1715

PART 2

IMPERIAL OIL ENTERPRISES LIMITED

500 - Sixth Avenue S.W.

Calgary 1, Alberta

Report on a Ground Magnetometer Survey

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

49°, ~~116°~~ 115° ~~S.W.~~ N.W.

From May 15, 1968 to September 1, 1968
(Magnetic Surveying from June 15, 1968 to September 1, 1968)
Preparatory Line Cutting & Surveying Commenced May 15, 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-~~west~~ EAST of the City of Kimberley, B.C. in the vicinity of Lone Pine Hill.

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ILLUSTRATIONS IN POCKET.
GRAVITY SURVEY. - 1"—1000' SCALE #1
GROUND MAGNETOMETER SURVEY - SCALE 1"=1000' #2

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 magnetic survey of the Imperial claim groups was carried out to assist in geological studies which are to be made in 1968 and 1969. The 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 MAGNETIC SURVEY

The purpose of the magnetic survey (and the gravity survey carried out at the same time) is to provide assistance in exploring for metallic minerals within the claimed area. The magnetic survey will assist in mapping the buried igneous rocks which have a higher magnetic susceptibility in general, than the surrounding sediments. Therefore, they will, in general, cause positive magnetic anomalies. Concentrations of pyrrhotite, an iron sulphide, will also cause measurable magnetic anomalies. Pyrrhotite is found associated with the orebodies at the Sullivan mine and was present in large concentrations at the Stemwinder Mine nearby. The magnetic survey may be of assistance in finding similar mineral deposits.

The instrument used for the survey was a McPhar M 700 portable field magnetometer purchased in 1968. This is a vertical field fluxgate magnetometer, which is self levelling and contains a self-nulling circuit. Its range is from zero to ± 100,000 gammas in 5 sensitivity ranges. It is battery-powered and has a maximum sensitivity of 20 gammas per scale division. Its weight is approximately eight pounds with batteries and carrying case.

The base station for all readings was station 102 on line 200 on the eastern edge of the claim group adjacent to the Kootenay Indian reservation. This station was given an arbitrary value of 3000 gammas. A series of subsidiary bases was established to provide a control network over the area. All field stations were tied to these base stations, to prevent excessive errors in relative magnetic values. In general, a base station reading was initially taken, with the time and base station number. Then, a series of field stations were read, recording the station numbers, the time and the reading. At the end of about one hour, the instrument was read at the initial base station and the time again recorded. This "looping" procedure allowed the operator to correct for variations in the earth's magnetic field with time - the "diurnal variation correction".

Some difficulty was experienced during the field season with rapid diurnal variations. It was necessary to abandon field work on some days and to repeat portions of field work because of this factor. It was possible, however to obtain an accuracy adequate for the purposes of the survey. A few very local anomalies, which probably caused by "tramp iron" or fences, occur in the survey area. This is to be expected in a populated area.

The personnel used for the survey were university students who were trained by the writer prior to the survey.

INTERPRETATION - (Map in pocket)

The magnetic relief in the area is about 2000 gammas, which is only about one-thirtieth of the earth's magnetic field for the area. The map has been contoured at an interval of 50 gammas, which is adequate to indicate the anomalies of significance.

The largest anomaly to be seen is anomaly "A" in the southeast corner of the map sheet. This anomaly correlates with a granitic intrusive of Tertiary or Cretaceous age which may be seen as a rock outcrop. This intrusive probably extends in a north-northeasterly direction into Kootenay Indian reservation No. 1. Anomalies B and C, to the west on lines 305, 310, 315 and 320, are probably also caused by buried granitic intrusives. Several other positive anomalies to the north of A, B and C may also be caused by granitic intrusives.

The east - west trending linear positive anomaly extending along line 195 between stations 100 and 230 may be caused by a buried stream channel containing magnetite or by an igneous dike. This anomaly will require geological field checking and, possibly, further magnetic readings to check its validity. It occurs on the edge of a slight monoclinal feature on the topographic map prepared for the gravity survey.

The positive anomalies near D on line 255 station 38 are probably caused by the Purcell diorite intrusions of Proterozoic age. The possibility that the northern edge of anomaly D is bounded by an east - west trending fault is worthy of field investigation.

In general, the causes of the magnetic anomalies require geological field checking on the ground. This project is now under way under the direction of Mr. James Scott.

Further interpretation of the map is not possible without the geological mapping, drilling or the use of other geophysical methods e.g. electromagnetic or induced polarization surveys.

RECOMMENDATIONS

1. The geological field mapping along the surveyed lines should be completed for comparison with the magnetic data.

2. Further magnetic detailing, trenching or drilling should be carried out only after more knowledge of the area is assembled and studied.

Signed: James T Hughson
James T. Hughson

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

SUMMARY SHEET ON PERSONNEL

The actual field work preparatory for the Ground Magnetometer 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)

Roadmen - 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 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 (Name.) Agent for Imperial Oil Enterprises Ltd. (Name.)

500 - 6 Avenue, S. W., (Address.) 500 - 6 Avenue, S. W., (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

situate at North of the Woods Ranch on Mather Creek to the west of the St. Eugene 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

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

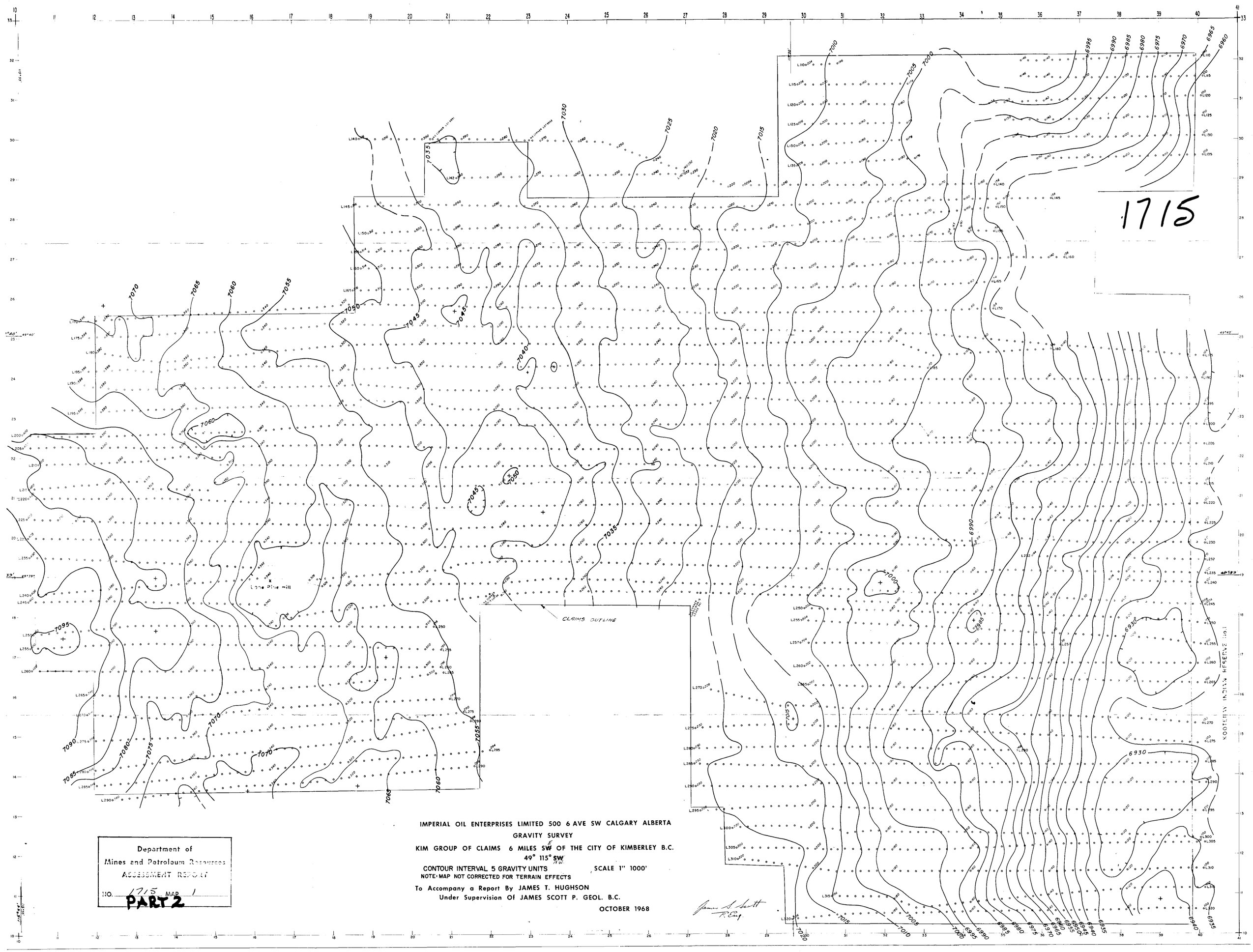
That I have not and will not use the work declared herein in any way for the purposes of obtaining tax exemption on a Crown-granted mineral claim under the terms of the *Taxation Act*.

SWORN and subscribed to at Calgary
this 23rd day of October
19 68, before me—
* [signature]

Douglas B. Layer

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

Notary Public, ~~Commissioner for Oaths~~ in and for the Province of Alberta



Department of
Mines and Petroleum Resources
ASSESSMENT REPORT
NO. 1715 MAP 1
PART 2

IMPERIAL OIL ENTERPRISES LIMITED 500 6 AVE SW CALGARY ALBERTA
GRAVITY SURVEY
KIM GROUP OF CLAIMS 6 MILES SW OF THE CITY OF KIMBERLEY B.C.
49° 115° SW
CONTOUR INTERVAL 5 GRAVITY UNITS SCALE 1" 1000'
NOTE: MAP NOT CORRECTED FOR TERRAIN EFFECTS
To Accompany a Report By JAMES T. HUGHSON
Under Supervision Of JAMES SCOTT P. GEOL. B.C.
OCTOBER 1968

James T. Hughson
P. Eng.

1715

Lone Pine Hill

CLAIMS OUTLINE

KOOTENAY INDIAN RESERVE No.1

MAIN BASE STATION

Department of
Mines and Petroleum Res.
ASSESSMENT REPORT
NO. 1715 MAP 2
PART 2

IMPERIAL OIL ENTERPRISES LIMITED 500 6 AVE SW CALGARY ALBERTA

GROUND MAGNETOMETER SURVEY

KIM GROUP OF CLAIMS 6 MILES ~~SW~~ SE OF THE CITY OF KIMBERLEY B.C.

49° 115° ~~SW~~ NW

C.I. 50 GAMMAS SCALE 1" 1000'

To Accompany a Report By JAMES T. HUGHSON

Under Supervision Of JAMES SCOTT P. GEOL. B.C.

OCTOBER 1968

James A. Scott P.Eng.