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WEST COAST MINING & EXPLORATION  
ANNUAL REPORT 1969  
PART II 93N/3  
NATION COPPER and TAN PROPERTIES

ANNUAL REPORT 1969

PART II

NATION COPPER and TAN PROPERTIES

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## TABLE OF CONTENTS

SUMMARY	Page 1
INTRODUCTION	2
CLAIMS	2
LOCATION, ACCESS, TOPOGRAPHY	3
GEOLOGY	3
MINERALIZATION	4
SURVEY PROCEDURE AND CONTROL	5
MAGNETIC SURVEY	6
ELECTRO MAGNETIC SURVEY	8
SOIL SAMPLING SURVEY	10
CONCLUSIONS	12
RECOMMENDATIONS	13

MAPS : G-100 Magnetometer Survey, 2 sheets  
Ronka E.M. 16 Survey, 2 sheets  
Soil Survey, 2 Sheets

SUMMARY

A program of soil sampling, magnetometer-, and E.M. Surveys was completed in the Chuchi Lake - Tchentlo Lake area during the summer of 1969.

A total area of about 20 square miles was included in the surveys, covering the contact between the Takla Group of volcanics and the Omineca -, and related intrusives.

Several geophysical and geochemical anomalies were located during this program, but none of these appear to be of the magnitude and importance hoped for.

Further work, to be carried out mainly on, or near the original Nation Copper claims, is recommended.

## INTRODUCTION

The Nation Copper Property and the TAN GROUP of claims have been reported on in the 1966 and 1967 ANNUAL REPORTS of WEST COAST MINING & EXPLORATION. Much of the information accumulated during these years formed the basis of the program completed in 1969.

The 1969 program however was of a much wider scope than the earlier work, and covered, or was intended to cover all the potential ground along the contact of the Takla volcanics and interbedded sediments with the intrusives that gave rise to the copper mineralization on the aforementioned properties.

The large area that had to be explored was initially estimated at about 20 square miles. At the completion of the program an area slightly larger than that had been covered with magnetometer, E.M. 16, and soil samples. Prospecting of areas showing anomalous conditions had been partly completed.

A crew of 7 men were employed in the area from June 1st to August 20th, under the supervision of one or two geologist.

During the final week of the program some of the anomalies found earlier were detailed with some fill in lines.

## CLAIMS

A total of 183 claims are held in the area by West Coast Mining & Exploration. Some of the claims are registered in the name of R.M. Reininger or H. Veerman, with the majority registered in the name of D.L. Moore.

Signed BILLS OF SALE are made out for all claims, so that a transfer may be registered if necessary.

Close to 100 of the claims will require assessmentwork to be done and registered before July 12, 1970, and later dates during that summer.

### LOCATION, ACCESS, TOPOGRAPHY

The area of interest is located some 65 air miles North of Fort St. James in North Central British Columbia, at  $55^{\circ}09$  North -  $124^{\circ}43$  West.

Access to the claim group is by float plane from Fort St. James to Chuchi Lake, Tchentlo Lake or Alexander Lake. A helicopter is required to gain access to most of the area, and landing sites are available in most parts of the property.

The eastern half of the area consists of fairly flat topography with swamps, lakes and ponds, largely covered with spruce. Undergrowth of buckbrush, tag alder and devils club makes travel difficult.

The western half, including most of the original Nation Copper Property, covers a mountain, rising to about 4800 feet above sea level, with moderate, and occasionally steep slopes, but travel becomes easier at higher elevations. Outcrops are few in the eastern parts, and more plentiful in the west. At higher elevations on the mountain large outcrops of granodiorite are exposed.

### GEOLOGY

The area investigated is underlain by a granodiorite or quartzdiarite, in contact with the Takla Group of volcanics, tuffs and interbedded sediments.

The main intrusive mass is part of the Hogen Batholith of the Omineca Intrusions, of the late Jurassic or early Cretaceous period.

Smaller intrusive bodies, probably younger, and possibly differentiations of the main intrusive, are known to occur in the area. Three distinct types of these younger intrusives have been recognized in the area to the south of Chuchi Lake- Tchentlo Lake :

- 1) A magnetite rich quartz gabbro, called a magnetite porphyry in earlier reports. This rock type was found near the centre of the original Nation Copper Property, and appears to be rather extensive and covering several claims. The rock is characterized by a high magnetite content in the

GEOLOGY (cont)

- 1) (cont) groundmass of the rock as well as in veins and blebs.  
Chalcopyrite is associated with the magnetite, with a copper content of 0.1 % being common.
- 2) Peridotite. This rock type, aswell as the third one mentioned, was found in a drilling program carried out by Asbestos Corporation in 1964.  
The rock is described as consisting of equal parts of pyroxene, olivine and magnetite.
- 3) Syenite. Composed of orthoclase and amphibole, with a fine grained, granitic texture.

The Takla Group, of Upper Triassic or Jurassic age consists of andesitic and basaltic flows, tuffs, breccias and agglomerates with minor interbedded shales, and argillites. In the area under consideration the trend of the series is mainly east and west. The Takla Group is cut by the Omineca intrusions, described above.

The contact between the volcanics and the intrusive appears to be quite irregular, with large volcanic masses or roof pendants near the southern contact.

On aerial photographs strong faults can be seen to cut through the intrusive as well as the volcanics.

MINERALIZATION

Pyrite, Pyrrhotite and chalcopyrite are the important sulphides found sofar. Minor bornite occurs in small shears within the intrusive.

The coppermineralization is associated with faults and shears, sometimes in disseminated form in the rock on both sides of shears, and in trace amounts throughout some intrusives.

Near the contact the volcanics locally carry fair pyrite with minor copper. Within the basic intrusives the copper may be associated with magnetite, as is the case on the Nation Copper Property.

SURVEY PROCEDURE AND CONTROL

A set of two contourmaps on a scale of 1"= 1000 feet was prepared for the area from aerial photographs.

Grid lines forming 5000feet squares, superimposed on the contourmaps, served as control for the surveys.

Base lines were cut along the easterly or westerly edge of each square that formed part of the area to be investigated.

The location and starting points for the base lines were located in the field with the help of contourmaps and aerial photographs. This may have resulted in errors of up to 200 feet.

The base lines were used for adjoining squares where possible, and chained and marked at 160 feet intervals. At 1000 feet intervals along the base lines side lines were marked off, and run in easterly or westerly direction.

The lines were run with a chain and compass. Stations were marked at 100 ft intervals with plastic flagging tape.

At every station a soil sample was taken, together with a magnetometer reading and an E.M. reading. Crews of 2 men each could complete one 5000 feet line in a day.

One 5000 ft square could be completed in one week by each crew working in this manner. The 7th day was used for moving camp and cutting base lines. A helicopter was used to move the camps once a week, and to bring in the necessary supplies. Samples were taken out on the return trip.

Errors in the location of the lines in relation to their location on the map became apparent after a few weeks surveying. Especially toward the end of the 5000 ft lines a considerable error of several hundreds of feet occurred in some places.

The results have been plotted without taking any of the possible errors into account.



MAGNETIC SURVEY

The instrument used for the survey was the Portable Magnetometer Model G-100 manufactured by GEOTRONICS INSTRUMENTS LIMITED in Vancouver.

The G-100 is a lightweight instrument based on the fluxgate principle. The instrument measures the vertical component of the earth's magnetic field, expressed in gammas, with a sensitivity of 20 gammas per scale division. A reading was taken at a fixed base station just before, and directly after an east-west line was run, and the time of day for both was marked down. Corrections for daily variations were calculated from the differences in base readings before and after each run. The difference was distributed evenly over the readings obtained on that run.

The base stations are indicated on the maps.

A helicopter was used to tie in the base stations to each other, and a correction was applied to all readings to balance them in relation to each other.

The corrected readings have been plotted on the map.

The magnetic profiles along the base lines have been plotted without any corrections.

In view of the high magnetite content of the basic intrusives, strong anomalies could be expected.

Beyond this however it was hoped that the magnetometer would be a help in recognizing the location of the volcanic-intrusive contact, which is hidden for most of the way.

On the Westerly (Tchentlo sheet) the 56,000 gamma contour in the south, taken over by the 57,000 gamma contour in the southwest and west, represents in a general way the searched for contact as far as is known from outcrops.

On the easterly sheet the results are less clear, and a definite determination of the location of the contact is not obvious.

MAGNETIC SURVEY ( cont)

Because of the extensive overburden in the eastern area the approximate location of the contact is known only on the JUDY 1 and 2 claims. This lack of outcrop makes it impossible to compare the magnetic results with known geology, and complicates interpretation in this area.

The strong magnetic anomalies of several thousand gammas indicate the basic or ultra basic intrusives with a high magnetite content.

On the westerly sheet the anomaly at :

72,000N-18,000E is entirely covered and nothing is known about the geology.

A small basic intrusive is postulated.

68,000N-25,000E , an area of magnetic intensity with variations of up to 3000 gammas is indicated.

From our work in 1967 it is known that this area extends to the east for another 2000 feet, and is characterized by basic rock, high in magnetite.

On the east sheet (Chuchi Lake sheet) strong magnetic relief occurs at :

60,000N-56,000E, with variation of up to 6000 gammas. The area has no outcrop but an ultra basic body is inferred. Extensions of this anomaly in north-westerly directions are indicated on the aerial magnetic survey map.

62,000N-47,500E a strong magnetic anomaly indicated in earlier surveys.

weaker extensions of this anomaly were picked up in our survey at

62,000N-45,000E and at 58,000N-51,000E , The cause of this anomaly is a body of serpentinite, as is indicated in the diamond drilling done by Asbestos Corp.

56,000N-62,500E, a strong anomaly of up to 3000 gammas is indicated in a ground magnetic survey by Asbestos Corp. Extensions to the west and southeast were picked up in our survey. A basic or ultra basic body is probably responsible for this, although extensive overburden makes it difficult to find evidence for this.

## MAGNETIC SURVEY (cont)

A total of five North-South traverses were completed along the base lines. These were plotted in the form of magnetic profiles on the magnetic contour map.

At the northerly end all profiles show intense magnetic variations, corresponding to the basic intrusions, known to exist here.

Going south, a transition zone is apparent, in which the magnetic variations are much less pronounced. This probably represents the general contact area, of the grano-diorite and the volcanics. In some instances (Lines 35,000E and 45,000E) the transition zone is known to be underlain by intrusive, probably with a low, and constant magnetite content.

The extreme southern portion of all profiles except 65000E, show a smooth curve with little variation. The main part of this curve fluctuates slightly around an intensity of about 56,000gammas. This is interpreted as representing a fair thickness of Takla volcanics and interbedded sediments.

## ELECTRO MAGNETIC SURVEY

Instruments used for the survey were the Ronka E.M. 16 and Crone RADEM. These are lightweight, one man instruments that consist of a receiver only. It measures variations in a magnetic field set up by V.L.F. transmitters in different parts of the world. In the presence of a conductor the primary field will induce a secondary field, which is the measured quantity in this survey. The secondary field is expressed as a percentage of the primary field. The transmitter used in this survey was Seattle, Washington, transmitting a signal at 18.6 kilocycles.

Readings were taken at the stations marked at regular 100 ft intervals along the side lines and recorded in a field book. The readings were plotted in the office directly from this field record, and a smooth curve was drawn through the points obtained this way.

ELECTRO MAGNETIC SURVEY (cont)

Several anomalies are indicated in the survey.

On the west sheet (Tchentlo Lake sheet) a strong anomaly is indicated at :  
72,000N-to 73,500N -18,800E Two detail lines prove the continuity of this anomaly with a near northerly strike. The anomaly may be enhanced by topographic effects from the gully at the same location.

64,000N to 65,000N - 19,500E. This anomaly coincides with a very steep gully which may be a fault expression. Some pyrite was found in the gully.

61,000N-20,100E. This anomaly appears to be due to topography mainly. The true location may be slightly to the west because of a deflection in the base line.

62,000N to 65,000N - 42,200E . A wide anomalous zone without much surface expression.

On the east sheet ( Chuchi Lake sheet) two first order anomalies are indicated :

61,000N-56,000E, with northerly strike.

50,000N-54,000E, with northerly to north westerly strike.

Several second order anomalies are indicated at :

58,200N-65,000E , with northerly strike .

60,200N-67,100E, with northerly strike.

60,200N-68,200E, with northerly strike.

Extensions in southerly direction of these anomalies is possible, as weaker cross-overs are indicated on the lines to the south.

Several other cross-overs of first order and second order strength are due to topography, such as at :

54,200N-61,400E, and

54,200N-68,200E

as well as the sharp cross-overs in the south westerly part of the area covered.

SOIL SAMPLING SURVEY

Samples were taken at 100 ft intervals along the east-west lines at the same stations that were used for the geophysical survey.

The resulting assay values are shown on the two map sheets.

On the west sheet the values from our 1967 samples are plotted in addition to our 1969 work. On the east sheet the values from our 1967 survey, covering part of the TAN group, are plotted in addition to the 1969 results.

Especially on the east sheet many blanks are showing on several lines, because swampy conditions made it impossible to obtain a proper sample.

On both sheets values over 100p.p.m. copper, were plotted below the line for easy distinction of anomalous values.

Background for the east sheet varies from 10p.p.m. to about 80 p.p.m. with an average of about 60 p.p.m. copper.

Background for the west sheet appears to be slightly lower, or 45-50 p.p.m, especially in the extreme west of this sheet.

Values over 100p.p.m. are considered to be slightly anomalous, with values over 200 p.p.m. copper definitely anomalous.

On the west sheet the outstanding area still appears to be on the original Nation Copper Property, where values are consistently high over large areas. Most of the remainder appears to be partly erratic single readings or small groups with little persistence over a large area.

To the south and west of the point 70,000N-25,000E, a fair grouping of high copper values indicate the extension of the magnetite rich intrusive found on the original Nation Copper ground.

To the northeast and southeast of the point 60,000N-35,000E high values show on lines 59,000N, 60,000N and 61,000N.

SOIL SAMPLING SURVEY (cont)

On the east sheet a low order anomalous zone is indicated on line 59,000N between 57,000E and 60,000E.

An area of possibly related high readings, mixed with many more low ones, centres around the point 57,000N-45,000E .

The remainder consists of single, or small groups of erratic highs without much lateral persistence.

The lack of drainage in parts of the area covered by this sheet, and the large number of moraines and other glacial land forms may partly obliterate geochemical patterns that would be more obvious under different conditions.

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CONCLUSIONS

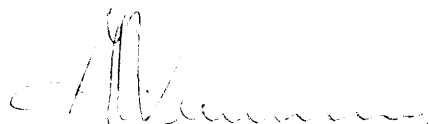
- 1) The geophysical and geochemical surveys in the Chuchi Lake-Tchentlo Lake area did not develop any large target areas of combined, and coinciding soil-, magnetometer- and E.M. anomalies.
- 2) No major anomalies are indicated in the contact zone of the intrusive with the Takla Group of volcanics and sediments.
- 3) Strong magnetic anomalies, sometimes combined with a favourable E.M. response may offer further exploration targets. The lack of strong geochemical anomalous values in all but one (centered around the point at 68,000N-25,000E) makes most of them second class targets.
- 4) The area centered around the point at 68,000N-25,000E deserves closer investigation.  
Geophysical and geochemical response is favourable.  
Copper mineralization is known to exist in this basic intrusive.

RECCOMENDATIONS

Part of the recommendations in the 1967 report, Nation Copper Property, are repeated as far as applicable at the present state of knowledge. In addition to this some of the recommendations below are based on the new information obtained during the 1969 season.

- 1) Drilling of the Vector zone. (1000ft EX, 300 ft pack sack)
- 2) Drilling of Nighthawk zone. (2000 ft EX)
- 3) Magnetometer survey of 6000x6000 ft area centered around 68,000N-25,000E
- 4) Detailed sampling and mapping of this area, to be followed by
- 5) Packsack diamond drilling for sampling purposes only, shallow holes, (500')
- 6) Claim staking. Additional coverage is necessary in the area of 68,000N-25,000E, part of which is open ground at present.

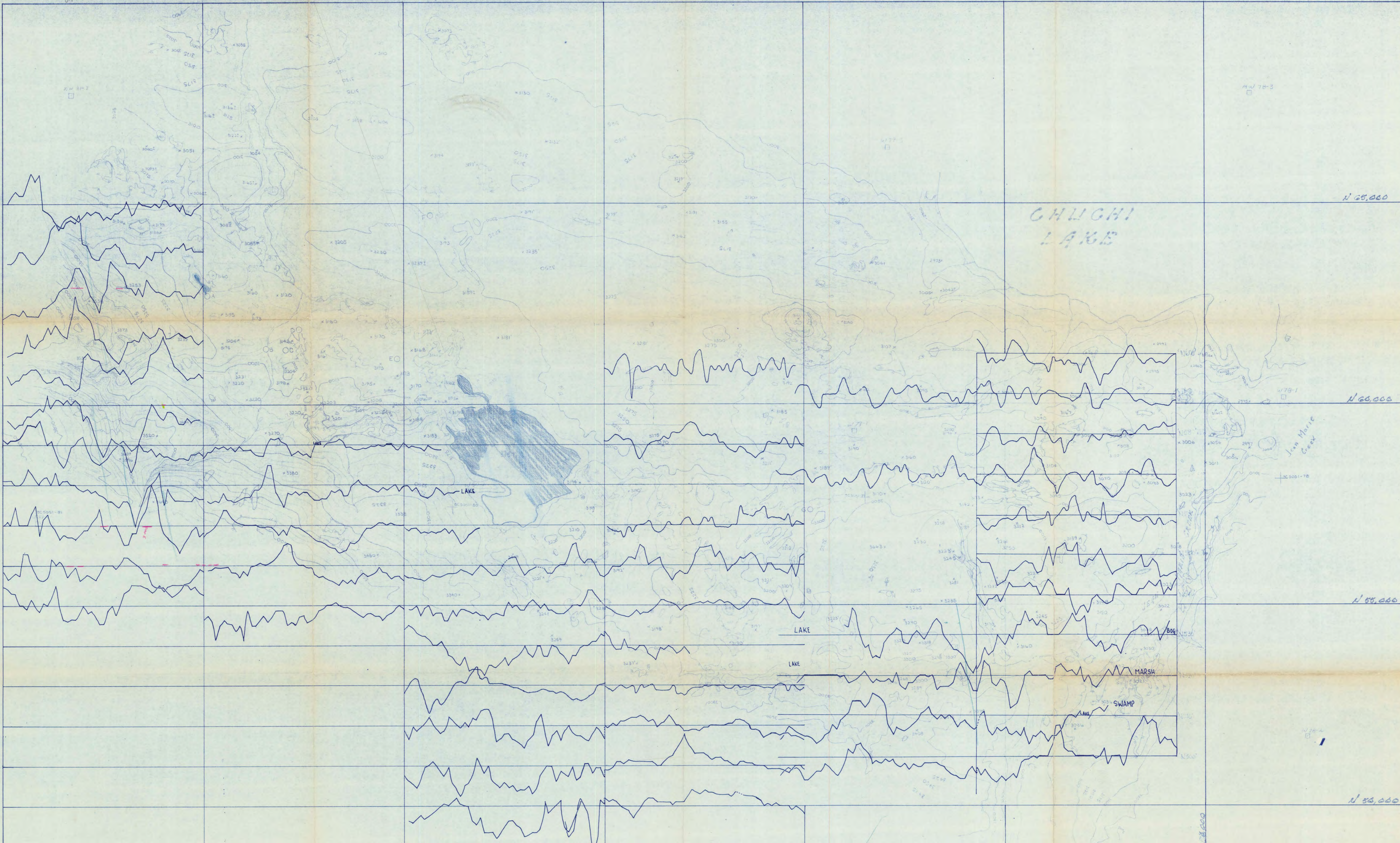
A total of 3000 feet of EX drilling and 1000 ft of packsack drilling, under the supervision of a geologist and assistant, will take 2 months, and will cost about \$60,000.-



December 1969

H. Veerman, P.Eng.





CHUCHI  
LAKE

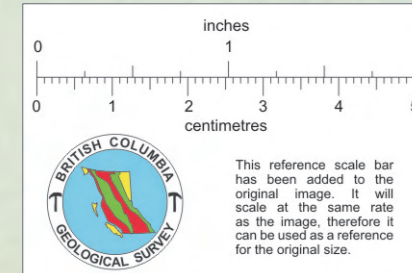
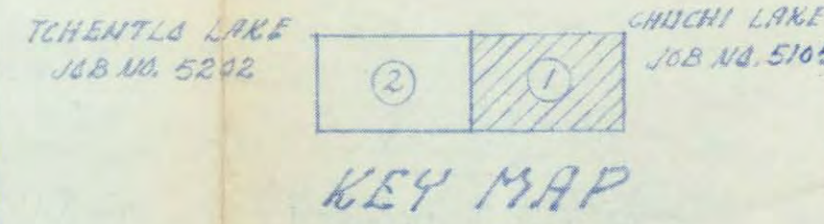
LAKE

LAKE

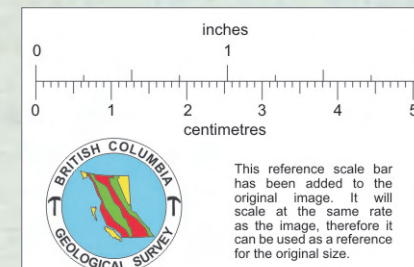
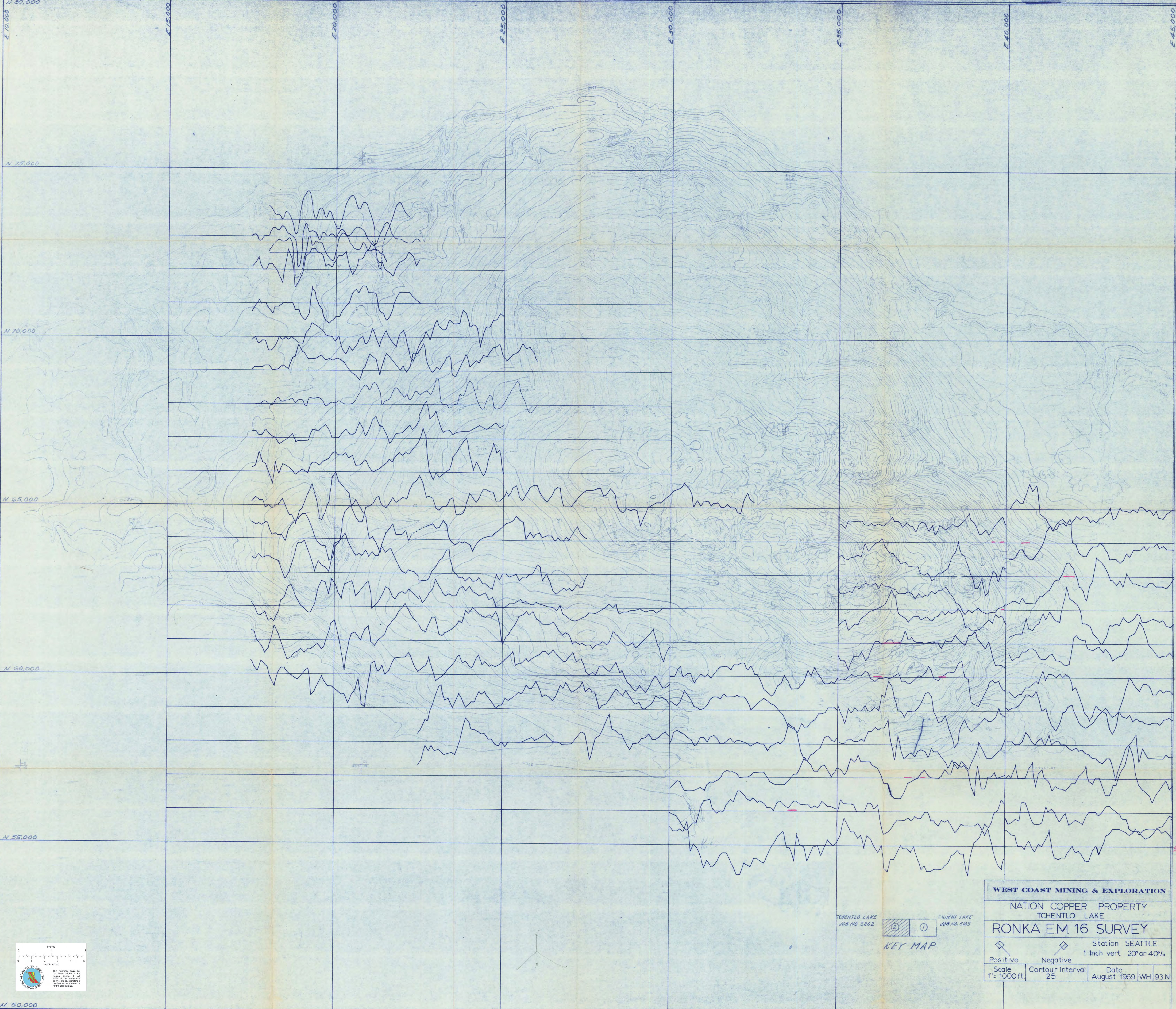
LAKE

MARSH

SWAMP



WEST COAST MINING & EXPLORATION			
NATION COPPER PROPERTY CHUCHI LAKE			
RONKA E.M. 16 SURVEY			
Positive	Negative	Station SEATTLE 1 Inch vert. = 20° or 40%	
Scale 1" = 1000 ft	Contour Interval 25	Date August 1969	WH 93 N



WEST COAST MINING & EXPLORATION			
NATION COPPER PROPERTY TCHENTLO LAKE			
RONKA E.M. 16 SURVEY			
Positive		Negative	
Station SEATTLE		1 Inch vert. 20' or 40'	
Scale 1" = 1000ft	Contour Interval 25	Date August 1969	WH 93 N