REPORT ON

AIRBORNE MAGNETIC SURVEY

KUTCHO PROPERTY

(KUTCHO 1 TO 4 AND KUTCHO 6 CLAIMS)

58 deg. 12'N 128 deg. 30' W

N.T.S. 104 I/2

Liard Mining Division, B.C.

by

R.G. MacArthur

NORANDA EXPLORATION COMPANY, LIMITED
(No Personal Liability)

September 1984
March 1985, Amended

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APPENDICES

LIST OF FIGURES AND DRAWINGS

I. GENERAL INTRODUCTION

This report describes the results of an airborne magnetic survey carried out over the Noranda Kutcho Property area during 1983.

The survey was carried out by Questor Surveys Limited of Mississauga, Ontario. The survey was carried out along with an Input MK VI electromagnetic survey. For the purposes of this report, only the magnetic data is reported. The results are discussed later in part II, Airborne Magnetic Survey in excerpts from the Questor Surveys Ltd. report by M.H. Konings, P. Eng.

The property covers occurrence of Cu-Zn mineralization in schistose volcanic, volcanoclastic and sedimentary rocks.

i. Location and Access

The property is located approximately 95 km southeast of Dease Lake in northwestern B.C.

Access to the property has been by helicopter from Dease Lake or via the Kutcho Airstrip located approximately 3 km to the north.

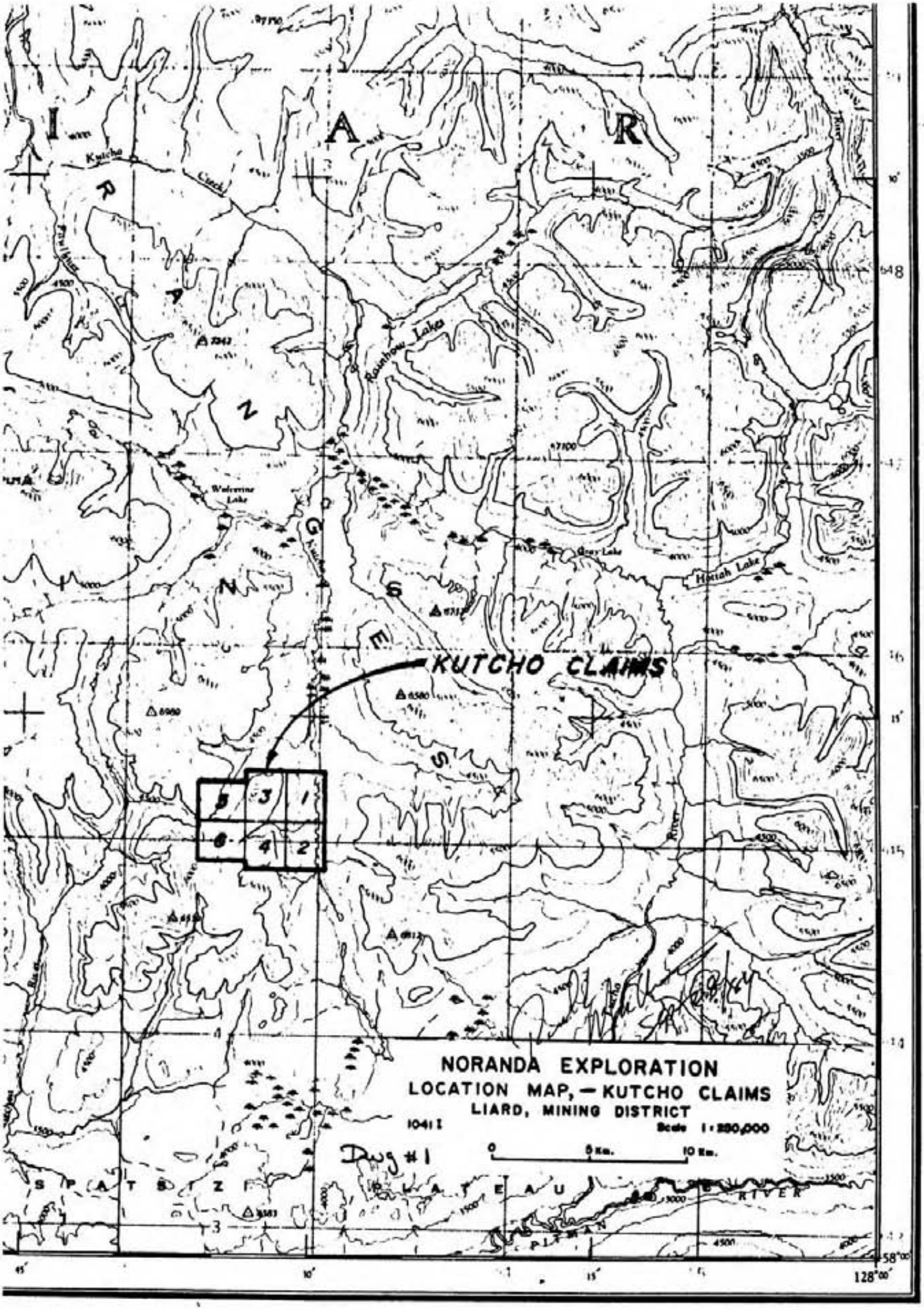
ii. Claims and Ownership

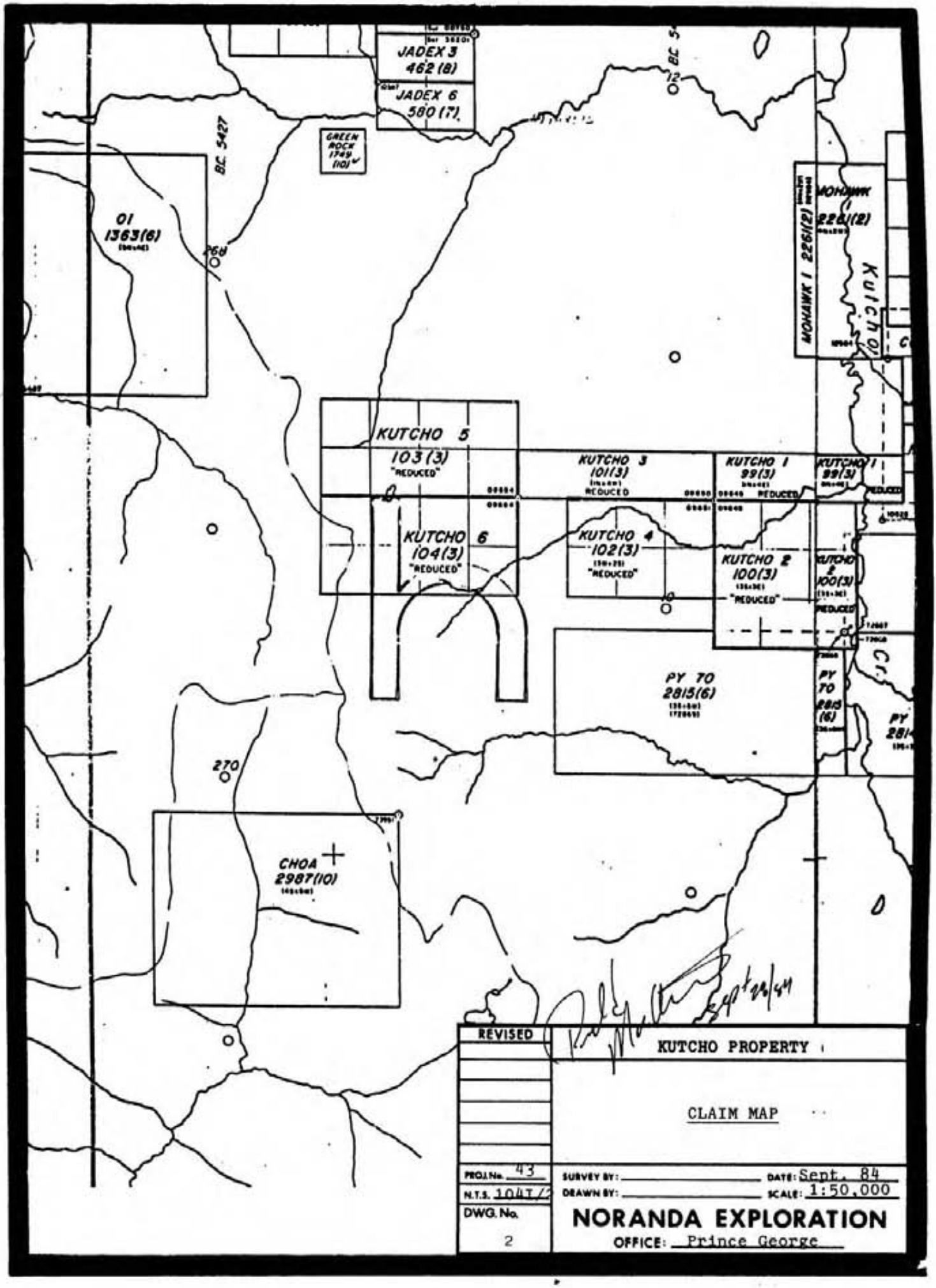
The Kutcho property consists of the following claims:

Claim	Units	Record #	Record Date	Owner
Kutcho 1	4	99	March 10, 1976	Noranda Expl. Co., Ltd. (no personal liability)
Kutcho 2	9	100	"	"
Kutcho 3	4	101	"	"
Kutcho 4	6	102	"	"
Kutcho 5	8	103	"	"
Kutcho 6	8	104	"	"

iii. Topography and Vegetation

The area is characterized by mountainous terrain with elevations up to 2200 meters and local relief on the order of 800 meters.


KUTCHO CLAIMS
5
3
1
6
4
2
NORANDA EXPLORATION
LOCATION MAP, — KUTCHO CLAIMS
LIARD, MINING DISTRICT
104I I
Scale 1:250,000
0
5 Km.
10 Km.
Dwg #1
Kutcho Creek
Rainbow Lake
Hirsch Lake
SPATSIZI PLATEAU
RIVER
128°00'


JADEX 3
462 (8)
JADEX 6
580 (7)
GREEN ROCK
1749
(10)
BC 5427
01
1363(6)
MOHAWK 1 2261(2)
MOHAWK
226(2)
Kutcho
KUTCHO 5
103 (3)
"REDUCED"
KUTCHO 3
101(3)
REDUCED
KUTCHO 1
99(3)
REDUCED
KUTCHO 6
104(3)
"REDUCED"
KUTCHO 4
102(3)
"REDUCED"
KUTCHO 2
100(3)
"REDUCED"
PY 70
2815(6)
270
CHOA
2987(10)
REVISED
KUTCHO PROPERTY
CLAIM MAP
PROJ No. 43
N.T.S. 104I/2
DWG. No.
2
SURVEY BY:
DRAWN BY:
DATE: Sept. 84
SCALE: 1:50,000
NORANDA EXPLORATION
OFFICE: Prince George

The area has been subjected to glaciation and most of the mountains are covered with a thin veneer of glacial debris while the lower valleys are filled with thick glacial deposits.

Vegetation in the area consists of a dense growth of spruce and fir below 1500 m merging into patches of mountain willow or "buckbrush" up to 1700 m. Above 1700 m there is only short grass and moss.

Many of the larger river valleys in the area are covered only with dense "buckbrush".

iv. Regional Geology

The area has been mapped regionally by the Geological Survey of Canada and their results are available as Open File Map #610 at a scale of 1:125,000.

Regional mapping indicates the area is underlain by a sequence of volcanic, volcanoclastic and sedimentary rocks ranging from Upper Triassic to Lower Jurassic in age. The sequence has been tightly folded with axes trending west northwest often plunging to the west.

v. Previous Work

The property was staked by Imperial shortly after the discovery of the Sumac-Imperial deposit on the nearby "Jeff" and "SMRB" claims. The property was dropped after a limited amount of work.

The property was staked by Noranda in 1976 and the following table outlines the work done prior to the 1983 program.

Year	Claims	
1976, February	Staking Kutcho 1 to 6	
1976, June, July		Geological Mapping Linecutting Soil Survey CEM Survey Vertical Loop EM Partial IP Survey Partial VLF Survey
1976, August	Staking Kutcho 7,8,9 & 10	
		Airborne VLF & Mag Survey

Year	Claims	
1977, June, July	Kutcho 1 to 6	Grid Extension Additional Mapping CEM, IP, and Soil Sampling Drill Holes NK-1, NK-2 & NK-3 = Total 229 m
	Kutcho 7,8,9 & 10	Grid Preparation Soil Survey CEM Survey Geological Mapping
1978, August	Kutcho 8	Geological Mapping and CEM Survey
1980 July	Kutcho 1-6	Geological mapping Petrographic Study

II. AIRBORNE MAGNETIC SURVEY

The Survey was carried out between June 6 and June 28, 1983 using Dease Lake as a survey operations base. 196.5 km of traverse lines and 23.9 km of control lines were flown for a total of 220.4 km. Line spacing was 400 meters.

i. Survey Personnel

The survey crew was made up of experienced Questor employees:

Crew Manager, Data Technician -- D. Isherwood

Pilot, Captain of Aircraft -- D. Davis

Co-Pilot, Navigator -- B. Smith

INPUT Equipment, Technician -- K. Higenbottam

Aircraft Engineer -- L. Currie

The flight path recovery was completed at the survey base, while the final data compilation and drafting was carried out by QUESTOR at its Mississauga, Ontario office. The magnetic processing was carried out using QUESTOR's software but computer drafted by Dataplotting Services. The INPUT interpretation and reporting was completed by M.H. Konings.

ii. Data Compilation

The flight path of the helicopter is recorded by a strip camera on black and white 35 mm. film continuously during flight. The camera is fired by the fiducial time system of the data acquisition system once every 2 seconds. Fiducial numbers are imprinted on the film, marked onto the analogue records and recorded digitally at the same instant.

The flight line headings are opposite on adjacent lines, which are normally flown sequentially in an "S" pattern. The navigation references are flight strips at a scale of 1:10,000 which are made from the base maps. The equipment operator logs the flight details recording line numbers, time, the fiducial range and other pertinent flight information. This information comes from the magnetic tape after it has been recorded (read-after-write). It is compared to the film, analogue records and the magnetic base station recording at the completion of the survey flight.

The film and all records are developed, edited and checked at the completion of each flight. Recovery of the flight track is carried out by comparing the negative of the 35 mm. film to the topographic features of the base map. Coincident features are picked and plotted on exact copies of the stable mosaic base map on which the final results are drafted. Points are picked at an average interval of 0.5 kilometres. This corresponds to one whole fiducial unit or 20 seconds. The picked points will not necessarily fall on whole fiducial numbers, but on the final presentation, only the first and last whole numbers on a line are marked on each flight line. By interpolation, the whole numbers are marked as ticks along the flight path. This keeps the anomaly and interpretation maps free of unnecessary numbers.

These procedures are performed daily so that the data quality and progress may be measured objectively. Reflights for covering navigational gaps and other deficiencies are usually flown on the following day.

The analogue records are inspected for coherence with specifications and anomalies are selected for classification and plotting. Selected anomalous conductors are positioned by plotting their fiducial positions, less the lag factor (Appendix C). These resultant positions are located by interpolating between fiducial points established by the flight path recovery process.

Only the magnetic contour map is presented with this report.

iii. Data Presentation

The base maps for the survey area are photomosaics constructed from 1:31,680 air photographs, supplied by the British Columbia Air Photo and Map Office and taken in 1971. These were used first for the flight strips and later as the base onto which the flight path was recovered. The mosaics are uncontrolled at a scale of 1:25,000.

The Magnetic Contour Map presents the aeromagnetic data as isomagnetic contours. The data has been levelled to the control lines, which were flown normal to traverse line directions, at a spacing of not more than 5 kilometres. The data has a basic noise envelope of plus or minus 1 gamma. The levelling process also has a sensitivity of plus or minus 1 gamma. The compilation of the magnetics was carried out digitally on a PDP 11/23 computer using QUESTOR software. The isocontour lines have a basic interval sensitivity of 10 gammas.

iv. Interpretation and Discussion of Results

The airborne survey appears to be mapping the geology in the area very well.

An east/west trending zone of high magnetic responses (59,000 +/- 500 nanotesia) near the southern limit of the survey area probably reflects the belt of ultramafic rocks in the area.

The large area of generally lower magnetic response north of the southern tie line (approx. 58,000 +/- 250 nanotesia) correlates well with the thick folded sequence of interbedded mafic to felsic volcanics and sediments of the Kutcho Formation.

Two linear belts of magnetic highs () 58,500 nanotesia) trend toward a convergence suggesting a closure west of the Kutcho claim group. This supports the picture developed by geological mapping in the area which indicates a westerly plunging anticline with a core of mafic to felsic volcanic flows and tuffs overlain by a sequence of limestone and phyllite and greywackie.

Some of the smaller magnetic peaks within the larger features described above may reflect concentrations of magnetic minerals in economic mineral deposits. The data presented here should be used in conjunction with geological, geochemical and electromagnetic surveys to select areas for detail work.

Ronald Martin
March/85

APPENDIX A

APPENDIX A

Survey Instrument

SONOTEK P.M.H. 5010 PROTON MAGNETOMETER

The airborne magnetometer is a proton free precession sensor, which operates on the principle of nuclear magnetic resonance to produce a measurement of the total magnetic intensitity. It has a sensitivity of 1 gamma and an operating range of 20,000 gammas to 100,000 gammas. The sensor is a solenoid type, oriented to optimize results in a low ambient magnetic field. The sensor housing is mounted on the tip of the nose boom supporting the INPUT transmitter cable loop. A 3-term compensating coil and perma-alloy strips are adjusted to counteract the effects of permanent and induced magnetic fields in the aircraft.

Because of the high intensity electromagnetic field produced by the INPUT transmitter, the magnetometer and INPUT results are sampled on a time-share basis. The magnetometer head is energized while the transmitter is on, but a measurement is only obtained during a short period when the transmitter is off. Using this technique, the sensor head is energized for 0.80 seconds and subsequently the precession frequency is recorded and converted to gammas during the following 0.20 seconds when no current pulses are induced into the transmitter coil.

APPENDIX B

APPENDIX B

The Survey Helicopter

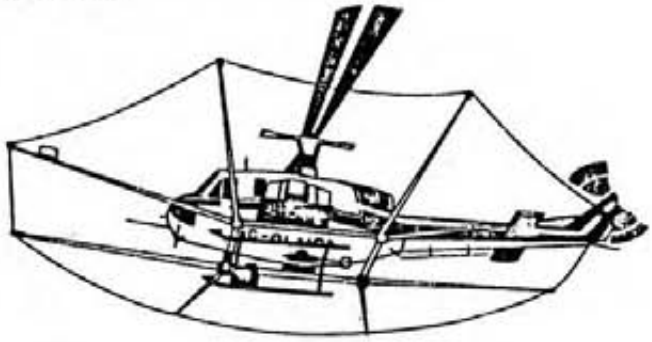


Figure B1

Manufacturer	Bell Helicopter Company
Type	205A-1
Canadian Registration	C-GLMC - present installation
Date of INPUT Installation	May 1982

Modifications:

1) Cradle and wing booms for transmitter coil mounting
2) Camera and altimeter mounting
3) Modified gasoline driven generator system

Any BELL 205-212 airframe can support the QUESTOR Helicopter INPUT system. The 205 is powered by one low maintenance turbine engine. The configuration of the helicopter provides for easy installation of equipment, which can be dissasembled and crated to the survey base. Reassembly takes less than two days. These factors have proven the helicopter to be a reliable and efficient geophysical survey system in areas not suitable for fixed-wing operation.

APPENDIX C

NORANDA EXPLORATION COMPANY, LIMITED

STATEMENT OF COST

DATE September 1984

PROJECT - Kutcho
TYPE OF REPORT Geophysics - Airborne & Magnetometer

a) **Wages:**

No. of Days -
Rate per Day -
Dates From -
Total Wages

b) **Food and Accommodation:**

No. of Days -
Rate per Day -
Dates From -
Total Cost -

c) **Transportation:**

No. of Days -
Rate per Day -
Dates From -
Total cost

d) Analysis

e) **Cost of Preparation of Report**

Author	**250.00**
Drafting	**100.00**
Typing	**$100.00**

f) **Other:**

Contractor	5,687.86
Total Cost	$6,137.86

UNIT COSTS

Unit Costs for Geophysics

No. of Days -		
No. of Units -	220.4 Line Kilometers	
Unit Costs -	27.85 / LKm	
Total cost	220.4 X 27.85	$6,137.86

APPENDIX D

STATEMENT OF QUALIFICATIONS

I, Ronald G. MacArthur hereby certify that:

1. I am a graduate of Dalhousie University with a Bachelor of Science Degree in Geology (1972).

2. I have been employed as a Geologist by Noranda Exploration since 1972.

3. I am a member of the Canadian Institute of Mining and Metallurgy.

4. I am a member of the Geological Association of Canada.

Sept 28/84

Ronald G. MacArthur
District Geologist,
Central Cordillera District
NORANDA EXPLORATION COMPANY LIMITED
(No Personal Liability)

GEOLOGICAL BRANCH
ASSESSMENT REPORT

12,961

MAGNETIC CONTOURS

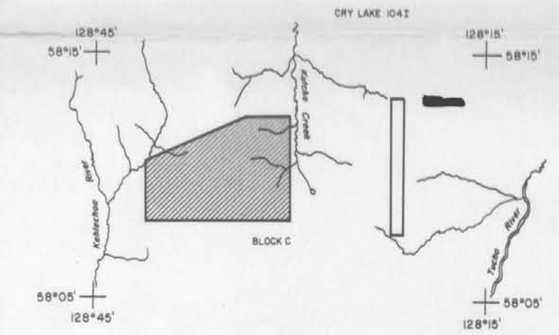
10 Gamma Contour Line

50 Gamma Contour Line

250 Gamma Contour Line

Magnetic Depression

1 Gamma = 1 Nanotesla in SI Units



SCALE APPROX 1:25,000

TOTAL MAGNETIC INTENSITY SURVEY

NORANDA EXPLORATION COMPANY LIMITED
(no personal liability)

KUTCHO AREA

Province of BRITISH COLUMBIA

FILE NO.	SHEET NO.	DATE	COMPILED BY
25H29 C	1 of 1	June, 1983	Questor Surveys Ltd.

Questor Surveys Limited
Mississauga, Ontario Canada

Sept 28/84