REPORT ON
TURAM ELECTROMAGNETIC SURVEY
CUB CREEK AREA, YUKON TERRITORY
ON BEHALF OF
CORANEX LIMITED

by

Robbert A. Bosschart, Ph.D., P.Eng.

Toronto, Ontario.

July 19, 1966.

SUMMARY

The present electromagnetic survey has revealed the presence of one anomalous zone of good conductivity up-glacier from the sulphide float discovery. Two diamond drill holes, totalling 800' in length, have been recommended for the examination of this target.

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GEOPHYSICAL CONTRACTORS AND CONSULTANTS
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REPORT ON A TURAM ELECTROMAGNETIC SURVEY IN THE CUB CREEK AREA, YUKON TERRITORY ON BEHALF OF CORANEX LIMITED

INTRODUCTION

During July, 1966, an electromagnetic survey was carried out on a property in the vicinity of Cub Creek, Yukon Territory, on behalf of Coranex Limited. The property is located in the vicinity of Whitehorse. Access is by road.

Lines for the geophysical survey were directed approximately N45°E and picketed at 100' intervals. Line spacing was 400'.

A solid state three frequency Turam unit of our own design and construction was employed on the survey. A primary frequency of 400 c.p.s. was used throughout the investigation. A description of the Turam method can be found in appendix "T".

Previous work on the property included a "Resistivity" survey and a galvanic-inductive Turam survey. Both these surveys indicate the presence of one or more conductive zones of long strike extension southwest of the baseline.

DISCUSSION OF RESULTS

The results of the present survey are shown in profile form on

the enclosed map (Plate 1) on a scale of 1" = 200', with vertical scales of 1" = 20% and 1" = 10° for the field strength ratio and phase difference respectively.

Except for one small weak conductor, the area southeast of the baseline is geo-electrically undisturbed, as is much of the remainder of the area. One approximately N-S directed conductor (A) is situated below lines 20 and 24S, 1500' northeast of the baseline. Depth to the current axis is approximately 200' and the body appears to have a relatively flat dip towards the east.

The amplitude relations indicate good conductivity.

Further to the northeast, near the boundary of the survey area some distortion appears. The anomalies are open to the east and do not appear of immediate interest.

CONCLUSIONS AND RECOMMENDATIONS

The area southwest of the baseline shows no significant conduction. Previously obtained anomalies in this part of the property may largely have been due to overburden conduction.

Anomaly "A", northeast of the baseline, is located up-glacier from the sulphide float discovery, and would merit further examination. For this purpose the following diamond drill holes are recommended:

	Collar	Direction	Dip	Length
DDH#1	L20S 16+50E	SW along traverse	50°	400'

	Collar	Direction	Dip	Length
DDH#2	L24S 15+50E	SW along traverse	50°	400'

Respectfully submitted,

Robbert A. Bosschart, Ph.D., P.Eng.

Toronto, Ontario.
July 19th, 1966.

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A P P E N D I X "T"

BRIEF DESCRIPTION OF THE TURAM ELECTROMAGNETIC METHOD

GENERAL

The Turam method can be classified as a fixed source compensation method. The primary or source field consists of a large energizing layout in the form of a long wire or a large loop laid out on the terrain, to which an audio frequency alternating current is fed by means of a motor generator. The resulting current pattern is investigated inductively, with two identical receiving coils connected to a bridge compensator which compares the signal received in each coil in relative phase and amplitude. When grounded cable is used, the energization is both galvanic and inductive; when the primary layout consists of a closed loop, the energization is purely inductive. Under most conditions the presence of galvanic current is undesirable and inductive energization is, as a rule, preferred.

Although the system allows the comparison of any two components of the resultant field, it is standard procedure in systematic surveys to measure the gradient of the vertical component.

The pattern for a typical Turam survey is shown in Fig. 1. A large rectangular loop is used as primary layout and the field gradients are measured with horizontal receiving coils along profiles perpendicular to a long side of the transmitting loop.

DATA REDUCTION

The relative strength of the undisturbed primary field is dependent on the loop dimensions and the location of the observation points, and can be determined by calculation. The measured

field strength ratios are normalized through division by these calculated free space ratios.

The primary field causes eddy currents to flow in subsurface conductors. As a result the resultant field will be distorted in both amplitude and phase. The presence of conductors will thus be indicated by abnormal field strength ratios and phase differences.

PRESENTATION

The measuring results are usually presented in profile form, as (reduced) field strength ratio and phase difference curves, with the observed values plotted at the midpoint between coil positions.

Occasionally one of the two parameters is presented in contour form, but contour plans are generally inadequate to express the full significance of the data.

INTERPRETATION

Where field distortion occurs the curves indicate the location and the depth of burial of the main current flow. The "current axis" are well defined when the current is concentrated as, for instance, in thin, steeply dipping conductors. In wide, banded conductors, or in horizontal conductors such as, for instance, overburden, the current is usually more dispersed and the anomalies will yield less positive information.

As a rule the current axis is located right below the maximum field strength ratio deflection or the maximum negative phase shift. Its depth under the traverse is indicated by the shape of the anomaly.

The relative amplitudes of field strength and phase distortions are a measure of the conductivity of the conducting bodies, i.e. good conductors are characterized by field strength distortion combined with relatively little phase shifting, whereas poor conductors affect the phase, rather than the strength of the resultant field.

For an accurate grading the resistivity thickness (r/d) ratio of the individual conductors can be derived from the calculated in-phase and out-of-phase components, taking further

into consideration the exciting frequency and the strike length of the conductor. The relations are shown in Fig. 2 and Fig. 3. The obtained r/d values are marked on the upper right side of the anomalies, in units of ohmcm/m. On the lower left side the depth of the current axis (ft.) is marked. It is normally located 30 - 40 ft. within the body and the indicated depth should be regarded as the maximum depth to the upper surface of the conductor.

To obtain the projection of the current pattern, the anomalies are connected between lines, whereby depth and r/d values, as well as other characteristics of the curves are used as criteria. The strike of the formations, if known, is also taken into consideration.

Fig. 4 and Fig. 5 show a plan and section of a typical Turam survey and interpretation.

References:

1937	Hedstrom, E.H.	Phase Measurements in Electrical Prospecting. A.I.M.E. Techn. Publ. 827.
1964	Bosschart, R.A.	Analytical Interpretation of Fixed Source Electromagnetic Prospecting Data. Delft.

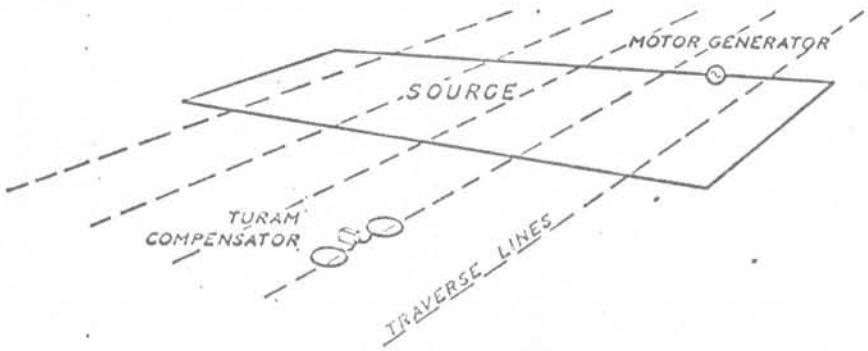


Fig. 1 The Turam method. General layout

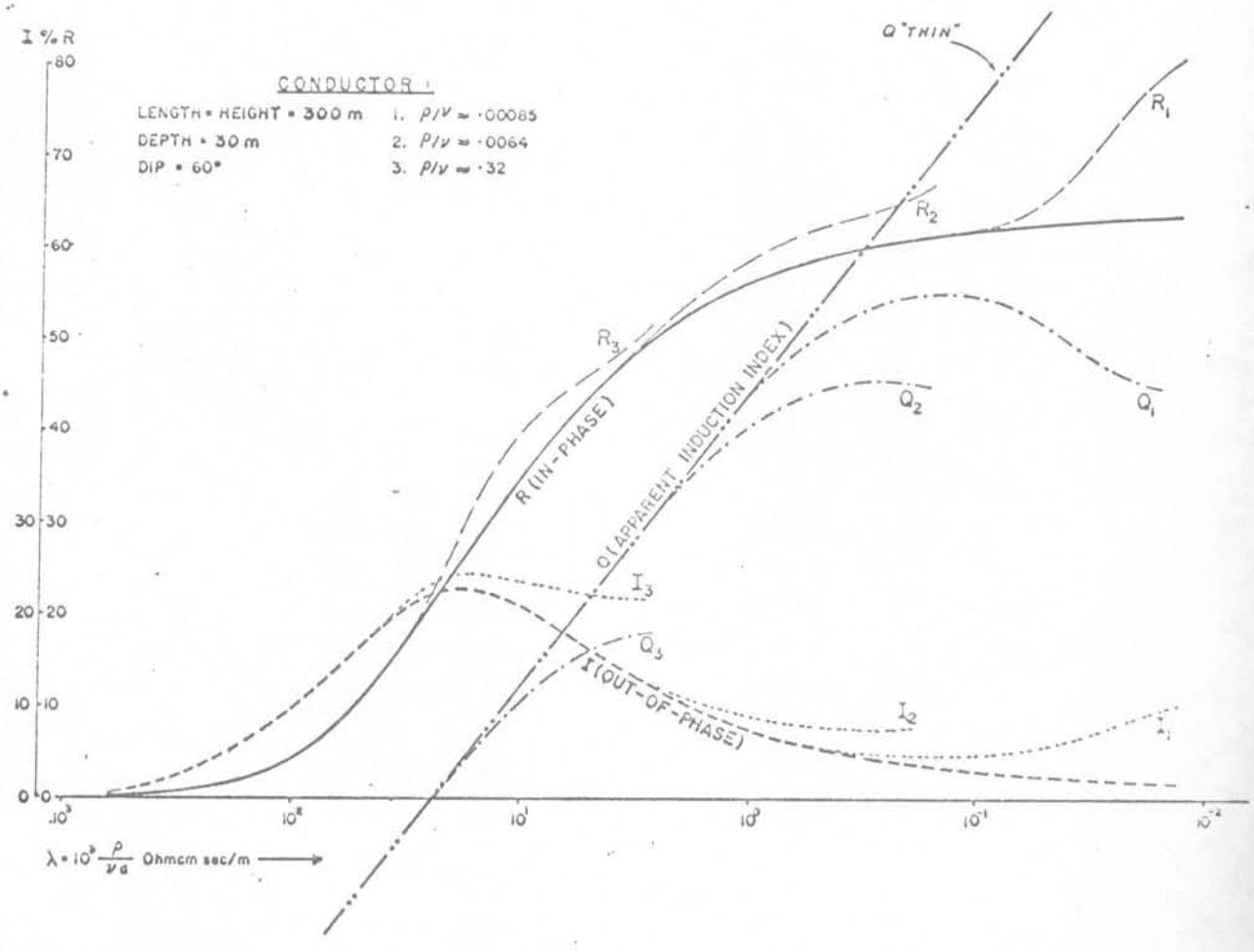


FIG. 2 RESPONSE OF A FINITE TABULAR CONDUCTOR.
(R.A. Bosschart 1964)

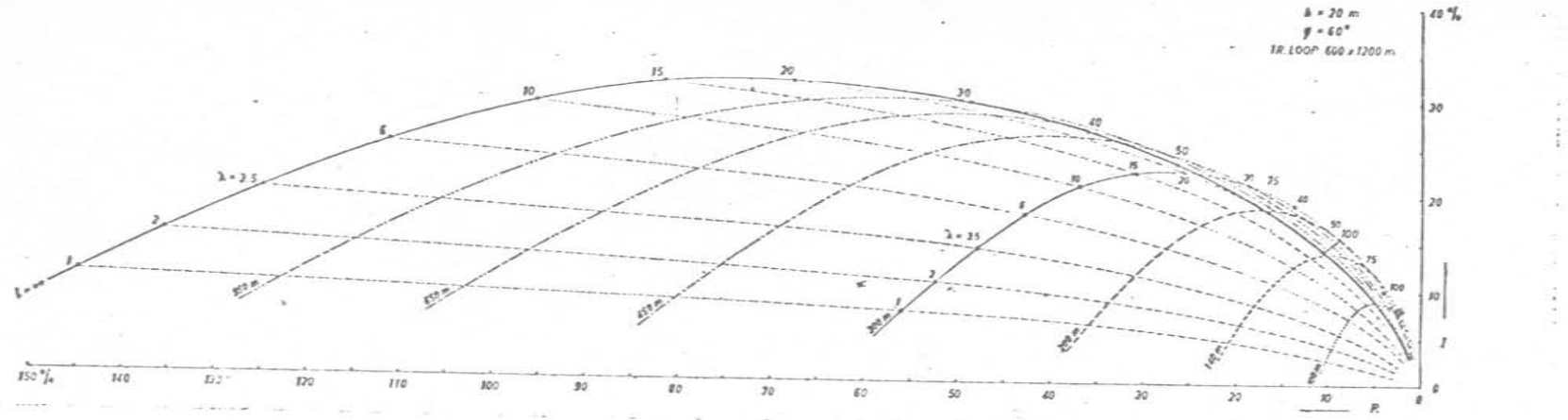


FIG. 3 RESPONSE DIAGRAM FOR CONDUCTORS OF VARYING STRIKE LENGTHS.

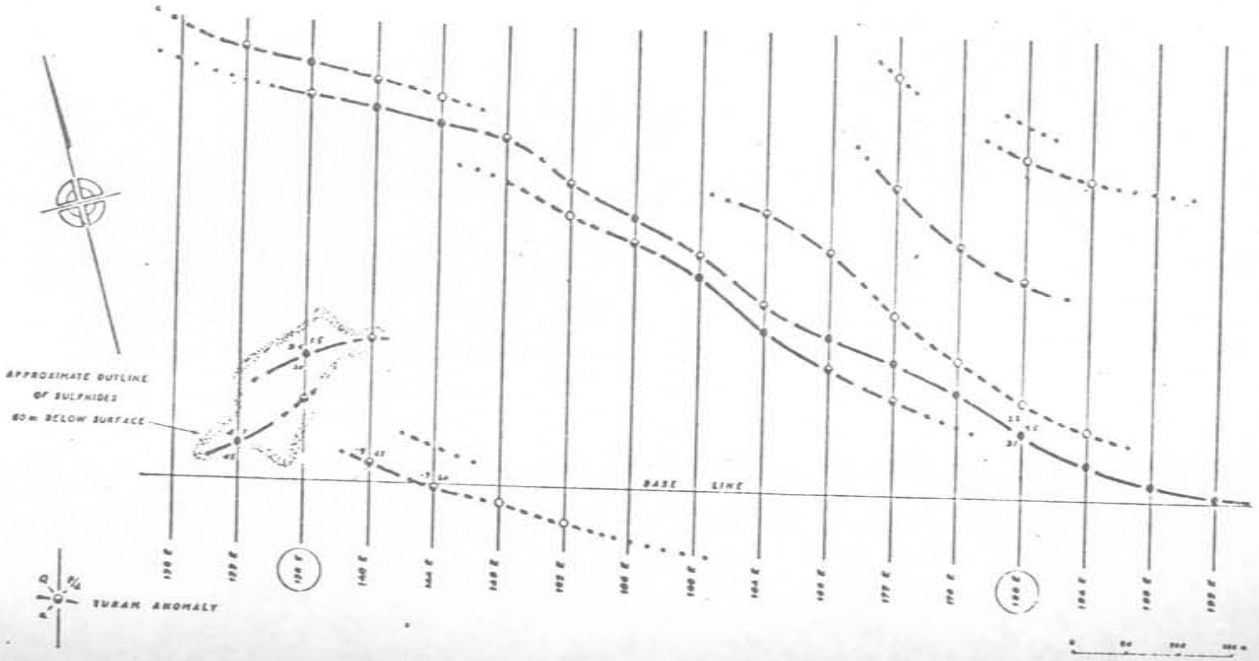


FIG. 4 TURAM SURVEY ON THE MURRAY GROUP, NEW-BRUNSWICK.

(R.A. Bosschart 1964)

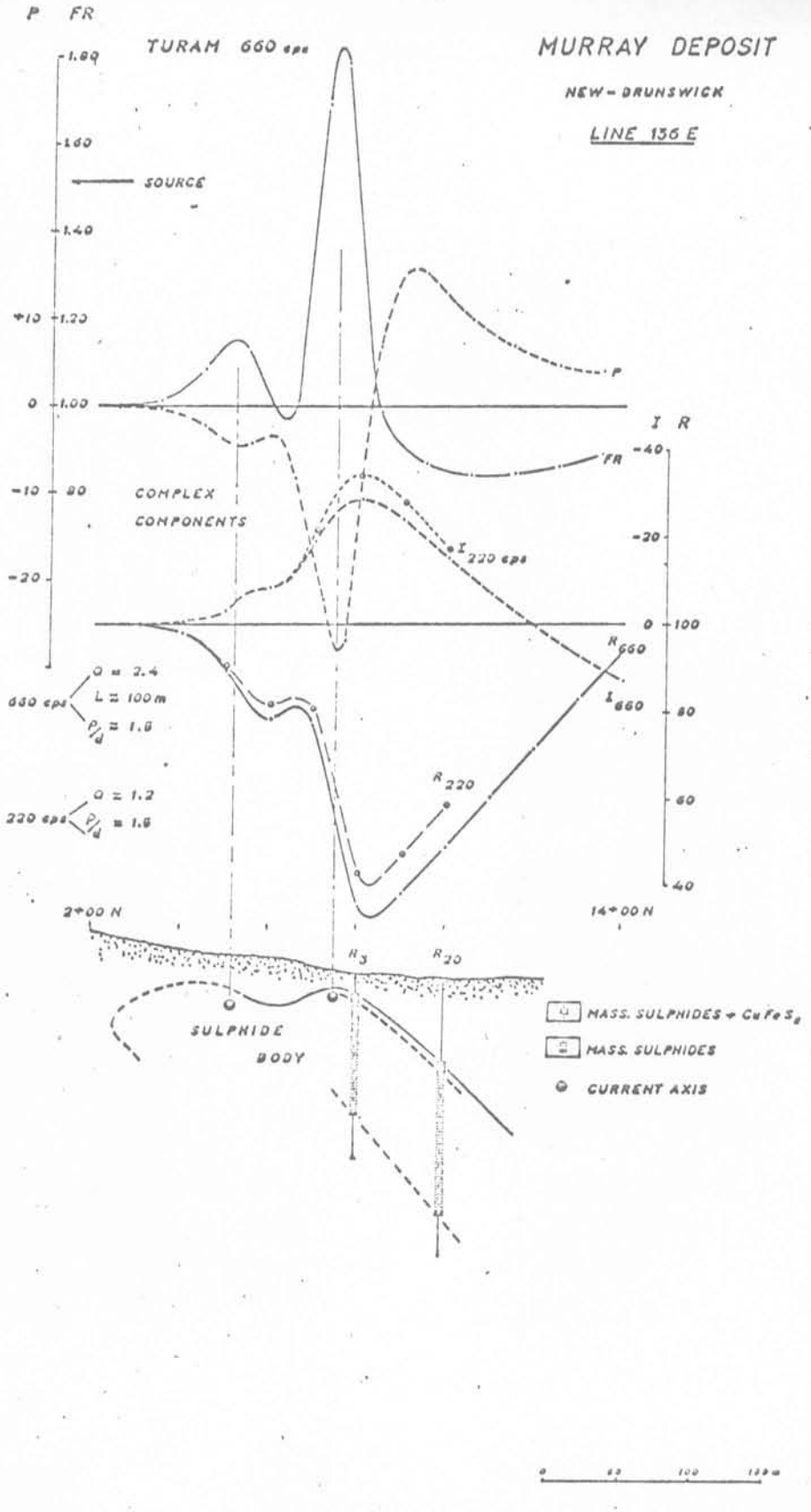
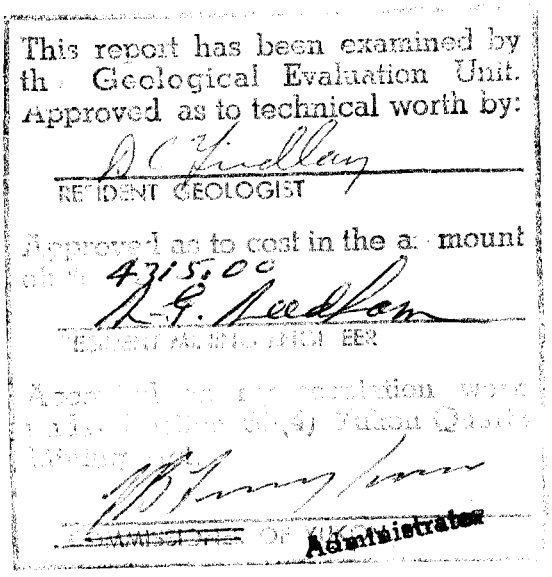


FIG. 5 TURAM SURVEY ON THE MURRAY GROUP, NEW BRUNSWICK. INTERPRETATION OF A TYPICAL SECTION. (R.A. Bosschart 1964)



AFFIDAVIT OF EXPENDITURE

I, J. R. Woodcock, do solemnly declare that the following expenditures were incurred for a Turam geophysical survey of part of the Cub and the Tel claim groups situated twenty-five miles northwest of Haines Junction in the Whitehorse Mining District:

Line cutting costs (14 miles @ $150 per mile)...	$ 2100
Charges by Canadian Aero Mineral Surveys Ltd....	2655
Helper for geophysicist (8 days at $16.00)	128
Food, transportation, supervision, etc.	132
	$ 5015

Sworn to and subscribed to
at Vancouver, British Columbia

This 13th day of September, 1966

N. L. Woodcock

A Notary Public in and for
The Province of British Columbia.

J. R. Woodcock
Applicant

CANADA

Department Of Indian Affairs and ~~of Northern Affairs~~ Northern Development ~~and National Resources~~ ~~Resource Development Branch~~

~~Ministère~~ Ministere des Affaires indiennes ~~du Nord canadien et~~ et du Nord canadien ~~des Ressources nationales~~ ~~Direction du développement des ressources~~

Box 1767,
Whitehorse, Y.T.,
October 25, 1966.

RESTRICTED

Mr. G. A. McIntyre,
Mining Recorder,
Whitehorse Mining District.

our file / notre dossier M.I. M-252
your file / votre dossier

Report on Turam Electromagnetic Survey
Cub Creek Area, Yukon Territory on
behalf of Coranex Ltd.

On the recommendation of the Resident Geologist and Resident Mining Inspector, I accept this report under Section 53 (4) of the Yukon Quartz Mining Act to the value of Four Thousand, Three Hundred and Fifteen Dollars ($4,315.00).

F. B. Fingland,
Administrator.

cc: Chief, Resource Management Division
Attention: Geological Evaluation Unit

Central Mining Records - Whitehorse, Y.T.

CANADIAN AERO SERVICE LIMITED
AN AFFILIATE OF LITTON SYSTEMS CANADA
RESOURCES DEVELOPMENT ENGINEERING

CANADIAN AERO SERVICE LIMITED · HUNT CLUB ROAD · BOX 468, R.R.#5 · OTTAWA, CANADA
TELEPHONE: AREA 613/822-0121 · TELEX 013-473 · CABLE: CANAERO

June 1, 1966

Coranex Limited,
1521 Pemberton Ave.,
North Vancouver, B.C.

Attention: Mr. J.R. Woodcock

Gentlemen:

The following are the terms under which Canadian Aero Mineral Surveys Limited (hereinafter called the Contractor), will undertake to perform a Turam survey for Coranex Limited, (hereinafter called the Contractee) in the Cub Creek area, Yukon Territory.

Survey Details:

The survey area will be described in greater detail on maps to be submitted to the Contractor's field engineer by the Contractee.

The survey will consist of approximately six line miles. Readings will be taken at suitable intervals along paralleled picketted lines spaced at approximately 400 feet intervals. The picketted lines will be prepared in advance by the Contractee.

The survey will be conducted in early July by an experienced graduate geophysicist-operator.

Cost of the Survey:

The Contractor will supply equipment, plus an engineer-operator plus a complete written report on the interpretation of the results at the rate of $200.00 per day.

No charge will be made for time lost due to instrument breakdown.

In addition the following extras are applicable:

1) The Contractee will supply the helpers required to carry out the survey.

2) The cost of subsistence for the engineer when engaged by the Contractee.

3) The cost of local transportation or transportation can be supplied by the Contractee.

4) The cost of mobilization - demobilization (Toronto-Whitehorse - Toronto) which will be $855.00. This cost will be pro-rated over all surveys done by the Turam crew in this area.

Results:

The Contractor will supply four copies of the maps and report covering the interpretation of the survey results.

Terms of Payment:

One third of the total estimated contract value ($2100.00) upon signing of this agreement. One third upon completion of the field work and the final billing upon delivery of the report.

General Provisions:

The Contractor agrees that it shall maintain strict security over all information developed with respect to the actual survey area during the performance of this survey and will not divulge any such information directly or indirectly to any person except on the written authorization of the Company.

Workmen's Compensation:

The Contractor agrees, at its own expense, to comply with all requirements of the Mechanic's Lien Act, Workmen's Compensation Act, Unemployment Insurance Act, Hours of Work and Vacation with Pay Act and generally all Federal and Provincial Acts and Regulations applicable to the Contractor's operations, including obtaining all necessary permits and licences, and agrees to indemnify the company against all claims, loss, damages and expenses incurred by the Contractor's failure to make the necessary returns or payments or by any violation of any such Act and/or Regulations.

Damages:

The Contractor shall continuously maintain adequate protection of all the work from damage and shall protect the Company's property from injury or loss arising in connection with this contract. The Contractor shall be responsible for any such damage, injury or loss to property, except such as may be directly caused by the agents or employees of the Company.

The Contractor assumes all liability and indemnifies the Company against any liability for injuries or damages to the Contractor's employees, or to any other person or persons incident to or relating from the operation of the Contract hereunder. The Contractor specifically represents that, in performing its obligations under this Contract, its status is that of an independent Contractor, and that its employees and the employees of its subcontractor are not the employees of the Company for any purpose whatsoever.

Insurance:

The Contractor shall maintain such insurance as will protect it from all claims and damages for personal injury, including death resulting therefrom, and from claims for property damage arising from the operations under this contract. Certificate of such insurance shall be filed with the Company upon request.

Obligations of Contract:

1. This Contract shall be binding upon the parties hereto, their respective heirs, personal representatives, successors and assigns, but shall not be assigned by the Contractor without the written consent of the Company.

2. In complying with the obligations of this agreement neither the Company nor the Contractor shall be held responsible for strikes, fire, war, or any damage due to causes beyond its control.

If the terms and conditions outlined herein meet with your approval, we would appreciate your signing and returning the attached carbon copy of this letter to constitute an agreement.

We appreciate the privilege of serving you and wish to assure you of our intention to provide you with the best possible service.

Yours very truly,

CANADIAN AERO MINERAL SURVEYS LIMITED,

Peer Norgaard

ACCEPTED FOR:

CORANEX LIMITED

BY: J. R. Woodcock

DATE: June 14/66

INVOICE

CANADIAN AERO MINERAL SURVEYS LTD.

BOX 468
R.R. 5, OTTAWA
HUNT CLUB ROAD

DATE SHIPPED | INVOICE DATE 23/8/66 | INVOICE NO. 882 | YOUR ORDER NO.

SHIPPED TO | SOLD BY | OUR ORDER NO. 6103

SOLD TO

Cessnock Limited,
1521 Pemberton Avenue,
North Vancouver, B.C.

Attention: Mr. J.R. Woodcock.

QUANTITY	DESCRIPTION	PRICE	SALES TAX	TOTAL
	Final billing re Turam survey in the Cub Creek area, Yukon Territory, as per agreement dated June 1, 1966.			
	Mobilization Demobilization (including interpretation)	$ 335.00		
	Survey days 3 days @ $300.00 per day	1,800.00		
		$2,135.00		
	Less Progress billing	700.00		
		$1,435.00		

20 N
16N
12N
8 N
5N
2 N
00
1 S
4 S
8 S
12 S
16 S
20 S
24 S
28 S
32 S
36 S
40 S
44 S

15-Ton Boulder

Cub Creek

Sulphide Float

Claim Post

Telluride Creek

1

2

A

BASE LINE

LEGEND:

RATIO PHASE

1.20 +10°

1.00 0°

.80 -10°

CORANEX LIMITED

CUB CREEK AREA, YUKON TERRITORY

TURAM ELECTROMAGNETIC SURVEY

SCALE: 1" = 200'

SURVEY BY SEIGEL ASSOCIATES LIMITED

JUNE, 1966