86-394-14992

Owner: O. Stecyk Operator: E.LLE. ENERGY INC GEOPHYSICAL REPORT ON A AIRBORNE VLF-EM AND MAGNETOMETER SURVEY INDIAN GOLD 1 & 2 CLAIMS LIARD MINING DIVISION LAT. 57°29'N, LONG. 127°29'W, NTS 94E/6W, 94E/SE AUTHORS: E. Trent Pezzot, B.Sc. GEOPHYSICIST GLEN E. WHITE, B.Sc., P.Eng. CONSULTING GEOPHYSICIST DATE OF WORK: March 13-14, 1986 DATE OF REPORT: July 22, 1986

FILMED

GEOLOGICAL BRANCH ASSESSMENT REPORT 14,992

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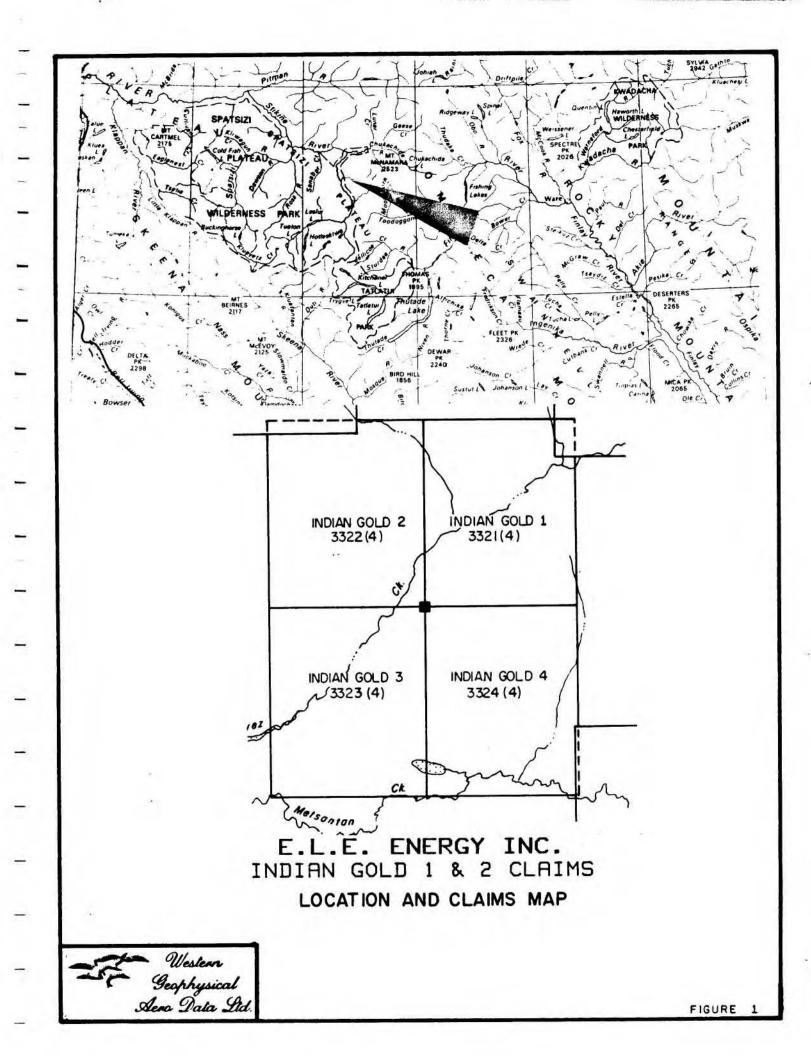
ILLUSTRATIONS

FIGURE 1 - Location and Claims Map FIGURE 2 - Magnetic Intensity Contour Map FIGURE 3 - VLF-EM Profiles (Seattle) FIGURE 4 - VLF-EM Profiles (Annapolis)

PLATE 1 - General Geology PLATE 2 - Magnetic Response Examples PLATE 3 - Geology and Outcrop Sketch Map

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INTRODUCTION

A regional program, totalling over 10,000 line kilometres of airborne magnetometer and VLF-electromagnetometer surveying, was conducted across the Toodoggone Gold Belt area in early 1986. Western Geophysical Aero Data Ltd. was commissioned by E.L.E. Energy Inc. to recover and examine in detail the data gathered across the Indian Gold 1 and 2 claims.

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These claims are located approximately 4 kilometres west of the Thesis gold deposits (Energex Minerals Ltd.). The geology of the area is essentially unknown due to extensive overburden in the area. It was the intention of this survey to assist the geological mapping and direct ground exploration to the more favourable areas. A limited amount of geological mapping and soil and silt sampling conducted by Ellen Lambert in September, 1985. The results of this study are included in this report.

PROPERTY

The Indian Gold 1 and 2 mineral claims are comprised of 40 contiguous units covering approximately 2,400 acres as described below and illustrated on Figure 1.

CLAIM NAME	RECORD NO.	UNITS	EXPIRY	Z DA	TE
Indian Gold 1	3321	20	April	29,	1986
Indian Gold 2	3322	20	April	29,	1986

LOCATION AND ACCESS

The Toodoggone River area is located approximately 280 kilometers north of Smithers, B.C. The Indian Gold 1 and 2 claims are situated on Moyez Creek some 5 kilometers east of

the Stikine River and 4 kilometers west of the Thesis II and III gold deposits. They lie within NTS 94E/6W and the Liard Mining Division. Approximate geographical co-ordinates of the centre of the claim group are latitude 57°29'N and longitude 127°29'W (see Figure 1). Access to the area is by fixed wing aircraft from Smithers to the Sturdee River airstrip (36 km southeast of the Indian Gold claims) or to many of the larger lakes in the area. Historically, a number of helicopter companies have established summer bases at the Sturdee River airstrip and are available for casual charter to nearby properties.

GENERAL GEOLOGY

The claim group lies within what is often termed the Toodoggone River epithermal precious metal district which is mapped as a 20 kilometre wide belt of volcanic, sedimentary and intrusive rocks extending from McConnell Creek to the Stikine River. Permian age limestones, argillites and cherts of the Asitka group are the oldest rocks in the area and normally are in fault contact with Takla volcanic rocks of Upper Triassic age. Lower Jurassic Toodoggone volcanics. consisting predominantly of subaerial dacit, latite, trachyte and rhyotite pryroclastics, unconformably overlie the Takla group. These rocks are bordered to the east by the Hazelton Group, consisting of intermediate volcanic conglomerate, breccia, lakas and feldspar porphyry dikes and sills. The Hazelton Group ranges from Lower to Upper Jurassic age and may include members of the Toodoggone Group. Acid to intermediate stocks and plugs intrude many of the sedimentary and volcanic rocks of the area.

Epithermal deposits are the most common type of precious metal minerlaization in the area and are predominantly associated with the Toodoggone volcanics. They occur as massive quartz veins or as slicified and amenthystine

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breccia zones generally close to major northwest faults and associated with siliceous volcanic centres, exhalative vents and zones of alteration within the Triassic and Jurassic volcanics. Vein minerals are acanthite, pyrite, electrum, chalcopyrite, native gold, sphalerite and galena and grades range from 0.1 to 1.0 oz/T Au and 1.0 to 20.0 oz/T Ag.

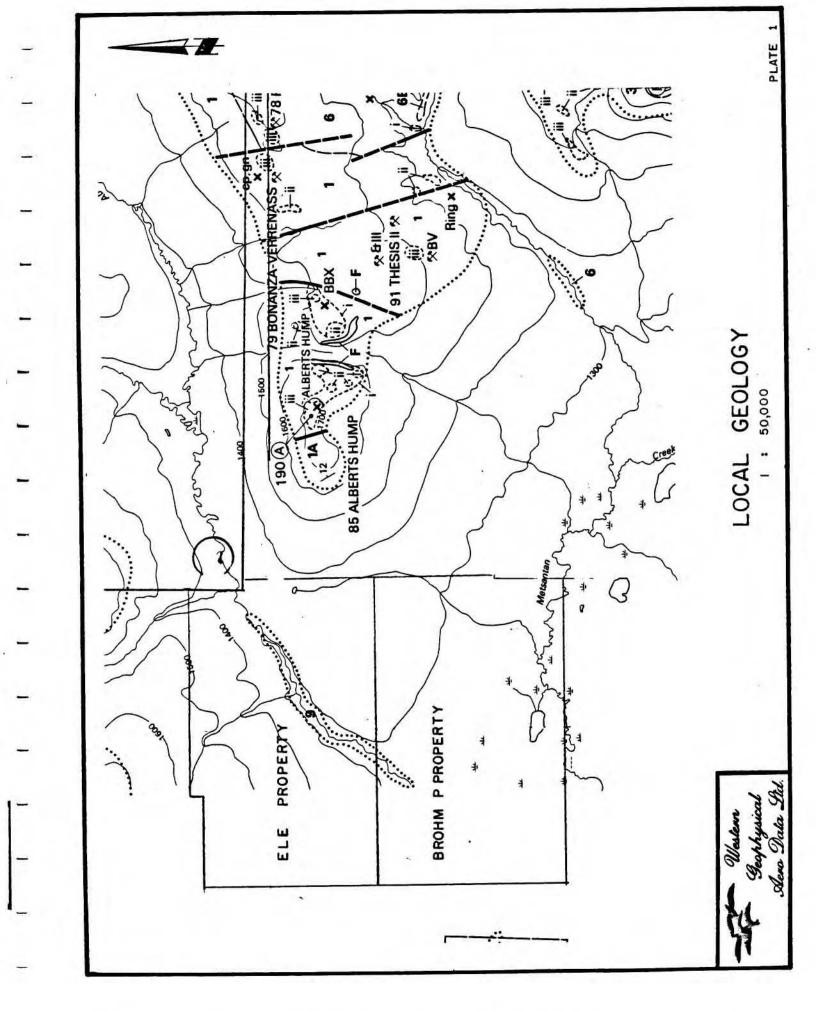
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LOCAL GEOLOGY

The British Columbia Department of Mines Preliminary Map #61 by Diakow, Panteleyev and Schroeder, 1985 is the most recently published geological map pertaining to the Indian Gold 1 and 2 claim area. This map shows the claim area to be covered by unconsolidate till and alluvium in all but the immediate vicinity of Moyez Creek. Outcrop along the creek is mapped as undivided Toodoggone volcanics.

PREVIOUS WORK

One document detailing previous work on the Indian Gold 1 and 2 claims was made available to the authors. It is a geological report by Colin Hardvel, B.Sc., F.G.A.C. of Alexim Developments Corp., dated July 23, 1985. This report reviews the general geological setting of the claims area and compares it with the environment of the mineralization observed on the properties immediately to the east.



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AIRBORNE VLF-ELECTROMAGNETIC AND MAGNETIC SURVEY

This survey simultaneously monitors and records the output signal from a proton precession magnetometer and two VLF-EM receivers installed in a bird designed to be towed 100 feet below a helicopter. A gimbal and shock mounted TV camera, fixed to the helicopter skid, provides input signal to a video cassette recorder allowing for accurate flight path recovery by correlation between the flight path cassette and air photographs of the survey area. A KING KRA-10A radar altimeter allows the pilot to continually monitor and control terrain clearance along any flight path.

Continuous measurements of the earth's total magnetic field intensity and of the total horizontal VLF-EM field strength of two transmission frequencies are stored in three independent modes: an analogue strip chart recorder, digital magnetic tapes and a digital video recovery system. A three-pen analogue power recorder provides direct, unfiltered recordings of the three geophysical instrument output signals. A Hewlett-Packard 9875 tape drive system digitally records all information as it is processed through an onboard micro-computer. The magnetic and electromagnetic data is also processed through the onboard micro-computer, incorporating an analogue to digital converter and a character generator, then superimposed along with the date, real time and terrain clearance upon the actual flight path video recording to allow exact correlation between geophysical data and ground location. The input signals are averaged and updated on the video display every second. Correlation between the strip chart, digital tape and the video flight path recovery tape is controlled via fiducial marks common to all systems. Line identification, flight direction and pertinent survey information are recorded on the audio track of the video recording tape.

DATA PROCESSING

Field data is digitally recorded, with the time of day fiducial, on magnetic cassettes in a format compatible with the Hewlett-Packard 9845 computer. The recovered flight path locations are digitized and the field data is processed to produce plan maps of each of the parameters. A variety of formats are available in which to display this data.

Total field intensity magnetic information is routinely edited for noise spikes and corrected for any diurnal variations recorded on a base magnetometer located in the survey area.

Total field intensity VLF-EM signals are sensitive to topographic changes and sensor oscillation. Oscillation effects can be reduced by filters tuned to the dominant period. Long period effects attributable to topography can be removed by high pass filtering the planimetric data.

DISCUSSION OF RESULTS I) GENERAL GEOLOGY AND ROCK DESCRIPTIONS BY ELLEN LAMBERT

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Referring to the geologic sketch map (Plate 3) the area in the far NW corner designated "A" is a region of frost heaves and minor outcrop. Boulder-sized angular blocks of a marcon volcanic rock-type occurs here. The volcanics contain abundant white plagioclase crystals and black hornblende (subhedral to euhedral in shape) in a microcrystalline The unique feature to this area maroon groundmass. (different from the rest of the exposed volcanics on this claim block (see below) is the presence of quartz veining up to 30 mm thick cutting the volcanics and filling fractures. The guartz veins contain small xenolithic inclusions of a variety of volcanic rock types as well as muscovite (?) that is preferentially weathering away. This is the only location where any indication of silicification occurs.

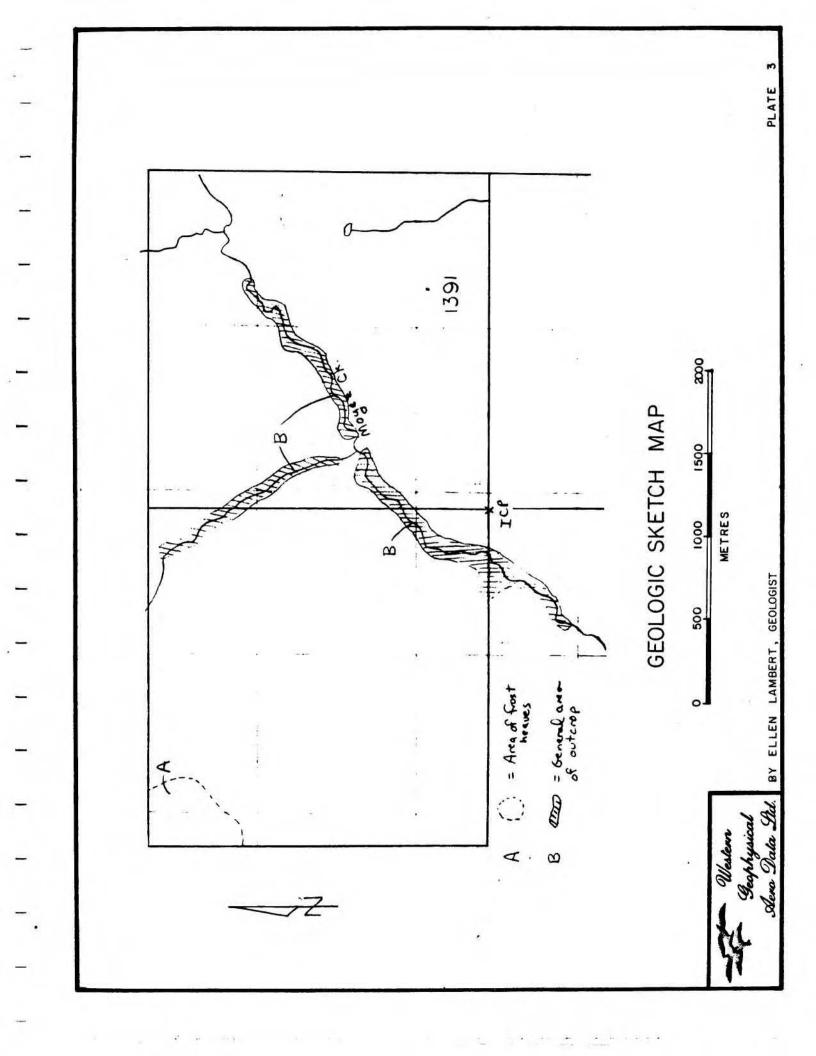
The outcrop regions designated "B" on the sketch map refer to basically unaltered Toodoggone volcanics. The most abundant rock type is a crystal-rich tuff that is purplish-gray in color and composed of white to pink, euhedral to subhedral plagioclase crystals (L1-2 mm in size), and minor biotite in a tuffaceous groundmass that is somewhat glassy in appearance. A eutaxitic texture occurs locally and one outcrop displayed what looked to be lithophysae. Calcite plus an orange zeolite (heulandite <?>) occurs locally as fracture fillings within the volcanics.

A variation of the crystal tuff is agglomerate, which occurs sporadically throughout the outcrops designated "B". Rounded cobbles and pebbles of volcanic rocks occur within

the crystal-rich tuff described above. Calcite and zeolite veins occur in this as well. Slight welding of the agglomerate gives the appearance of bedding in outcrop. Minor local alteration of both the crystal tuff and agglomerate has resulted in a light pink color to the rocks, and the biotite going to chlorite. These sporadic occurences of alteration may be representative of slight propylitic alteration of the volcanics.

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In addition to the pyroclastic rocks there may be some flow rocks as well. A sample taken on the Indian Gold #3 claim location to the south is a light brown rock consisting of white euhedral plagioclase crystals (20% of rock), chloritized hornblende (15%) and minor biotite in a light brown microcrystalline groundmass. There is minor amounts of magnetite in this rock as well.



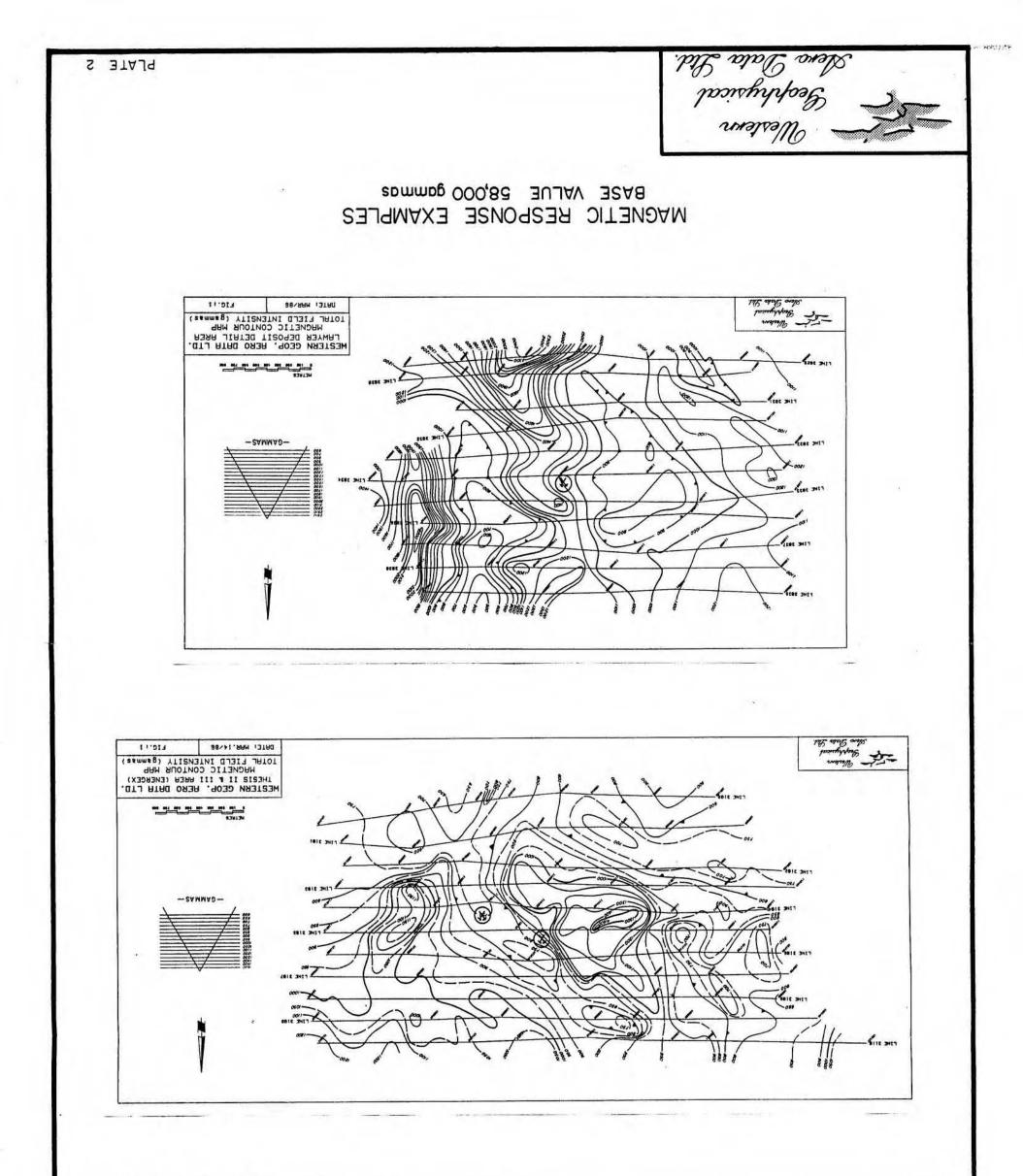
DISCUSSION OF RESULTS II AIRBORNE SURVEY

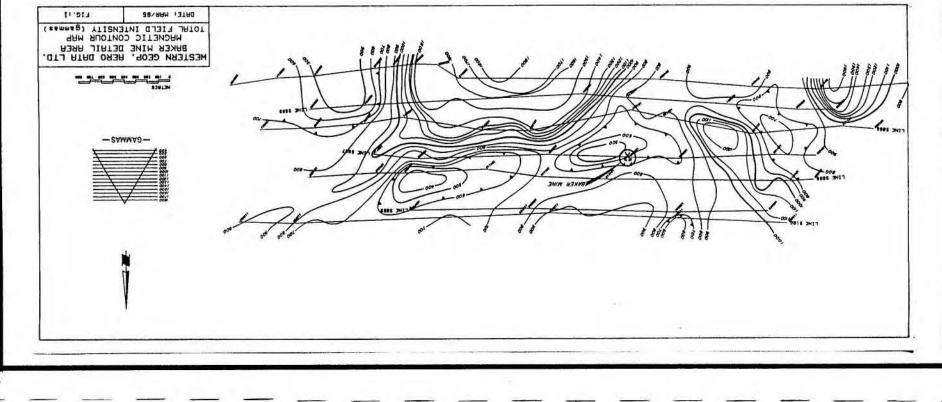
The E.L.E. Energy Inc. claim block was surveyed from March 13 to March 14, 1986 inclusive and 142 line kilometers of magnetic and VLF-electromagnetic data have been examined to evaluate the property. Survey lines were flown in an east-west direction on 200 metre centres with data being digitally recorded at one second intervals, providing an average station spacing of 25 metres. The geophysical sensors maintained a terrain clearance of approximately 60 metres. The magnetic data is presented in contour form as Figure 2 of this report and the VLF-EM data in profile format as Figures 3 and 4 corresponding to the Seattle and Annapolis frequencies respectively.

This survey was flown as part of a regional package covering the Toodoggone Gold belt from the Finlay River northwest to the Chukachida River. Over 10,000 line kilometers of data was gathered to assist the geological mapping of the area as well as to locate specific targets for ground exploration.

Two distinctive magnetic signatures are observed within this geological environment. Firstly, Jurassic intrusives appear as magnetic highs; typically with an intensity of greater than 59,300 NT. Secondly, faults and shear zones appear as linear magnetic lows, generally with intensities of less than 58,600 nT, and often located along the flanks of intrusive bodies. The two major rock types of the area are the upper Triassic Takla Group and the lower to middle Jurassic Toodoggone Volcanics. The magnetic intensities mapped do not differentiate between these two units.

Regional magnetic lineations in the Toodoggone Gold Belt are northwesterly, mirroring the dominant geological





orientation. The area of the Indian Gold claims is anomalous in that it reflects a small pocket of relatively quiet magnetic activity. Furthermore, the magnetic field in this area aligned to the east-northeast and a gentle gradient of decreasing magnetic intensity to the southeast is observed.

An isolated magnetic high, interpretted as reflecting a small intrusive body, is mapped some 1200 metres to the east of the Indian Gold 1 claim (Alberts Hump). A northwesterly trending magnetic low lineation flanks this anomaly to the east. This response is similar to the responses observed across three of the larger epithermal precious metal deposits discovered in the area; Baker Mine, Lawyers deposit and Thesis I and II deposits. At these locations, precious metals have been found within the linear magnetic low trends flanking distinct magnetic highs as illustrated on Plate 2 of this report.

Straddling the northern borders of the Indian Gold 1 and 2 claims, are two isolated magnetic highs associated with narrow northwesterly trending magnetic lows along their northeastern flanks (Figure 2). Although the size and shape of these magnetic highs are similar to the responses associated with Alberts Hump and the Thesis deposits located immediately to the east, these anomalies do not reach as high an amplitude. The eastern-most anomaly (Indian Gold 1 claim) is a broad circular feature and most likely reflects a Jurassic intrusive buried approximately 100 metres below the surface. The western-most anomaly reflects a body closer to the surface but the reduced amplitude suggests a different composition from the normal Jurassic intrusive. Extensive alteration could account for this variation. The two northwesterly trending magnetic lows flanking these bodies are well defined, narrow zones which generally follow the local surface drainage systems.

In the northwest corner of the Indian Gold 2 claim, a small magnetic dipole maps a localized near surface accumulation of magnetic or pyrrhotite mineralization.

A narrow magnetic low lineation is observed to the northwest of the Indian Gold 2 claim. This is most likely the response to additional faulting.

The VLF-EM data is presented as profiles on Figures 3 and 4. Both the Seattle and Annapolis frequency data are extremely quiet, indicating a thick and uniformly conductive blanket of overburden. A number of very weak (less than 4% amplitude), northerly to northwesterly trending conductivity lineations are observed in the Annapolis frequency data. These trends may be following basement lineations however they are too weak to be reliably interpretted.

SUMMARY AND CONCLUSIONS

The area of the Indian Gold 1 and 2 claims was included as part of a regional airborne magnetometer and VLF-electromagnetometer survey conducted in the Toodoggone Gold Belt area. One hundred and forty-two line kilometers of data has been examined in detail on behalf of E.L.E. Energy Inc. to evaluate these claims.

magnetic and electromagnetic data The is subdued by extensive overburden cover in the area. Both the magnetic data and scattered boulders and outcrop suggest the claims is underlain by Toodoggone volcanics. area Two weak magnetic highs, which straddle the northern claim borders, are interpretted as reflecting Jurassic intrusive bodies. The eastern-most intrusive appears to be buried some 100 metres below the surface. The western-most body is closer to the surface but has likely been extensively altered. Magnetic low lineations flank these anomalies to the northeast and likely reflect fault or shear zones. This same magnetic environment is observed across the Thesis II WESTERN GEOPHYSICAL AERO DATA LTD.

and III gold deposits, located some 4 kilometers to the east of the Indian Gold claims, as well as at the Lawyers deposit and Baker Mine. In these areas, epithermal gold mineralization is found within the shear zones mapped as magnetic lows.

Additional magnetic evidence of faulting is noted in the northwest corner of the Indian Gold 2 claim.

RECOMMENDATIONS

The magnetic data suggests that the northern portions of the Indian Gold 1 and 2 claims are underlain by a similiar geological environment to that which hosts some of epithermal precious metal deposits in the area. Although the target horizons are likely hidden by a relatively thick overburden cover, the claims warrant continued exploration.

Initially, a program of ground magnetometer surveying is recommended to precisely outline the airborne anomalies. Ground exploration should then be concentrated across the magnetic low lineations interpretted as reflecting faults and shear zones.

The amount of overburden in these areas will govern the next exploration phase. Soil geochemistry and trenching will be the most effective techniques in areas with less than 10 feet of overburden. Alternatively, humus sampling and rotary or tricone drilling to determine overburden thickness and gather near bedrock soil and chip samples are recommended.

Contingent upon encouraging results from the initial geochemical and magnetic studies a drilling program may be warranted. Both the induced polarization and the deep

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penetrating time domain electromagnetic techniques have proven useful in delineating this type of target shear zone. These methods should be tested prior to committing to an expensive drilling program.

Respectfully submitted

E. Trent Pezzot, B.Sc. Geophysicist



Glen E. White, B.Sc., P.Eng. Consulting Geophysicist

BARRINGER AIRBORNE MAGNETOMETER

MODEL:		Nimbin M-123
TYPE:		Proton Precession
RANGE:		20,000 to 100,000 gammas
ACCURACY:		<u>+</u> 1 gamma at 24 V d.c.
SENSITIVITY:		1 gamma throughout range
CYCLE RATES:		
Continuous	-	0.6, 0.8, 1.2 and 1.9 seconds
Automatic	-	2 seconds to 99 minutes in 1 second steps
Manual	-	Pushbutton single cycling at 1.9 seconds
External	-	Actuated by a 2.5 to 12 volt pulse longer
		than 1 millisecond.
OUTPUTS:		
Analogue	-	0 to 99 gammas or 0 to 990 gammas
		- automatic stepping
Visual	2 - 7	5 digit numeric display directly in gammas
EXTERNAL OUTPUT	cs:	
Analogue	-	2 channels, 0 to 99 gammas or 0 TO 990
		gammas at 1 m.a. or 1 volt full scale
		deflection.
Digital	-	BCD 1, 2, 4, 8 code, TTL compatible
SIZE:		Instrument set in console
		30 cm X 10 cm X 25 cm
WEIGHT:		3.5 Kg.
POWER		
REQUIREMENTS:		12 to 30 volts dc, 60 to 200 milliamps
		maximum.
DETECTOR:		Noise cancelling torroidal coil installed
		in air foil.

SABRE AIRBORNE VLF SYSTEM

Source of Primary Field:	-VLF radio stations in the
	frequency range of 14 KHz to 30 KHz
Type of Measurement:	-Horizontal field strength
Number of Channels:	Two;
	Seattle, Washington at 24.8 KHz
	Annapolis, Maryland at 21.4 KHz
Type of Sensor:	-Two ferrite antennae arrays, one
	for each channel, mounted in
	magnetometer bird
Output:	-0 - 100 mV displayed on two
	analogue meters (one for each
	channel)
	-recorder output posts mounted on
	rear of instrument panel
Power Supply:	-Eight alkaline "AA" cells in main
	instrument case (life 300 hours)
	-Two 9-volt alkaline transistor
	batteries in bird (life 300 hours)
Instrument Console:	-Dimensions - 30 cm X 10 cm X 25 cm
	-Weight - 3.5 Kg

FLIGHT PATH RECOVERY SYSTEM

i) T.V. Camera:

Model:	RCA TC2055 Vidicon
Power Supply:	12 volt DC
Lens:	variable, selected on basis of expected terrain clearance.
Mounting:	Gimbal and shock mounted in housing, mounted on helicopter skid.

ii) <u>Video Recorder:</u>

Model:	Sony SLO-340	
Power Supply:	12 volt DC / 120 volt AC (60Hz)	
Tape:	Betamax 1/2" video cassette - optional length.	
Dimensions:	30 cm X 13 cm X 35 cm	
Weight:	8.8 Kg	
Audio Input:	Microphone in - 60 db low impedance microphone	
Video Input:	1.0 volt P-P, 75 Ω unbalanced, sync negative from camera.	

iii) <u>Altimeter:</u>

Model:	KING KRA-10A Radar Altimeter
Power Supply:	27.5 volts DC
Output:	0-25 volt (1 volt /1000 feet) DC
	signal to analogue meter,
	0-10 v (4mv/ft) analogue signal to
	microprocessor.
Mounting:	fixed to T.V. camera housing,
	attached to helicopter skid.

DATA RECORDING SYSTEM

i) <u>Chart Recorder</u> Type:

> Model: Specification: Amplifiers:

Chart:

Chart Drive:

Controls:

Power Requirements:

9.3 kg.

Writing System:

Dimensions: Weight:

Esterline Angus Miniservo III Bench AC Ammeter - Voltmeter Power Recorder. MS 413B S-22719, 3-pen servo recorder Three independent isolated DC amplifiers (1 per channel) providing range of acceptable input signals. 10 cm calibrated width z-fold chart. Multispeed stepper motor chart drive, Type D850, with speeds of 2,5,10,15,30 and 60 cm/hr. and cm/min. Separate front mounted slide switches for power on-off, chart drive on-off, chart speed cm/hr. - cm/min. Six position chart speed selector individual front zero controls for each channel. 115/230 volts AC at 50/60 Hz (Approximately 30 W). Disposable fibre tipped ink cartridge (variable colors) 38.6 cm X 16.5 cm X 43.2 cm

ii) Digital Video Recording System

Type:	L.M. Microcontrols Ltd.
	Microprocessor Control Data
5 <u>6</u> 2	Acquisition System.
Model:	DADG - 68
Power Requirements:	10 - 14 volts DC, Maximum 2
	amps.
Input Signal:	3,0 - 100 mvolt DC signals
	1,0 - 25 DC signals
Microprocessor:	Motorola MC-6800
CRT Controller:	Motorola MC-6845
Character Generator:	Motorola MCM-6670
Analogue/Digital	
Convertor:	Intersil 7109
Multiplexer:	Intersil IH 6208
Digital Clock:	National MM 5318 chip
	9 volt internal rechargeable
	nickle-cadmium battery.
Fiducial Generator:	internally variable time set
	controls relay contact and
	audio output.
Dimensions:	30 cm X 30 cm X 13 cm
Weight:	3 kg.

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iii) Digital Magnetic Tape

Type:	Hewlett Packard cartridge
	tape unit.
Model:	9875A
Power Requirements:	24 volt d.c.
Data Format:	HP'S Standard Interchange
	Format (SIF)
Tape Cartridge:	HP 98200A 225K byte cartridge
	compatible with HP Series
	9800 desktop computers.
Tape Drive:	Dual tape drives providing up
	to 8 hours continual
	recording time.
Controller:	Internal micro-computer
	provides 23 built in commands
	External computer generated
	commands.

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The geophysical data was analyzed and this report prepared for an all inclusive fee of \$6,500.00. This figure includes the proportional cost of the larger field program as well as the computer and office expenses incurred in producing this report.

Airborne Geophysical survey, report \$6,500.00

Geological examination (Ellen Lambert) \$1,500.00

TOTAL ASSESSMENT VALUE

\$8,000.00

STATEMENT OF QUALIFICATIONS

NAME: PEZZOT, E. Trent

PROFESSION: Geophysicist - Geologist

EDUCATION: University of British Columbia -B.Sc. - Honors Geophysics and Geology

PROFESSIONAL

ASSOCIATIONS: Society of Exploration Geophysicist

EXPERIENCE: Three years undergraduate work in geology -Geological Survey of Canada, consultants.

> Three years Petroleum Geophysicist, Senior Grade, Amoco Canada Petroleum Co. Ltd.

Two years consulting geophysicist, Consulting Geologist - British Columbia, Alberta, Saskatchewan, N.W.T., Yukon, Western U.S.A.

Seven years geophysicist with White Geophysical Inc. and Western Geophysical Aero Data.

STATEMENT OF QUALIFICATIONS

NAME: WHITE, Glen E., P.Eng.

PROFESSION: Geophysicist

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

PROFESSIONAL Registered Professional Engineer, ASSOCIATIONS: Province of British Columbia.

Associate Member of Society of Exploration Geophysicists.

Past President of B.C. Society of Mining Geophysicists.

EXPERIENCE:

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

-Two years Mining Geophysicist with Sulmac Exploration Ltd. and Airborne Geophysics with Spartan Air Services Ltd.

-One year Mining Geophysicist and Technical Sales Manager in the Pacific north-west for W.P. McGill and Associates.

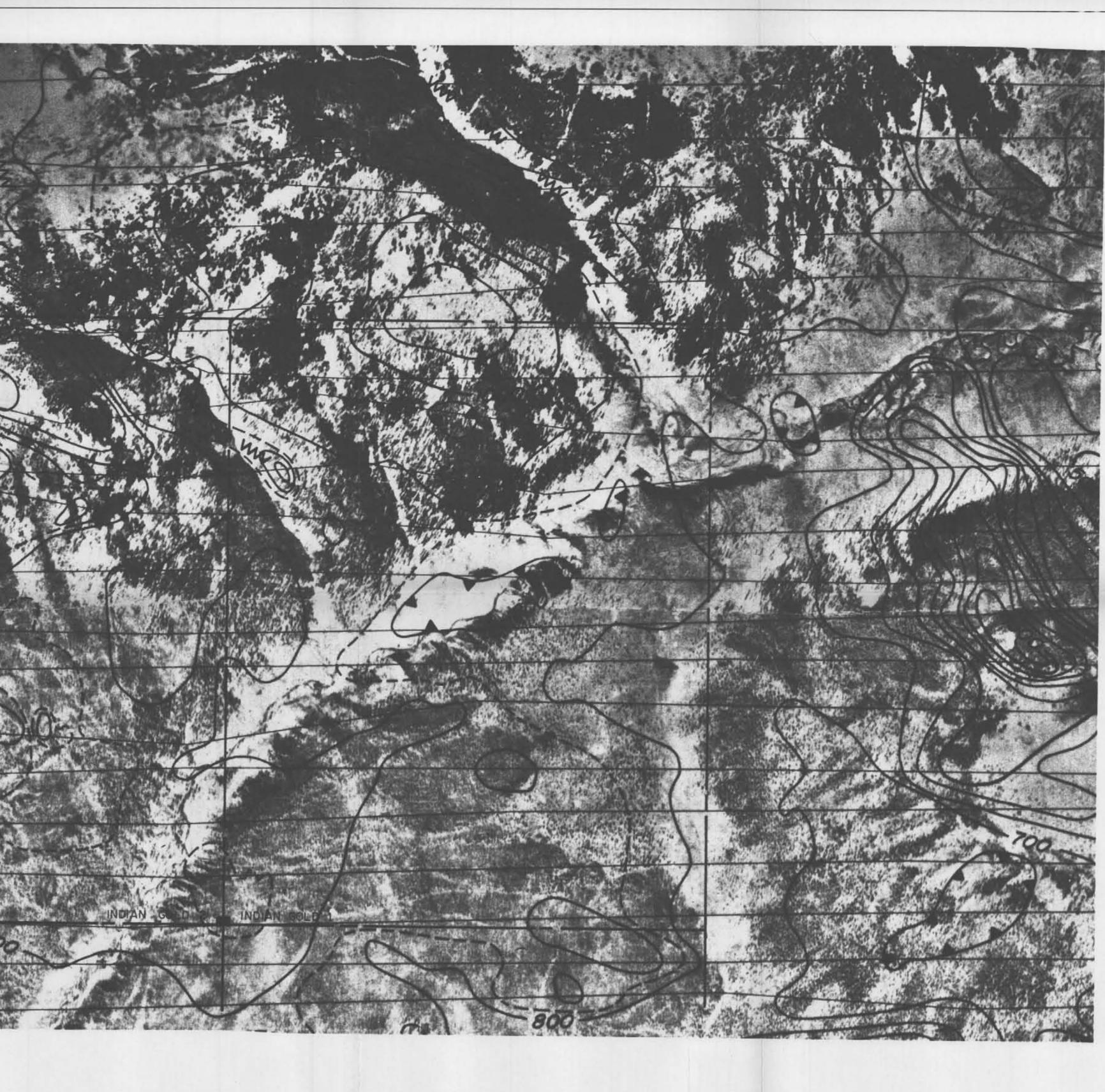
-Two years Mining Geophysicist and supervisor airborne and ground geophysical divisions with Geo-X Surveys Ltd.

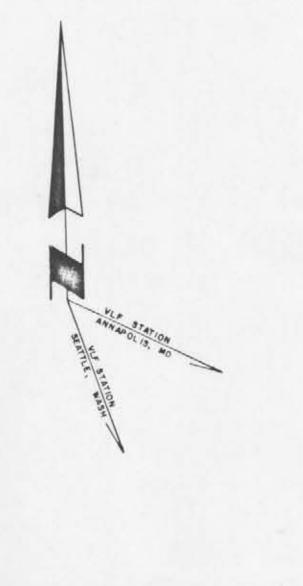
-Two years Chief Geophysicist Tri-Con Exploration Surveys Ltd.

-Fourteen years Consulting Geophysicist.

-Active experience in all Geologic provinces of Canada.

-5-Western Geophysical Acro Data Ltd.





KEY

	INSTRUMENT: Barringer M-123 Magnetometer	
	Data corrected for diurnal variations	
1	Base value= 58000 nT	
	Contour interval= 100 nT	
	Sensor Elevation: 60 metres	
-	Claim boundary	
	Claim post	
V	WWV Inferred Fault	

VLF-EM Conductor Axis



E.L.E. EN	ERGY INC.
INDIAN GOLD	1 & 2 CLAIMS
MAGNETIC C	
TOTAL FIELD I	NTENSITY (Nt)
SVY.DATE: MAR/86	FIG.:2



