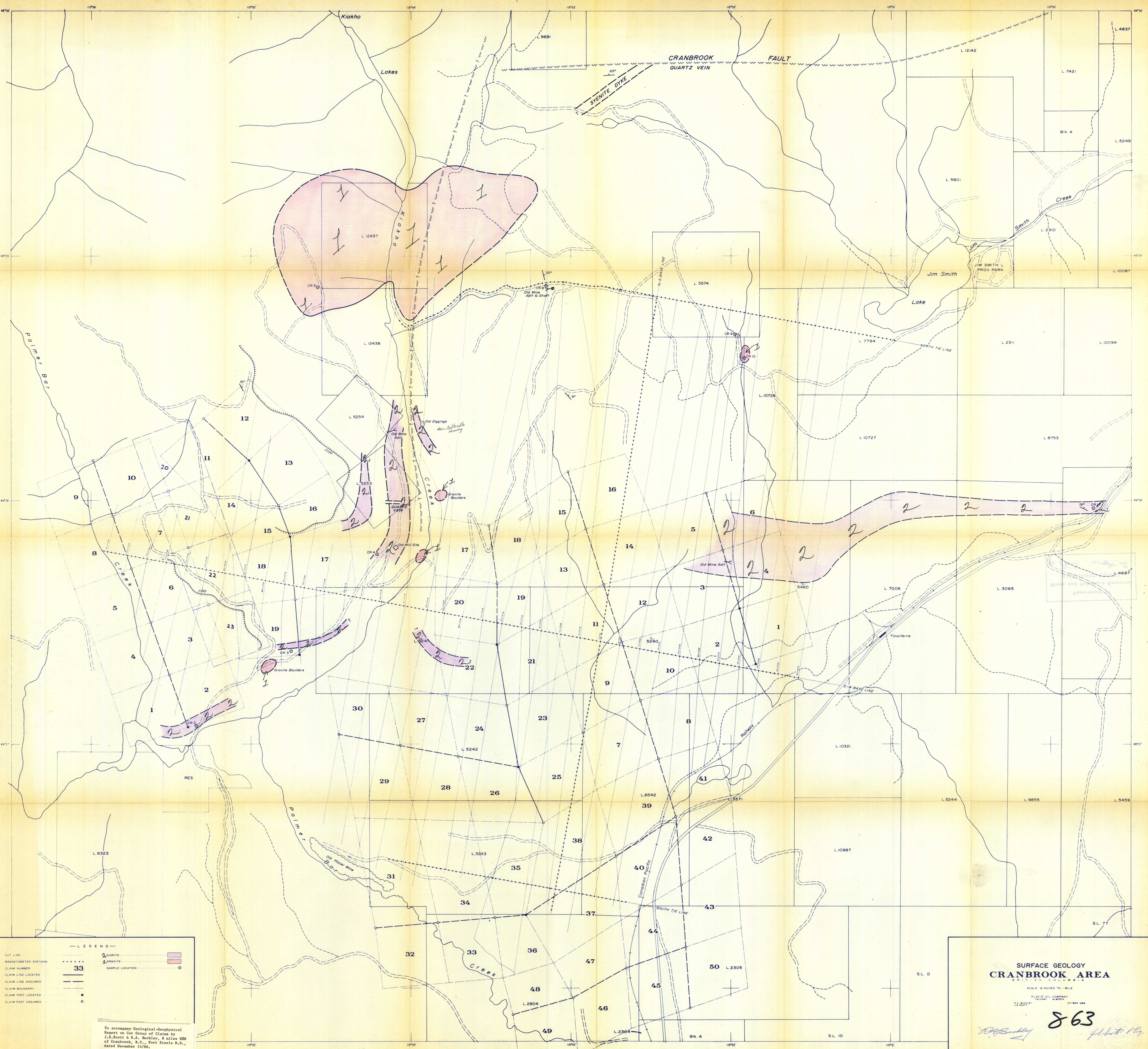
R. A. BuckleyQualifications

- A. I, Ronald A. Buckley, am by profession a Geologist, residing in the City of Calgary, Province of Alberta.
- B. I graduated in the year 1957 from Acadia University, Wolfville, Nova Scotia, with a Bachelor of Science Degree in Geology, with a minor in Chemistry and Physics.
- C. I graduated in the year 1959 from McGill University, Montreal, Quebec, with a Master of Science Degree in Geology.
- D. Since graduation, I have been employed by a Mining Company, a Provincial Department of Mines, and two Oil Companies in the search for oil, gas and metallic minerals.
- E. I am a member:
The Alberta Association of Petroleum Geologists
Mineralogical Association of Canada
Society of Economic Geologists
Society of The Sigma XI
Canadian Institute of Mining and Metallurgy
- F. I have applied for membership:
Association of Professional Engineers of B.C.
Association of Professional Engineers of Alberta.

R. A. Buckley, B.Sc., M.Sc.

December 14, 1966.

Calgary, Alberta.



LEGEND

- CUT LINE
- MAGNETOMETER STATIONS
- CLAIM NUMBER
- CLAIM LINE LOCATED
- CLAIM LINE ASSUMED
- CLAIM BOUNDARY
- CLAIM POST LOCATED
- CLAIM POST ASSUMED
- SYENITE
- QUARTZ VEIN
- SAMPLE LOCATION

To accompany Geological-Geophysical Report on Cut Group of Claims by J.S. Scott & R.A. Buckley, 8 miles WSW of Cranbrook, B.C., Fort Steele N.D., dated December 14/66.

SURFACE GEOLOGY
CRANBROOK AREA
 BRITISH COLUMBIA

SCALE - 8 INCHES TO 1 MILE
 PLACID OIL COMPANY
 22 BUCKLEY "ALEXANDER" ALBERTA
 OCTOBER 1966

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R.A. Buckley
J.S. Scott



— LEGEND —

- CUT LINE
- MAGNETOMETER STATIONS
- CLAIM NUMBER **33**
- CLAIM LINE LOCATED
- CLAIM LINE ASSUMED
- CLAIM BOUNDARY
- CLAIM POST LOCATED
- CLAIM POST ASSUMED
- MAGNETIC FEATURE

To accompany Geological-Geophysical Report on Cut Group of Claims by J.S. Scott & R.A. Beckley, 8 miles WSW of Cranbrook, B.C., Fort Steele H.B., dated December 14/66.

MAGNETOMETER SURVEY
CRANBROOK AREA
 BRITISH COLUMBIA

SCALE: 8 INCHES TO 1 MILE

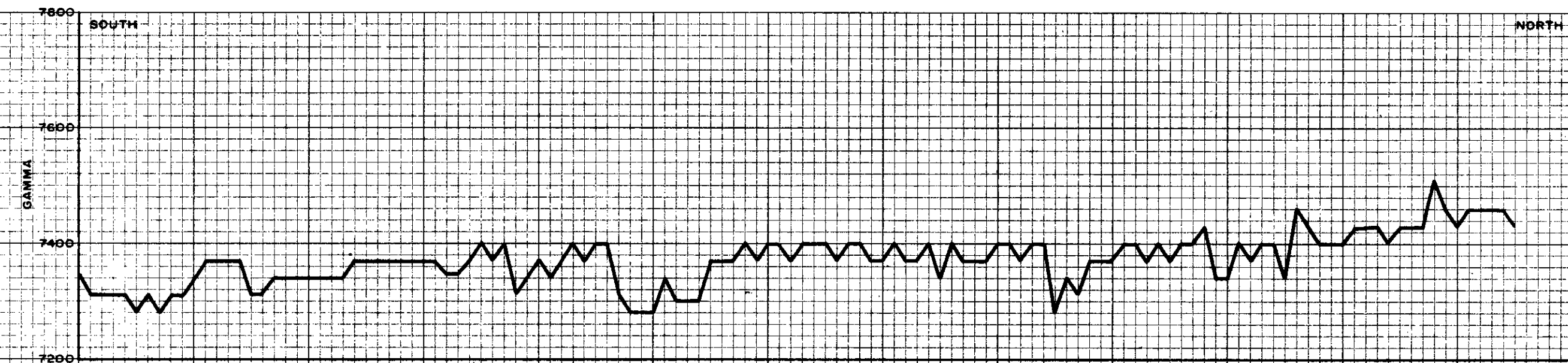
PLACID OIL COMPANY
 VANCOUVER, B.C.

OCTOBER 1966

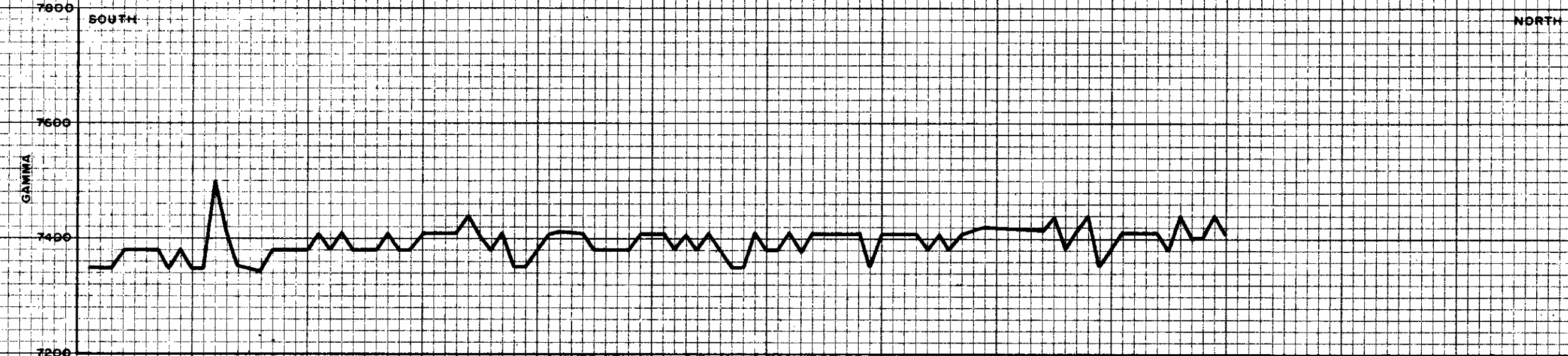
R. Buckley **863** *J. Scott & R. Beckley*

S.L. D
 S.L. 10

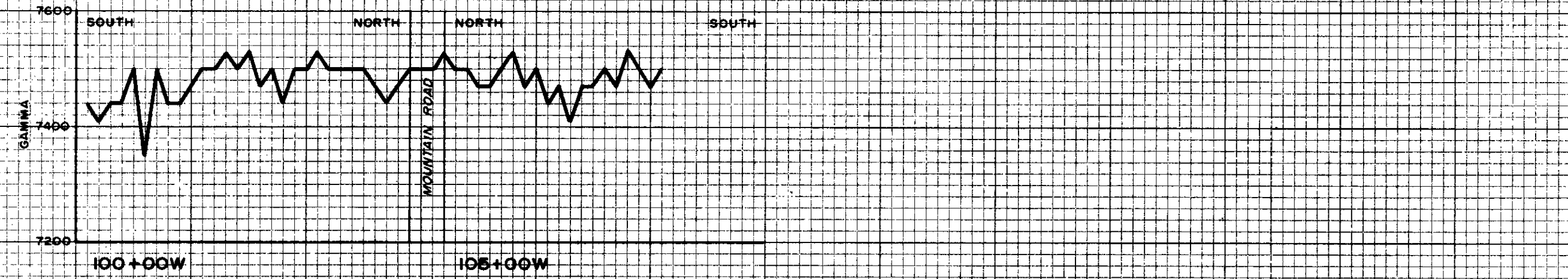
ENCLOSURE 2



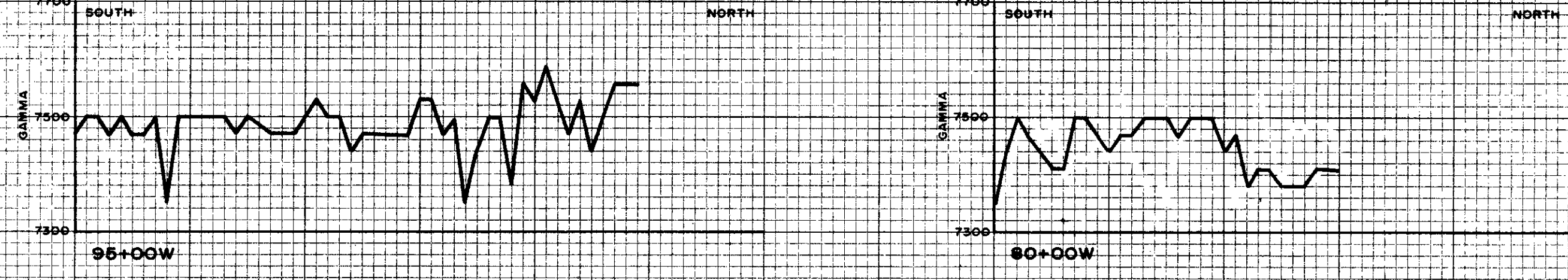
ALONG FORESTRY ROAD FROM PALMER BAR CREEK RESERVOIR PARALLEL TO KIAKO CREEK



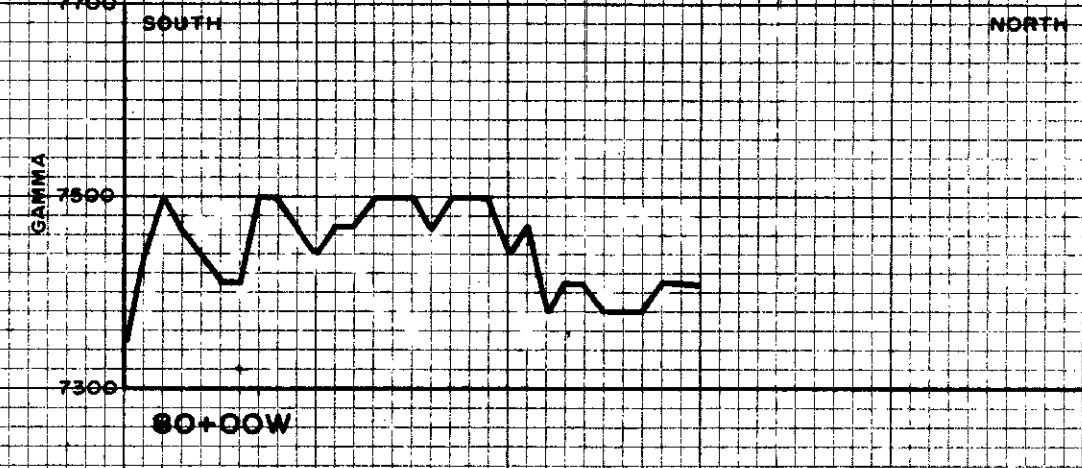
UP MOUNTAIN ROAD FROM JUNCTION CLAIM No. 19



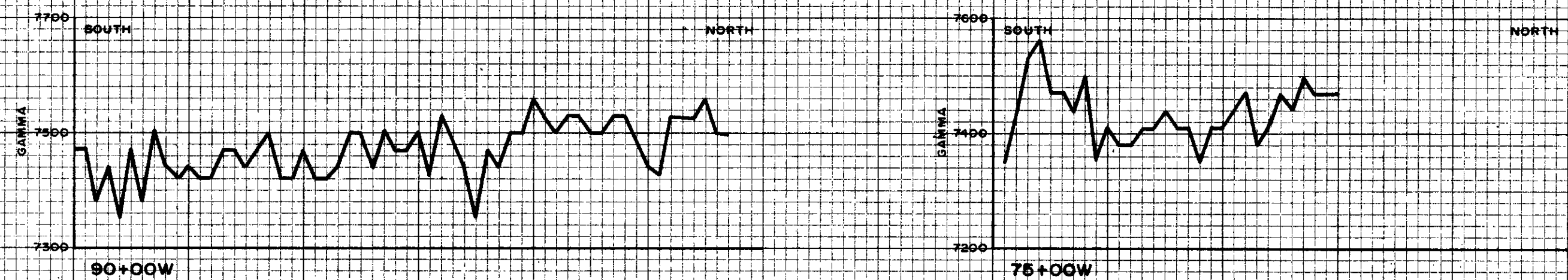
100+00W 105+00W



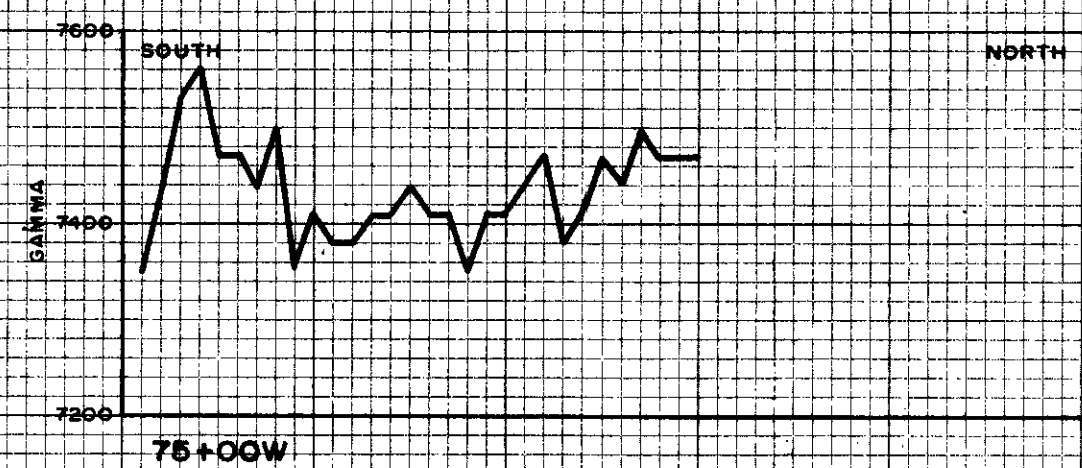
95+00W



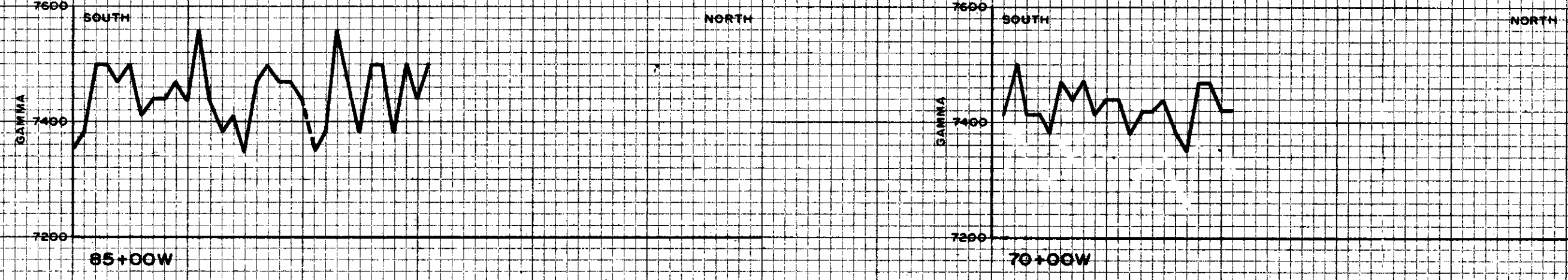
80+00W



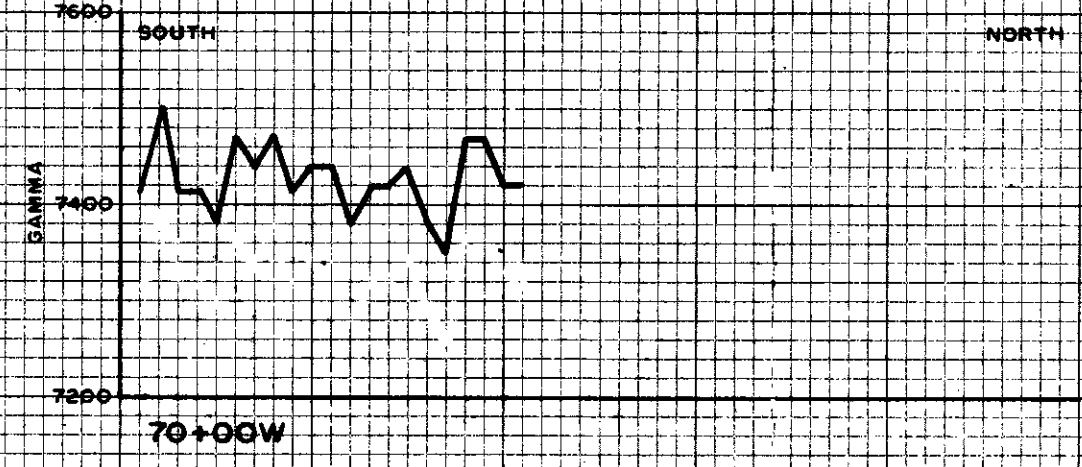
90+00W



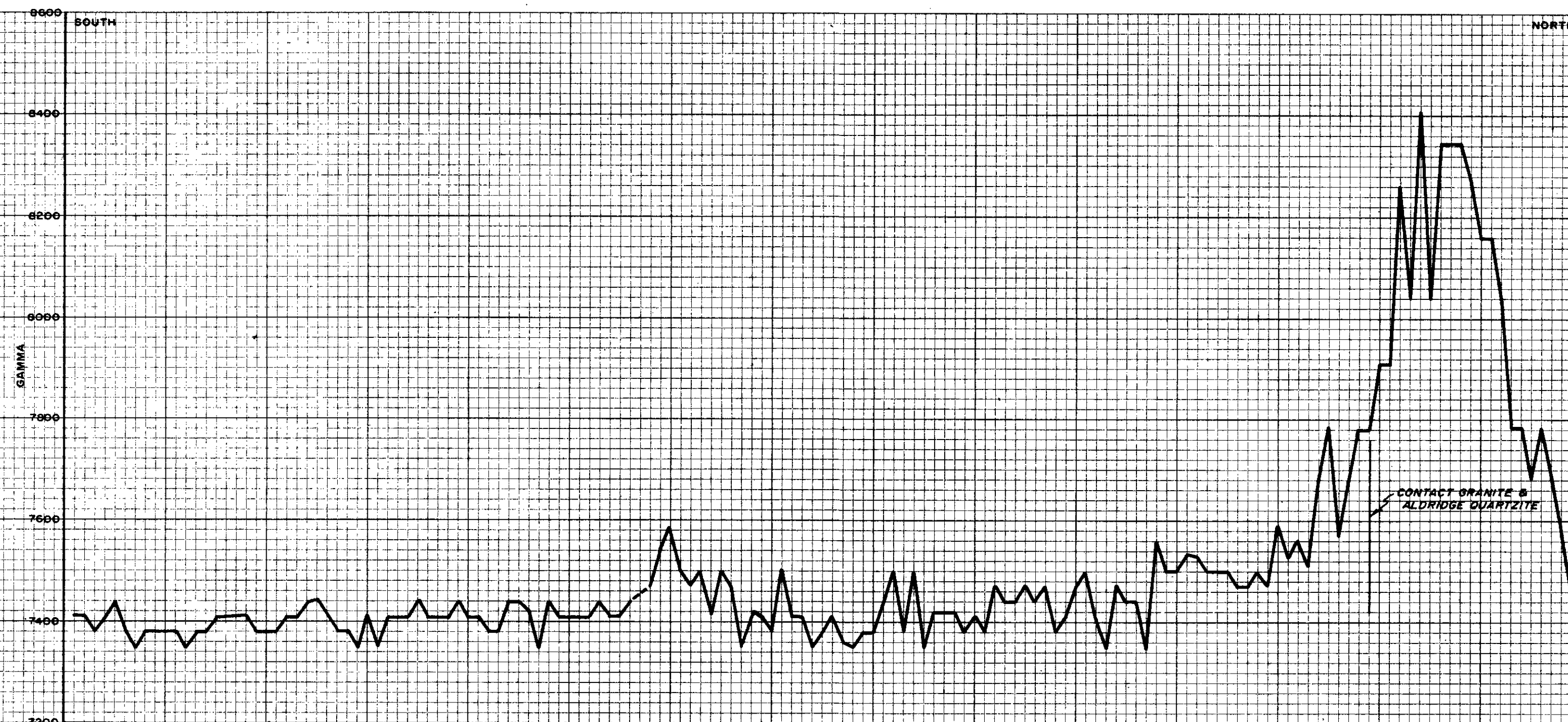
75+00W



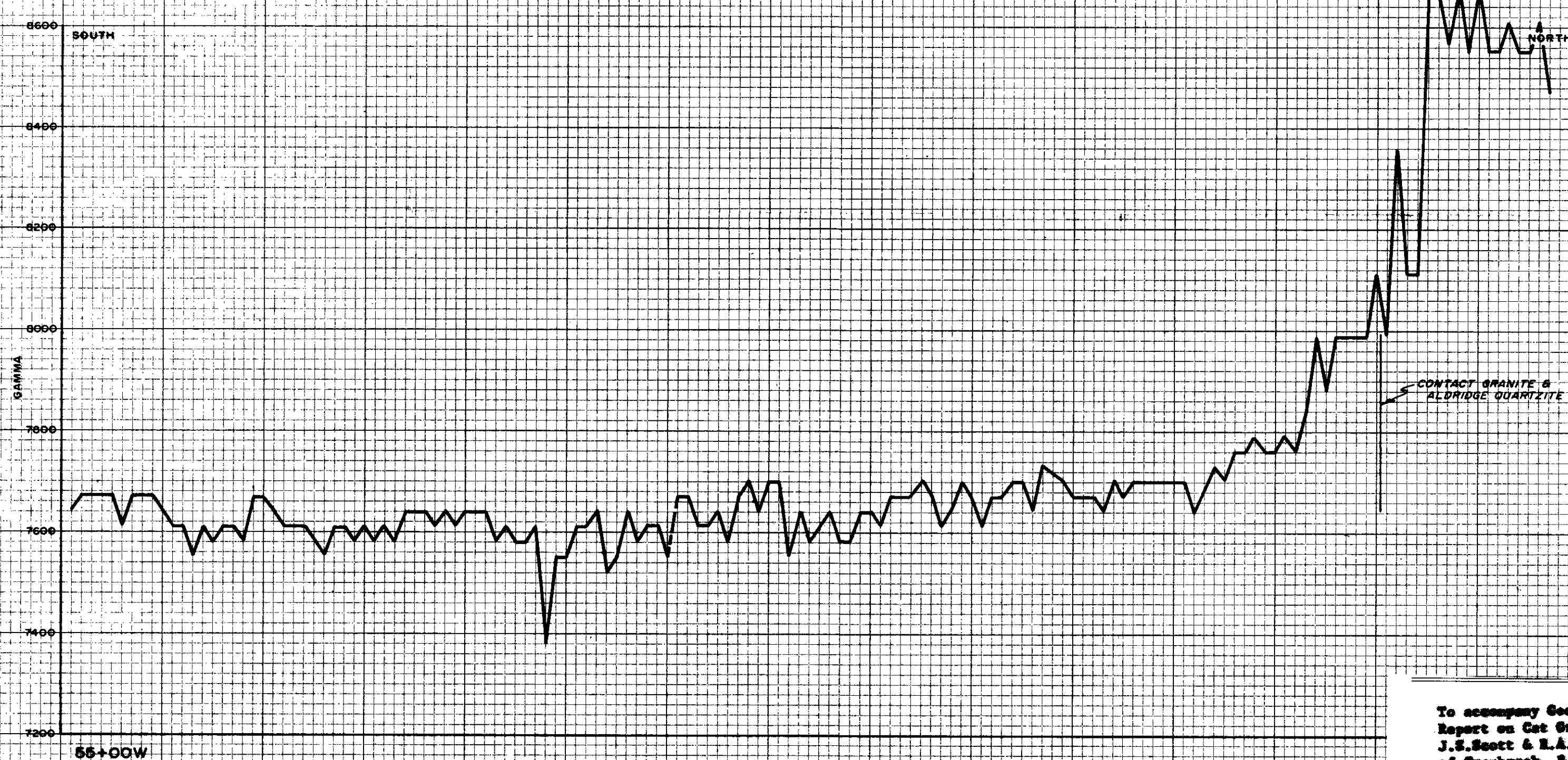
85+00W



70+00W



60+00W



55+00W

CONTACT GRANITE & ALDRIDGE QUARTZITE

CONTACT GRANITE & ALDRIDGE QUARTZITE

To accompany Geological-Geophysical Report on Cat Group of Claims by J.S. Scott & E.A. Buckley, 8 miles NW of Cranbrook, B.C., Fort Steele N.D., dated December 14/66.

MAGNETOMETER PROFILES
CRANBROOK AREA
HORIZONTAL SCALE - 1 INCH TO 1000 FEET

863

PLACID OIL COMPANY
CALGARY ALBERTA

W.A. SWINLEY
J.S. SCOTT
E.A. BUCKLEY

W.A. Swinley

J.S. Scott