

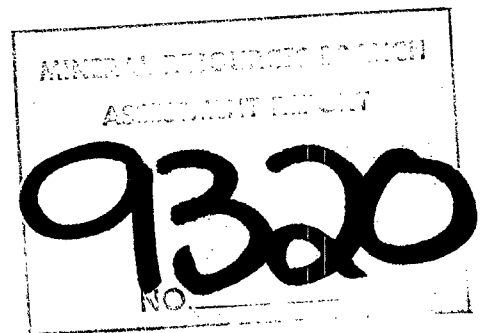
NORANDA EXPLORATION COMPANY LIMITED

GEOPHYSICAL REPORT

AIRBORNE MAGNETOMETER & ELECTROMAGNETIC

SURVEY

J E A N P R O P E R T Y



Chuchi Lake Area, Omineca M.D., B.C.

N.T.S. 93N 2 & 3E

LATITUDE: 55°05'00'N - LONGITUDE: 124°55'00'W

Geophysical Field Work Performed:

MAY 22-26/81 on the JEAN, JW Mineral Claims

JULY 6, 1981

J.T. WALKER

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AIRBORNE GEOPHYSICAL SURVEY

on the

JEAN PROPERTY

and adjacent area

NORANDA EXPLORATION COMPANY, LIMITED

INTRODUCTION

During May 22 - 26, 1981, Noranda Exploration Company, Limited carried out an airborne geophysical survey in the Chuchi Lake area of B.C. covering an area of approximately 355 square kilometers. The survey area lies 85 kilometers N 30° W of Fort St. James, B.C. The area flown is outlined on the location map (N 2 & 3 W) at a scale of 1:250,000.

The mineral claims lying within the survey area are the Jean Group, owned by the N.B.C. Syndicate (Chuchi Lake Mines Ltd.). The list of claims and record numbers is appended.

The purpose of the survey was to provide data for compiling a low level aeromagnetic contour map and to locate zones of conductivity at the VLF frequencies (18kHz - 21kHz).

Three measurements were recorded during the survey:

1. Total magnetic field intensity
2. Relative field strength of the horizontal component of the VLF-EM electromagnetic field from two transmitters.
 - a) Seattle, Washington (Jim Creek) 18kHz
 - b) Annapolis, Maryland 21kHz

A Bell 206B helicopter, chartered from Highland Helicopters, Smithers, B.C. was used to fly the survey. One hundred and eight lines were flown in a N35°E - S35°W direction for a total of 1,425 kilometers. The line spacing was nominally 250 meters with a helicopter terrain clearance of 60 meters. An aircraft speed of approximately 60 m.p.h. (100 km/hour) was maintained on the survey flight lines.

SURVEY PERSONNEL

Pilot: M. Dickinson
Navigator: M. Leahey
Operator: T. Walker
Data Reduction, Drafting: T. Walker and E. Coulson

All personnel are employees of Noranda Exploration Company, Limited except M. Dickenson an employee of Highland Helicopters.

SURVEY PROCEDURE AND NAVIGATION

A flight line base map of the survey area was prepared by enlarging a 1:50,000 N.T.S. topographic map to a scale of 1:20,000. Proposed flight lines and topographically located control points were plotted prior to flying the survey. During the survey, flight line path corrections were made by the navigator where necessary. Line information, control point locations and numbers, announced by the navigator, were recorded on stereo magnetic tape together with the VLF-EM data.

INSTRUMENTATION AND DATA RECORDING

The following instruments are installed in the helicopter for measuring and recording the geophysical data during flights.

a) Proton Magnetometer (ELSEC)

The magnetometer was manufactured by the Littlemore Scientific Engineering Co., Oxford, U.K. and is designated type 595. The magnetometer measures the total magnetic field at a 1 second cycle rate. The measurement is digitally displayed to one gamma and has an analog output of 100, 1000, and 10,000 gammas full scale. The 1000 gamma full scale output is normally used.

The toroidal wound detector is installed in a fibreglass "bird" towed beneath the helicopter on a 12 meter cable.

b) Electromagnetic Receiver (VLF-EM)

The VLF-EM receiver was manufactured by Sabre Electronic Instruments Ltd., Burnaby, B.C. The instrument has dual receivers tuned to 18.6 kHz (Seattle) and 21.4 kHz (Annapolis). Two omnidirectional antenna arrays are employed. They are mounted in the fibreglass "bird" also housing the magnetometer detector. The antenna arrays are designed to detect the horizontal magnetic component of the VLF fields. Signals originating from U.S. Navy transmitters near Seattle and Annapolis were utilized for this survey. The amplitudes of the horizontal component are measured continuously and displayed as relative field strengths. An analog output is provided for recording each measurement.

c) Recording System

Two recording systems were employed simultaneously during the survey.

1. Chart recorder, Model 7155B manufactured by Hewlett Packard is used to record the aeromagnetic data in profile form. The recorder has an event marker, controlled by the navigator to record control point locations. The points are numbered in flight by the operator.

2. The tape recording system consists of a Marantz Superscope recorder Model 330 and a frequency modulator manufactured by Sabre Electronic Instruments Ltd. This system records both VLF-EM measurements and radar altimeter readings on the left channel and all in flight conversation between pilot, navigator and operator on the right channel. The right channel also records an event tone (1000 kHz) controlled by the navigator to indicate control points locations.

High Fidelity cassette magnetic tapes (Phillips Type) are used to record the in-flight data and conversation.

c) Playback System

The playback system consists of a stereo cassette tape recorder (Marantz Superscope Model 330), demodulator and 2 pen strip chart recorder (M.F.E. Model M-26). To retrieve the in-flight tape recorded data, the tapes are replayed, demodulated and the data is reproduced in profile form on the strip chart recorder. Playback is in real time and all voice recorded information, control points numbers and tones are written on the strip charts during playback.

d) Radar Altimeter

A Mark 10 radar altimeter, manufactured by Bonzar Inc. was installed to measure and display helicopter terrain clearance during the survey as an aid to the pilot in maintaining a constant aircraft clearance. The terrain clearance is recorded on magnetic tape.

DATA REDUCTION AND PRESENTATION

All survey data are presented on a plan map at a scale of 1:25,000. Corrected flight line and control points are drawn and numbered. Flight line direction is indicated at the beginning of each line. The topographic contour map, used as a base map for the survey, is used as an underlay to allow ground positioning.

a) Aeromagnetic Data

The magnetic data is presented as isomagnetic contours of the total field as presented on the Magnetic Contour Map (Drawing No.1). Contour values are based on a datum of 58 nanoteslas total magnetic field intensity. The results are not corrected for diurnal variations.

Magnetic values at 50 and 100 nanotesla intervals were picked on the in-flight profile recordings. These points were then transcribed to the flight line plan map with reference to the flight line and control points. The transcribed points of equal magnetic intensity were then contoured.

b) Electromagnetic Data (VLF-EM)

The recorded VLF-EM data measures the relative field strength (horizontal component). A significant conductive anomaly is indicated by a definitive increase in the field strength. Anomaly locations are indicated on the magnetic contour map by a hollow bar, the length corresponding to the profile width at the half height. The enclosed number within the bar represents the percent increase in relative field strength. The anomalous locations are transcribed to the flight line base as was described under aeromagnetic data.

DISCUSSION OF RESULTS

The aeromagnetic contour map indicates the total magnetic field with contour values noted above a reference level of 58,000 nanoteslas. The magnetic field ranges from a low of less than 100 to a high of greater than 1800 nts.

A broad south west trending feature of moderate magnetic relief is dominate within the area surveyed. The 500 nts contour line generally defines this feature. The magnetic field surrounding this area is flat with values ranging as low as 100 nts on the west and below 450 nts on the east.

A very strong magnetic linear is indicated at the south west end of flight lines 1 through 35. Although this anomaly is open on both ends, and the south west flank, the contours between lines 7 and 9 suggest the source to be relatively narrow. A second moderate to strong magnetic high linear is located 2 to 3 kilometers south of the tie line between flight lines 30 and 50.

This low level aeromagnetic survey pattern corresponds closely to the G.S.C. aeromagnetic series results (Chuchi Lake, sheet 93N2) while providing much more detail.

The results of the VLF-EM Survey have indicated numerous field strength anomalies. The anomaly locations are indicated by a hollow bar along the flight lines with a response from Tx-Seattle west of the flight line and a response from Tx-Annapolis east of the flight line. The enclosed numbers insicate the percent increase in the field strength of the VLF signal.

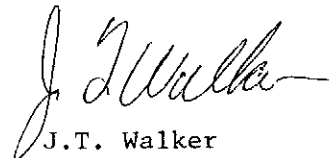
The majority of VLF anomalies are grouped along the north east part of the survey area. Within an area of low magnetics (less than 400 nts) suggesting a possible cause to be graphitic sediments.

The most significant VLF-EM anomalies are:

.../5

Flight line 17 - 0.8 km. north of C.P. 94
Flight line 27 - 1-2 km. south of C.P. 137
Flight line 28 - 1.0 km. south of C.P. 139
Flight line 29 - 0.5 km. south of C.P. 148A
Flight line 42 - 1.0 km. north of C.P. 223
Flight line 54)- 0.2 km. north of C.P. 302
Flight line 55)-
Flight line 62 - 0.1 km. north of C.P. 372
Flight line 93 - 1-2 km. north of C.P. 541

Further investigation of these VLF-EM anomalies should include locating by ground VLF-EM followed by geological and geochemical prospecting techniques.


J.T. Walker
July 22, 1981

APPENDIX "A"

N.B.C. Syndicate (Chuchi Lake Mines Ltd.) List of Claims and Record Numbers.

<u>CLAIMS</u>	<u>RECORD No's</u>	<u>DATE RECORDED</u>
Jean 2	71291	April 15/69
Jean 4	71293	April 15/65
Jean 6	71295	April 15/69
Jean 23	71312	April 15/69
Jean 24	71313	April 15/69
Jean 25	71314	April 15/69
Jean 26	71315	April 15/69
Jean 27	79094	Aug. 4/69
Jean 28	79095	Aug. 4/69
Jean 29	79096	Aug. 4/69
Jean 30	79097	Aug. 4/69
Jean 31	79098	Aug. 4/69
Jean 32	79099	Aug. 4/69
Jean 33	79100	Aug. 4/69
Jean 34	79101	Aug. 4/69
Jean 35	79102	Aug. 4/69
Jean 36	79103	Aug. 4/69
Jean 37	79104	Aug. 4/69
Jean 39	79106	Aug. 4/69
Jean 41	79108	Aug. 4/69
Jean 43	79110	Aug. 4/69
Jean 45 Fr.	79218	Aug. 18/69
Jean 46 Fr.	79219	Aug. 18/69
Jean 47	79873	Sept. 4/69
Jean 48	79874	Sept. 4/69
Jean 49	79875	Sept. 4/69
Jean 50	79876	Sept. 4/69
Jean 51	79877	Sept. 4/69
Jean 52	79878	Sept. 4/69
Jean 53	79879	Sept. 4/69
Jean 54	79880	Sept. 4/69
Jean 81	79907	Sept. 4/69
Jean 109	79935	Sept. 4/69
Jean 119	79945	Sept. 4/69

<u>CLAIMS</u>	<u>RECORD No's</u>	<u>DATE RECORDED</u>
Jean 121	79947	Sept. 4/69
Jean 123	91048	July 28/70
Jean 124	91049	July 28/70
Jean 125	91050	July 28/70
Jean 126	91051	July 28/70
Jean 127	91052	July 28/70
Jean 128	91053	July 28/70
Jean 200 (9 Units)	1279	July 25/78
Jean 300 (12 Units)	1362	Aug. 23/78
Jean 400 (2 Units)	1363	Aug. 23/78
Jean 500 (6 Units)	1364	Aug. 23/78
JW 13	88946	June 24/70
JW 15	88948	June 24/70
JW 17	88950	June 24/70
JW 19	88952	June 24/70
JW 21	88954	June 24/70
JW 22	88955	June 24/70
JW 23	88956	June 24/70
JW 24	88957	June 24/70
JW 25	88958	June 24/70
JW 26	88959	June 24/70
JW 27	88960	June 24/70
JW 28	88961	June 24/70
JW 29	88962	June 24/70
JW 30	88963	June 24/70
JW 31	88964	June 24/70
JW 32	88965	June 24/70
JW 51	88984	June 24/70
JW 52	88985	June 24/70
JW 54	88987	June 24/70
JW 61	88994	June 24/70
JW 62	88995	June 24/70
JW 63	88996	June 24/70
JW 64	88997	June 24/70
JW 65	88998	June 24/70
JW 67	89000	June 24/70

<u>CLAIMS</u>	<u>RECORD No's</u>	<u>DATE RECORDED</u>
JW 69	89002	June 24/70
JW 70	89003	June 24/70
JW 77	89010	June 24/70
JW 81	89014	June 24/70
JW 83	89016	June 24/70
JW 85	89018	June 24/70
JW 87	89020	June 24/70
JW 89	89022	June 24/70
JW 91	89024	June 24/70
JW 92	89025	June 24/70
JW 93	89026	June 24/70
JW 94	89027	June 24/70
JW 95	89028	June 24/70
JW 96	89029	June 24/70
JW 97	89030	June 24/70
JW 98	89031	June 24/70
JW 99	89032	June 24/70
JW 100	89033	June 24/70
JW 101	89034	June 24/70
JW 102	89035	June 24/70
JW 103	89036	June 24/70
JW 104	89037	June 24/70
JW 105	89038	June 24/70
JW 106	89039	June 24/70
JW 107	89040	June 24/70
JW 108	89041	June 24/70
JW 109	89042	June 24/70
JW 110	89043	June 24/70
JW 111	89044	June 24/70
JW 112	89045	June 24/70
JW 113	89046	June 24/70
JW 114	89047	June 24/70
JW 115	89048	June 24/70
JW 116	89049	June 24/70
JW 117	89050	June 24/70
JW 118	89051	June 24/70

<u>CLAIMS</u>	<u>RECORD No's</u>	<u>DATE RECORDED</u>
JW 119	89052	June 24/70
JW 120	89053	June 24/70
JW 121	89054	June 24/70
JW 122	89055	June 24/70
JW 123	89056	June 24/70
JW 124	89057	June 24/70
JW 125	89058	June 24/70
JW 126	89059	June 24/70
JW 127	89060	June 24/70
JW 128	89061	June 24/70
JW 130 Fr.	89063	June 26/70
JW 131 Fr.	89064	June 26/70
JW 126 Fr.	89065	June 26/70
JW 133 Fr.	89066	June 26/70
JW 134 Fr.	89067	June 26/70
JW 134	89068	June 26/70
JW 135	89069	June 26/70
JW 136	89070	June 26/70
JW 137	89071	June 26/70
JW 138	89072	June 26/70
JW 139	89073	June 26/70
JW 140	89074	June 26/70
JW 141	89075	June 26/70
JW 142	89076	June 26/70
JW 143	89077	June 26/70
JW 144 Fr.	91054	July 28/70
JW 200	127400	Aug. 29/73
JW 201	127401	Aug. 29/73
JW 202	127402	Aug. 29/73
JW 203	127403	Aug. 29/73
JW 204	127404	Aug. 29/73
JW 205 Fr.	127405	Aug. 29/73
JW 206	127406	Aug. 29/73
JW 207	127407	Aug. 29/73
JW 208	127408	Aug. 29/73
JW 209	127409	Aug. 29/73

<u>CLAIMS</u>	<u>RECORD No's</u>	<u>DATE RECORDED</u>
JW 210	127410	Aug. 29/73
JW 211	127411	Aug. 29/73
JW 212	131821	Aug. 19/74
JW 213	131822	Aug. 19/74
JW 214	131823	Aug. 19/74
JW 215	131824	Aug. 19/74
JW 216	131825	Aug. 19/74
JW 218	131827	Aug. 19/74
JW 220	131829	Aug. 19/74
JW 221	131830	Aug. 19/74
JW 222	131831	Aug. 19/74
JW 500 (8 Units)	50	July 14/75

STATEMENT OF EXPENDITURES

AIRBORNE GEOPHYSICAL SURVEY

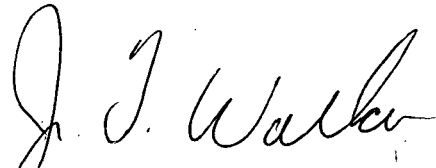
JEAN PROPERTY

(and adjacent area)

CHUCHI LAKE AREA, OMINICA MINING DIVISION, B.C.

Field Work: May 22 - 26, 1981

1425 line kilometers @ \$18.44/km = \$ 26,840

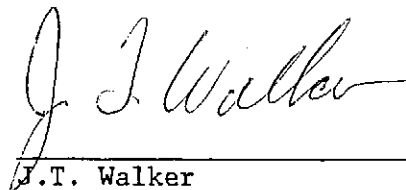


J. T. Walker, Geophysicist
Noranda Exploration Company Limited

STATEMENT OF QUALIFICATIONS

I, James T. Walker of the City of Vancouver, Province of British Columbia do certify that:

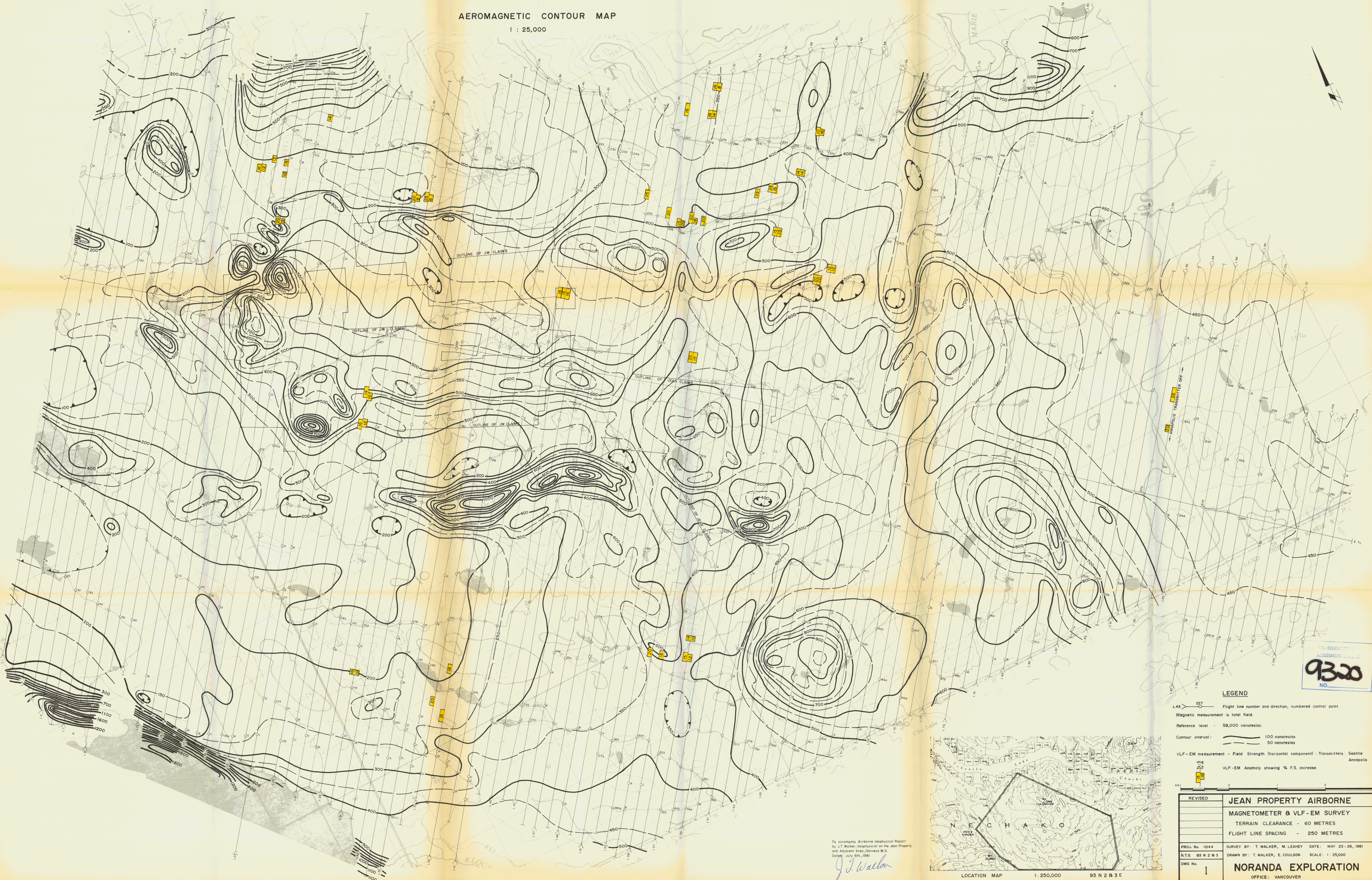
1. I have been an employee of Noranda Exploration Company, Limited since May, 1958.
2. I have held the position of Geophysicist for Noranda Exploration Company, Limited, British Columbia since June, 1965.
3. I am a member of the Canadian Institute of Mining and Metallurgy.
4. I am a member of the Canadian Exploration Geophysical Society.
5. I am a member of the British Columbia Geophysical Society.



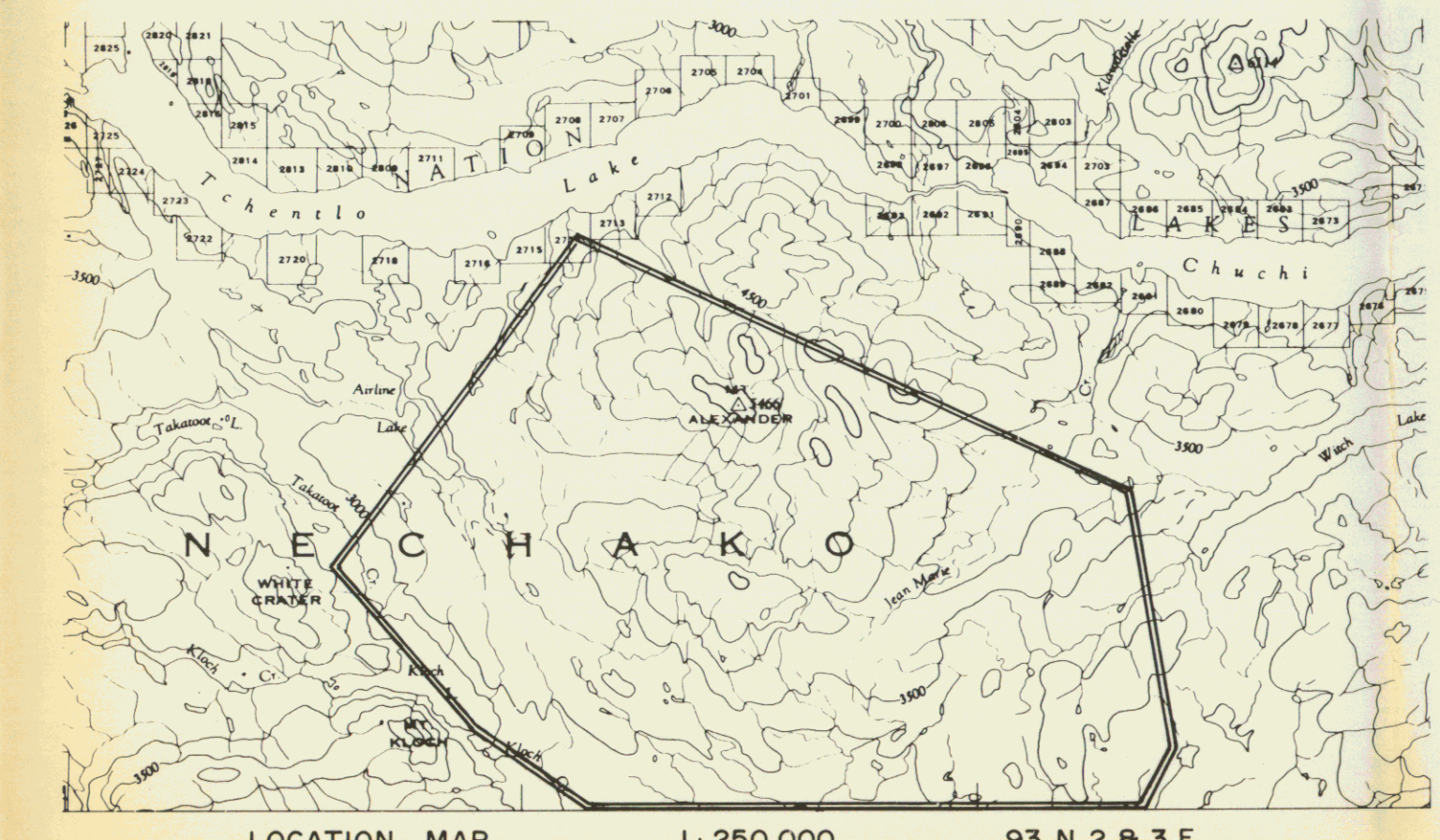
J.T. Walker
Geophysicist
Noranda Exploration Company, Limited

AEROMAGNETIC CONTOUR MAP

1 : 25,000



- LEGEND**
- L 43 → 227 Flight line number and direction, numbered control point.
 - Magnetic measurement is total field.
 - Reference level - 58,000 nanoteslas.
 - Contour interval:
 - 100 nanoteslas
 - 50 nanoteslas
 - VLF-EM measurement - Field Strength (horizontal component) - Transmitters: Seattle
Annapolis
 - VLF-EM Anomaly showing % F.S. increase



To accompany Airborne Geophysical Report
by J.T. Walker, Geophysicist on the Jean Property
and Adjacent Area, Okanogan M.D.
Dated July 6th, 1981
J.T. Walker

9320
NO.

REVISED	JEAN PROPERTY AIRBORNE	
	MAGNETOMETER & VLF-EM SURVEY	
	TERRAIN CLEARANCE - 60 METRES	
	FLIGHT LINE SPACING - 250 METRES	
PROJ: No. 1044	SURVEY BY: T. WALKER, M. LEAHEY	DATE: MAY 23-26, 1981
N.T.S. 93 N 2 & 3	DRAWN BY: T. WALKER, E. COULSON	SCALE: 1 : 25,000
DWG No. 1	NORANDA EXPLORATION	
	OFFICE: VANCOUVER	