GEOPHYSICAL REPORT

Covering an

AIRBORNE MAGNETOMETER SURVEY

Over the

Wilmac No. 1 Claim Group

Situated near

Corral Creek, Princeton Area

Similkameen Mining Division

and centered at

Latitude 45°23'N; Longitude 120°40'W

N.T.S. 92 H

On behalf of

CAN WEST INVESTMENTS LTD.

Instrument Operator

J. Pasche

of

June 17, 1969 Geo-X Surveys Ltd. Vancouver, B.C.

Report by:

D.R. Cochrane,

P. Eng.

James Cerne, M.S. G.E. White, B. Sc.

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GEO-X SURVEYS LTD. 627 HORNBY STREET, VANCOUVER I, B. C.



Summary and Recommendations	i,	ii	
Introduction	1		
Location and Access	1		
Claims and Ownership	1		
General Setting	2,	3	
Airborne Field Procedure	3,	4	
Data Processing	5,	6	
Results/Discussion/Interpretation	7,	8	
Discussion of Results	9,	10,	11

Appendix:

- I Certificates
- II Personnel and Dates Worked
- III Cost Breakdown
 - IV Instrument Specifications

Figures:

- 1. Location Map
- 2. Claim Map
- 3. Black Line Mosaic and Flight Line Plan
- 4. Isomagnetic Plan
- 5. General Interpretation

Department of

Mines and Petroleum Resources

ASSESSMENT REPORT

NO. /852 MAP

SUMMARY and RECOMMENDATIONS:

Early in May 1969, Geo-X Surveys Ltd. completed 35 line miles of total field aeromagnetic surveying on the Wilmac No. 1 claim guoup, situated near Princeton, B.C. and on behalf of Can West Investments Ltd.

The survey was completed in an Excalibur 800 fixed wing aircraft with a Varian V4937A proton precession magnetometer (†1 gamma); SDV 4991 digital recorder and analog chart recorders. Flight line positioning was facilitated by 35 m.m. strip photography matched to mosaics prepared from Government airphotos (see accompanying Figure 3). Terrain clearance was recorded in analogue mode by a radar-type pulse altimeter.

Data processing was conducted by Geo-X Surveys Ltd. personnel using IBM equipment in Vancouver.

The total field isomagnetic plan (Figure 4, 1":1000') was plotted by a computer-plotter unit at a contour interval of 75 gammas.

Three areas of interest were located and designated 1 to 3 inclusive, in order of indicated priority (see Figure 5). The authors recommended further investigation of these areas. A fourth area (which is not numbered) should be checked for possible associated iron-copper mineralization. This latter area is a reasonably broad magnetic high located near the

northwestern corner of the southeastern quadrant of the area surveyed.

Respectfully submitted,

D.R. Cocheanger P. Eng.

Glen Whilte LB. Sc.

James Cerne, M.S.

INTRODUCTION:

On May 10, 1969, Geo-X Surveys Ltd. of Vancouver, British Columbia, on behalf of Can West Investments Ltd., conducted an airborne magnetometer survey over a group of claims in the Princeton area, Similkameen Mining Division, Province of British Columbia. The purpose of this survey was to (a) delineate, if possible, any diagnostic magnetic pattern that may be associated with areas of known copper mineralization within the survey area; (b) to indicate the extent of these zones; and (c) to possibly locate other areas that could be of economic interest.

A total of 35 line miles of total intensity airborne magnetometer surveying was conducted. This report describes the instrumentation, field procedure and data processing, and discusses the results obtained.

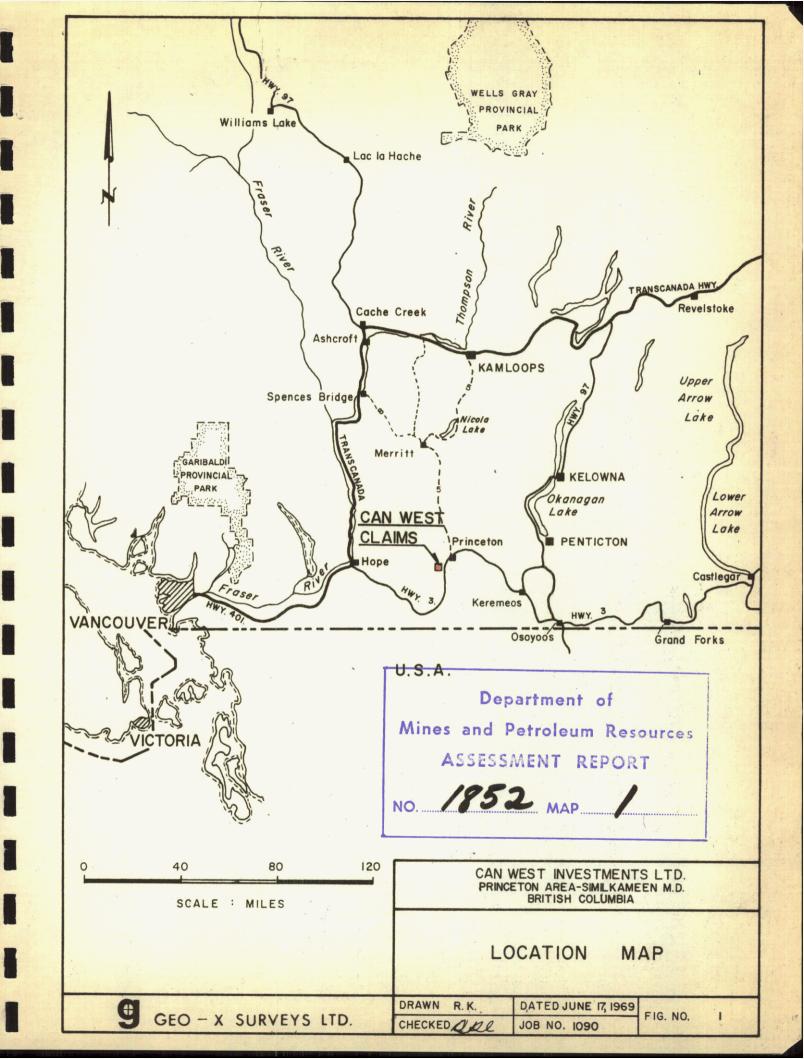
LOCATION and ACCESS:

The Wilmac No. 1 claim group is centered at latitude 49°23'N and longitude 220°40'W near Corral Creek, some 9 miles southwest of Princeton, B.C.

Access to the property is by approximately 6 miles of loose surface road that runs north from highway #3 near the Whipsaw Creek bridge.

CLAIMS and OWNERSHIP:

The property in the Corral Creek area on which the airborne magnetometer survey was conducted consists of some 30 contiguous mining claims listed as follows:



Claim

Record No.

Wilmac 1-4, 5-18

17880-17883, 20132-20145

Mac 1 & 2

22592, 22593

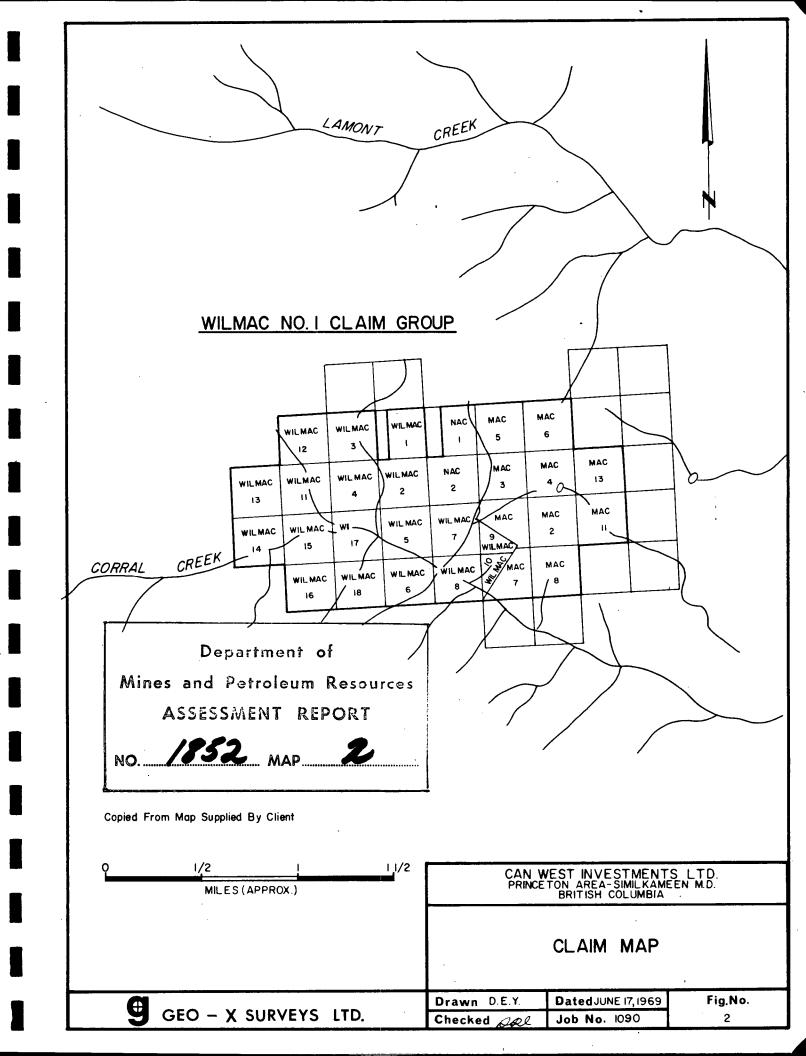
Mac 1-8, 11 & 13 22595-22602, 22605, 22607

The survey was conducted on behalf of Can West Investments Ltd. registered office 1770 - 777 Hornby Street, Vancouver 1, B.C.

GENERAL SETTING:

The mineral claims are situated southwest of Princeton in the Hozameen Range of the Cascade Mountains Physiographic Division of British Columbia. They are actually very near the Interior Plateau division and probably lie in a transitional zone between the two. The area consists of dissected uplands having moderate to steep relief. The elevation in the immediate claims area varies from approximately 4,300 fo 5,900 feet above sea level. The property lies on a southwest facing slope.

All the area surveyed was covered by Pleistocene ice and thus is generally covered with a mantle of glacial till.



as shown on the Geological Survey of Canada map No. 888A, is apparently primarily volcanic and sedimentary strata belonging to the Nicola group (Upper Triassic age). In the Princeton area these rocks form a broad north-northwest trending belt and are intruded by a varied assemblage of ultrobasic to acidic intrusives of Jurassic to Upper Cretaceous age.* They are overlain in some places by a blanket of Miocene lavas and sediments of the Princeton Group. Copper mineralization has been found in the Olivine Mountain intrusive (gabbro to peridotite) some five miles northwest of the claims; in the Copper Mountain stock of syenogabbro some five miles to the southeast; and in the Nicola andesites immediately north of Copper Mountain.

In a preliminary geologic report on the Wilmac group March 1969, Mr. A.J. MacDonald, P. Eng., states that "The Copper mineralization in the Wilmac group is associated with a contact shear zone along the northern side of a pyroxenite-hornblende intrusive". The relative position of the trenches on which he based this description, to the magnetic data is shown on Figure 5.

AIRBORNE FIELD PROCEDURE:

The total intensity of the geomagnetic field was

^{*} H.M.A. Rice G.S.C. Memoir 243, Geology and Mineral Deposits of the Princeton map area, British Columbia.

measured and recorded along 21 flight lines, at an average terrain clearance of 500 feet. Cross flight lines 1 to 7 have a general N-S bearing while lines 8 to 21 have an E-W bearing.

The survey was flown in a fixed wing aircraft, towing an airfoil sensor. A proton magnetometer, digital and chart recorders, camera and altimeter were mounted in the aircraft. The magnetometer and chart recorder continuously measured and recorded the magnetic field intensity. At one second intervals, the field amplitude and fiducial number were recorded on punch tape by the digital recording system. At thirty second intervals, the time and line number were punched on the tape. At two second intervals, a split image camera simultaneously photographed (1) the terrain, and (2) the clock and fiducial display panel. Thus each terrain photograph is bordered by a photograph of the clock and fiducial number.

The terrain clearance was measured with a Bonzar pulse type radar altimeter and recorded by a G-2000 chart recorder.

Solar flare warning and predictions, issued daily at the Space Disturbance Forecast Center in Boulder, Colorado, were used to schedule the flight during a magnetically quiet period.

The punch tape, chart and strip photograph processing is described in the following section. Instrument specifications are in Appendix IV.

DATA PROCESSING:

The data processing procedure consisted of four steps, discussed under the following headings:

- 1. Flight line X-Y positioning.
- 2. Editing of the paper tape.
- 3. Tabulation of critical fiducial numbers and their X-Y coordinates.
- 4. Contour plotting;

1. Flight Line X-Y Positioning:

From the aircraft, while the lines were being flown, the flight lines were roughly positioned on government aerial photographs. In the office, the beginning and end of each flight line was marked on the strip photographs. From the strip photos Geo-X personnel transferred the flight lines on to a mosaic prepared from the government photos. An X-Y coordinate system was also superimposed on the flight line mosaic with +Y north and +X east (see Figure 3). Thus, every position along a flight line was defined in terms of X (number of feet east of the origin) and Y (number of feet north of the origin), and has a corresponding magnetic value in gammas.

2. Editing of the Paper Tape:

A listing of the contents of the paper tape was made by IBM of Vancouver. The listing was examined and compared

with the analog record as a guard against possible machine or operator error. The magnetic readings for areas of flight line intersection were compared as a check on the time variations of the geomagnetic field.

3. Tabulation of Critical Fiducial Numbers:

The first and last fiducial number on each line were tabulated along with their X-Y coordinates. In addition, points where the flight line changed direction were tabulated along with the appropriate fiducial number. The tabulated information was keypunched onto computer cards, and sent with the punch tape to IBM.

4. Contour Plotting:

TBM fed the punch tape to its computer, along with the X-Y coordinates of the start, end and any changes of direction that may have occurred in the flight line. The data sampling interval along the flight lines was roughly 160 feet and every other data point was plotted. The magnetometer readings were evenly spaced along the line segments and contoured by a computer-plotter unit at a contour interval of 75 gammas.

RESULTS/DISCUSSION/INTERPRETATION:

Introductory

Since ferromagnetic susceptibility and natural rock magnetism change measurably from one rock type to another, accurate detailed mapping of the geomagnetic field often provides valuable information about the subsurface geology (even in heavily drift covered areas). Aeromagnetic surveys provide new knowledge of the type, general attitude, configuration and complexity of the geosuperstructure and often identifies local elements which sometimes indicate ore. Aeromagnetic prospecting can be applied to the delineation of buried contacts and disruptions, the location of areas of possible plutonic differentiation and its varied products. Considerable speed and accuracy is inherent in this survey. When it comes to interpretation, however, there are two factors which can exert considerable influence. The first is geologic control, which reduces the number of variables that the interpreter must consider. The second is data analysis, which is essentially the use of filtering techniques. Filtering can remove noise, regional variation, and the effects of various physical phenomena (such as the effect of topography, or changing depth of burial). In addition, interpretation techniques (explaining the data) must be flexible enough to be revised in the light of new geological, geochemical or geophysical information.

This Survey:

A total intensity isomagnetic field plan is presented as Figure 4. The horizontal scale is l":1000' (approximately). The planimetry has been derived from uncontrolled airphoto mosaics. Some distortion is inevitable. The map depicts the intensity of the geomagnetic field present at the given nominal altitude on the particular flight day.

A general graphic interpretation accompanies this report and is designated Figure 5. It is basically a "manual" qualitative analysis of the magnetic features rather than a "computational" quantitative one. Considerable reference has been made to the aerial photography, available geology and geophysics in the preparation of the accompanying interpretation map.

General Description:

In order to facilitate description of the isomagnetic map, morphological terms were employed. Figure 5 therefore may be regarded as a contoured "magnetic" surface or "scape" (magnetic terrain) complete with magnetic gradients, hills, valleys and linears.

Furthermore, terms borrowed from fabric and textural analysis may be embodied in the description, but have identical connotations. The reader is referred to Figures 4 and 5 for the following discussion.

DISCUSSION of RESULTS:

The recorded local total intensity range was between a maximum of 58837 and a minimum of 56505 gammas.

The general interpretation map (Figure 5) illustrates the primary features to be discussed and has been contoured to draw attention to the various magnetic patterns. As can be seen in Figure 4 the general magnetic intensity background for the area surveyed is approximately 57275 gammas. The magnetic intensity in the eastern section of the claim group is some 200-250 gammas lower than that of the western section, while the central portion, a buffer zone, is quite complex, and contains zones of much higher magnetic values. The rapid variation of the magnetic intensity within this central region could possibly indicate contact and hornfels development. Thus the values of higher magnetic intensity could possibly reflect an intermediate to basic Jurassic intrusive which has been emplaced into the Nicola Lithologic unit, or hybrid metamorphosed rocks.

Rock samples containing copper mineralization apparently collected from the trenches shown in Figure 5 were examined for magnetic mineral content and only one sample contained magnetite of any geophysical significance. Thus, known occurrences of copper mineralization are believed to lie in areas of lower magnetic intensity. This is somewhat similar to the copper occurrence at the Copper Mountain Mine where the ore bodies

are located in, or on the edge of magnetic lows rather than on the magnetic high peaks which appear to be associated with the periphery of the Copper Mountain Intrusive.

The showings on the Wilmac No. 1 claim group are located in Wilmac No. 1 and 2 claims as discussed by Mr. A.J.

MacDonald, P. Eng. This area is just northwest of a northeast trending ridge and a strong magnetic linear. These features are the north and northwestern extensions of the central magnetically disturbed region (Figure 5). Also depicted in Figure 5 are magnetic linears which could possibly be caused by fault, shear or fracture systems. Three areas of interest which warrant further investigation have been located. They are designated 1 to 3 respectively in order of significance and are shown in Figure 5.

- Area No. 1 Is an area of steep magnetic gradients where a ring of high magnetic values surrounds a large general magnetic low.
- Area No. 2 Contains the known sulphide mineralization and should be further examined parallel to the magnetic ridge.
- Area No. 3 Is similar to Area No. 1.

A fourth area of interest which has not been designated but which should be examined is the large magnetic peak

high near the northwestern corner of the southeastern quadrant of the property. This may be caused by overlying volcanic rocks or possibly a concentration of a ferromagnetic mineral such as magnetite.

Respect Toll Ly Submitted,

D.R. Cock P. Eng

Glen Ell White / B. Sc.

James Cerne

James Cerne, M.S.

PERSONNEL AND DATES WORKED

The following Geo-X Surveys Ltd. personnel were employed on the Can West Investments Ltd. airborne magnetometer survey project.

A. FIELD WORK

G.E. White Navigator May 10, 1969

J. Pasche Flight Operator May 10, 1969

B. DATA PROCESSING AND REPORT PREPARATION

G.E. White Geophysicist May 23, 1969

June 9, 12, 13.

J. Cerne Geophysicist June 4, 5.

D.R. Cochrane P. Eng. June 16, 1969

B. Roddy Photo-Plotter May 28-30, 1969
June 2, 3.

C. DRAFTING AND REPRODUCTION

R. Key Draftsman May 16, 28-30.
June 9.

D. Yip Draftsman May 16, 27, 1969
June 5, 6, 9, 10.

J. Carvajal Draftsman June 17, 18, 1969

T. Malesku Draftsman June 13, 1969

Declared before me at the City

of Nancocco , in the

Province of British Columbia, this /9

day of June 1969. , A.D.

A commissioner for taking Affidavits within British Columbia or ANotary Public in and for the Province of British Columbia.

Sub-mining Recorder

COST BREAKDOWN

The following is a cost breakdown for an Airborne Magnetometer Survey conducted over the Wilmac No. 1 Claim Group by Geo-X Surveys Ltd. through an Agreement with Can West Investments Ltd. dated May 8, 1969.

Geo-X Surveys Ltd. provided the following for an all inclusive price.

- Air Photo Mosaic (a)
- (b) Aeromagnetic Survey Coverage
- (c) Base Map Preparation
- (d) Preliminary Data Preparation
- (e) Computer Data Processing
- (f) Report Preparation

35 line miles at \$85.71 per line mile ALL INCLUSIVE TOTAL PRICE \$3,000.00

Secretary-Treasurer.

Declared before me at the

in the

Province of British Columbia, this 19

day of

of

immissioner for taking Affidavits within British Columbia or A Notary Public in and for the Province of British Columbia,

Sub-mining Recorder

PERSONNEL

Name:

COCHRANE, Donald Robert

Education:

B.Sc. - University of Toronto M.Sc. (Eng.) - Queen's University

Professional Associations:

Professional Engineer, registered in British Columbia, Ontario, Saskatchewan.

Member of M.C.I.M.M., M.E.I.C., M.G.A.C., M.M.A.C.

Experience:

Engaged in the profession since 1962 while employed with Noranda Exploration Co. Ltd., Quebec Cartier Mines Ltd., Meridian Exploration Syndicate.

Experience in West Indies, Central and South America, U.S.A. and Canada.

PERSONNEL

Name:

WHITE, Glen E. .

Education:

B.Sc. Geophysics - Geology University of British Columbia.

Professional Associations:

Associate member of Society of Exploration Geophysicists.

Experience:

Pre-Graduate experience in Geology-Geochemistry-Geophysics with Anaconda American Brass.

Since Graduation in 1966 in Geophysics - Geology, has obtained experience in Mining Geophysics with Sulmac Explorations Ltd.

Airborne Geophysics with Spartan Air Services consulting on second derivative.

Micro-Gravity project with Velocity Surveys Ltd.

Recently acted as mining Geophysicist and technical Sales Manager in the Pacific north-west for W.P. McGill and Associates.

Presently employed as Airborne and Mining Geophysicist with Geo-X Surveys Ltd.

Active experience in all Geologic provinces of Canada has been obtained.

PERSONNEL

NAME:

CERNE, James

EDUCATION:

B.S. Geology (June 1967)

Case Institute of Technology - Cleveland,

Ohio.

M.S. Geophysics (August 1968)
California Institute of Technology Pasadena, California.

EXPERIENCE:

July 1965 - June 1957 - Metallurgy Dept., Case Institute of Technology - Student Asst.

June - September 1967 - N.A.S.A. Manned Spacecraft CNT. Lunar and Earth Sciences Div., Geophysics Group, Houston, Texas.

September 1967 - August 1968 - California Institute of Technology, Seismological Laboratory, Graduate Research Asst.

September 1968 - present. Employed by Geo-X Surveys Ltd. as Geophysicist.

PERSONNEL

Name:

PASCHE, Juergen

Education:

Mittelschule - equivalent to Grade 12. Completed apprenticeship as precision mechanic with Carl Zeiss - Graduate Electrical Technology.

Experience:

3 years - Electro-Technician with SIEMENS of Braunschweig, Germany.

3 1/2 years - Seismic Party Chief with PRAKLA Association for practical deposit research in Germany - including field experience in Switzerland, Italy, and North Africa.

PERSONNEL

NAME:

RODDY, Robert B.

EDUCATION:

Senior Matriculation - Alberta

Military Courses Attained:

1942 - Air Observer; 1948 - Photographic Technician; 1949 - Air Camera Operator; 1956 - Photographic Supervisor; 1956 - Camera Recorder Repair; 1957 - Junior Officer; 1957 - Public Relations Officer; 1959 - Flying Officer's Qualifying Exams; 1960 - Technical Photographic Officer; 1963 - Technical Officer's Radiological Defence; 1964 - Technical Officer's Logistics; 1966 - Royal Canadian Air Force Staff School; 1967 - Program Evaluation and Review Techniques.

EXPERIENCE:

- 1964 68: Manager-Photographic Logistics Cell at Material Command Headquarters -Canadian Armed Forces, Ottawa.
- 1959 64: Staff Officer-Photography at Training Command Headquarters, Royal Canadian Air Force, Winnipeg.
- 1957 59: Public Relations Staff Officerat Training Command Headquarters, Royal Canadian Air Force, Trenton.
- 1947 57: Supervisor-Photographic Services Unit at various R.C.A.F. stations throughout Canada and England.

PERSONNEL

Name:

KEY, Robert A.

Education:

Grade XII Diploma.

1 year Petroleum Geology at the Institute of Technology and Arts in Calgary.

Experience:

2 years in Steam Heating Design Drafting.

12 years with Mobil Oil Canada Limited,

Senior Draftsman.

PERSONNEL

Name: YIP, David Edward

Education: Grade 12 - Majors: Science, Mathematics,

Social Studies and

Industrial Arts.

Lake Cowichan Secondary School

1 year - Vancouver Vocational Institute -

Drafting Training.

Presently employed by Geo-X Surveys Ltd. since November 27, 1967 as Draftsman. Experience:

CERTIFICATE

NAME:

MALESKU, Terrance D.

EDUCATION:

Grade XII - Balfour Technical School, Regina, Saskatchewan.

EXPERIENCE:

September 1961 - September 1965 as Geological Draftsman for Marathon Oil Co., Regina, Saskatchewan.

September 1965 - December 1968 as Structural Draftsman for Con-Force Products, Regina, Saskatchewan.

April 1969 - presently employed as Geological Draftsman for Geo-X Surveys Ltd.

SPECIFICATIONS OF THE V-4937A MAGNETOMETER SYSTEM

Performance

Range: 20,000 to 100,000 gamma (worldwide) Sensitivity: \pm 1/2 and \pm 1 gamma in any field.

Sampling

Rate: manual and "clock" operation permits any

timing sequence.

Power Requirements

22-30 V, 6 amps for magnetometer, 60 watts for analog recorder and 100 watt maximum for digital recorder:

Physical Specifications

Console: size - 19 x 17 x 24 inches; Weight 68 lbs.

Analog

Recorder: dual channel - 15 x 10 x 10 inches, 30 lbs.

Scanner-

coupler: fucical counter, ident. control, 24 hr. clock,

.40 lbs.

Recorder: size - 14 x 11 x 28 inches; Weight 41 lbs.

Data Output

Digital

Recording: BCD 1-2-4-8 (four line output)

"O" state - 18 to -30v through 100K ohms

1 state -1 to +3v through 100k ohms

Print

Command: Positive going 12 to 25v pulse; 15M second.

Auxiliary

Channels: A & B for radio altimeter and navigation equipment.

Analog

Recording: Galvanometric -1 mA full scale into 1500 ohms

Potentiometric: 100mV full scale. Minimum load

resistance 20K

Full scale resolution of the least most significant digits of the total geomagnetic field 0-99, 0-999 at 1 gamma sensitivity; 0-49, 0-499

at 1/2 gamma sensitivity.

Instrument Specifications

Camera

Neyhard Automax 35 m.m. pulse camera Type:

Model: G-2 with auxiliary data box

Up to 10 frames per second Pulse Rate:

0.738" \times 0.738" square picture with 0.200" \times 0.738" data area. Film Format:

Mitchell 400 foot 35 m.m. Magazine:

17 m.m. F/14 Super-Takumar Fish-eye Lenses: (a)

> 35 m.m. F/2.0 Super Takumar (b)

24 hour Accutron Clock Data Box: (a)

Frame counter (b)

Available for optional feature (c)

Dimensions

8 3/8" high, 4 1/2" deep, 6 1/4" wide. (less magazine):

Weight

(less lens and

12 lbs. magazine):

INSTRUMENT SPECIFICATIONS

Aircraft

Type and Model: Excalibur 800

(Beechcraft Twin Bonanza modified by

Swearingen Aircraft, San Antonio,

Texas)

Power: Two 400 H.P. Lycoming 10-720-AIA

engines.

Gross Weight: 7900 pounds

Empty Weight: 5300 pounds

Useful Load: 2600 pounds

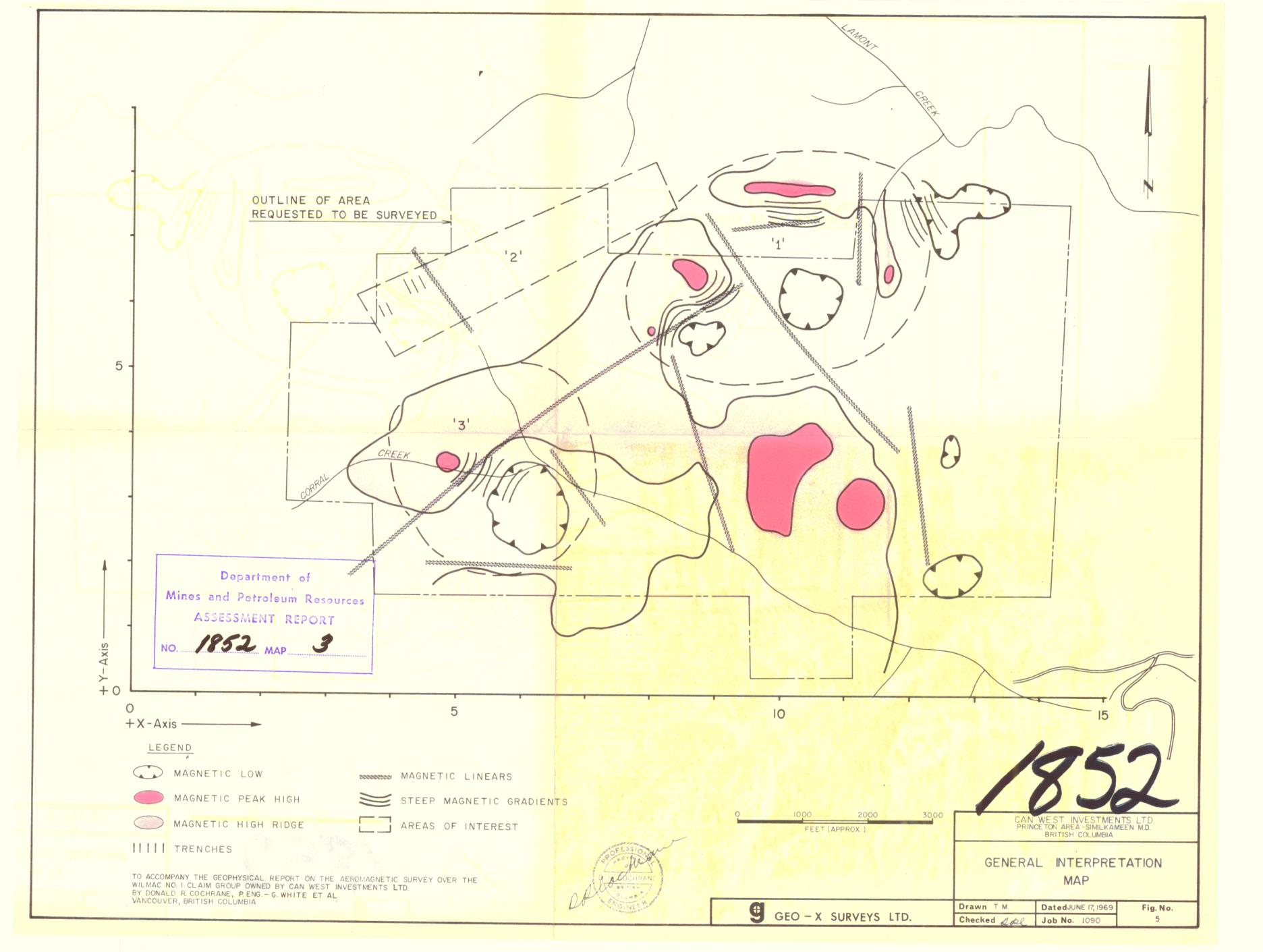
Fuel Capacity: 230 gallons (U.S.)

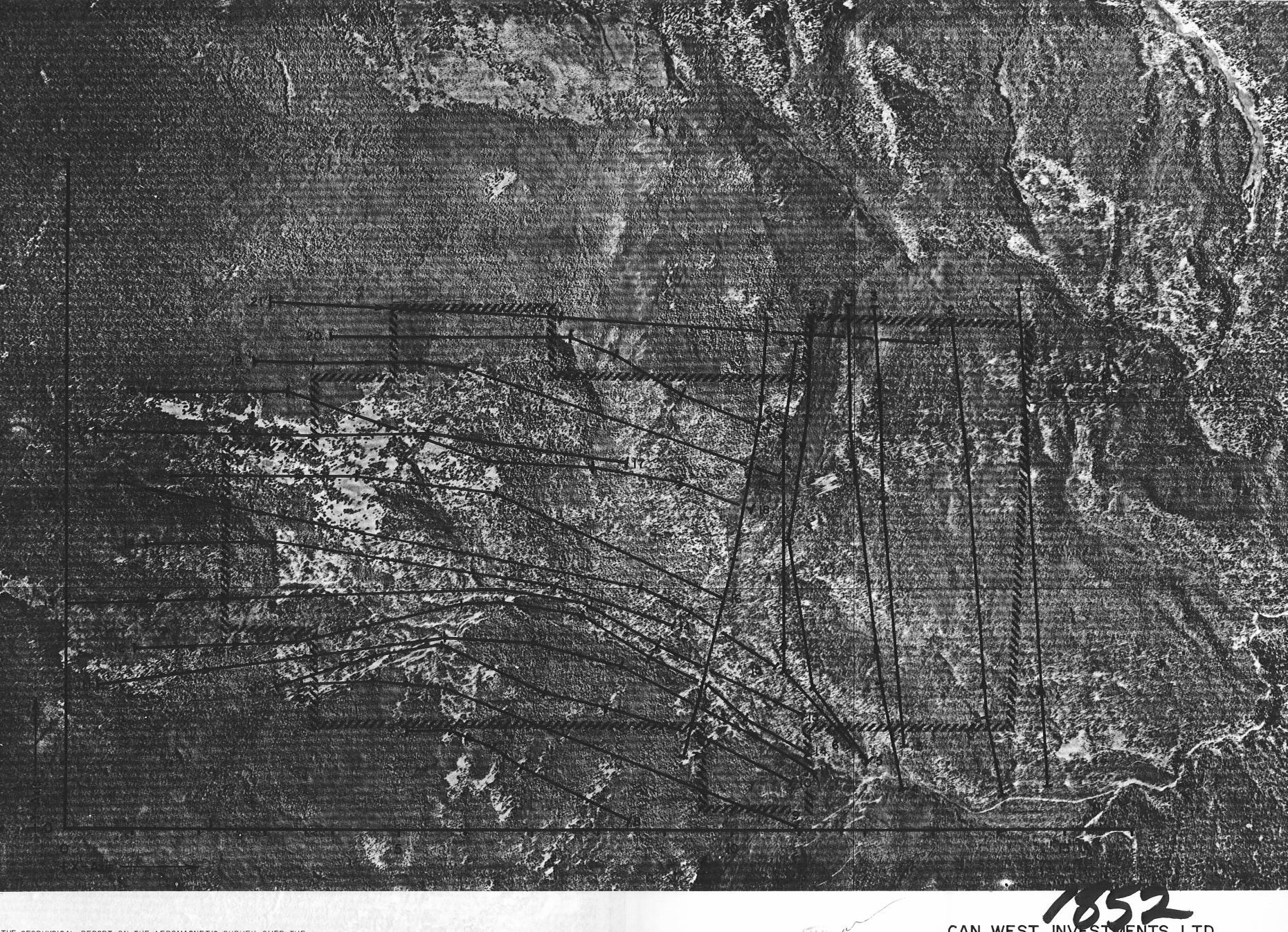
Performance at

7900 lbs. Gross: Climb - 1535 feet per minute (at sea level)

Cruise - 230 miles per hour.

Range - 1200 miles.





THE GEOPHYSICAL REPORT ON THE AEROMAGNETIC SURVEY OVER THE CLAIM GROUP OWNED BY CAN WEST INVESTMENTS LTD.

COCHRANE, P. ENG. - G. WHITE ET AL RITISH COLUMBIA

0 1000 2000 3000 FEET (APPROX.)



CAN WEST INVESTMENTS LTD.
PRINCETON AREA, B.C.
Fig. 3 FLIGHT LINES ON AERIAL MOSIA
GEO-X SURVEYS LTD. JOB NO. 1090 JUNE 17, 19

