

1715

PART 1

IMPERIAL OIL ENTERPRISES LIMITED

500 - Sixth Avenue S.W.

Calgary 1, Alberta

Report on a Gravity Survey

on the Kim Group, 6 miles S.W. of Kimberley, B.C.

49°, 115° S.W.

From May 15, 1968 to September 1, 1968

By: James T. Hughson

October 22, 1968

This report is part of an Exploration Project being conducted on the Kim Group of 203 claims near Kimberley, B.C. under the general supervision of Mr. James Scott, Registered Professional Engineer of British Columbia. The Kim Claim Group is located about 6 miles south-east of the City of Kimberley, B.C. in the vicinity of Lone Pine Hill.

TABLE OF CONTENTS

	Page
1. Qualifications of Supervisory Personnel	2
2. Introduction	3
3. Acknowledgements	3
4. General remarks on the purpose, instrumentation and procedures used in the gravity survey	3
5. Interpretation	5
6. Recommendations	5
7. Statement of Personnel & Costs	7
8. Affidavit on Application for Certificate of Work	8
9. Appendix Base Station Descriptions	9

In Pocket

#1 Gravity Map 1" = 1000'

#2 Topographic Map 1" = 1000'

Qualifications of Personnel

The Project Supervisor, Mr. James Scott is a Registered Professional Engineer of British Columbia.

He is a resident of Vancouver with many years of experience in Canada.

The Author, James T. Hughson has the following qualifications:

Academic: BAsC. Mining Engineering, University of Toronto, 1940
MASc. Mining Geology, University of Toronto, 1946

Practical: 5 years Mining Geology, Mining and Mining Geophysics at International Nickel Co., Sudbury, Ontario, British Columbia, Ontario and Quebec.

20 years conducting and interpreting gravity and magnetic surveys with Imperial Oil Limited in various parts of Canada.

Presently a Research Geophysicist for Imperial Oil Enterprises in the Exploration Research Department in Calgary, Alberta.

The Party Chief, Mr. Gordon Grant, is a surveyor and geophysical party manager with 20 years experience with Imperial Oil Enterprises. He has been a gravity observer for two field seasons in the Mackenzie Delta Area, N.W.T.

INTRODUCTION

The gravity survey of the Imperial claim groups was carried out to assist in geological studies which are to be made in 1968 and 1969. Magnetic observations were made at the same positions used for the gravity survey of the claims. The gravity and magnetic observations were usually made simultaneously. The lines were extended in an east-west direction and are about 500 feet apart. The stations were at intervals of 200 feet along the lines. The stations were located by use of a plane table and rod relative to lot corners or other land marks. Bench marks at Marysville station and at the Cranbrook airport were used for elevation data. Bearings were obtained between survey stations provided by engineers at the new Cranbrook airport. This enabled the surveyors to establish the east - west direction of our main baseline, which was line 200 on the enclosed map.

ACKNOWLEDGEMENTS

Very valuable assistance from the Mines and Forestry offices at Cranbrook was gratefully received. Mr. James Ryley at the Mines Branch was particularly helpful in advising us on mining regulations. Road maps of particular value, and information on forest regulations were obtained from the Forestry office at Cranbrook. The engineering department at the new Cranbrook airport provided valuable surveying information. Mr. E.J. Frost of Cranbrook was of particular assistance in acting as a guide and advisor, because of his intimate knowledge of the district. Consolidated Mining and Smelting Company generously allowed us to traverse areas where they possessed surface rights. Permission for this was obtained from their general offices at Kimberley. The kindness of various land owners who gave us permission to traverse their property is also gratefully acknowledged.

GENERAL REMARKS ON THE PURPOSE, INSTRUMENTATION AND PROCEDURES USED IN THE GRAVITY SURVEY

The purpose of the gravity survey is to provide assistance in exploring for metallic minerals within the claimed area. The gravity survey will assist in mapping the buried rocks or mineralized zones with a higher density than the surrounding sediments. Therefore, they will, in general, cause positive gravity anomalies. The sulphide ore deposits at the Sullivan Mine for example, should produce an easily measurable gravity effect.

The instrument used for the survey was a Worden Master gravity meter, purchased in 1965. This is a temperature-regulated meter, which was checked over by the manufacturer immediately prior to the survey. It was calibrated, in the field, by taking repeated readings on Dominion Observatory gravity stations at Cranbrook and at Kimberley.

A description of these stations is attached as an appendix to this report. The scale constant of the instrument was 0.8813 gravity units per scale division (1 gravity unit = 0.1 milligals).

The survey has been tied to the Dominion Observatory gravity station at the old Cranbrook airport. This station has an absolute observed gravity value of 980.71632 gals. The value assumed for this station was 7163.2 gravity units, which is obtained by subtracting 980.00000 gals from the absolute values. This ensured that all observed gravities in the survey area would be positive.

The latitude corrections for the survey were taken from the 1931 tables as given in Nettleton's "Geophysical Prospecting for Oil". A value of 981.00000 gals, was subtracted from the 1931 values to give the necessary correction which is negative.

LATITUDE CORRECTIONS

<u>Latitude</u>	<u>Correction - Gravity Units</u>
49° 10'	-43.28
49° 20'	-192.18
49° 30'	-340.95
49° 40'	-489.59
49° 50'	-638.09

An average correction of -0.244 gravity units per 100 feet of distance in a north direction exists in the vicinity of the claim group. This was corrected by means of a transparent scale which was applied to the stations plotted on the map, and read directly in gravity units.

Gravity Field Procedures

An observation was made on a base station established in the field at the beginning of the day. Then, a series of reading and time notations were made on the surveyed station locations for a time interval of perhaps 1½ to 2 hours. Then, the initial base station was reread. By means of this procedure, instrumental drift could be corrected for each station for its time within the elapsed time interval between base readings. A total of about 4,350 gravity readings were observed within the claim group.

Terrain Corrections

It was necessary to provide an electronic computer program to correct for the effects of topography. The method, devised by Mr. Lars Granar of the Swedish Geological Survey, as given in "Geoexploration" 5, 1967, 65-70, was adapted for this purpose. A topographic map with a contour interval of 20 feet was used to obtain the required elevations, for

input for the computer program. The values obtained by the terrain correction program were checked by the use of standard terrain correction charts. The chart procedure was considered to be too time-consuming for such a large number of stations. The corrections were considered to be accurate enough to allow contouring of the map to a 2 gravity unit interval. An average rock density of 267 grams per cubic centimetre was used for the terrain calculations.

Density Data and Density Correction Factors

A number of rock samples were collected, and density measurements were made on them. The average density was found to be 2.67 grams per cubic centimetre. This density was used for the Bouguer correction, which was calculated from a datum elevation of 2,500 feet above sea level. The combined Free Air and Bouguer Correction used for the gravity computations was therefore 0.6 gravity units for each foot of elevation above the 2,500 foot datum elevation datum.

INTERPRETATION

The gravity field over the claim area varies from about 6,940 gravity units on the east to about 7,100 gravity units on the west. The contours have a spacing of 2 gravity units and their general strike is northerly.

A number of positive gravity anomalies may be seen on the map, some of which may be attributed to density variations in bedrock. For example, the Purcell diorite which has a density of 2.9 to 3.1 grams per cubic centimetre occurs in surface near the anomaly on line 250, stations 380 to 400. The anomaly may be caused entirely by the contrast in density between the heavy diorite and the lighter Aldridge formation (density 2.60 grams per cubic centimetre).

The anomaly at station 344 on line 250 may be caused, in part, by Purcell diorite, but may, it is hoped, be caused by a concentration of heavy minerals in the adjacent Aldridge formation.

An exception is the anomaly with centre at station 108 line 315, which correlates with a granitic batholith. Some of the smaller anomalies in the eastern half of the map area may be due to local relief on the dense bedrock which is in contact with lighter, surrounding gravels.

The steep gradient on the east side of the map may be caused by a fault and/or contact of two rocks of different density.

RECOMMENDATIONS

1. The anomalies shown should be carefully reconnoitered by a surface geological survey.
2. The most favourable anomalies, from a geological and geophysical point of view, should be trenched or drilled to determine their causes.

3. A seismic survey should be made over the anomalies, particularly in the eastern area of the survey (this is an area of few outcrops). This should indicate areas of shallow drift, and help to avoid excessive casing costs in drilling.
4. The seismic survey should traverse the north-south area of steep gradient near the eastern edge of the survey. This gradient may indicate important faulting, which could be a site of mineral deposition.

Signed: James T. Hughson
James T. Hughson

James S. Scott per JTB
James S. Scott
P. Eng. British Columbia

SUMMARY SHEET ON PERSONNEL

The actual field work for the Gravity-Magnetic Survey was commenced May 15, 1968 by the following men:

Party Chief and Surveyor	- Gordon H. Grant
Surveyors	- G.A. Winters, R.D. Horn, C. Christenson (Contract Surveyor)
Rodmen	- L. Dvorak, R. Kunst
Gravity Meter Operator	- K. Standing
Magnetometer Operator	- K. Standing, P. Cherry, H.H. Hirschmanner

The total salary paid to these men amounted to \$16,651.62. In addition, from two to eleven line cutters and chainmen were employed at varying times with total wages paid of \$7,311.23.

All salary data is maintained in our Toronto office and in as much as this program was not completed until September 6, 1968, we are unable to supply any further breakdown at this time.



THE GOVERNMENT OF
THE PROVINCE OF BRITISH COLUMBIA

DEPARTMENT OF MINES
AND PETROLEUM RESOURCES

MINERAL ACT
FORM B

Affidavit on Application for Certificate of Work

I, D. B. Layer Agent for Imperial Oil Enterprises Ltd.
(Name.) (Name.)
500 - 6 Avenue, S. W., 500 - 6 Avenue, S. W.,
(Address.) (Address.)
Calgary, Alberta Calgary, Alberta
 Free Miner's Certificate No. 69399 Free Miner's Certificate No. 67600
 Date issued August 14, 1968 Date issued May 29, 1968

make oath and say:—

I have done, or caused to be done, work on the Kim No. 1 to 203

Mineral Claim(s)

Record No.(s) 9967 to 10169
North of the Woods Ranch on Mather Creek to the west of the St. Eugene
 situate at Mission - Ta Ta Creek Road

in the Fort Steele Mining Division, to the value of at least

one hundred dollars, since the 4th day of October, 19 67.

The following is a detailed statement of such work:—

(Set out full particulars of the work done in the twelve months in which such work is required to be done.)

Gravity/Magnetic Survey

<u>Salaries</u>	<u>\$16,651.62</u>
<u>Meals, Accomodation and Travel</u>	<u>7,794.68</u>
<u>Line Cutting - Salaries</u>	<u>7,311.23</u>
<u>- Rentals & Repair of Equipment</u>	<u>1,018.04</u>
<u>Surveyors and Appraisors Fees</u>	<u>3,005.33</u>
<u>Automotive Expense</u>	<u>1,197.78</u>
<u>Equipment Rentals</u>	<u>155.00</u>
<u>Miscellaneous</u>	<u>6.15</u>
<u>General Material</u>	<u>597.10</u>
	<u>\$37,736.93</u>

That I have not and will not use the work declared herein in any way for the purposes of obtaining tax exemption on a Crown-granted mineral claim under the terms of the *Taxation Act*.

SWORN and subscribed to at Calgary

this 23rd day of October

1968, before me—

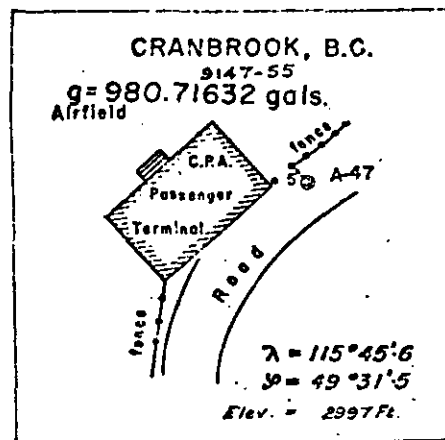
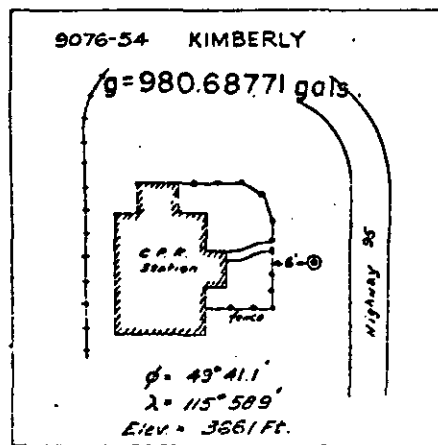
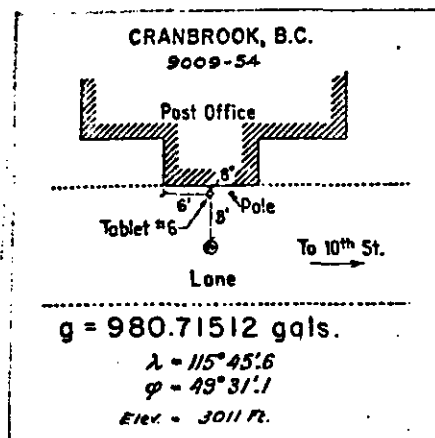
[Signature]

Douglas B. Langer

* This affidavit may be taken by a person empowered to take affidavits by the *Evidence Act* of British Columbia.

APPENDIX

BASE STATION DESCRIPTIONS



THIS BASE STATION
IS TIED TO THE
KIM GRAVITY SURVEY

IMPERIAL OIL ENTERPRISES LTD.
500 - 6 AVENUE SW - CALGARY 1, ALBERTA
NEW GROUP OF CLAIMS & WELLS S.E. OF
CITY OF KIMBLEY S.E. 40' 100' 50"
GRAVITY SURVEY
Scale 1" = 100'
NOTE: MAP CORRECTED FOR TERNAN EFFECTS
TO ACCOMPANY A REPORT BY JAMES T. HUGHSON
UNDER SUPERVISION OF JAMES SCOTT
OF THE BRITISH COLUMBIA
DEPARTMENT OF
MAY 1955

1715

Department of
Mines and Petroleum Resources
ASSESSMENT REPORT
NO. 1715 MAP 1
PART 1

IMPERIAL OIL ENTERPRISES LTD.
500 - 6 AVENUE SW - CALGARY 1, ALBERTA
NEW GROUP OF CLAIMS & WELLS S.E. OF
CITY OF KIMBLEY S.E. 40' 100' 50"
GRAVITY SURVEY
Scale 1" = 100'
NOTE: MAP CORRECTED FOR TERNAN EFFECTS
TO ACCOMPANY A REPORT BY JAMES T. HUGHSON
UNDER SUPERVISION OF JAMES SCOTT
OF THE BRITISH COLUMBIA
DEPARTMENT OF
MAY 1955

IMPERIAL OIL ENTERPRISES LIMITED
500 - 8 AVENUE S.W., CALGARY, ALBERTA
MINI GROUP OF CLAIMS (Areas 118747-119150) MP37-8842
8 MILES SE OF THE CITY OF WIMBERLEY, S.C.
ELEVATIONS
Elevations in feet above 2000 Foot Datum
1:1 = 2500 feet to 1 inch to give elevations above sea level
Contour Interval 20 Feet. Scale = 1:5000
To Accompany a Report by James T. Huggan
Under Supervision of James Scott P. Eng. (Senior Geologist)
December 1988

Department of
Mines and Petroleum Resources
ASSESSMENT REPORT

1715

NO. 1715 MAP 2
PART 1

IMPERIAL OIL ENTERPRISES LIMITED
500 - 8 AVENUE S.W., CALGARY, ALBERTA
MINI GROUP OF CLAIMS (Areas 118747-119150) MP37-8842
8 MILES SE OF THE CITY OF WIMBERLEY, S.C.
ELEVATIONS
Elevations in feet above 2000 Foot Datum
1:1 = 2500 feet to 1 inch to give elevations above sea level
Contour Interval 20 Feet. Scale = 1:5000
To Accompany a Report by James T. Huggan
Under Supervision of James Scott P. Eng. (Senior Geologist)
December 1988

1715p1 MAP02

