82K/15E

GEOLOGICAL, GEOCHEMICAL and GEOPHYSICAL REPORT

on the

BOB NO. 1 to 4, LIZ 166 & 167 and HL NO. 1 to 8 and

NO. 20 to 25 Mineral Claims

known as the Warren Creek Property
situated 32 air miles south of

Golden, B.C.

Golden Mining Division
Latitude 50°53'N, Longitude 116°45'W

N.T.S. 82 K/15

on behalf of

JUNIPER MINES LTD.

Field Work - September 12 to 22, 1972

Report by:

D.R. Cochrane, P. Eng.,
A. Scott, B. Sc.,
Frank P. O'Grady, B. Sc.,
October 26, 1972,
Delta, B.C.

4514

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APPENDIX 1

Certificates

NAME:	COCHRANE, Donald Robert
EDUCATION:	B.A.Sc. - U. of T., M.Sc. (Eng.) - Queens
PROFESSIONAL ASSOCIATIONS:	Professional Engineer of B.C., Ontario, and Saskatchewan. Member of C.I.M.M., G.A.C., M.A.C., Geological Engineer
EXPERIENCE:	Engaged in the profession since 1962 while employed with Noranda Exploration Co. Ltd., Quebec Cartier Mines Ltd., and Meridian Exploration Syndicate.
NAME:	SCOTT, Alan R.
EDUCATION:	B.Sc. - Geophysics, U.B.C.
EXPERIENCE:	Two summers - crew member and operator with Geo-X Surveys Ltd. Presently employed with Cochrane Consultants Ltd. - Geophysicist
PROFESSIONAL ASSOCIATIONS:	Member of S.E.G.
NAME:	O'GRADY, FRANK P.
EDUCATION:	B.Sc. (Geology) - U.B.C.
EXPERIENCE:	Employed as an Exploration Geologist by American Smelting and Refining Co. from April, 1969 until August, 1972.
PROFESSIONAL ASSOCIATIONS:	Member of C.I.M.M., Associate Member of the Canadian Geological Society.
NAME:	ROSSIER, Jean-Claude
EDUCATION:	Secondary and Vocational School - Architectural Drafting Degree
EXPERIENCE:	Since 1965 - General Drafting Experience Geophysical Drafting, Seigel Associates - 1969 - 1972 Employed with Cochrane Consultant since spring, 1972
NAME:	PARADIS, Robert
EXPERIENCE:	Seigel Associates Ltd. Employed with Cochrane Consultants since spring, 1972.
AGE:	24
NAME:	HATCHARD, H., P.O. Box 88, Merritt, B.C.
AGE:	30
EXPERIENCE:	Several years experience with exploration companies since 1967 including Carolin Mines, Sonic Ray Resources, Valnicola Mines, Employed temporarily with Cochrane Consultants in September-October, 1972.

APPENDIX I (cont.)

Certificates

NAME:	SIMLA, R., Reservation Road, R.R. No. 2, Vernon, B.C.
AGE:	47
EXPERIENCE:	Several years bush experience linecutting, soil sampling with various exploration companies. Employed temporarily with Cochrane Consultants Ltd.

APPENDIX II

MINING DIVISION: Golden

SPONSOR: Juniper Mines Ltd.

LOCATION: 32 air miles south of Golden, B.C.

SURVEY: Geological Mapping
Geochemical Soil Sampling
Fluxgate Magnetometer
Self Potential

SURVEY MAN DAYS: 11 x 4 = 44

MOBILIZATION: 4 x 4 = 16

DATA PROCESSING AND REPORT PREPARATION MAN DAYS: 8½ (see below)

DRAFTING MAN DAYS: 15 3/4 days

NUMBER OF ALONG LINE READINGS: Magnetometer - 480
Self Potential - 437
Number Soil Samples - 398

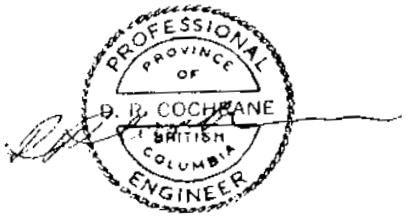
LINE MILES: 4.55

DATA AND REPORT PREPARATION:

A. Scott, B.Sc. (Geophysics) U.B.C. - 1½ days
Frank P. O'Grady, B.Sc. (Geology) U.B.C. - 4 days
D. R. Cochrane, P.Eng. - 3 days

FIELD CREW: Frank P. O'Grady)
R. Paradis)
H. Hatchard) September 12 to 22, 1972
R. Simla)

DRAFTING: Jean-Claude Rossier



COCHRANE CONSULTANTS LTD.

APPENDIX III

Instrument Specifications

Self Potential Unit

Manufacturer;

Terra Physics
Draper, Utah

Readout: Meter Type, Center reading ± 5 percent of full scale

Power: 2 9 volt transistor radio batteries

Ranges:

0 - ± 50 millivolts
0 - ±100 "
0 - ±500 "
0 - ±1000 "

Instrument Specifications for HEW-200
Pulse Type (Time Domain) Induced Polarization Unit

Receiver-Transmitter Package:
15" x 13" x 10" Weight: 38 lbs.

Transmitter Power Supply:
30 volt rechargeable battery 5-RF 680 Central Lab.
Primary Power Supply: 1 #420 ER dry cell timer battery

Receiver:
Common mode rejection 100DB (DC-60 Hz)
Input impedence 1×10^6 ohms
Operation temperature: -20° C + 75° C
Sealed galvanometer type meters for very humid or wet climates
Polarity automatically read on meter dial
Three input combinations
Sealed switches and panel for wet climate (dessicant incl.)

Transmitter:
24 - 30 volt DC-DC transistorized converter
Power output 500 watts maximum
Timer two second or four second pulse intervals
Automatic reverse current cycling
Operating temperature: - 20°C to + 75° C
Sealed switches and panel for wet climates (dessicant incl.)
Sealed meter for very humid or wet climates

TIME CONSTANTS:
The following table lists current on times, and corresponding delay and integration times

Current On(seconds)	Delay Time (seconds)	Integration Time (seconds)
2.0	0.4	1.2
2.5	0.5	1.5
3.0	0.6	1.8
3.5	0.7	2.1
4.0	0.8	2.4
4.5	0.9	2.7
5.0	1.0	3.0
5.5	1.1	3.3
6.0	1.2	3.6

Manufactured by:
Hewitt Enterprises and Terra Physics
12215 South, 900 East
DRAPER, Utah

APPENDIX V

Details of Cost

By contract between Juniper Mines Ltd. (client) and Cochrane Consultants Ltd. (contractor) dated September 10, 1972 for surface exploration work on the Warren Creek Prospect (Bob No. 1 to 4; Liz 166 and 167; and HL No. 1 to 8 and HL 20 to 25 mineral claims);

1.	Linecutting, chaining and refurbishing grid	$ 2,250.00
2.	Self Potential Survey readings at 50 foot intervals	1,800.00
3.	Magnetometer Survey of Grid area	1,650.00
4.	Geochemical Soil Sampling Survey - Samples @ 50 foot intervals and with analysis for Cu, Zn, Hg and Au	4,750.00
5.	Geological survey of grid area complete with maps and report	1,520.00
	Total	$11,970.00

WARREN CR. PROJECT

Respectfully submitted,

PROFESSIONAL ENGINEER PROVINCE OF BRITISH COLUMBIA D. R. COCHRANE

D. R. Cochrane, P.Eng.

A-1 INTRODUCTION:

Between September 12 and September 22 1972, a crew employed by Cochrane Consultants Ltd. of Delta, B.C., carried out an exploration program which included geological mapping, self potential, a magnetometer, and a soil geochemical survey on the Warren Creek property in the Golden Mining Division and on behalf of Juniper Mines Ltd. The program was conducted to test for possible extensions of known mineral showings on the property and to trace the known showings into areas covered by overburden. This report describes the field and data processing procedures employed and discusses the results obtained. It is divided into 5 sections: Part A includes the Summary and Conclusions; Part B, the Setting; Part C, Geology and Mineralization; Part D, the Geophysical Survey;s and Part E describes the Geochemical Work. Appendices located at the end of the report contain Certificates of Personnel employed on the project, Instrument Specifications and Survey Details for Assessment work recording information.

A-2 SUMMARY AND CONCLUSIONS:

1. Juniper Mines Ltd. holds title (by option agreement) to the twenty (20) full sized, contiguous located mineral claims situated on Warren Creek in the Golden Mining Division.

2. 4 x 4 truck access is available to a portion of the claims by following a logging road proceeding east from Highway No. 95 at Parson, and then onto a mining road constructed by former owners. The claims are 24 road miles from Parson and 45 miles from Golden, British Columbia.

3. The mining property is characterized by high values in copper, and minor to moderate gold and silver values, and is situated in the rugged Purcell Mountains on the west side of the Rocky Mountain Trench.

4. Previous exploration work on the property has included over 5,000 feet of diamond drilling, rock pitting, bulldozer trenching and electromagnetic surveys. The best diamond drill intersection recorded 2.2 percent Cu, less than 0.01 oz. Au and about 0.10 oz. Ag across 20.0 feet of vein material.

5. A ground control grid was refurbished and extended by the Cochrane Consultants field crew, and the base line runs magnetic east for 2,000 feet and cross lines are magnetic north-south, spaced 200 feet apart and are 2,000 feet long. In September, 1972, geological, geochemical and geophysical surveys were conducted on this gridded area on behalf of Juniper Mines Ltd.

6. The main mineralized zone is a complex silicified band trending magnetic east and subparallel to the strike of the Horse Thief Creek Series of metasediments. The silicified band is mainly drift covered but maybe as wide as 50 feet, and contains veinlets and blebs of chalcopyrite and pyrite and various copper and iron oxydation products.

7. Vertical field magnetometer values exhibit an 800 gamma range, and the predominant east-west (magnetic) isomagnetic trend is believed to reflect the overall geological trends. Several faults are indicated by magnetic disruptions, the most prominent is situated along Warren Creek. The mineralized zone is non-magnetic.

8. Self potential response ranged from a high of +147 millivolts (m.v.) to a low of -140 m.v. Values less than -80 m.v. have been designated moderately to strongly anomalous and several anomalies were outlined. One such anomaly is coincident with the main mineralized zone, however the most widespread anomaly may be due to a specific lithologic unit. The causes of several others is unknown but they may indicate additional sulphide zones, especially when coincident with or close to geochemical soil "highs".

9. A total of 398 B horizon soil samples were collected and analyzed by Crest Laboratories of Vancouver for their content in gold (Au), zinc (Zn), mercury (Hg) and copper (Cu).

10. The arithmetic mean and range of the various metals found in the Warren Creek soils is compared with the averages reported by Hawkes and Webb (Geochemistry in Mineral Exploration, Harper and Row, 1962) in the table below:

Metal	Minimum	Maximum	Mean	Average Reported by Hawkes and Webb
Au (p.p.m.)	0.02	2.83	0.105	Sandstone av. 0.03
Cu (p.p.m.)	6	>2000	67	20
Zn (p.p.m.)	10	120	74	50
Hg (p.p.b.)	10	470	31	30 to 300

The Warren Creek soils may be generally classified as gold and copper rich.

11. A fairly extensive plus 225 p.p.m. Cu geochemical anomaly lies close to and north of the showings area and is presumably due to the relatively narrow silicified-chalcopyrite zone, but the width of the anomaly suggests that a parallel or subparallel band may possibly exist about one hundred feet north of the presently known zone.

12. There are scattered gold and mercury geochemical anomalies and these two metals are weakly correlatable suggesting a possible similar geological origin and setting. Similarly, copper and mercury are moderate to weakly correlatable.

13. Zinc is inversely correlatable with mercury and there is evidence of zoning when comparing the zinc results with the geochemical results of other metals.

14. Investigation as to the cause of the relatively wide copper soil anomaly, and several nearly coincident gold, mercury and self potential anomalies situated about 500 feet north of the showing area (and base line) is recommended.

Respectfully submitted,

Frank P. O'Grady

Frank P. O'Grady, B.Sc.

A. Scott

A. Scott, B.Sc.

PROFESSIONAL ENGINEER PROVINCE OF BRITISH COLUMBIA

D. R. Cochrane

D. R. Cochrane, P.Eng.,
Delta, B.C.

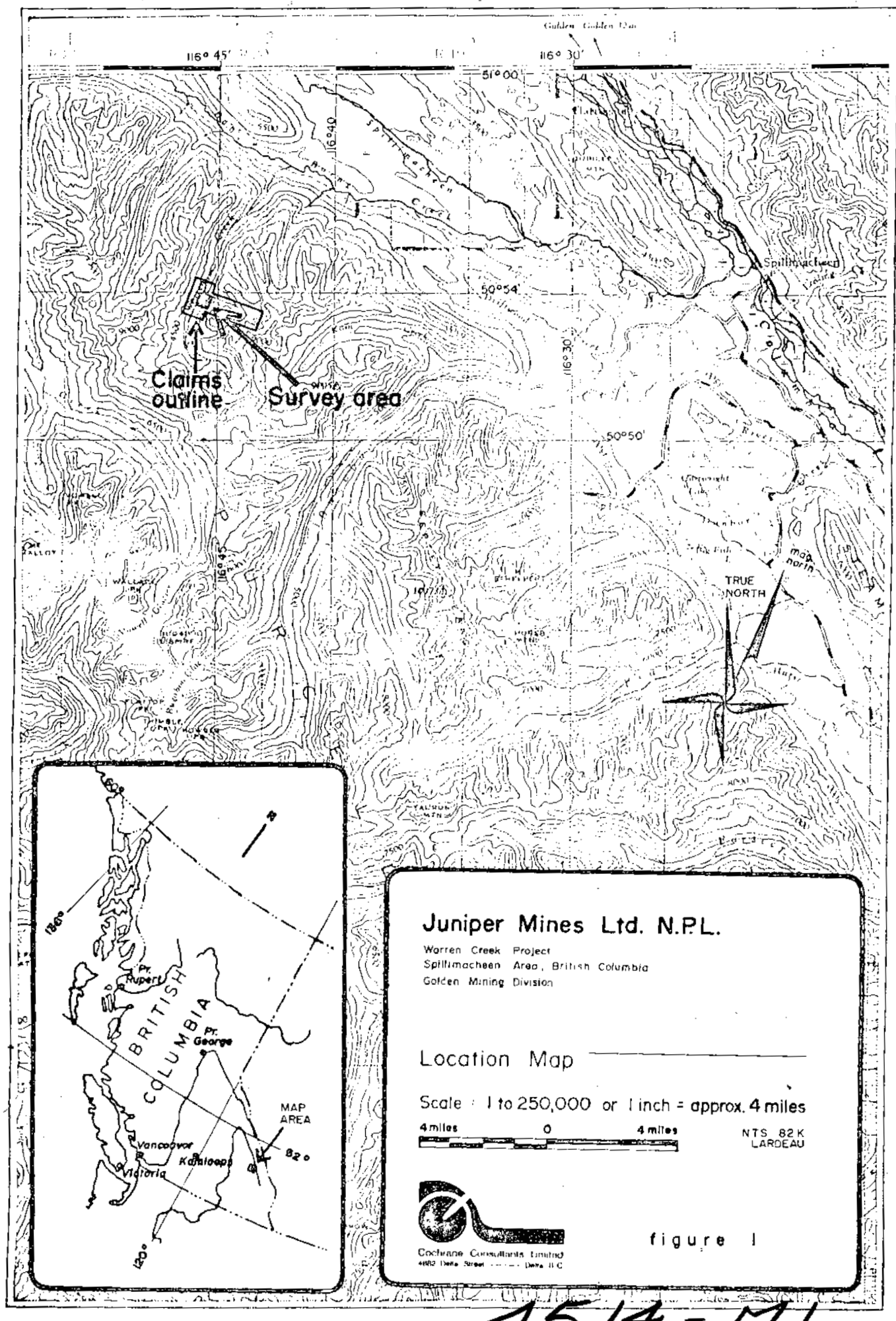


figure 1

4514 - M1

Department of
Mines and Petroleum Resources
ASSESSMENT REPORT
NO. 4514 MAP #1

PART B:

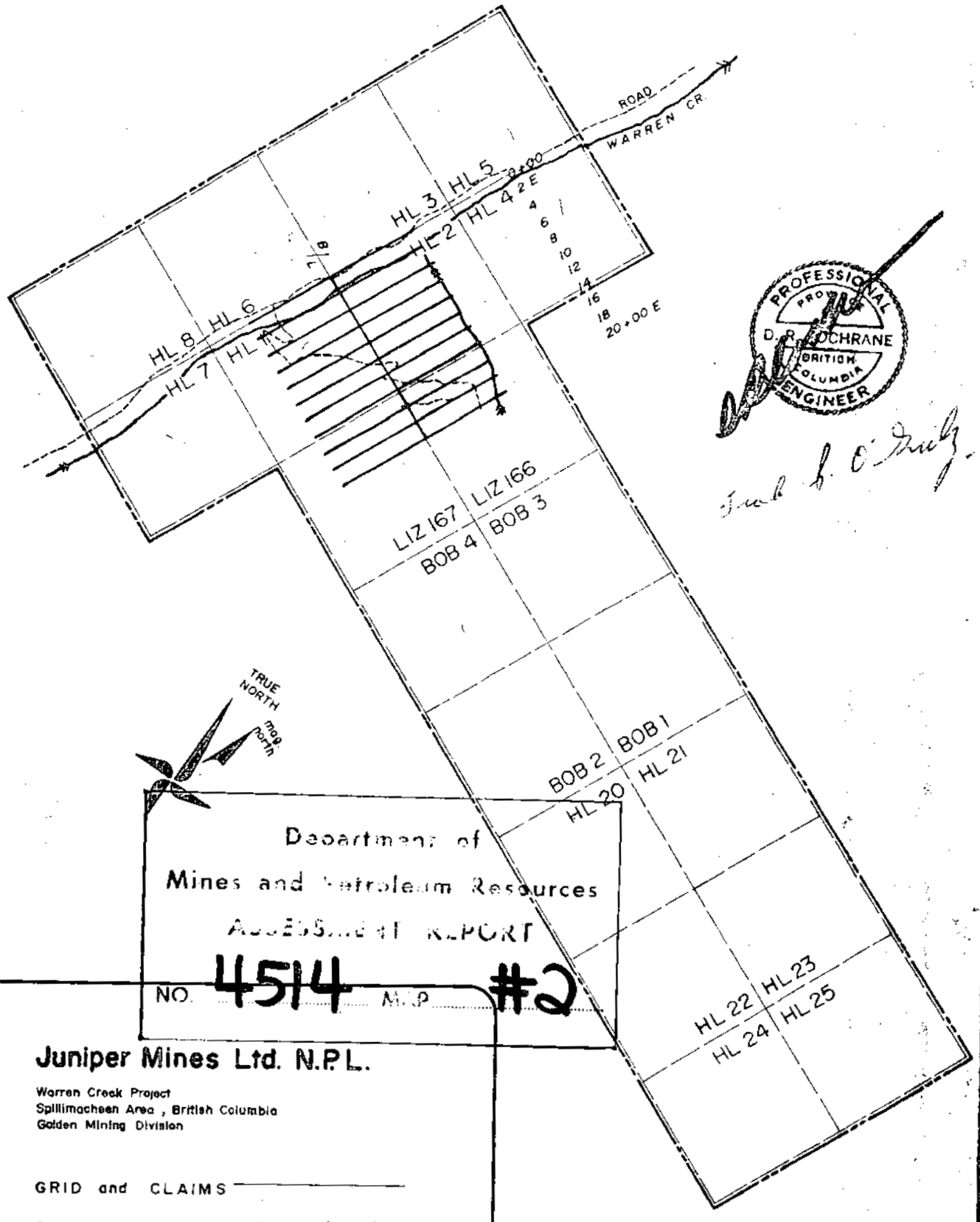
B-1 LOCATION AND ACCESS:

The property is located approximately 32 air miles slightly east of south of Golden, B.C.

Access is from Parson, B.C. on the Draton logging road to a point near the confluence of Warren Creek and Bobby Burns Creek, a distance of eighteen miles. From this point, a four wheel drive access road follows the Warren Creek valley eight (8) miles to the property. The access road is marked by a St. Andrews Mining Co. sign.

B-2 GENERAL SETTING:

The Warren Creek property is situated in the Purcell Mountains of British Columbia on the west side of the Rocky Mountain Trench. The showings are located on the east side of the Warren Creek valley. The elvation of the valley floor at the camp is approximately 6,000 feet and increases to approximately 7,500 feet at the highest point on the property. The lower portion of the property is, for the most part, timber covered, however, two large boulder covered slopes are present. The remainder of the property consists of talus slopes and cliffs with some sparse timber cover.



Department of
Mines and Petroleum Resources
ASSESSMENT REPORT
NO. 4514 MAP #2

Juniper Mines Ltd. N.P.L.

Warren Creek Project
Spillimacheen Area, British Columbia
Golden Mining Division

GRID and CLAIMS

Scale : 1 inch = 1500 feet 0 500' 1000' 1500'

Cochrane Consultants Limited
4592 Dartu Street — Duns B.C.

To accompany a report by F.P. O'GRADY B. Sc. and D.R. COCHRANE P. Eng.

dated november 3, 1972

FIGURE 2

B-3 PROPERTY

Information concerning the claims covering the Warren Creek property follows:

Claim Name	Record Number
Bob 1 - 4	11528 - 11531
Liz 166 - 167	11594 - 11595
H.L. 1 - 5	14020 - 14024
H.L. 6 - 8	14413 - 14414
H.L. 20 - 25	14416 - 14421

The above claims, excluding H.L. 1 - 5 are in good standing until August, 1973. H.L. 1 - 5 are in good standing until October, 1973. Title to the claims at this date, is held by option by Juniper Mines Ltd., registered office, 9th floor, 850 West Hastings Street, Vancouver, B.C.

B-4 HISTORY:

The first published information on the Warren Creek property is contained in the Minister of Mines Annual report for 1920. It describes the mineralization and also the workings at that time. The workings consisted of a 35 and a 20 foot tunnel, and several hand trenches.

A geological investigation of the Warren Creek property was undertaken by H.H. Cohen, P. Eng. on behalf of Mr. Roger LeBeuf during the summer of 1956. A subsequent report by Mr. Cohen

was filed with the British Columbia Department of Mines and Petroleum Resources as assessment report No. 182. Mr. Cohen recommended further exploration on the property in his report.

An exploration program was carried out on the Warren Creek property by St. Andrew's Mining Co. in 1960 and 1961. This program included airborne and ground electromagnetic surveys and 3450 feet of diamond drilling. According to a report by J. H. Montgomery this work proved the presence of three copper bearing quartz veins with pods of pyrite and chalcopyrite along the vein walls. Also A.C.A. Howe and Associates Ltd. have reported average assays of 0.5 percent copper, and 0.05 oz./ton silver over 20 to 50 foot widths of vein material. The best hole intersected a zone of 1.73 percent copper, 0.005 oz./ton gold and 1.17 oz./ton silver across 13 feet.

Carolin Mines conducted an exploration program on the property during the summer of 1968. This program included an E.M. survey by Geo-X Surveys, 2600 feet of bulldozer trenching, and 2180 feet of diamond drilling, as well as some road construction. A report on the electromagnetic survey was undertaken

in 1968 recommended further investigation of the electromagnetic anomalies.

A report by E. O. Chisholm, dated September 13, 1971, recommended a program similar to the one conducted by Cochrane Consultants and which forms the body of this report.

B-5 GROUND CONTROL GRID:

Survey grid control was established by Carolin Mines personnel in 1968. The base line is 3600 feet long and is oriented magnetically east-west. The crosslines are spaced at 400 foot intervals and are oriented magnetically north-south.

Cochrane Consultants Ltd. personnel refurbished 2000 feet of the base line, from 0 + 00 to 20 + 00E and intersecting cross lines. The lines required rechaining and, in many locations, considerable recutting was required as brush had grown up to obstruct the lines. In addition, north-south cross lines were added between the existing north-south lines so as to have north-south cross lines at 200 foot intervals.

PART C: GEOLOGY AND MINERALIZATION

C-1 GEOLOGY:

Geological Survey of Canada Map 12 - 1957 describes the rocks underlying the property as members of the Horse Thief Creek Series of Paleozoic age. The rocks mapped on the property include phyllite, quartz pebble conglomerate, argillite, limey talc schist and quartzite.

Three faults are present on the property and the most isgnificant fault strikes sub parallel to the base line. This fault contains chalcopyrite bearing silicified zone present in the southern side of the fault and in gouge zones as well. A second fault virtually forms the northern boundary of the mapped portion of the property, A creek flows along the surface expression of this fault. Vertical and near vertical cleavage is exhibited in the creek bottom. Rusty quartz boulders are common in the creek, however, no sulphides were found in the float. The third fault forms the boundary between the silicified quartz pebble conglomerate (Unit 6) and the shales (Unit 7) of the South Eastern corner of the mapped area.

C-2 MINERALIZATION:

Chalcopyrite and its oxidation products constitute the visible economic mineralization of the showings. Gold and silver, of minor value, have been recorded in assays of previous drill core and in samples collected by Mr. O'Grady.

The chalcopyrite occurs in three ways; firstly and the most prevalent, is in quartz veins and silicified zones. The three showings that constitute the original showing area are of the quartz vein type. Two of these showings have short tunnels driven on them. The veins vary in thickness from a few to several feet thick. The three showings are located within three hundred feet of each other on the south side of the fault zone. Drill holes have been located in the immediate vicinity of these showings.

Secondly, the chalcopyrite occurs in quartz boudinage which occur in the talc phyllite (Unit 4). The boudinage are in the wall rock on the south side of the base line fault. Chalcopyrite is present in some of the boudinage, however, pyrite is more common. A substantial amount of sulphide has been leached from the boudinage leaving a box work structure in some places. The easily identifiable box work appears to be "after" pyrite, however, in many places it is not definitely possible to ascertain which sulphide has been removed.

The third mode of occurrence is exhibited in an outcrop located on the base line at 2E. This outcrop, recently exposed by bulldozer trenching, appears to be rounded by glaciation. The outcrop is extremely hard, and therefore it is difficult to obtain good hand specimens from it. The local rock is a limey talc schist which has been highly silicified. The outcrop probably represents a fault breccia that has been cemented with quartz and which the contemporaneous introduction of chalcopyrite. The copper content of this outcrop is difficult to estimate but it probably is greater than 1½percent. A chip sample taken by Mr. O'Grady ran 1.68 percent Cu across 30 feet. The length of this outcrop is somewhat greater than thirty feet.

Malachite and azurite are found in the shaley cleavage south of the central quartz vein type showing. This mineralization has probably been placed there by circulating ground water with its source the nearby showing.

C-3 GEOLOGICAL DISCUSSION:

Several holes have been diamond drilled on the property. The core has been vandalized to the extent that it is virtually impossible to obtain much pertinent information from it. Some of

the core is, however, of a similar rock type to that of the outcrop described at line 12. Furthermore the diamond drill holes observed on the property were apparently to test the mineralized quartz veins on the south side of the base line fault. In addition to this, geological mapping and observations have revealed that a fault zone of between two hundred and three hundred feet wide and of undetermined length may be present. A possible northern limit of the fault zone may be defined by the scarp like outcrop mapped at 375E on line 14N. The possible east-west extent of the fault zone is indicated by the topographic low that extends on either side of the base line from approximately line 8E to beyond the mapped portion of the property at line 20E.

West of line 8E, the overburden is extensive and may be of a thickness that would obscure any possible fault or shear zone topographic depression.

However, it remains that the area west of the base line is, geologically speaking, a very high priority zone.

PART D: PROCEDURES

D-1 MAGNETOMETER:

A Scintrex vertical force, fluxgate Model MF-2 was used for the magnetic survey on the Warren Creek project.

A main base station was established near camp and the instrument was adjusted to zero at this position. Several readings were recorded to ascertain if the magnetic field was steady enough to carry out the survey. The operator, after a check-out reading at the base station, moved out on the ground control grid to take readings on all north-south cross lines at fifty foot intervals. During the course of the day readings were taken near the base station at 20 minute intervals by a second magnetometer. The magnetometer used at the base station is a Scintrex Model MF-1. The magnetic field was quite steady throughout the survey. The average drift correction was 36. The largest single correction was 175 gammas.

D-2 SELF POTENTIAL PROCEDURE:

The S.P. survey was done in two stages. The first stage included the base line from 0 + 00 to 10 + 00 and contiguous

cross lines. The second stage included the base line from 10 + 00 to 20 + 00 and contiguous cross lines.

The instrument was zeroed at 0 + 00 on the base line. Readings were taken at fifty foot intervals along the base line. Readings were also taken at fifty foot intervals along the cross lines.

Taking of the readings was accomplished by connecting the instrument to the negative electrode at the base line, the positive electrode was then connected to the instrument by a reel of wire. The assistant operator then placed the positive electrode in the ground at the correct stations while the operator took the readings, thus measuring the self potential between the two electrodes.

D-3 GEOCHEMISTRY:

Soil samples were collected at fifty foot intervals along the cross lines of the ground control grid and the base line.

A hole was excavated to the necessary depth by grub-hoe. A sample of approximately ¼ lb. was removed from the hole and placed in a pre-numbered, water resistant kraft paper geochemical bag. The sampler recorded line and station number;

colour of soil; type of soil; soil horizon; depth of sample and remarks at each location on standard printed soil sampling note forms. The samples were collected at various depths ranging from 2 inches to 18 inches but averaging approximately 8 inches. After each days sampling, the bags were placed on a cord and hung up to dry in a heated cabin. The samples were taken to Vancouver by Cochrane Consultants staff.

The samples were delivered to Crest Laboratories of Vancouver, B.C., where the samples were air dried and sieved to minus 80 mesh.

The copper and zinc were digested in hot $HClO_4$ and HNO_3 and analyzed for Cu and Zn by atomic absorption method.

For the gold analysis, a 10 gram portion of the sample is used. The sample is digested in HCl and HNO_3, and then leached to a pastein aqua regia. The paste is then dissolved in excess HCl and filtered. The filtrate is then treated organically to remove the gold. The organic phase is further treated to strip Fe from it. After which, the organic compound, containing the gold, is analyzed by atomic absorption method.

For mercury analysis a one gram portion of the soil sample is used. The mercury in the sample is converted to a

metallic state by leaching within HNO_3 (cold) and further treatment with stannous sulphide. The metallic mercury is then aerated until the Hg evaporates. The air, containing the evaporated Hg is then put through a closed system and analyzed for Hg by atomic absorption methods.

PART E: GEOPHYSICAL AND GEOCHEMICAL RESULTS

E-1 MAGNETOMETER RESULTS:

The magnetomer survey results are plotted on Figure 4 and Figure 5 is a contoured plan of the values.

The plotted values represent the vertical magnetic field at the plotted point relative to a value of "0" (latitude adjusted) at the main base station at the start of the survey (September 13, 1972).

The inset diagram on Figure 4 shows the relative frequency distribution of the vertical magnetic field values. The distribution is multimodal with the primary mode lying in the 50 to 100 gamma class and encompassing 24 percent of the values. The secondary mode lies in the 200 to 250 gamma class (7 percent of the values) and the tertiary mode lies in the greater than 300 gamma class (3 percent of the values).

The results range from a high of 519 gammas (10N:16E) to a low of -295 gammas (8 + 50S:2E and 4 + 50S:8E). The arithmetic mean is 47 gammas and the standard deviation is 121 gammas. Statistically, background can be defined as including the range of values from -74 to +168 gammas. Values below -74 gammas are defined as a magnetic low and values above +168 gammas

are defined as a magnetic high.

The most dominant feature on the contour plan is the disruption of the contours along Warren Creek. This is believed to represent the magnetic response to a fault.

Several other disruptions are apparent on the iso-magnetic plan and these also are believed to be caused by faults (see Figure 12, Compilation).

The dominant magnetic trend to the east of Warren Creek is slightly south of (magnetic) east, and reflects the dominant lithologic trend. The known mineralized zone is non-magnetic and no significant magnetic feature is associated with the silicified copper zone.

E-2 SELF POTENTIAL RESULTS:

The Self Potential Results are presented as Figure 6. The values represent the potential difference (in millivolts) between the plotted point and station 0 + 00; line 0 + 00.

The inset diagram shows the relative frequency distribution of the SP values. The arithmetic mean is +23 m.v. and the standard deviation is 30 m.v.

The contours on the iso self potential plan (Figure 7) have been reduced by 40 m.v. to offset the positive bias of the zero point (at 0 + 00 on the base line).

The contoured results vary from a positive SP value of +147 m.v. at 6 + 50N:18E to a negative SP of -140 m.v. at 6N:14E and 5 + 50S:0 + 00.

While there are many factors that contribute to SP effects (for example changes in ground water conditions and topography) the presence of sulphides is often indicated by strong negative SP values. Hence only negative zones are discussed below:

less than -110 m.v.	strongly anomalous
-80 to -110 m.v.	moderately anomalous
-50 to -80 m.v.	weakly anomalous

The three degrees of anomaly have been decided statistically. A weakly anomalous zone is 1 standard deviation from the mean, a moderately anomalous zone is 2 standard deviations from the mean and a strongly anomalous zone is 3 standard deviations from the mean.

Negative SP Anomaly No. 1 trends east-southeast from 5 + 50N:12E to 3N:20E and peaks at -140 m.v. at 6N:12E. This anomaly is some

100 feet in width and extends over a length of 1000 feet and is the highest in amplitude and largest in extent.

Negative SP Anomaly No. 2 lies in the extreme southwest of the grid area and peaks at -140 m.v. at 5 + 50S:0 + 00. This anomaly is believed to be caused, at least in part, by the marked change in hydrologic-ground water conditions (swampy lowlands) that exist along Warren Creek valley.

Negative SP Anomaly No. 3 composed of two small peaks of -100 m.v. at 5S:14E and at 7S:16E.

Negative SP Anomaly No. 4 peaks at -100 m.v. at 0 + 50S:12E and trends east-west along the baseline. This anomaly is coincident with some surface copper mineralization. Small patches of weakly anomalous response trend along the length of the baseline out from the anomaly.

E-3 SOIL DESCRIPTION:

Soil colours vary from black to grey and from a light brown through red brown to dark brown. The soil was variously

classed as gravelly sand, rocky sand, sandy, and clayey. In some cases a high proportion of organic material was noted in the sample. When this occurred a larger sample was taken to give a sufficient sized sample for analysis.

Soil horizons were developed sufficiently well to be recognizable in the timbered, less steep portion of the claim group that lies roughly to the west of line 10E.

On the remainder of the property, the soil horizons are poorly developed. Poor profile development is a result of the steep slope which causes a rapid rate of erosion. Also some of the soil in this area appears to have been transported from the soil covered area above the bluffs on the east side of the property.

The soil samples taken are mainly from the B horizon with some mixture of C horizon in a few cases.

E-4 GOLD RESULTS:

The gold content in soils is presented in contoured plan form as Figure 8 in the map pocket at the rear of this report. The inset diagram graphically displays the relative frequency distribution of the gold values.

The results vary from a high of 2.83 p.p.m. at 0 + 50S: line 16E to a low of 0.02 p.p.m. at 2N:Line 0. The arithmetic mean is 0.105 p.p.m. and the standard deviation is 0.07 p.p.m. The frequency distribution histogram is bimodal. The primary mode lies in the .06 to .08 p.p.m. class which encompasses 34 percent of the values, and the secondary mode lies in the .12 to .14 p.p.m. class which encompasses 25 percent of the values.

The following categories of gold content in soils are herein defined:

less than .10 p.p.m.	below average
.10 to .17 p.p.m.	weakly anomalous
.17 to .24 p.p.m.	moderately anomalous
greater than .24 p.p.m.	strongly anomalous

Strongly anomalous gold content in soils is present at station:

0 + 50S:16E	2.83 p.p.m.
8S:L 0	.68 p.p.m.
1S:L 8E	.24 p.p.m.
5 + 50N:L 10E	.24 p.p.m.

The value of .68 p.p.m. at 8S:L 0 is an isolated high in an area of generally low average values. The very high value of 2.83 p.p.m. at 0 + 50S:L 18E together with the .24 p.p.m. value at 1S:L 8E are part of a complex weakly to moderately

anomalous trend along the baseline. A subparallel trend of weakly to moderately anomalous response lies immediately north of this and includes the 0.24 p.p.m. value at 5 + 50N: L 10E.

E-5 COPPER RESULTS:

Results are presented in Figure 9 in the map pocket at the rear of the report and the inset figure shows the relative frequency distribution of the copper values. The results vary from a high of greater than 2000 p.p.m. at 1300E on the base line and at 0 + 50S on line 16E to a low of 6 p.p.m. at 5 + 00S on line 10E and at 2 + 00 and 2 + 50N on line 20E.

The arithmetic mean is 67 p.p.m. and the standard deviation is 95 p.p.m. The primary mode of the histogram is in the 51 to 75 p.p.m. class which encompasses 37.75 percent of the values. The distribution is skewed strongly to the right.

The following categories of copper soil content are herein defined:

less than 65 p.p.m.	background
65 - 150 p.p.m.	weakly anomalous
150 - 225 p.p.m.	moderately anomalous
greater than 225 p.p.m.	strongly anomalous

The geochemical copper plan shows four anomalous copper zones.

A strongly anomalous area lies along and near the base line from 8E to 14E and varies in width from 50 feet to 200 feet. This zone is surrounded by halos of moderately and weakly anomalous copper. The dimensions of the total anomaly is approximately 1000 feet long and 400 feet wide. This anomaly straddles the base line between 6E and 17E.

A second anomaly trends across a portion of the claim property in a northwest to southeast direction from approximately 3 + 00S on line 20 to 10 + 00N on line 8E. This anomaly is mostly weak, however there are two small moderate to strong anomalous zones near the northern edge of the grid. This anomaly varies in width from approximately 100 feet to greater than 600 feet and is 1,400 feet long.

A third weakly anomalous zone is situated between line 4E and 10E with its center at approximately 3 + 50S.

A fourth weakly anomalous zone is situated on the south side of the grid and is approximately 1,400 feet long and is 150 feet wide at its widest point but is still open to the south.

E-6 ZINC RESULTS:

The zinc soil sampling results are presented in contoured plan form as Figure 10. The inset diagram shows the relative frequency distribution of zinc values. The primary mode lies in the 80 to 89 p.p.m. class and the secondary mode lies in the 40 to 49 p.p.m. class. The distribution is skewed to the left.

The results vary from a low of 10 p.p.m. at several stations to a high of 120 p.p.m. at 8 + 50S:L 0. The arithmetic mean is 74 p.p.m. and the standard deviation is 26 p.p.m.

The following categories of zinc are herein defined:

less than 75 p.p.m.	below average
75 - 100 p.p.m.	above average but sub-anomalous
100 - 125 p.p.m.	weakly to moderately anomalous

Patches of greater than 100 p.p.m. zinc extend along the baseline in a similar manner to that of gold and mercury. Anomalous zinc is also present between lines 10 and 16E, 200 feet north of the baseline and along most of lines 0 and 2E south of station 2N.

Overall zinc response is very patchy and there is generally poor definition of anomalies.

E-7 MERCURY RESULTS:

The mercury content in soils is presented in contoured plan form as Figure 11 (Map Pocket at rear of report). The inset diagram graphically displays the relative frequency distribution of the mercury values. The primary mode lies in the 11 - 20 p.p.b. class which encompasses 26 percent of the values, and the distribution is skewed strongly to the right.

The results vary from a high of 470 p.p.b. at 0 + 50S:L 16E to a low of 10 p.p.b. at several stations. The arithmetic mean is 31 p.p.b. and the standard deviation is 19 p.p.b.

The following categories of mercury content in soils are herein defined:

less than 30 p.p.b.	below average
30 - 50 p.p.b.	weakly anomalous
50 - 70 p.p.b.	moderately anomalous
greater than 70 p.p.b.	strongly anomalous

A weakly to moderately anomalous zone trends along the baseline and contains several peaks of strongly anomalous mercury content.

Several moderately and strongly anomalous values lie between lines 10E and 14E to the north of the baseline.

Moderately to strongly anomalous mercury values also exist to the south of the baseline between lines 2E and 8E.

PART F: CORRELATION

Figure 12, the Compilation Map located in the map pocket, shows the various pertinent geophysical and geochemical features.

The known mineralized zone, which lies along the base line between 16 and 10E is characterized by

(a) a weak self potential anomaly,
(b) a relatively strong geochemical copper anomaly,
and(c) a fairly weak electromagnetic conductor.

On the north flank of the mineralized zone is a plus 100 p.p.m. Zn high, a plus 50 p.p.b. mercury high and a plus 0.17 p.p.m. gold in soils high.

No other area is characterized by geophysical and/or geochemical features which are exactly identical, but there are areas of definite coincident anomalies. There is both geological and geochemical (copper) evidence to suggest that mineralization persists to the north of the presently known zone, and there are also areas that require further investigation several hundred feet to the north of the main copper anomaly especially in the area characterized by high gold, mercury and anomalous SP response.

A correlation table of the various metals determined in the samples of soil is presented on the next page.

Coefficient of Correlation:

	Au	Zn	Cu	Hg
Au		+0.165	-0.035	+0.232
An	+0.165		+0.24	-0.43
Cu	-0.035	+0.24		+0.35
Hg	+0.232	-0.43	+0.35	

Note: A coefficient of correlation of +1.0 indicates perfect positive correlation, one of 0.0 (or close to 0.0) no correlation or randomness, and one of -1.0 a perfect inverse correlation (i.e. if one variable increases the second variable decreases).

Except for the moderately strong inverse correlation between mercury and zinc, the correlations are on the whole rather weak. There does appear to be a weak correspondence between copper and mercury and therefore some suggestion that the two share a similar source or origin. On the other hand, it appears as if zinc is most definitely not related to mercury. There is a weak correlation between mercury and gold, and therefore a slight suggestion that the two share a similar geologic setting.

Respectfully submitted,

Frank P. O'Grady, B.Sc.

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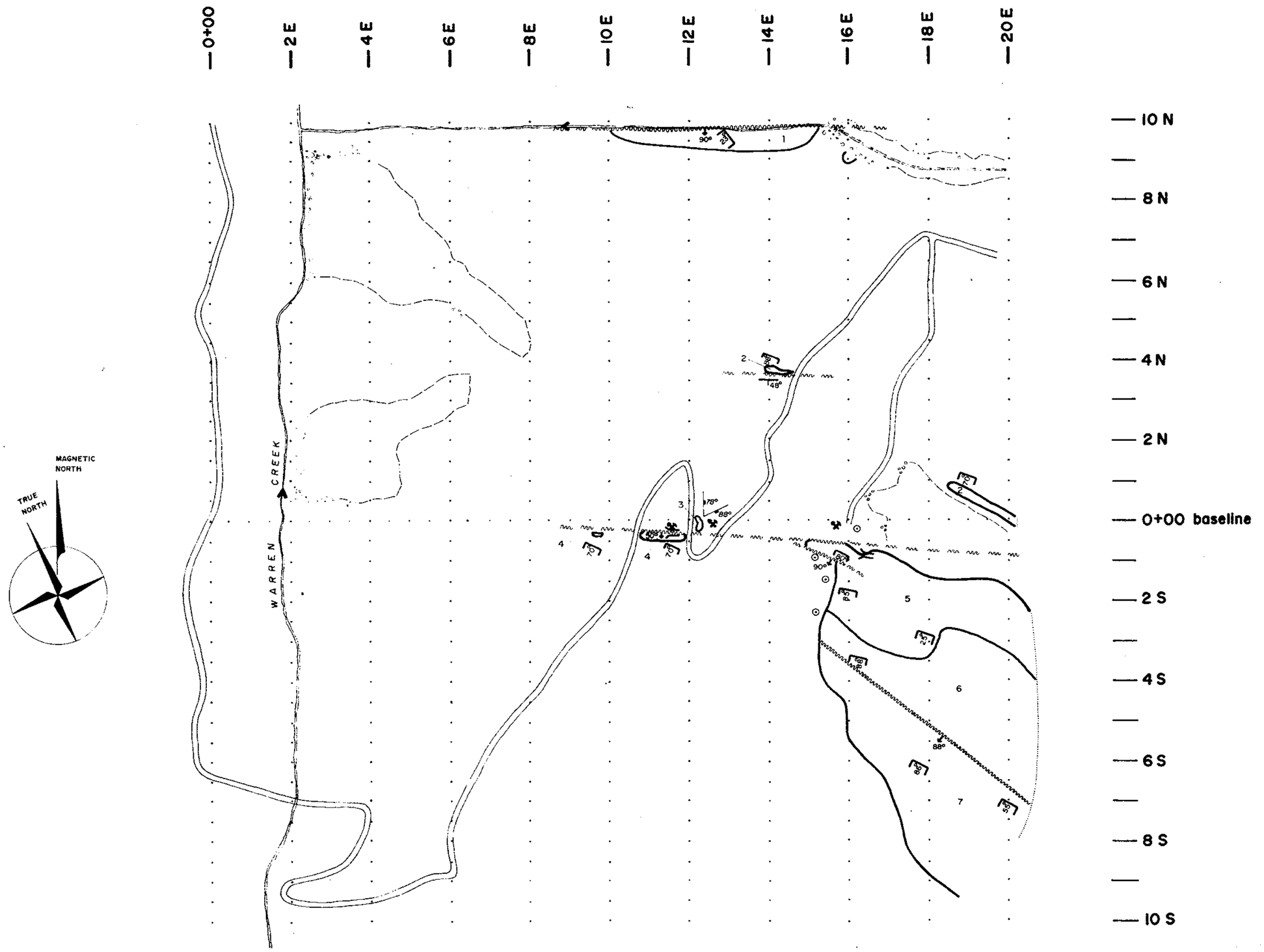
D. R. Cochrane, P.Eng.,
Delta, B.C.

A. Scott, B.Sc.



Legend

- ROAD
- CREEK
- ROCK SLIDE AND BOULDERS
- SHOWINGS (Cu)
- OLD TUNNEL
- FAULT
- FAULT ASSUMED
- CLEAVAGE
- BEDDING
- DIAMOND DRILL HOLE
- JOINTS
- OUTCROP
- 7 THIN BEDDED SHALES
- 6 SILICIFIED QUARTZ PEBBLE CONGLOMERATE
- 5 LIMEY TALC SCHIST
- 4 TALC PHYLITE
- 3 SILICIFIED QUARTZITE
- 2 INTERBEDDED SHALEY CONGLOMERATE AND SHALEY QUARTZITE
- 1 SHALE

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GEOLOGY MAP

scale : 1 inch = 200 feet

200 100 0 200
SCALE IN FEET

Department of
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figure 3

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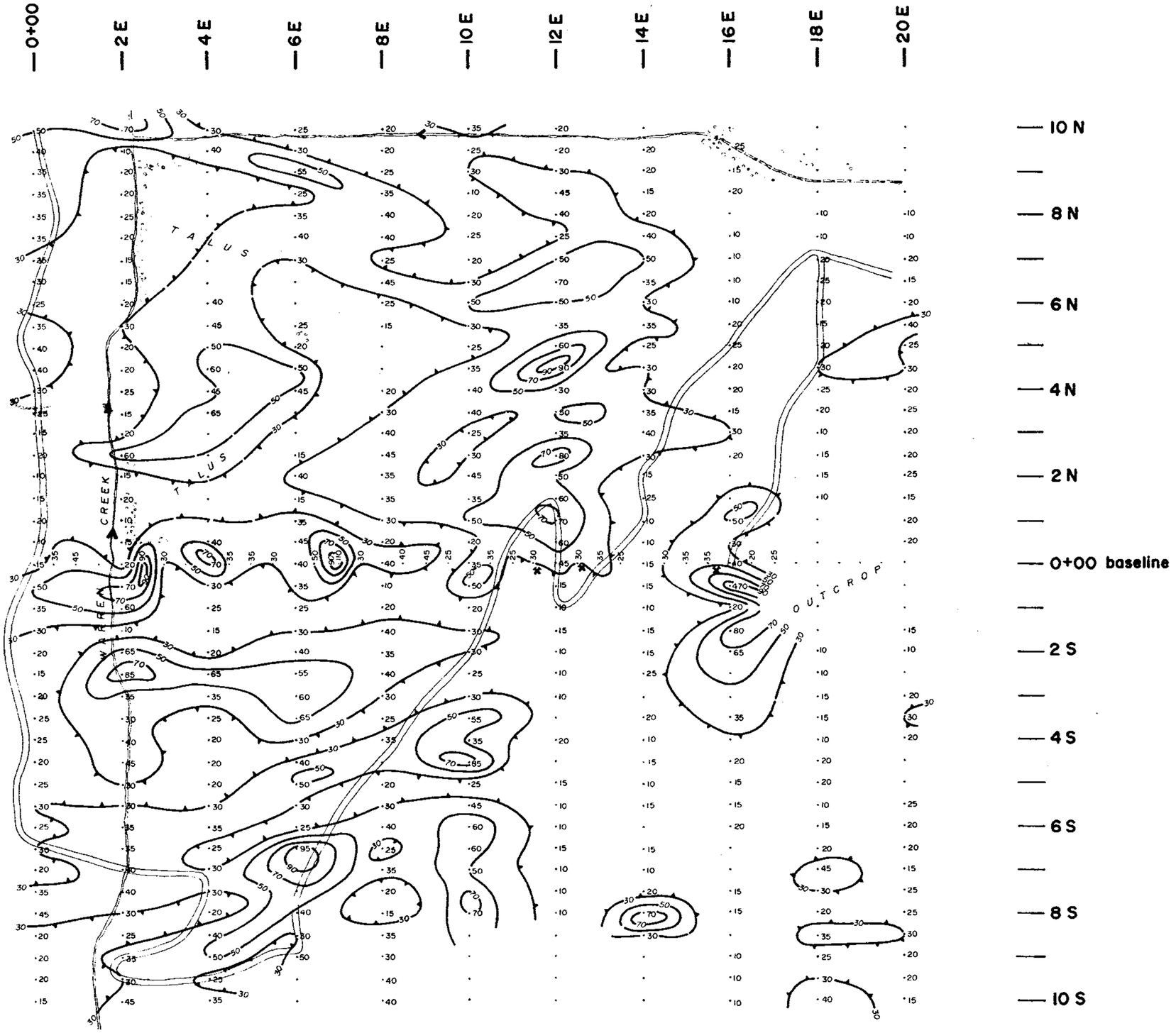


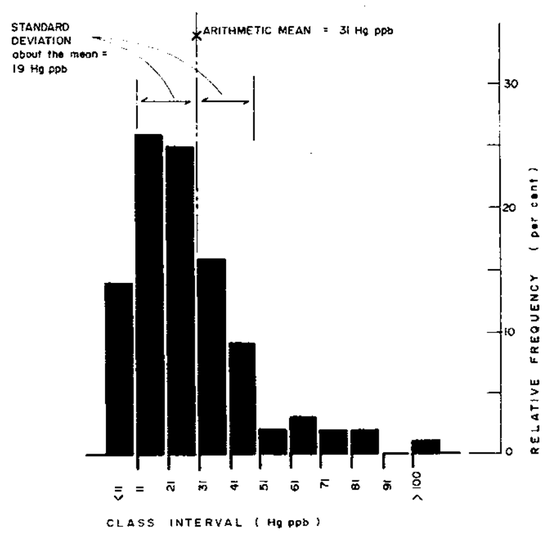
Legend

- ROAD
- CREEK
- ROCK SLIDE
- SHOWINGS

VALUES IN " Hg ppb "

30 — 30, 50, 70, 90 Hg ppb CONTOURS

Relative Frequency Histogram



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NO. 4514 MAP #11

GEOCHEMICAL SOIL SURVEY - MERCURY

scale - 1 inch = 200 feet

200 100 0 200
SCALE IN FEET

figure 11

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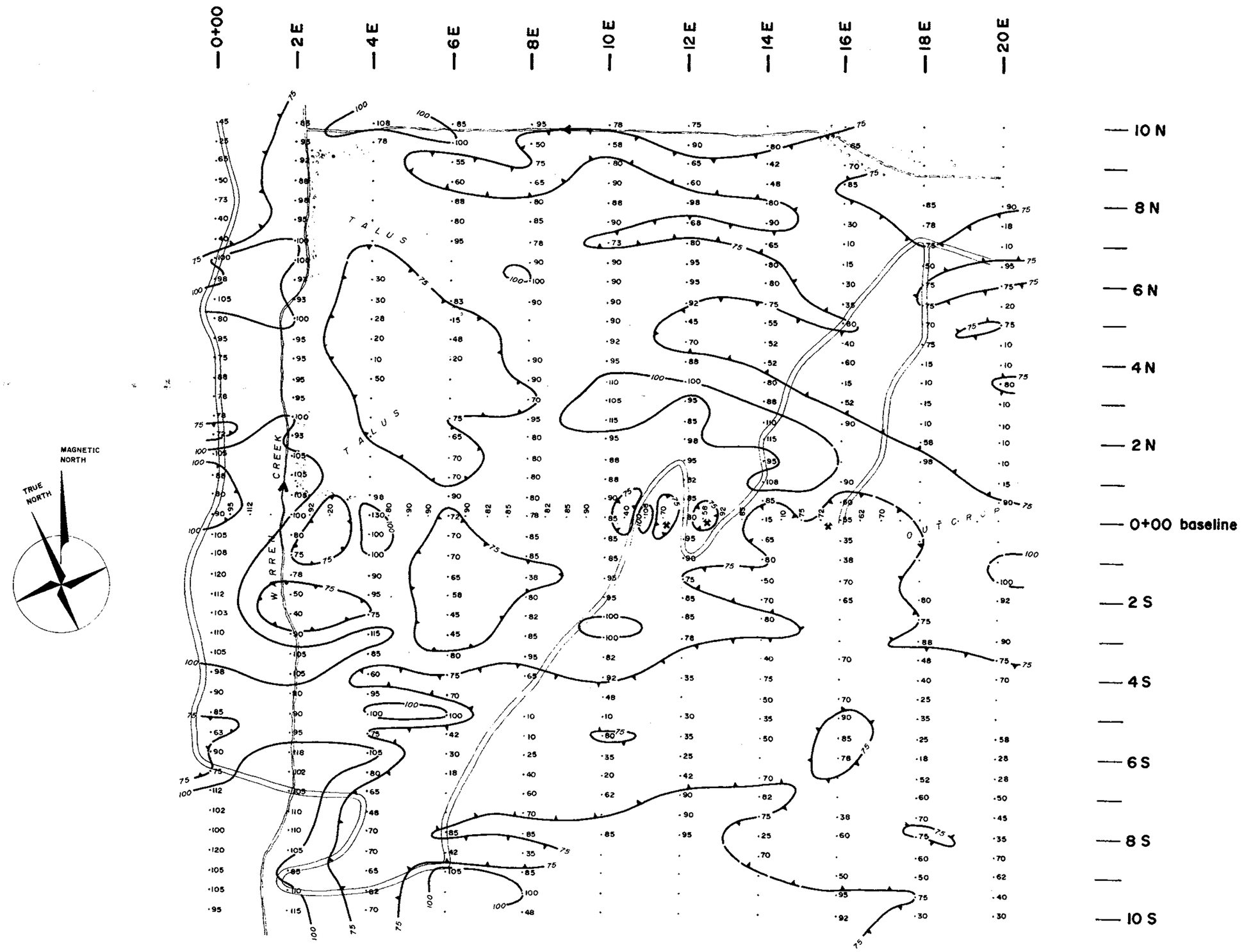


Legend

ROAD

CREEK

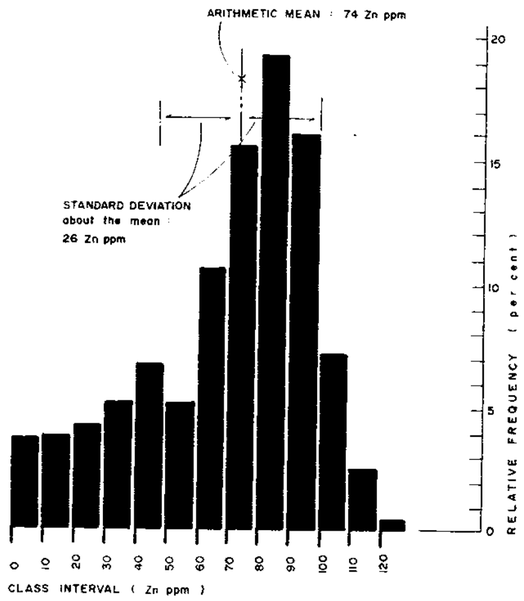
ROCK SLIDE

SHOWINGS

VALUES IN " Zn ppm "

75, 100 Zn ppm CONTOURS

Relative Frequency Histogram



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GEOCHEMICAL SOIL SURVEY - ZINC

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scale : 1 inch = 200 feet

200 100 0 200
SCALE IN FEET

figure 10

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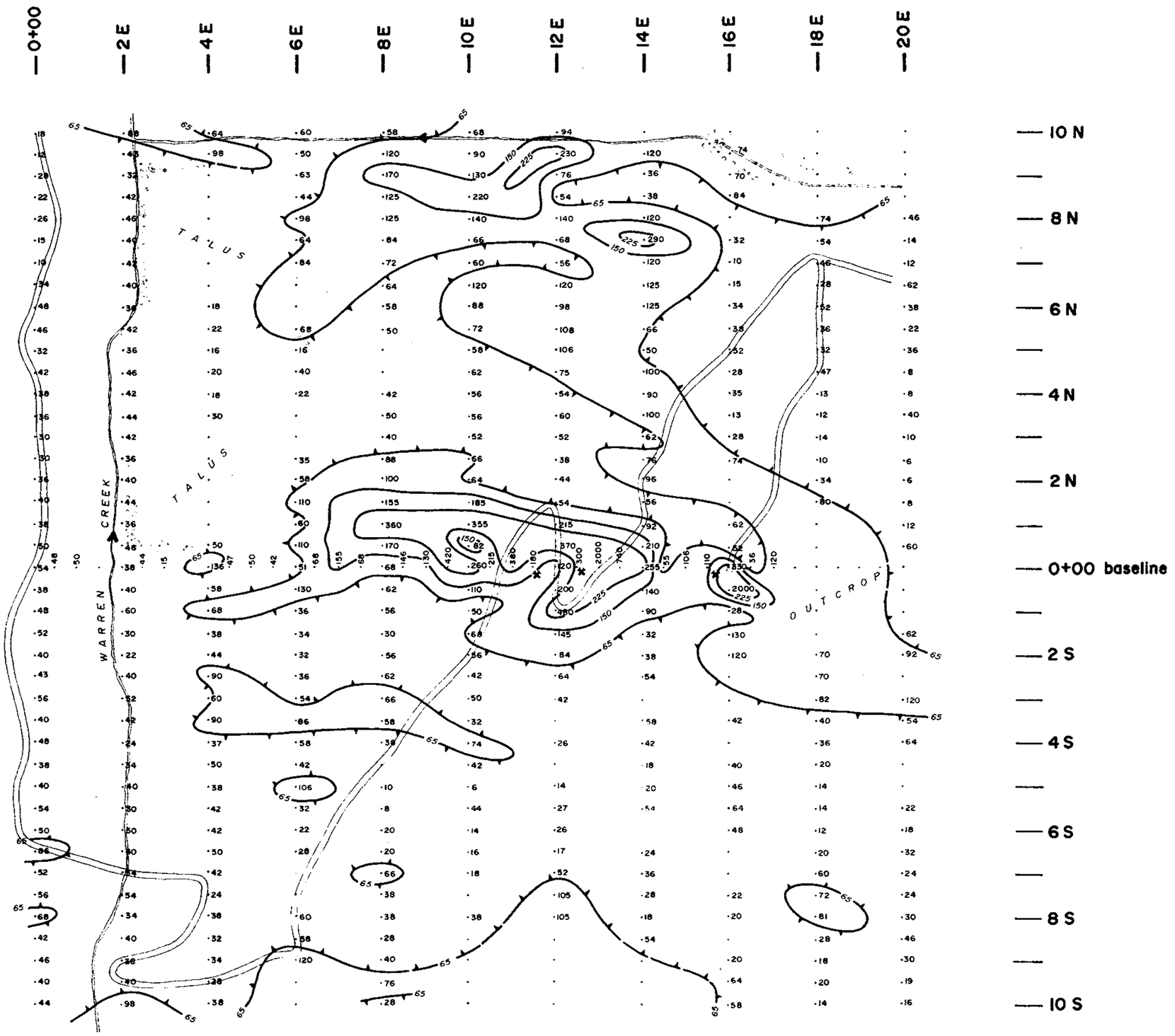


Legend

ROAD

CREEK

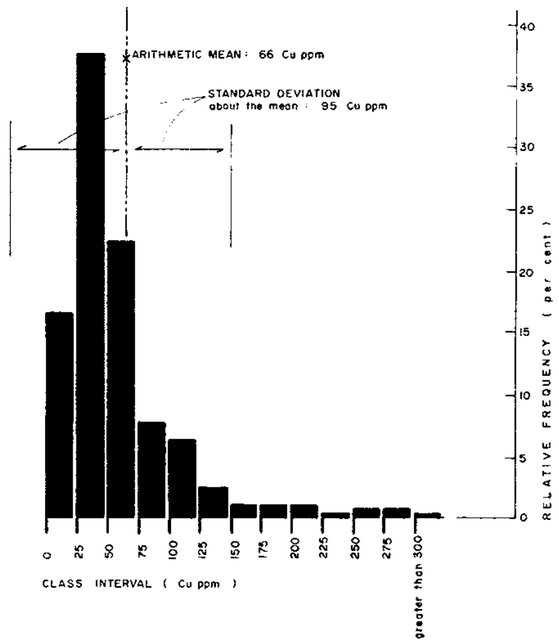
ROCK SLIDE

SHOWINGS

VALUES IN "ppm"

65, 150, 225 Cuppm CONTOURS

Relative Frequency Histogram



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GEOCHEMICAL SOIL SURVEY - COPPER

scale : 1 inch = 200 feet

200 100 0 200
SCALE IN FEET

figure 9

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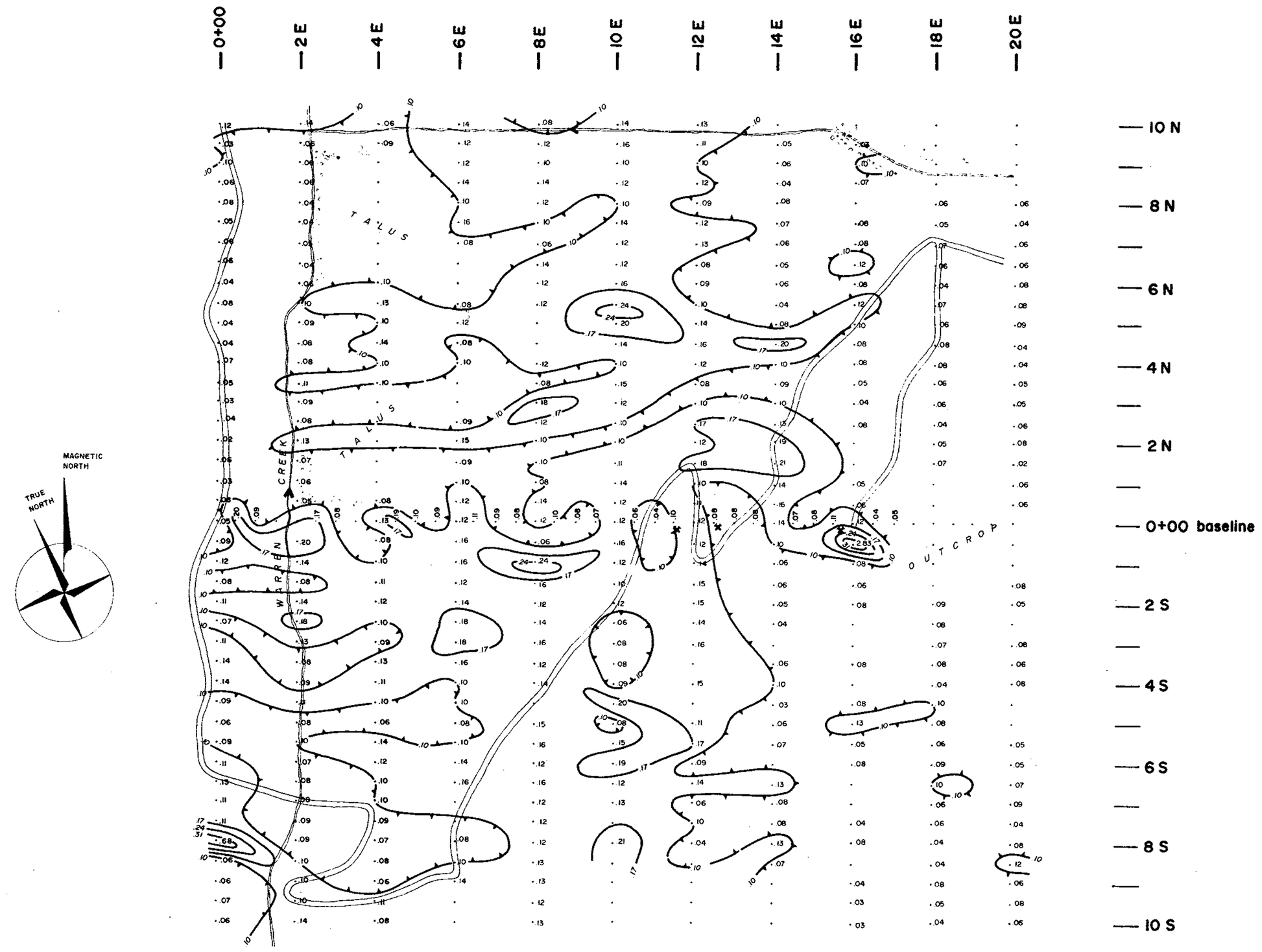


Legend

ROAD

CREEK

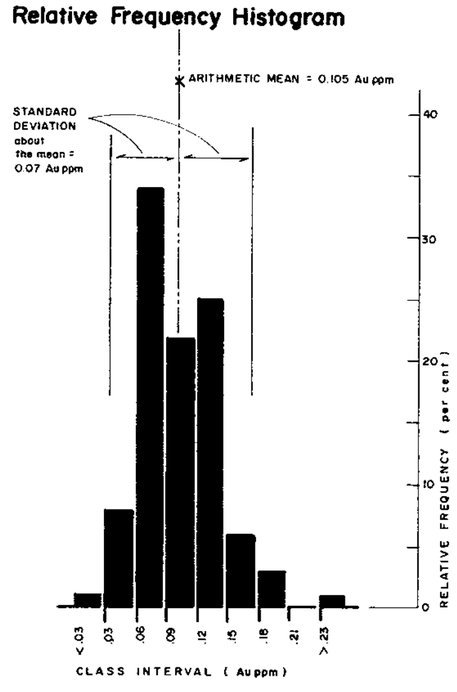
ROCK SLIDE

SHOWINGS

VALUES IN "Au ppm"

.10 , .17, .24 , .31 Au ppm CONTOURS

Relative Frequency Histogram



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GEOCHEMICAL SOIL SURVEY - GOLD

scale : 1 inch = 200 feet

200 100 0 200
SCALE IN FEET

figure 8

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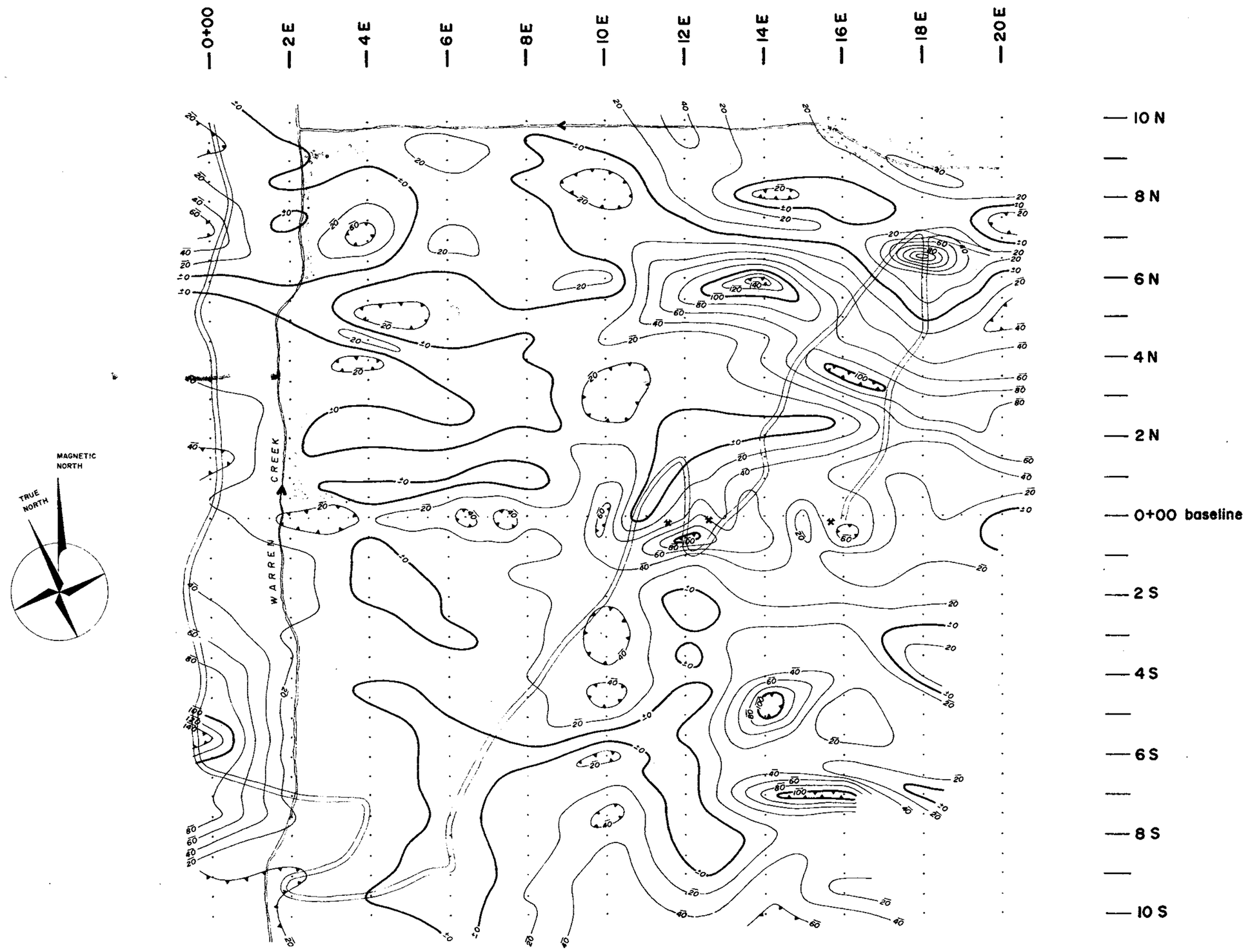

Legend

- ROAD
- CREEK
- ROCK SLIDE
- SHOWINGS
- 20 mv CONTOUR INTERVAL
- ±0, 100 mv CONTOURS

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ISO POTENTIAL PLAN

scale : 1 inch = 200 feet

200 100 0 200
SCALE IN FEET

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figure 7

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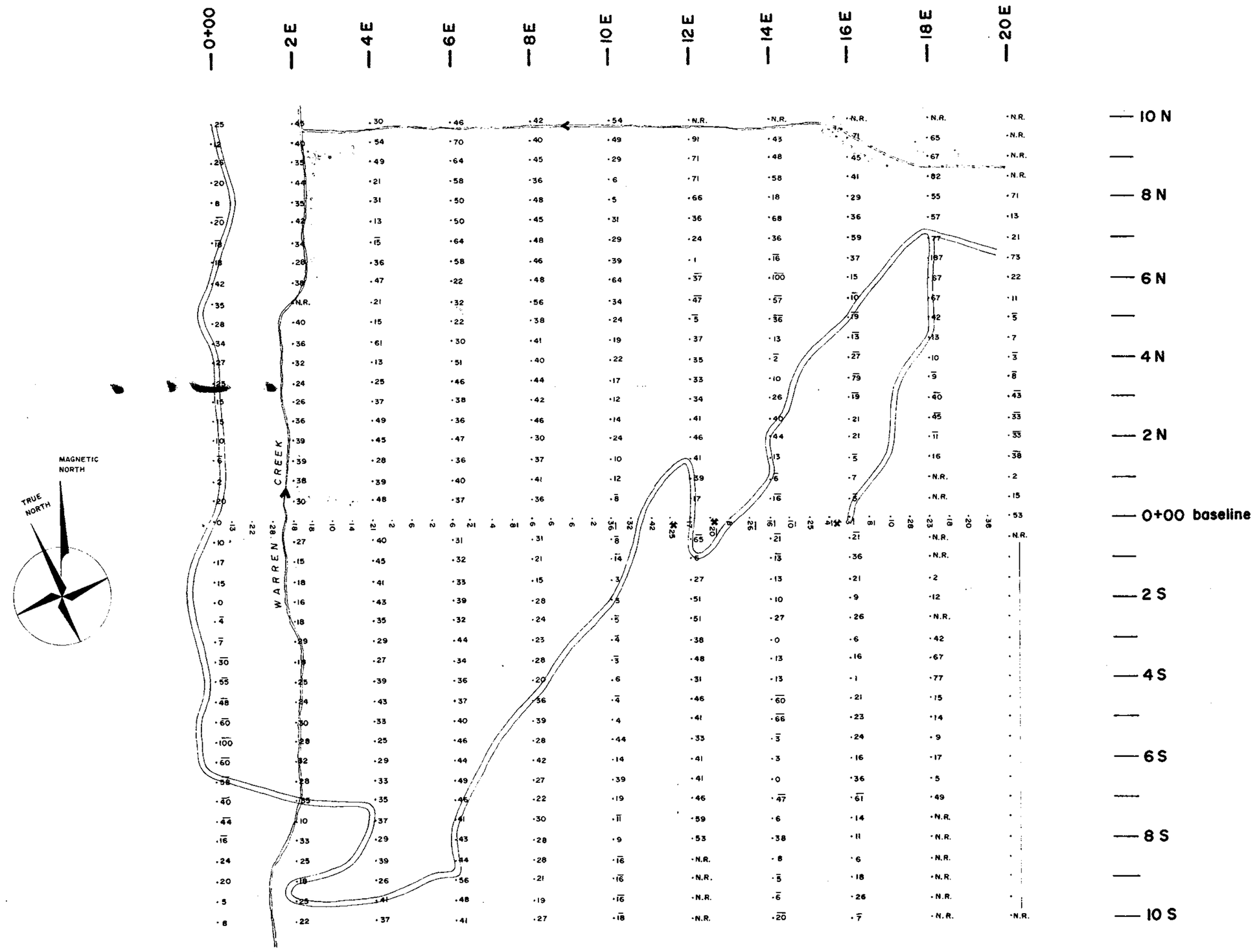


Legend

ROAD

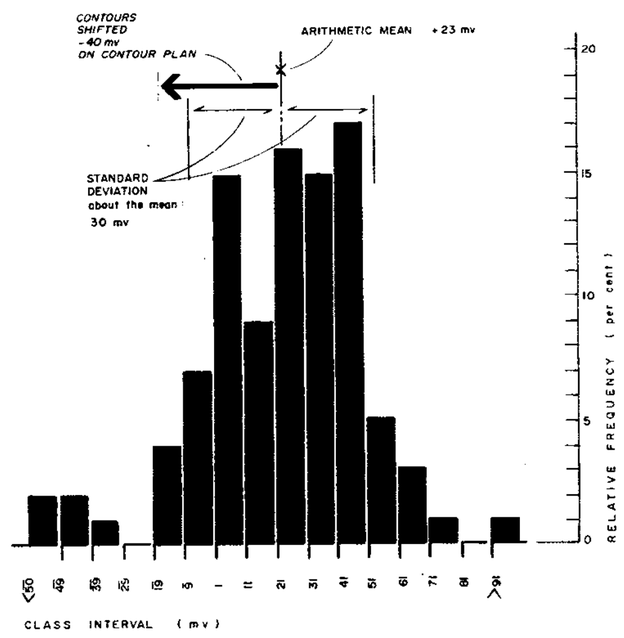
CREEK

ROCK SLIDE

SHOWINGS

VALUES IN " mv "

Relative Frequency Histogram



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SELF POTENTIAL VALUES

scale : 1 inch = 200 feet

SCALE IN FEET

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figure 6

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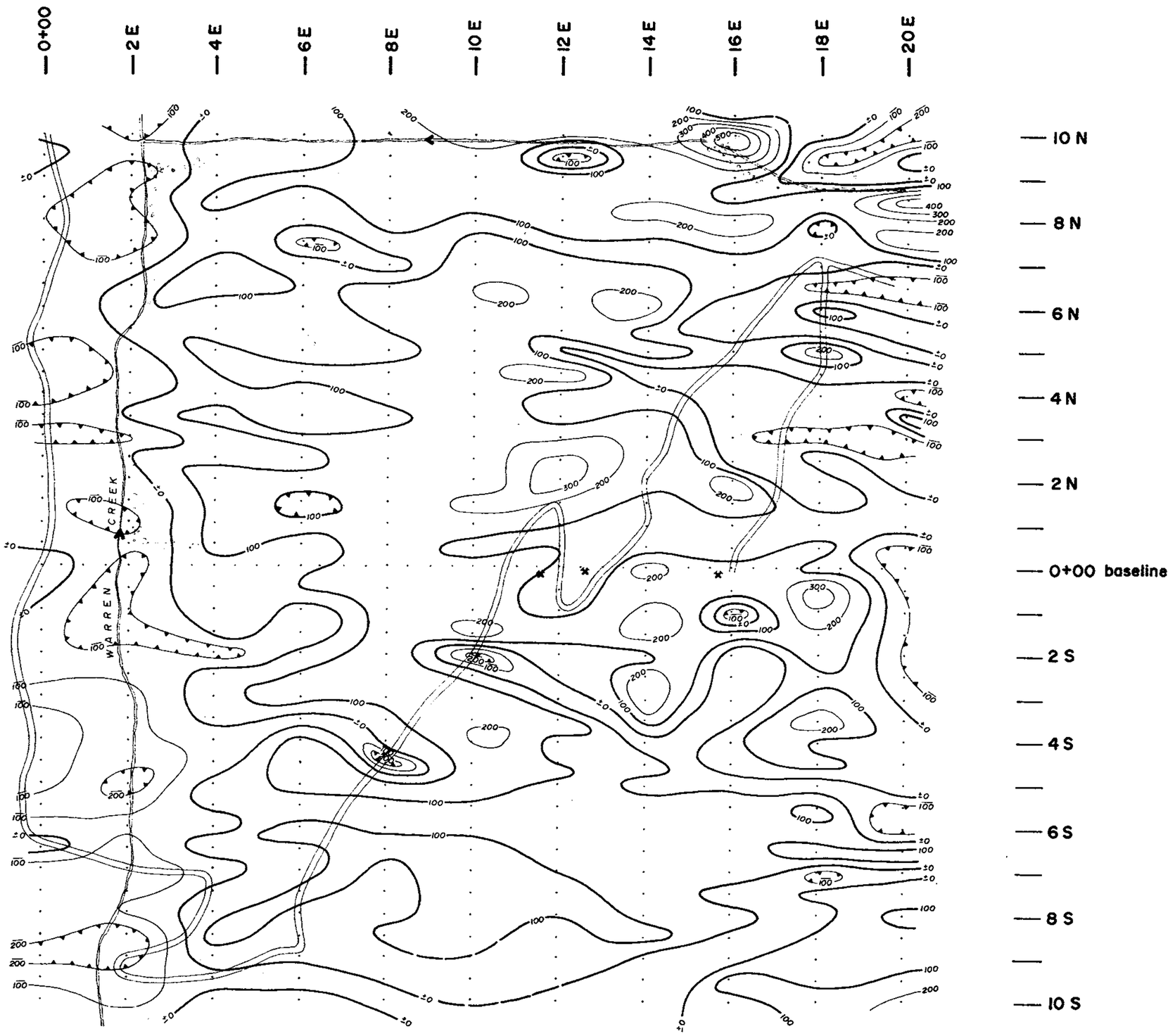

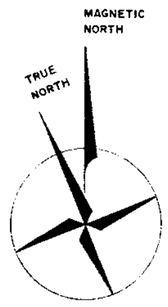

Legend

ROAD

CREEK

ROCK SLIDE

SHOWINGS

100 gammas CONTOUR INTERVAL

±0, 100 gammas CONTOURS

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ISOMAGNETIC PLAN

scale - 1 inch = 200 feet

200 100 0 200
SCALE IN FEET

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figure 5

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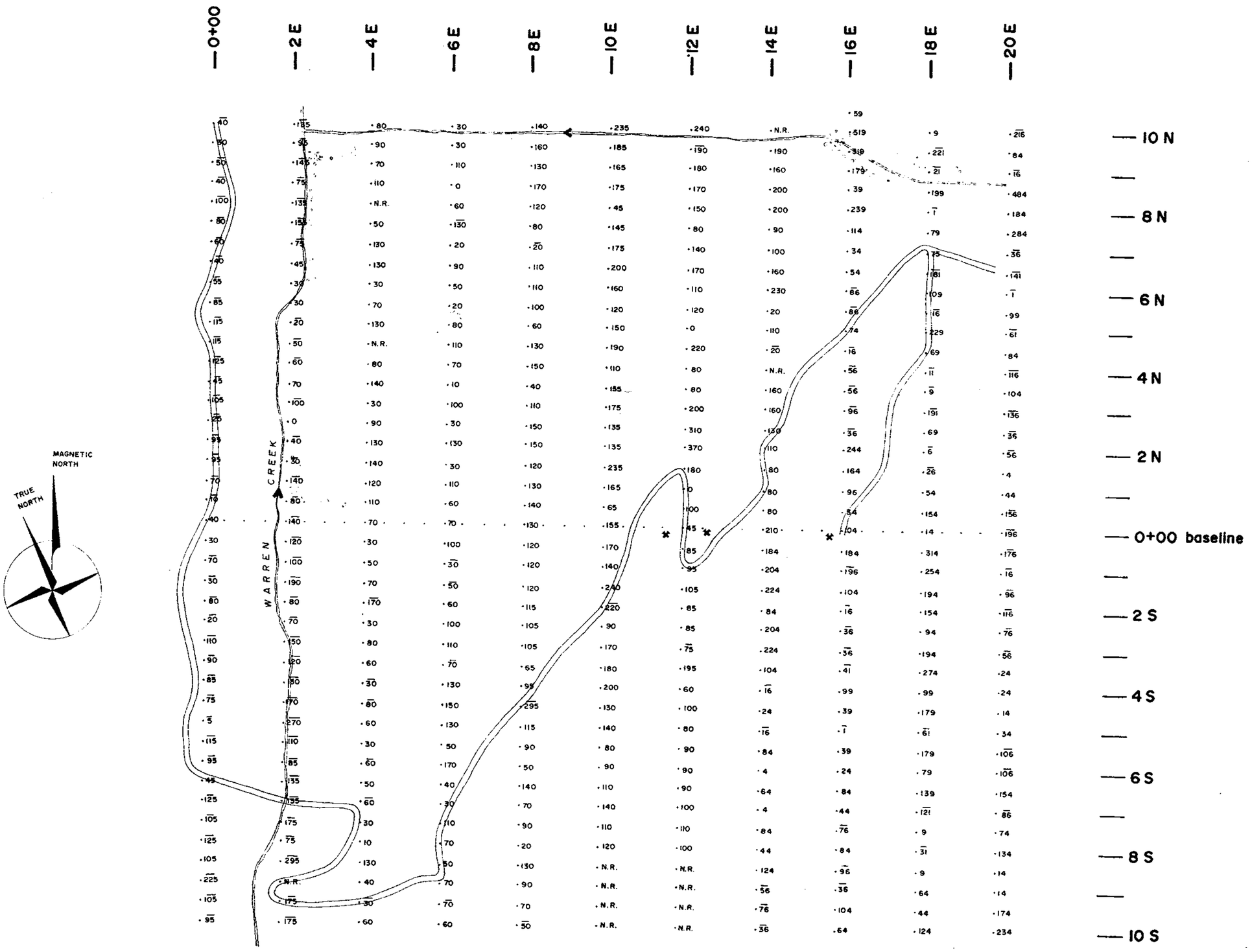


Legend

ROAD

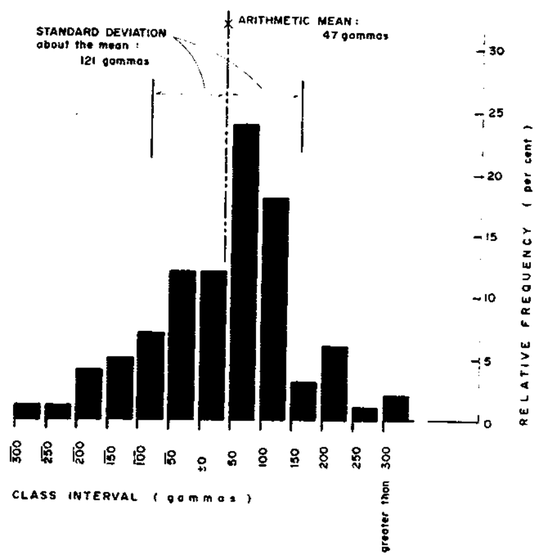
CREEK

ROCK SLIDE

SHOWINGS

VALUES IN " gammas "

Relative Frequency Histogram



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MAGNETOMETER VALUES

scale - 1 inch = 200 feet

SCALE IN FEET

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figure 4

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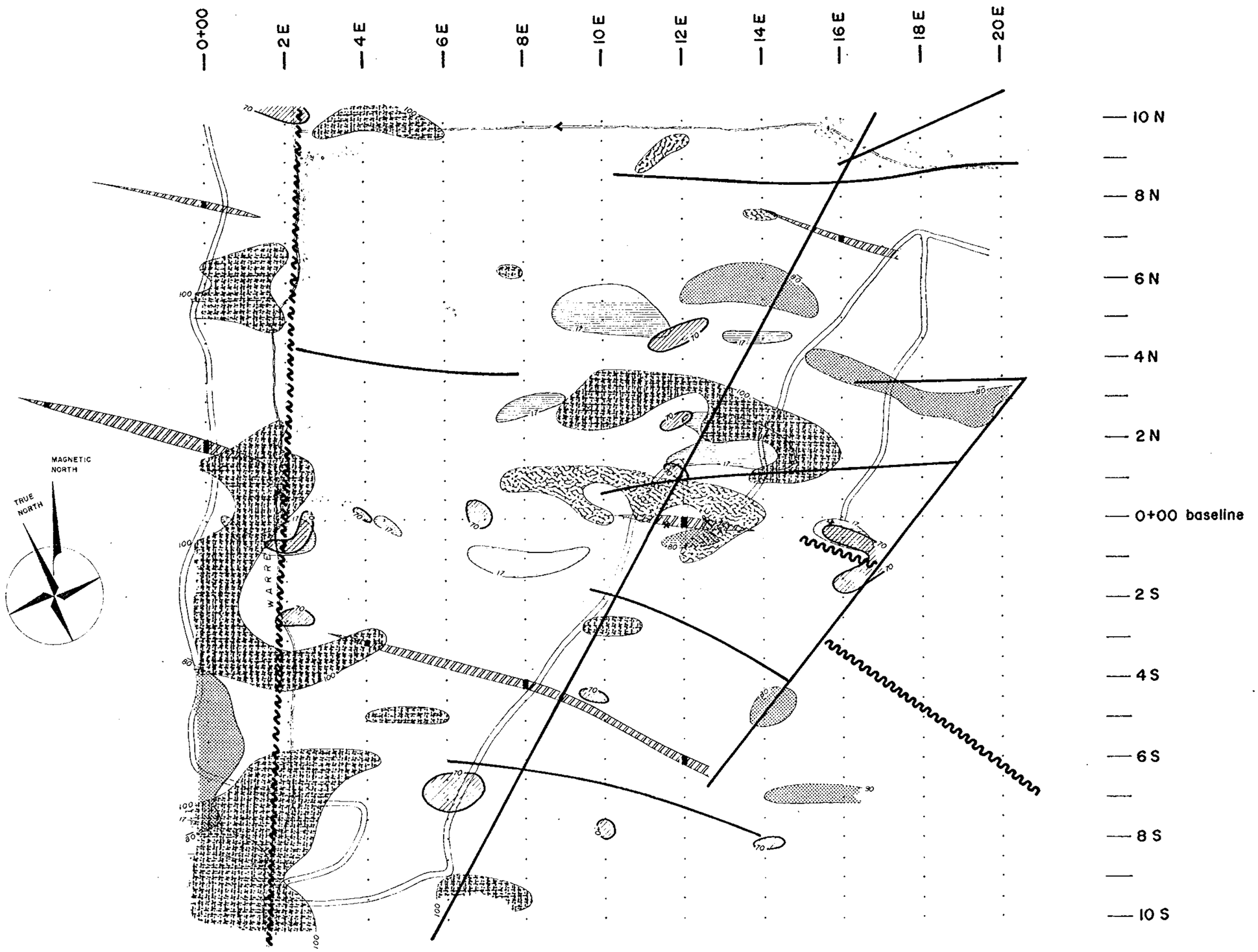

Legend

- ROAD
- CREEK
- ROCK SLIDE
- SHOWINGS
- Cu IN EXCESS OF 225 ppm
- Zn IN EXCESS OF 100 ppm
- SIGNIFICANT SELF POTENTIAL LOWS
- Au IN EXCESS OF 17 ppm
- Hg IN EXCESS OF 70 ppb
- FAULT (INDICATED)
- FAULT (DEFINED)
- E.M CONDUCTORS WITH STRENGTH INDICATED BY WIDTH
- MAGNETIC TRENDS

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COMPILATION

scale : 1 inch = 200 feet

200 100 0 200
SCALE IN FEET

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NO. 4514 MAP #12

figure 12

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