

REPORT

On An
AIRBORNE MAGNETOMETER SURVEY
And
PARTIAL GEOCHEMICAL SURVEY
Over The
STAR GROUP OF CLAIMS
Situated On The
South Side of Prospector Mountain
And Centered Near
Latitude 62°-26': Longitude 137°-47'
(N.T.S. 115-I-5)

In The
DAWSON RANGE, YUKON TERRITORY

On Behalf Of
STARBIRD MINES LTD.

By
GEO-X SURVEYS LTD.

Vancouver

March 10, 1971

Airborne Instrument Operator

D. Otter

Report By:

S.L. Sandner
B. Sc.
Honours Geology

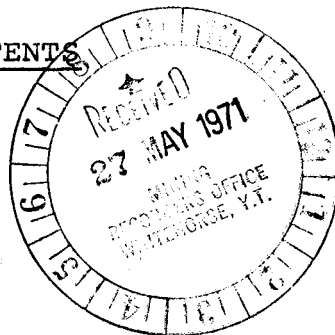


GEO-X SURVEYS LTD. 627 HORNBY STREET, VANCOUVER I, B. C.

604-685-0312
TELEX 04-50404

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This report has been examined by the Geological Inspector and it is certified to be true and correct to the best of his knowledge and belief.

\$5,000

D. B. Craig

Geological Inspector

Consolidated as per section work under Section 66 (1), Consolidated Mining Act.

[Signature]

PREFACE (Aeromagnetism)

Magnetic susceptibility may change perceptibly from one lithologic unit to another; thus accurate detailed mapping of the geomagnetic field often provides valuable information about subsurface geology, even in heavily drift covered areas. Aeromagnetic surveying can aid in the delineation of buried contacts and disruptions, or the location of areas of possible plutonic differentiation. Often local magnetic patterns associated with known ore bodies can be identified, and the existence of similar variations in magnetic intensity elsewhere may lead to the discovery of new ore bodies.

INTRODUCTION

On Feb. 7, 1971, Geo-X Surveys Ltd., of Vancouver, B.C., on behalf of Starbird Mines Ltd., conducted an airborne magnetometer survey over the STAR (1-40) Group of claims on Prospector Mountain, Whitehorse Mining Division - Yukon Territory. A total of 54 line miles of total intensity airborne magnetometer surveying was conducted. This report describes the instrumentation, field procedure, data processing and discusses the results obtained.

INTRODUCTION TO AEROMAGNETOMETRY

The earth has a magnetic field which is basically that of a magnetic dipole. There are, however, major and minor divergences from the basic dipolar field. Major divergences are interpretable as indications of structure within the geoid proper and are of mostly academic interest. Minor differences are of more interest to the mineral prospector since they may be attributable to local variations in either the ferromagnetic susceptibility or the natural rock magnetism, or both. Since ferromagnetic susceptibility and natural rock magnetism change measurably from one rock type to another, accurate detailed mapping of the local geomagnetic field often provides valuable information about the subsurface geology (even in heavily drift-covered areas). Aeromagnetic surveys can provide information about the type, general attitude, configuration and complexity of the geo-superstructure. Local elements associated with known ore bodies can often be identified, and the existence of similar local elements elsewhere may lead to the discovery of new ore bodies. Aeromagnetic prospecting can be applied to the delineation of buried contacts and disruptions, or the location of areas of possible plutonic differentiation and its varied products.

LOCATION

The survey area covered by this report is approximately centered at latitude 62° 26'N and longitude 137° 47'W (NTS 115-I-5) in the Prospector Mountain Area, Dawson Range, Yukon Territory.

CLAIMS AND OWNERSHIP

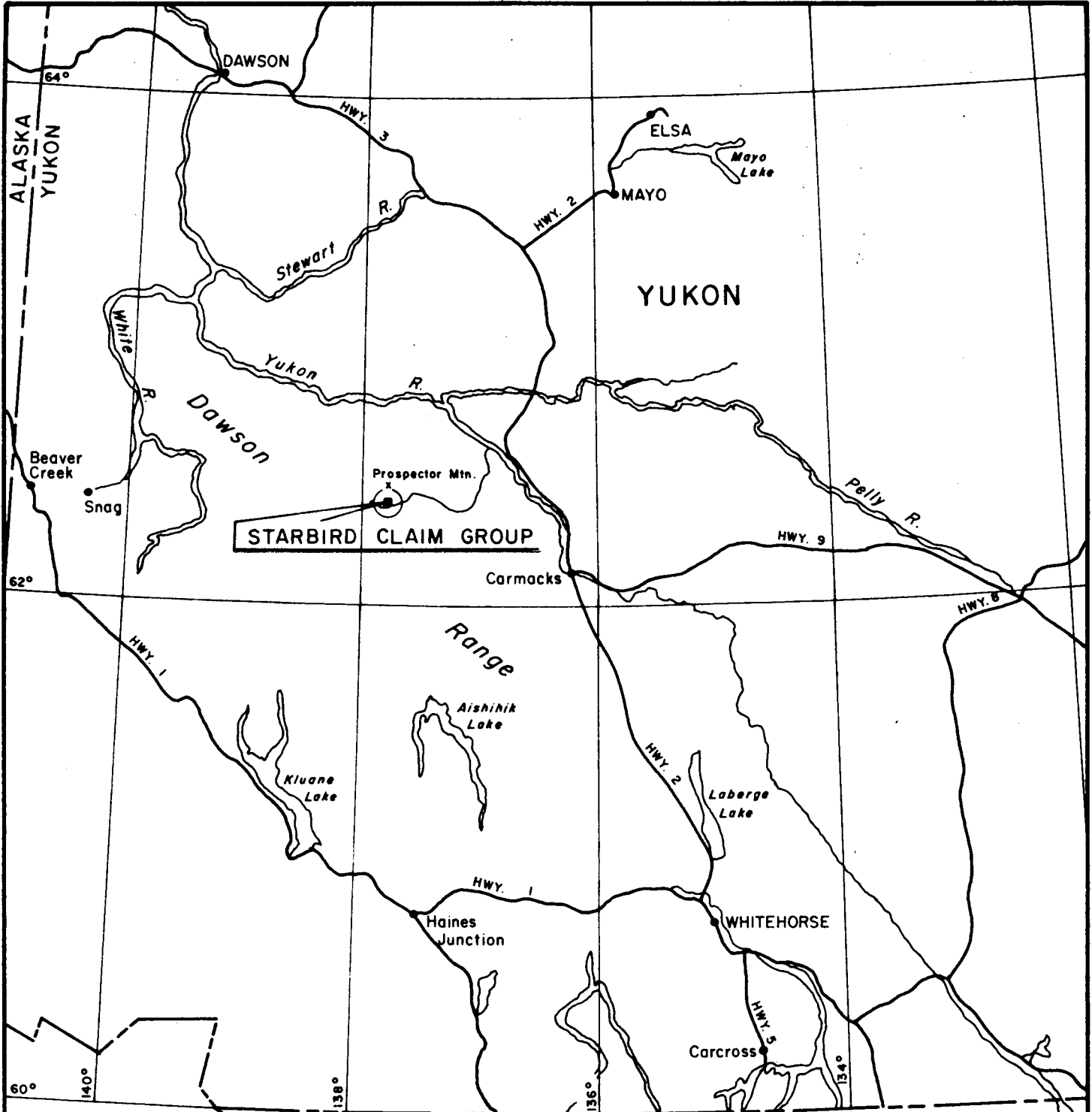
The property on which the airborne magnetometer survey was conducted consists of one claim group, listed as follows: STAR 1-40. The survey was conducted on behalf of Starbird Mines Ltd., registered office at: 2218 W. 4th Ave., Vancouver, B.C.

GENERAL SETTING

The area surveyed is located in the Dawson Range. The topography is unglaciated and consists of deep, narrow valleys separated by long, smooth-topped ridges. These ridges converge and culminate in monadnocks that consist of dome-like eminences or groups of relatively smooth-sloped mountains including the Dawson Range.

The generalized geology of the Dawson Range consists of Pre-Cambrian metamorphic rocks of sedimentary and igneous rocks (largely granite and granodiorite), probably of Cretaceous or Jurassic Age, apparently contemporaneous with the Coast Range Intrusives.

(H.S. Bostock. Physiography of the Canadian Cordillera with special reference to the area north of the fifty-fifth parallel. G.S.C. Memoirs 247.)



ALASKA

BRITISH COLUMBIA



STARBIRD MINES LTD.
DAWSON RANGE AREA - WHITEHORSE M.D.
YUKON TERRITORY

LOCATION MAP

G GEO-X SURVEYS LTD.

Drawn T.M.

Dated MAR. 10, 1971

Fig. No.

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Job No. 1165

1

137°45'

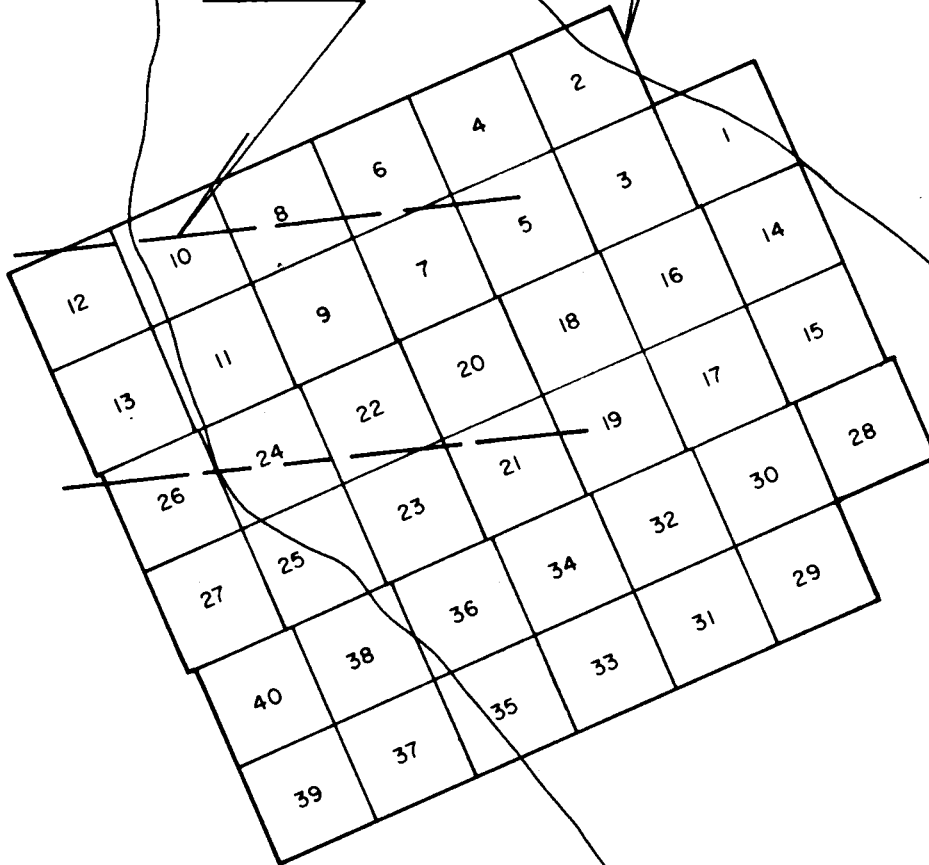


PROSPECTOR MTN.



STAR CLAIM GROUP

APPROXIMATE AREA OF GEOCHEM



NOTE

Copied From Government Claim Map



STARBIRD MINES LTD.
 DAWSON RANGE AREA - WHITEHORSE M.D.
 YUKON TERRITORY

CLAIM MAP



GEO - X SURVEYS LTD.

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Dated MAR. 10, 1971

Fig. No.

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AIRBORNE FIELD PROCEDURE

The total intensity of the geomagnetic field was measured and recorded along 24 flight lines, flown in a general north-south direction. The 1 tie line was flown in an east-west direction.

The survey was flown in an Excalibur 800 fixed wing aircraft towing an air foil sensor with a Varian V4937A proton precision magnetometer (+ 1 Gamma), Varian SDV 4991 digital paper punch recorder and a Neyhard Automax 35 m.m. pulse camera. The terrain clearance was recorded with a Bonzar pulse type radar altimeter.

Analog records were made of the total magnetic field intensity and terrain clearance during flight.

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.

Solar flare warnings and predictions, issued daily at the Space Disturbance Forecast Centre 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 co-ordinates.
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. Geo-X Surveys Ltd. personnel transferred the flight lines onto a mosaic prepared from the government photos.

An X-Y coordinate system was 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 computer printed listing of the contents of the paper tape was made and compared with the analogue record as a guard against possible machine or operator error.

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 then keypunched onto computer cards.

4. Contour Plotting

The punch tape information was input to a 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. The magnetometer readings were evenly spaced along the line segments and posted by a computer-plotter unit. The posted values were then hand contoured at a contour interval of 25 gammas.

DISCUSSION OF RESULTS OF AEROMAGNETIC SURVEY

A total of 22 flight lines heading approximately S.SE, two lines following the creeks on each side of the property and one tie line at right angles to the flight lines was used to cover the property.

The high density flight line spacing with all flight near constant terrain clearance, and common flight direction (North to South) produces perhaps the best magnetic results obtainable. The results shown in figure 3 attached to this report reveal several important features.

Firstly, the most pronounced feature is the well defined magnetic double peak high located near the north central portion of the property. Total magnetic difference within the survey area is 2,200 gammas, a very note worthy difference. Such an anomaly suggests the possibility of a "plug like" intrusive body centred within the property boundaries. This possibility should be checked on the ground by geological mapping. Many mineralized zones in the Dawson range are associated with younger plug like intrusives intruding the older igneous rocks.

The high magnetic trend extends westwardly off the property. This trend should be checked out and if found of geological and/or mineralogical importance additional ground should be staked to the west.

Rough outlines of the area can be obtained from a study of the government aeromagnetic maps. Since this substantial magnetic high is surrounded by lows of almost equal intensity on all sides (except to the west), it suggests

a near vertical dipolar effect. In other words, the body causing the magnetic high is standing near vertical.

INTRODUCTION TO GEOCHEMICAL SURVEY

Approximately one third of the 40 Star Claims were systematically sampled at 400 by 400 foot grid spacing by a four man Geo-X Surveys field crew. The crew was headed by Warren Bellemy, a very experienced geochemical soil sampler. Analysis for copper and molybdenum were carried out on the samples and the results plotted and contoured.

Extremely cold weather and early snow prevented completion of the soil sampling program over the entire property. Sufficiently favourable indications in the copper values suggest the balance of the property should be sampled when conditions permit.

GEOCHEMICAL FIELD PROCEDURES

The initial survey base line was established near the northern boundary of the Star Claim Group in an east-west direction. Ground control was established by located claim posts. Soil samples were collected at 400 foot intervals along crosslines spaced 400 feet apart. The samples were taken by excavating a small pit with a shovel to the appropriate depth, to reach the B Horizon. The soil sample was placed in a geochemical sample bag (marked with line number and station number) and on standard field notes together with a description of the color, composition and depth of soil sample. The sample depth varied slightly and averaged 8 inches below the vegetation base or A zone.

Bags containing the soil samples were sent directly to Bondard-Clegg & Co. Ltd., 1500 Pemberton Ave., North Vancouver for analysis. The hot aqua regia atomic absorption 80 mesh method of analysis for copper and molybdenum was used.

DISCUSSION OF GEOCHEMICAL RESULTS

Some nine lines spaced 400 feet apart with samples taken every 400 feet along each line covered approximately one third of the property. Analysis for copper and molybdenum are shown on figures 5 & 6 of this report. Background for copper throughout most of the Dawson Range runs about 20 ppm. Molybdenum background is usually in non detectable amounts.

Based on the writers fairly extensive experience throughout the Dawson Range copper values 4 or 5 times back ground or more can be considered anomalous and should ^abe further investigated.

The group of three 80 to 100 ppm copper highs near the northern central portion of the claim group coincide rather closely with the peaks of the aeromagnetic high. This point may prove to be significant. These areas should be carefully examined for out crop and possible indication of mineralization or gossen.

The strongest copper anomaly indicated within the area completed is near the North Eastern corner of the property. The highest reading is 240 ppm copper or approximately 12 times background. This area should be closely examined and perhaps closer spacing (50 - 100 feet) should be used to fill in between line and stations.

It should be noted however that this area coincides with a topographic low and creek bank slopes. This may reflect some natural migration and accumulation of Cu values down slope.

No significant molybdenum values were noted throughout the area sampled.

Respectfully Submitted,

A handwritten signature in cursive script, appearing to read "S. L. Sandner", written over a horizontal line.

S. L. Sandner

APPENDIX I

PERSONNEL

Name: SANDNER, Stanley L.

Education: B.Sc. - University of British Columbia
(Honours - Geology) when?

Professional Associations: Registration pending - Association of Professional Engineers of British Columbia.

Experience: 9 years active exploration and production experience throughout western North and western South America. Most of this experience was directly involved in geophysical, geological and geochemical studies of base metal and iron deposits.

Directly involved in bringing two properties into profitable production.

President and Director of Geo-X Surveys Ltd.

APPENDIX I

PERSONNEL

Name: MLCUCH, Alexander

Education: Ph.D. Physics - Komensky University,
Bratislava Czechoslovakia

Experience: Programming course at the British
Columbia Institute of Technology

Lectured and did research work in
Astronomy for five years

Assistant Professor of Physics at
Slovak Technical College for four years

Research Assistant in Physics Department
at the University of British Columbia

Presently employed with Geo-X Surveys Ltd.

APPENDIX I

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.

2 years, mining exploration with Geo-X Surveys Limited as Chief Draftsman.

APPENDIX I

CERTIFICATE

NAME: MALESKU, Terrance D.

EDUCATION: Grade XII - Balfour Technical School,
Regina, Saskatchewan.

EXPERIENCE: September 1961 - September 1965 as Geologi-
cal 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 Geologi-
cal Draftsman for Geo-X Surveys Ltd.

APPENDIX I

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 Officer-at 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.

APPENDIX II

PERSONNEL AND DATES WORKED

A. Field Work

Dick Otter	Instrument Operator	Feb. 7, 1971
Ken Mowbray	Pilot	Feb. 7, 1971
Larry Williams	Navigator	Feb. 7, 1971

B. Data Processing and Report Preparation

A. Mlcuch	Data Processor	March 8, 9
S.L. Sandner	Geologist	March 8, 9, 10
R. Roddy	Photo Co-ordinator and Plotter	March 8, 9
R. Key	Report Preparation	March 9

C. Drafting and Reproduction

R. Key	Draftsman	March 8, 9, 10
T. Malesku		March 8

APPENDIX III

COST BREAKDOWN

The following is a cost breakdown for a Soil Geo-chemical Survey and an Airborne Magnetometer Survey conducted over the STAR (1-40) Claim Group by Geo-X Surveys Ltd. through an Agreement with STARBIRD MINES LTD. dated September 8, 1970.

Geo-X Surveys provided the following for an all inclusive price of \$125.00 per claim for the combined survey:

- (a) Air Photo Mosaic
- (b) Aeromagnetic Survey Coverage
- (c) Soil Geochemical Survey
- (d) Computer Data Processing
- (e) Report Preparation

All Inclusive Total Price

40 Claims @ \$125.00 - \$5,000.00



S.L. Sandner, President

APPENDIX IV

SPECIFICATIONS OF THE V-4937A
MAGNETOMETER SYSTEM

Performance

Range: 20,000 to 100,000 gamma (worldwide)
Sensitivity: $\pm 1/2$ and ± 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)
"0" 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.

APPENDIX IV

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.

APPENDIX IV

Instrument Specifications

Camera

Type: Neyhard Automax 35 m.m. pulse camera
Model: G-2 with auxiliary data box
Pulse Rate: Up to 10 frames per second
Film Format: 0.738" x 0.738" square picture with
0.200" x 0.738" data area.
Magazine: Mitchell 400 foot 35 m.m.
Lenses: (a) 17 m.m. F/14 Super-Takumar Fish-eye
(b) 35 m.m. F/2.0 Super Takumar
Data Box: (a) 24 hour Accutron Clock
(b) Frame counter
(c) Available for optional feature

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

Weight
(less lens and
magazine): 12 lbs.



PROSPECTOR MTN.

B16 CREEK

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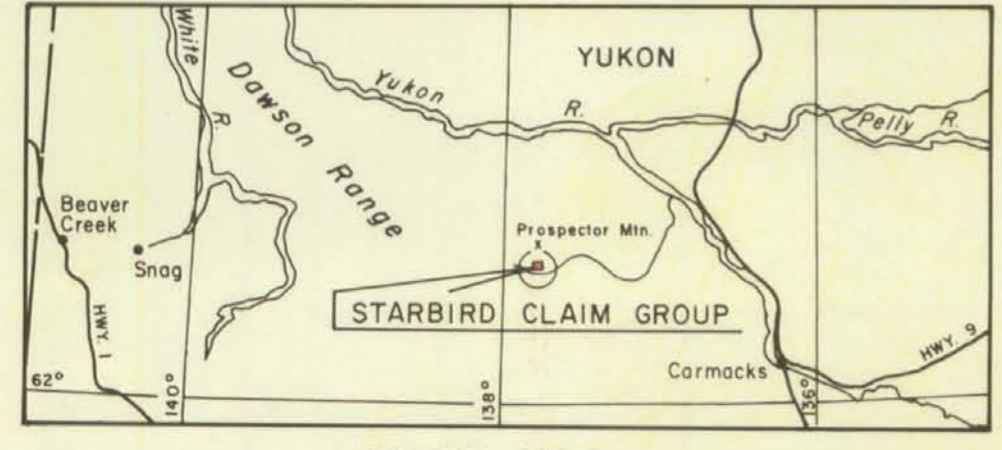
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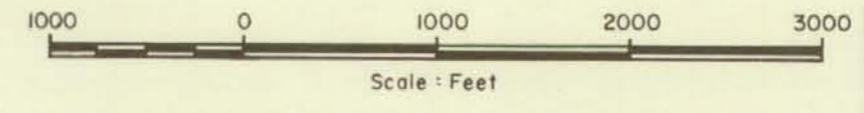
Y Axis

X Axis



INDEX MAP
Scale 1" = 40 Miles

SURVEY SPECIFICATIONS
 LINE SPACING - 500'
 TERRAIN CLEARANCE - 500'
 FLIGHT DIRECTION - N.S.

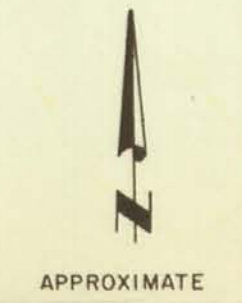
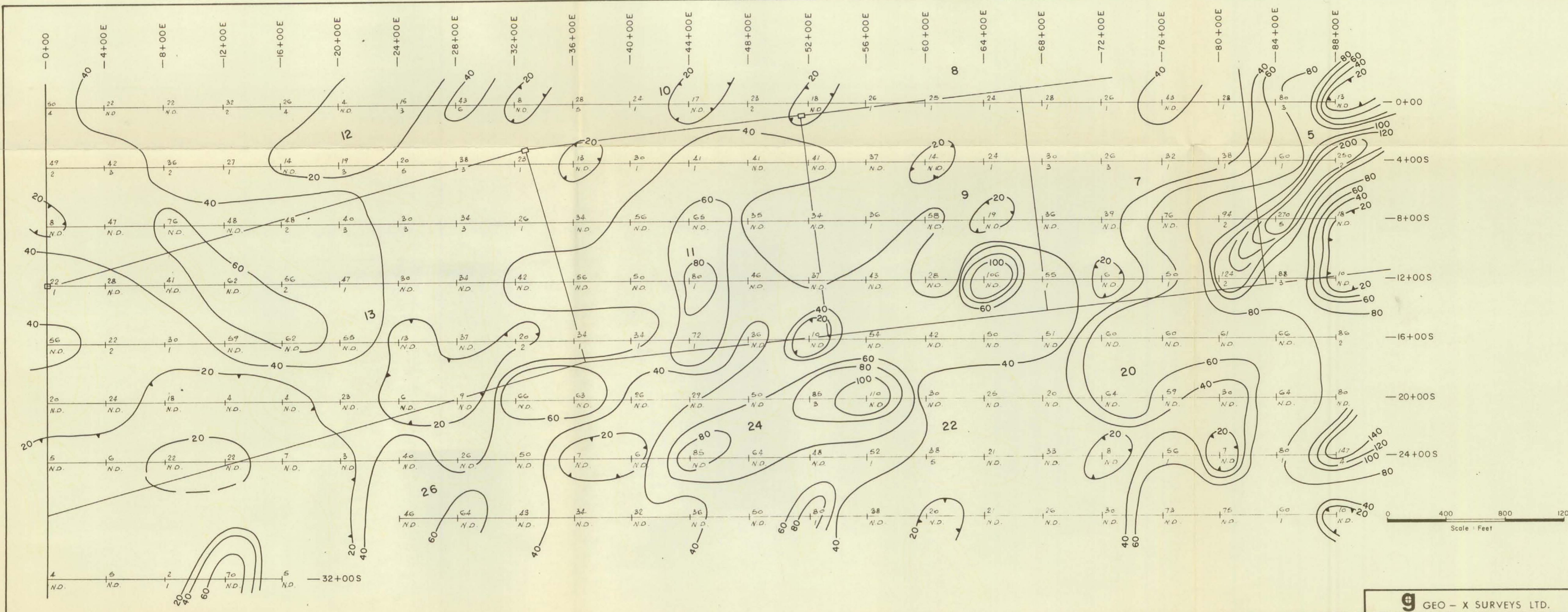


STARBIRD MINES LTD.
 DAWSON RANGE AREA-WHITEHORSE M.D.
 YUKON TERRITORY

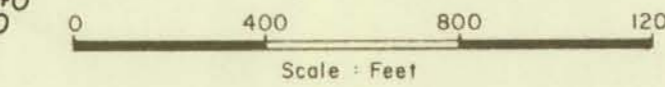
**FLIGHT LINE LAYOUT
 &
 ISOMAGNETIC PLAN**
 CONTOUR INT. : 25 GAMMAS

g GEO - X SURVEYS LTD.

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DATED	MAR. 10, 1971	1165
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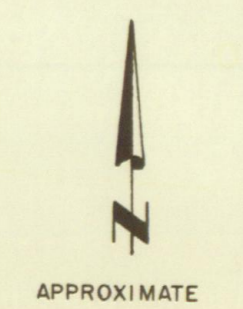
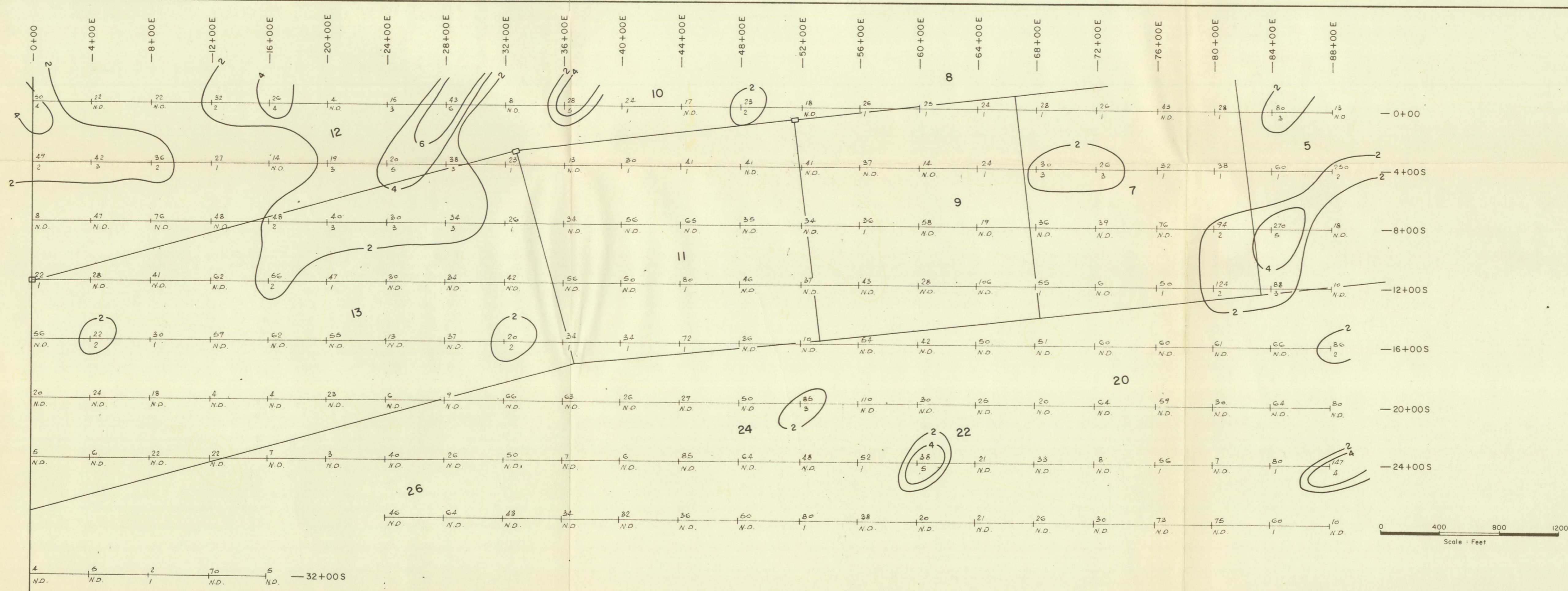


20 COPPER
2 MOLYBDENUM

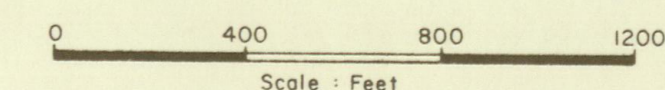


STARBIRD MINES LTD. DAWSON RANGE AREA-WHITEHORSE M.D. YUKON TERRITORY		
COPPER GEOCHEMICAL P.P.M. CONT. INT. 20,40,60,80,100,140,160 180,200		
Drawn T.M.	Dated MAR. 10, 1971	Fig. No.
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G GEO - X SURVEYS LTD.



20 COPPER
2 MOLYBDENUM



STARBIRD MINES LTD. DAWSON RANGE AREA-WHITEHORSE M.D. YUKON TERRITORY		
MOLYBDENUM GEOCHEMICAL P.P.M.		
CONT. INT. 2,4,6		
Drawn T.M.	Dated MAR. 10, 1971	Fig. No.
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