GEOLOGICAL, AIR PHOTO INTERPRETATION, GEOCHEMICAL, AND GEOPHYSICAL REPORT ON THE

NED CLAIM
KAMLOOPS MINING DIVISION, B.C.

Location

1. NTS Map No. 92I/10
   Military Grid Reference 720 130

2. 25 km W. of Kamloops, B.C.

3. Latitude 50° 38.5' N
   Longitude 120° 34'

By

Dr. A. B. L. Whittles, P. Eng.
Geonics Consulting Services Ltd.
(Director, Rhino Resources Ltd.)
1989 - 1990

TABLE OF CONTENTS

LIST OF FIGURES

REPORT SUMMARY

This report is a summary of some preliminary geological, geochemical, air photo, and geophysical investigations of the Ned Claim Group some 25 km west of Kamloops, B.C. Some 29 soil and rock I.C.P. values are reported, as well as two copper and gold assays.

The results suggest that there may be a mineralized zone running NW/SW diagonally across the property from the LCP to Ned Roberts Lake. This zone seems to be in the Nicola Group rocks, and possibly in some intrusive phases. It is perhaps contemporaneous with the Iron Mask mineralization, as the Afton Mine is only short distance away. As this zone is in a soil covered, low lying area, it is the subject of the geophysical part of this report.

An unusual result of the present report is the possibility of an epithermal precious metal deposit that post-dates the Iron Mask mineralization. This is found in the Kamloops volcanics. Good As, Sb, Bi, Ba, Cu, and Ag results were obtained in several I.C.P. analysis. One copper assay returned 0.79%. This zone seems to be centered on a silicified hill, 300 m north of the north end of Ned Roberts Lake. This silicified area may represent the upper part of an epithermal system.

1. PROPERTY LOCATION, ACCESS, AND DESCRIPTION

The Ned Claim group consists of 12 mineral claim units located approximately 25 km due west of Kamloops, B.C. (See Figure 1 and 2.)

Access is attained by leaving Kamloops on the Cocahalla Highway, branching off on Highway 1 to Cherry Cr. road. (The distance from the 4 Seasons Motel in East Kamloops to Cherry Cr. road is 23 km.). 3 km south of the highway on Cherry Creek road one enters the claim group. This occurs at the Dominic Lake road intersection. The LCP lies to the west on this road. The main road continues SE past Ned Roberts Lake, effectively diagonally across the claim group from NW to SE corners.

The claim group topography consists of pleasant low rolling hills with intermixed open fields and draws with sparse tree cover.

2. OWNERSHIP

The Ned Claim Group is owned by Rhino Resources Inc. and consists of 12 metric units, record number 8863. Upon acceptance of this report, the expiry date will be September 22, 1993.

3. HISTORY

3.1 General

Work in this area started before the turn of the century, and has continued to the present.

Minor production was recorded on several properties prior to the opening of the Afton Mine. The Iron Mask and Frin orebodies produced over 180,000 tons averaging 1.5% copper (plus silver and gold) between 1904 and 1928. The Copper King Mine produced 7500 tons averaging 3% copper and 0.14 oz./ton gold.

Two old pits/trenches/adits (?) are located on the central part of the Ned Group. These appear to be about the same age of the other old working. Good copper mineralization is present, but the history of the workings is not known.

The Federal Government released aeromagnetic maps of the area in 1968.

The Afton orebody was discovered in 1971 and developed into a major open pit mine in 1977. This mining has continued until the present. Start up reserves (Kwong, 1987) were about 31 million tonnes, at 1% copper, 0.6 gram/tonne gold, and 4.2 grams/tonne silver.

Exploration work has continued all around the Iron Mask Batholith. The more recent B.C. Assessment Reports Covering the Ned Group were obtained and reviewed (No. 2262, 1970; No. 3593, 1972; No. 5852, 1976.)

3.2 <u>Assessment Report 2262</u>
(Holcapek, 1970)

The magnetic surveys in this report show a NW/SE trend parallel to the trend of the mineralized intrusive (the Iron Mask Batholith) in which the Afton Mine is located. (Kwong, 1987). The irregular "bulls-eye" pattern is typical of magnetized volcanic rocks; in this case, the Kamloops Group. Weaker, but still NW/SE trending magnetic values, occur in the SW half (south of the road) of the Ned Claim Group this may represent either sedimentary rocks, or weakly - magnetized intrusive rocks.

The geological mapping information present in this report could not be evaluated at this time since the reproduction of the report is of poor quality. The original reports will have to be examined in detail. This report suggests intrusive units are present in the NE part of the Ned Group (north of the road).

The geochemical data covers the NE part of the Ned Group. One very strong anomaly (561 ppm over a background of approximately 60 ppm) was found and may correspond to the type of copper mineralization reported farther to the north. An old adit (?) exploring some mineralized calcite veins is near this location and may be the source of this anomaly (see Report 5852). The trend of the geochemistry anomalies is NW/SE which gives one parameter of the exploration model discussed later; however, the odd "bullseye" pattern of the geochemical plot casts considerable doubt upon the validity of the entire survey.

3.3. <u>Assessment Report 3593</u>
(Sandner, 1972)

This report is mainly concerned with the results of an I.P. survey (chargeability, apparent resistivity, and S.P.) covering part of the NE half of the Ned Group.

A brief review of the report suggest that although the conclusions (high chargeability, low resistivity, high S.P. over single zone) <u>do not</u> agree with the plotted data, (high chargeability, <u>high</u> resistivity, mostly <u>negative</u> - high - S.P. values) some general trends are suggested.

An anomalous (4 to 6 times background) chargeability zone runs NW/SE in the vicinity of the NW end of Ned Roberts Lake, then swings directly north for about 6000 feet.

Apparent resistivity results suggest a similar high (not low) anomaly somewhat displaced. Near Ned Roberts Lake this high zone is south of the chargeability high. About 2000 feet north of the west end of the lake, a resistivity high coincides with a chargeability high. There is just a hint of two NW resistivity low zones, one south and one north of the road.

Note that one would normally expect that a resistivity low would correspond to a more conductive mineralize zone (eg. possible disseminated sulfphides indicated by a chargeability high zone). Since this is not the case, it is possible that there is a northerly running fracture zone (as indicated also on the air photos) which is mineralized and also silicified (giving the higher resistivity values).

The SP results in this report are very difficult to assess without access to the original data, since it is not known whether the data represents cumulative SP values, first derivative SP values, or raw differential SP data. It is suspected from the wording of the report that it is the latter; in this case, it would need to be converted to one of the former values, a time consuming task complicated by an uncertainty in the original orientation/polarity of the potential electrodes.

3.4 Assessment Report 5852
(Reed, 1976)

The information in this particular report was for ground now covered mainly by the NE part of the Ned Claim Group. The report was completed by Afton Mines Ltd. because of the different scales used in this report compared to the two previous reports, and the limited time available, comparisons with previous work is difficult and preliminary; however, several general features do seem clear.

The geological map indicates an old adit is located on the Ned Claim Group. This adit was apparently exploring a set of mineralized calcite veins; however, these appear to be in the later Kamloops volcanics and not in the Nicola rocks. On the other hand, they may represent remobilized mineralization that occurred when Faults F1 and F2 offset the inferred anomalous zones to the south of the road. The geology available in the various reports needs to be correlated, replotted, and then rechecked on the ground.

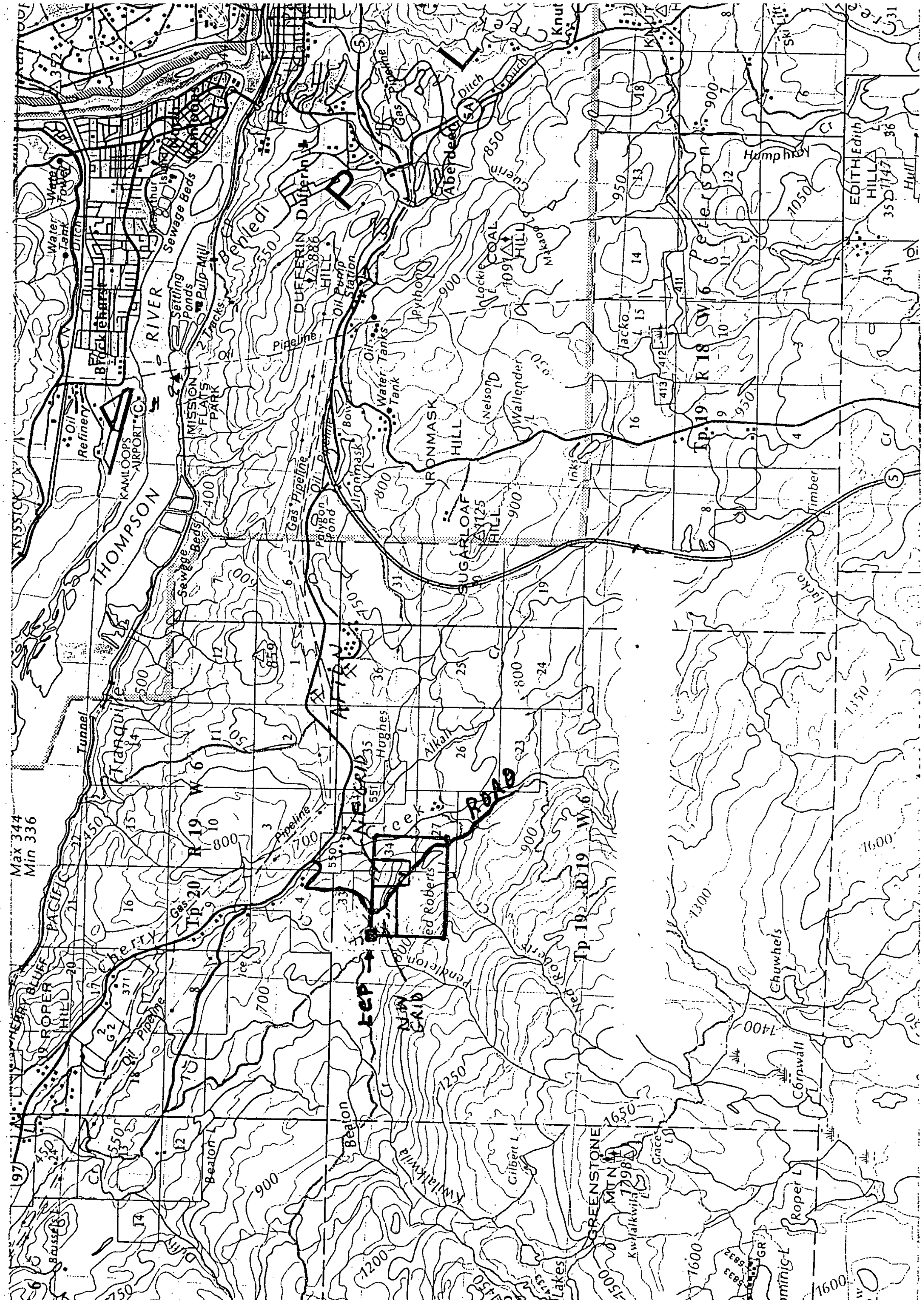

Figure 1: Ned Claim Group Location

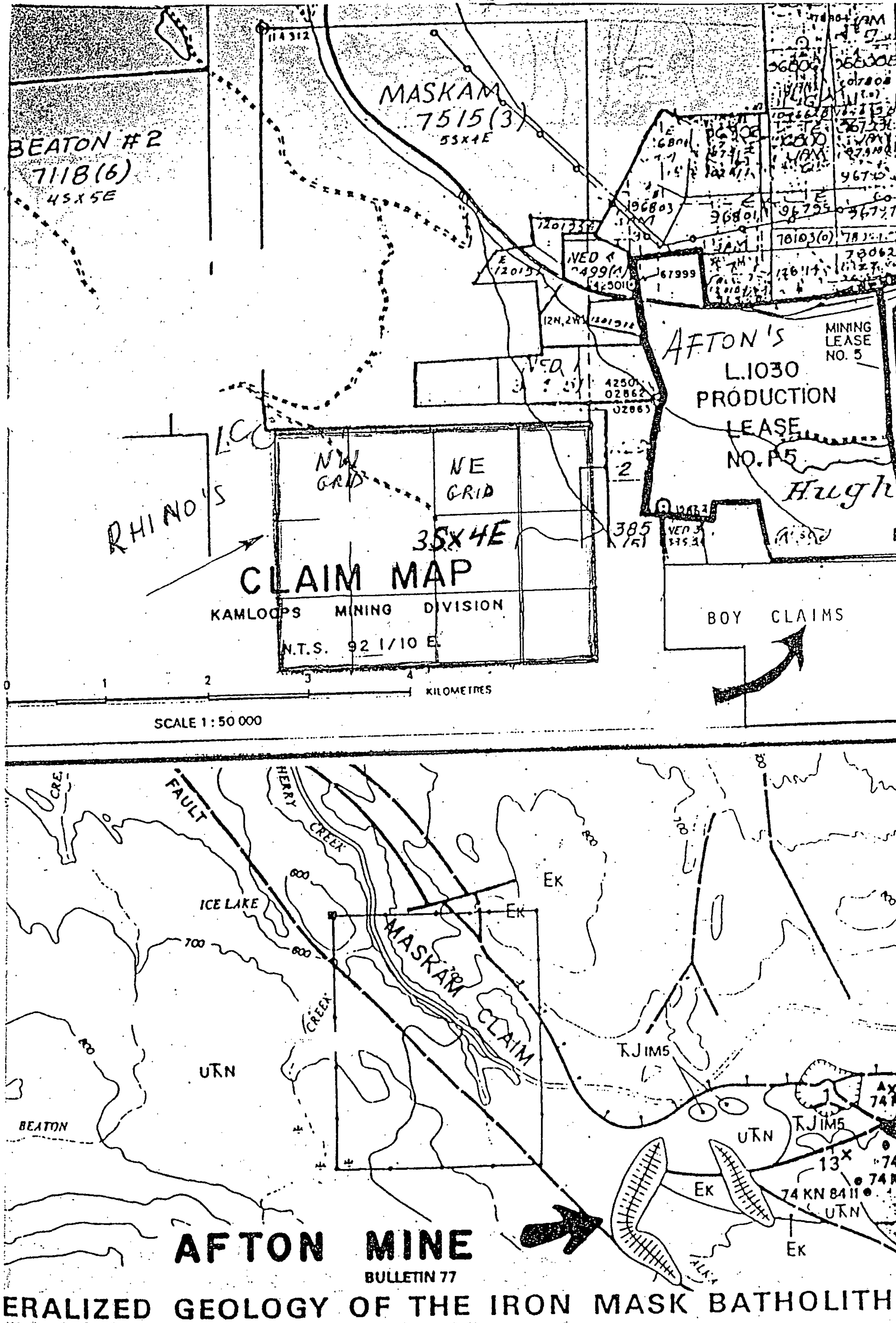

Figure 2: Relation of Ned Claim Group to Other Claims in the Area

The geochemical results also need to be correlated for the various reports - there appears to be some differences, although a NW/SE trend can be inferred.

The VLF-EM data also confirms the NW/SE structure; in addition, a NNE trend is suggested. This latter trend agrees with the northerly IP trends in report 3593, and the air photo analysis.

3.5 1989 Geophysical Field Work

Some preliminary geophysical results were obtained in 1989, but since the claims were restaked these results were not previously reported. Although no assessment credit is claimed for the field work, the major part of the plotting analysis took place in the 1989 - 1990 assessment year and is included in this report.

4. GENERAL GEOLOGY AND MINERALIZATION

4.1 General Comments

There are a variety of geological information sources available, many of these provided in the bibliography of Kwong (1987). Additional information was obtained from Holcapek (1970) and Reed (1976).

4.2 Regional Geology

The Ned Claim Group lie in the southern part of the Quesnel trough, which is also known as the Nicola belt. As Kwong (1987) notes: "The Quesnel trough, located in the Intermontaine structural belt of British Columbia, is 1200 kilometres long, 30 to 60 kilometres wide and consists of Lower Mesozoic volcanic and related rocks enclosed between older rocks. It is much invaded by batholiths and smaller intrusions and is copper rich".

The Nicola belt extends from south of Kamloops Lake 200 kilometres to the International Boundary. The most important pre-tertiary rocks in this belt are Late Triassic volcanic and sedimentary rocks of the Nicola Group. The Nicola belt is divided into a series of narrow northerly trending blocks by several large, high-angle, northerly trending faults (Figure 1). These faults are interpreted to be basement structures which controlled the distribution of volcanic centres and flanking sedimentary basins. "Previous workers have" identified four groups of major plutonic events in the belt. They are characterized by the ages of 200 million years (Ma), 160 Ma, 100 Ma, and 50-70 Ma respectively. The Iron Mask batholith is one of the larger alkaline plutons of the 200-Ma age group. It is situated along the southwest side of a regional northwest-trending fracture zone and is itself cut by numerous northwesterly faults. The batholith and other alkaline plutons in the same group are likely centres of Nicola volcanism."

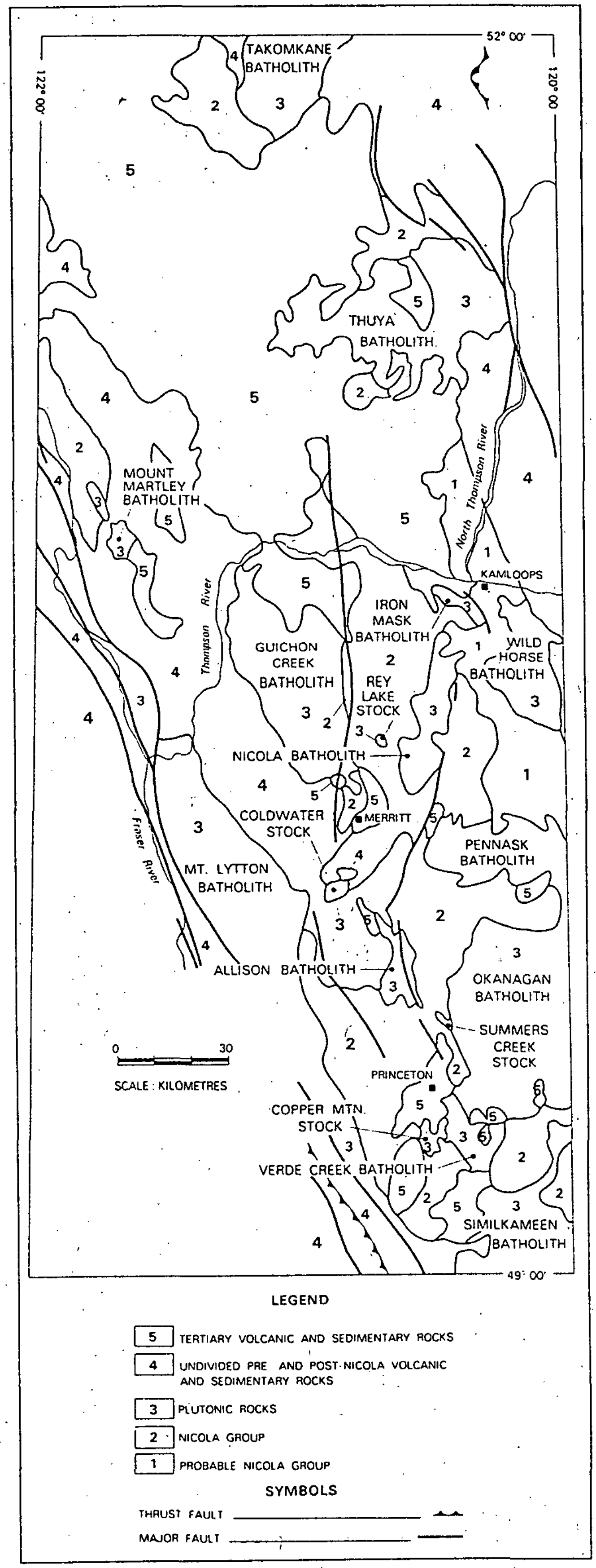

Figure 3. Generalized geology of south central British Columbia (modified from Geological Survey of Canada, Map 232A).

4.3 Kamloops Volcanics (Miocene or later)

4.3.1 General

Early Tertiary sedimentary and volcanic rocks of the Kamloops Group unconformably overlie the Nicola rocks and the Iron Mask batholith. These include tuffaceous sandstone, siltstone, and shale with minor conglomerate, as well as basaltic to andesitic flows and agglomerates with minor dacite, latite, and trachyte.

4.3.2 Rock Descriptions

The following detailed descriptions were provided by Holcapek (1970), as applying to the Ned Claim area -

(1) Basalt: Upper bed, yellow to dark brown to black, fine grained with euhedral phenocrysts of plagioclase and clinopyroxene, occasional small vugs present.

(2) Rhyolite: pinkish to brownish weathering, fine grained containing less than 10% mafics which are strongly weathered and cannot be positively identified, whitish weathering due to breakdown of orthoclase present. This rock type outcrops along the northern part of the property and could be in part intrusive.

(3) Basalt: same general appearances as the upper bed, but contains large phenocrysts of clinopyroxene - up to 3mm in size.

4.4 Iron Mask Intrusions (Jurassic or later)

4.4.1 General

According to Kwong (1987):

"The multiphase batholith is believed to have been emplaced in a subvolcanic environment. All component units except the Picrite unit are thought to be genetically related. Their distribution is largely controlled by major systems of northwesterly, northerly, and northeasterly trending fractures or faults. Most units show some degree of alteration and/or contamination which may be intense locally. Weak to moderate saussuritization is ubiquitous in all batholithic rocks while potassium feldspathization is more prominent in rocks of the Cherry Creek unit. Rock units and varieties are mainly distinguished in the field by original textures which, in most cases, are still visible despite alteration."

"The Iron Mask batholith consists of two related plutons, namely the Iron Mask pluton and the Cherry Creek pluton, formerly believed to be a single connected body. The Iron Mask pluton comprises four major, successively emplaced units designated as the Iron Mask Hybrid, (first) Pothook, Sugarloaf, and Cherry Creek units (last emplaced). Locally, an additional Picrite unit also occurs which is probably not genetically related to the batholith.

The smaller Cherry Creek pluton consists entirely of Cherry Creek unit. Isotopic dates (194 to 204 $\pm$ 6 Ma) indicate that all of these units are of Late Triassic or earliest Jurassic age."

4.4.2 Rock Relationships

Kwong (1987) describes these rocks in more detail, the pertinent features of which are as follows:

(1) CHERRY CREEK UNIT (Youngest)

The Cherry Creek unit is the most widely distributed phase of the batholith. It constitutes the entire Cherry Creek pluton and also accounts for about 50 per cent of the exposure of the Iron Mask pluton. The unit consists of rocks with composition ranges from diorite, monzonite, syenite, to their porphyritic and fine-grained equivalents as well as local intrusive breccias. These rocks are believed to represent small, localized, differentiating offshoots intruded into widely varied physical and chemical environments during the later stages of evolution of the batholith.

(2) SUGARLOAF UNIT

The Sugarloaf unit occurs mainly along the southwest side of the Iron Mask pluton and as small enclosed bodies in the southern half of the pluton. Rocks of this unit are mainly porphyritic with hornblende, minor clinopyroxene, and plagioclase in a greyish green matrix. They are of fairly uniform diorite-andesite composition. Fine-grained varieties are not readily distinguished from the Nicola volcanic flows.

(3) PICRITE UNIT (Age uncertain?)

The Picrite unit consists of rocks of basaltic composition with abundant clinopyroxene and serpentinized olivine phenocrysts. These rocks generally occur as steeply dipping, poorly exposed and relatively small lenticular bodies in many parts of the batholith. They appear to be associated with recurring, northwesterly trending fracture systems and copper mineralization frequently occurs in their vicinity. The genetic relationship of the Picrite unit with the other phases of the batholith is not clear. Because picrite basalt has been observed far from the two component plutons of the batholith, it is probable that this unit is not part of the batholith.

(4) POTHOOK UNIT

The Pothook unit occurs mainly in the northwestern half of the Iron Mask pluton, appearing frequently as narrow, gradational zones between the Iron Mask Hybrid and Cherry Creek units. Rocks of this unit are uniformly of dioritic composition and are medium to coarse grained.

(5) IRON MASK HYBRID UNIT (oldest)

The Iron Mask Hybrid unit, the oldest intrusive phase of the batholith, forms the spine of the Iron Mask pluton and accounts for about 40 per cent of its exposures.

This unit consists of fragments of diorite, gabbro, hornblendite and xenoliths of Nicola Group volcanic rocks in a dioritic matrix.

4.4.3 ROCK DESCRIPTION

According to Holcapek (1970) the most important units in the immediate area of the Ned Claims are as follows

(1) Picrite-Basalt:

A greenish-black dense rock of conspicuously porphyritic appearance. Olivine is serpentinized and crystals range up to 5 mm. Altered specimens possess a glassy matrix. The rock type is appreciable magnetic, fresh or altered.

(2) Coarse-grained Batholithic Rocks:

(a) Pyroxenite: (Edith Lake Area) This is a heavy grey-green rock of crystalline appearance and is strongly magnetic. Pyroxene, hornblende and magnetite are the main minerals present. Dioritic and gabbroic rocks rich in pyroxene are present in the same region.

(b) Gabbro & Diorite: They are not separately recognizable except under microscope. The rocks have a variable appearance due to changes in grain size and mafic mineral content. Weathering is dark brown to light grey. The fresh surface is uniformly dark grey green or white and dark speckled. Biotite shows as glistening flakes. The rock is commonly magnetic. An inconsistent banding is developed in places and inclusions are common.

(c) Monzonite: This rock type underlies an area along the north eastern margin of the batholith. The rock is more uniform than diorite and shows a distinct pink color which is due to the feldspars, including orthoclase. The monzonite is in part an alteration product of diorite. It is relatively non-magnetic.

(3) Fine grained Batholithic Rocks

(a) Cherry Creek Rocks: These rocks are of dioritic and monzonitic composition and named micro diorite or micromonzonite to distinguish them from their coarser grained counterparts. Micrograndiorite is also present. These varieties probably grade into each other. Alteration and recrystalliazation processes seem to be responsible for the existing differences.

All the rocks are grey, white to pinkish in colour. The mean grain size is 1 mm but a porphyritic tendency is present. A perceptible foliation is common and marked by bladed crystals of pyroxene and hornblende. Inclusions of chloritic rock fragments do not exceed 2 cm. in length.

(b) Sugarloaf Diorite:
Dark to light green, well crystallized, containing approximately 15% quartz, euhedral plagioclase, up to 10% euhedral augite, less than 1% sugary light green transparent olivine.

4.5 Nicola Group (Upper Triassic to Jurassic?)

4.5.1 General

According to Kwong (1987):

"The two plutons of the Iron Mask batholith are emplaced in Upper Triassic strata of the Nicola Group. In the vicinity of the batholith, the Nicola Group is dominated by volcanic and volcaniclastic sedimentary rocks. They are generally recognized by albitization of feldspars, occurrence of patchy epidote, and/or rare hematite alteration.

On the southwestern flank of the Iron Mask pluton, well-indurated, massive and bedded tuff, breccia, and interbedded flows and flow breccia are prominent. All of these rocks are weakly metamorphosed and most of them show a fairly uniform green-grey colour. On the northeast flank, less well-indurated and less altered tuff and tuff breccia predominate. However, adjacent to the intrusive contact, these rocks are also well indurated and epidotized and are locally mineralized with sulphides. Fragments found in the tuff breccia include some belonging to the intrusive Cherry Creek unit. This apparently contradictory observation is readily explained if the batholithic rocks and the Nicola volcanic rocks are comagmatic and coeval, such that during the evolution of the common parent magma, the prevalence of an intrusive phase or its volcanic equivalent is dependent on whether or not the magma reached the surface."

4.5.2 Rock Descriptions

(1) According to Kwong (1987):

"At the southeastern tip of the Iron Mask pluton and locally along the southwestern flank, the Nicola rocks comprise distinctive porghyritic augite-hornblende basalt, very similar to varieties of the Sugarloaf unit that occur along the southwest flank of the pluton. Locally, basaltic breccia that is porphyritic with 10 to 25 per cent olivine and augite phenocrysts is also prominent. North of Hughes Lake near the northwestern end of the pluton, the volcanic breccia contains occasional argillite and limestone blocks. adjacent to the Cherry Creek pluton farther north, rocks of the Nicola Group consist mainly of porphyritic plagioclase andesite with occasional interbedded tuffs."

(2) According to Holcapek (1970) the most important rocks in the immediate vicinity are:

(a) Andesite: Upper bed, fine grained sugary texture containing up to 60% epidote and minor pyroxene.

(b) Andesite: grey to dark green, strongly serpentinized and chloritized, pyroxene more abundant, epidote less than 10%.

(c) Andesite: lower bed, light green to dark containing dark grey fragments, chloritized and serpentinized, but less strongly, up to 30% epidote present.

4.6 Alteration

According to Holcapeck (1970) alteration minerals appear to be epidote, calcite, albite, pink K - feldspar, biotite, and magnetite. Calcite and epidote are the most common and at least a trace of chalcopyrite usually accompanies them.

Pink alteration appears to be due to replacement of pink orthoclase feldspar, often in the form of veins.

Overlapping of pink and white alteration also occurs.

Picritic basalt can be altered to a hard uniform dark green rock in which the altered phenocrypti appear as vague rounded black shapes, or to a black rock glistening with abundant finely disseminated biotite.

4.7 Structural Geology

4.7.1 Regional Trend

The most dominant structural trend in the area is north-westerly. This trend shows in the exposure of the Iron Mask Batholith, geochemical data and geophysical data.

4.7.2 More localized Features

(1) Bedding

According to Holcapek (1970) the bedding within the Nicola group trends nearly east west and dips at 60 ° N.

(2) Foliation

According to Holcapek (1970)

"Foliation was observed along most of the shears and can extend up to four feet on either side of the shear. Strike of the foliation is northwesterly and dips are vertical. These attitudes are parallel to the main shearing direction.

(3) Jointing

"The most pronounced jointing direction are N20 to 0E and vertical, or parallel to the bedding.

(4) Shearing and Faulting

"The rhyolites are in general strongly brecciated and sheared, but outcrops are too small and too weathered to obtain directions.

"A strong shear up to 50 feet wide is exposed in the eastern part of the property. It strikes S40°W, vertical. This trend is about parallel to the shear exposed on the Afton Mines property to the east in the old workings."

North-south faults (dips to east) were observed on the air photos on the Ned Claims.

4.8 Mineralization

4.8.1 Form and Type of Mineralization

In a regional sense, porphyry Copper mines in the Quesnel trough include, from north to south, Bell, Granisle, Gibraltar, Afton, the Highland Valley deposits, Brenda, Ingerbelle, and Copper Mountain.

Copper deposits in the local area are veins, stockworks, and dissemination of replacement origin and meso-thermal type; chalcopyrite (accompanied by pyrite) is the principal copper mineral. Gold and silver values are low and appear to decrease with increasing proportion of pyrite. Bornite is important at the Copper King mine of Cherry Bluff.

4.8.2. Alteration and Mineralization

Intense rock alteration is a general guide to the likelihood of strong or widespread mineralization.

4.8.3 Mineralization and Structure

Structural conditions undoubtedly play a major role in localization of sulphides (northerly and northeasterly-trending zones).

4.8.4 Mineralization and Rock Type

According to Kwong (1987):

"Mineralization, particularly of iron and copper, is almost ubiquitous in the Iron Mask Hybrid unit. In fact, except where Nicola xenoliths are predominant, all rock varieties in the unit contain magnetite which is often more than 10 per cent by volume. The Iron Mask mine, a former copper producer, is located in this unit, but is also associated with picrite.

"The Pothook unit is locally mineralized with copper and iron. Magnetite occurring in uniformly dipping veins is prominent south and southeast of the Afton deposit.

"Several copper occurrences are hosted by the Sugarloaf rocks. For example, the Ajax property east of Jacko Lake is located within brecciated and albitized Sugarloaf rocks.

"Copper and minor iron mineralization is prominent in the Cherry Creek unit, particularly in zones of intense brecciation associated with alkali metasomatism. Afton mine, for example, lies at the western termination of a narrow, 4-kilometre-long, easterly trending zone of intense intrusive brecciation that is located at the northern edge of the Iron Mask pluton. The brecciation is considered to have resulted from high-level venting events. Similar breccia, consisting largely of Cherry Creek fragments, has also been observed on the Kimberley copper property northwest of Knutsford and at the extreme southeastern tip of the Iron Mask pluton."

5. GEOLOGICAL MAPPING

5.1 General

The field work done during the current year was aimed mostly at obtaining a more detailed geological map than is available in the older assessment reports, and to collect samples for rock ICP analysis.

The results of this work are seen on Figures 4, 5 and 6.
Rock exposures are few and usually small in the north and eastern part of the property, but extensive in the southwestern part. In general there is less than 20% outcrop present.

The regional trend of the different rock formations is northwesterly, parallel to the topographical trend and the direction of the last ice movement.

5.2 Detailed Mapping of Rock Types

Figure 5, the Geological Map, shows some of the features found in earlier work but differs significantly in several regards.

Firstly, the Nicola volcanics (as described in section 4.5.2 (2)) are present all across the southern part of the mapped area, as well as in the NE corner.

Secondly, there seems to be at least three levels of Kamloops rocks present:

(1) <u>Rhyolite:</u> weathered, but otherwise relatively unaltered, as described in section 4.3.2. (2).

(2) <u>Altered Kamloops:</u> rhyolitic, weathered, but also exhibiting red to white breccia with some quartz/calcite veining.

(3) <u>Highly Altered Kamloops:</u> similar in appearance to (2) above, but abundant chalcedony veins (up to perhaps 10 cm thick, a milky brown color, waxy texture), calcite, vugs, cockscomb textures, abundant limonite and hematite, silica sinter? (one sample), and some malachite and azurite.

The "Highly Altered Kamloops" zone appears to be mostly confined to the east central side of the mapped area. The more silicic nature of this zone is perhaps reflected in the topography: this is a rounded dome which is the highest point within 1500 m. It is elevated perhaps 30 m above the land at the foot of the dome, and 60 m above Ned Roberts Lake. It is adjacent to VLF-EM, resistivity, I.P. chargeability anomalies of the earlier assessment reports. It is the site of most of the anomalous Rock ICP analysis (anomalous in Sr, Cu, Cr, As, Sb, see section 7.2)

5.3 Structural Geology

One complicating feature of this area are the large faults indicated on the air photos (see section 6.3). Although no direct evidence of these appear on the ground (apart from sometimes deep gulleys filled with soil and vegetation), on the air photos they appear to be recent block faults striking roughly N/S. The block motion appears to be to the east, into the Cherry Creek valley, flowing out of Ned Roberts Lake.

5.4 Mineralization

Apart from the widespread alteration mineralization (calcite, quartz/chalcedony) the only surface mineralization is some malactite and azurite. These minerals appear to be "primary", due to the calcite rich environment that accompanied the hychothermal solutions causing the alteration, rather than due to the weathering of sulfides.

6. AIR PHOTO ANALYSIS

6.1 Instrumentation

A Sokkisha MS-27 Mirror Stereoviewer with 1.8 power lenses was used to view the complete overlapping stereo photo pair. 3 power and 8 power binocular attachments were used for much more detailed examinations of certain features, and to confirm the continuation of some of the longer structural features.

6.2 Procedures

The analysis for these claim groups was based primarily upon BC flight line 86021, flown in 1986.

The general principles involved in air photo analysis and interpretation may be found in Ray (1960), Miller and Miller (1961), Lottman and Ray (1965), Avery (1970), Sabine (1978), Swain and Davis (1983), or Siegel and Gillespie (1983).

6.3 Preliminary Analysis

A preliminary look at air photos for this area show the distinctive NW/SE trend with the probable fault offsets in a N to NE direction. The main NW/SE trend starts in the vicinity of Ned Roberts Lake, appears to be faulted north just past the west end of the lake, then continues NW/SE in the central part of the Ned Group (just south of the road bisecting the claims.) and then appears faulted south where it continues NW/SE into the swampy area adjacent to the LCP (refer to figure 7, faults F1 and F2).

This evaluation generally agrees with the earlier assessment reports, and observations on the ground but no attempt has been made to closely correlate ground observation with the other information, nor the air photo patterns at the same scale as the earlier reports.

A more detailed analysis of the air photos is planned for the next assessment report.

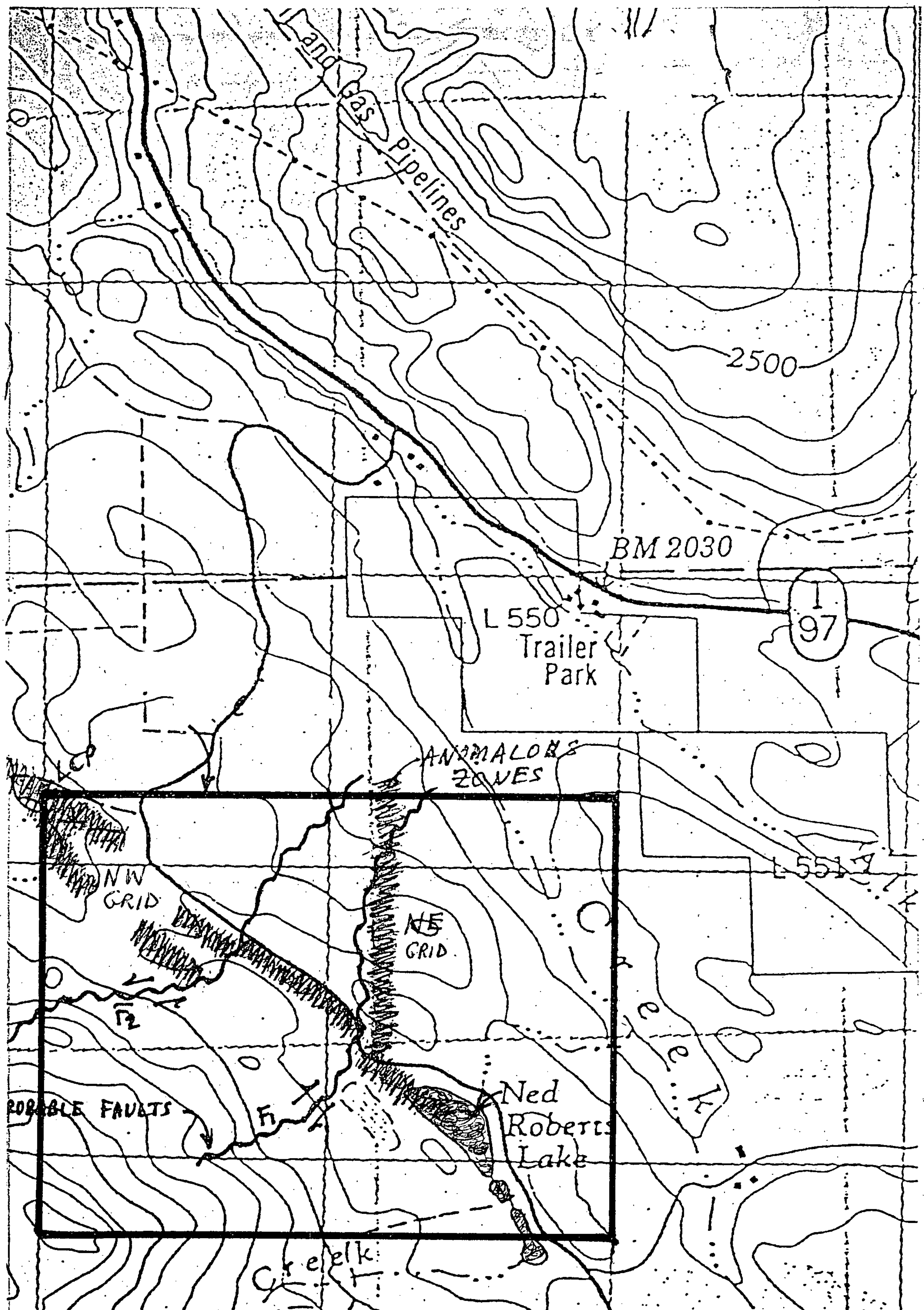

Figure 7: Preliminary Air Photo Interpretation

7. GEOCHEMICAL SURVEYS

7.1 General

Numerous samples were collected from the sites shown on Figure 6, on the NE grid located to the north of Ned Roberts Lake.

29 rock and soil I.C.P. analysis, and 2 gold and copper assays were obtained (Appendices 12.1, 12.2, and 12.3)

7.2. Rock I.C.P. and Assay Results

Several samples showed anomalous I.C.P. values in As and Sb (epithermal indicator elements): KNE 90W-37, KNI90W-42, and KN14-45 (Appendix 12.1)

Several samples were also anomalous in copper I.C.P. readings: KNE90W-1, -21, -22, KNI90W-39, -42.

In addition, one assay result returned 0.790% copper (Appendix 12.3). Malachite and azurite stains were found nearby in two loctions.

7.3 Soil I.C.P. Results

Several soil samples were taken to test out a copper anomaly of over 560 ppm as reported in an earlier assessment report (Holcapek, 1970).

The first four samples were obtained in areas reported to be non-anomalous, and used as control samples (average of 91 ppm Cu, see Appendix 12.1)

The remaining 5 samples were targeted in a grid around the earlier reported anomaly. These 5 samples returned on average of 125 ppm.Cu. This result is not strongly suggestive of a copper anomaly in this area, unless it is very localized. As noted earlier, the resulting pattern of the Assessment Report No. 2262 (Holcapek, 1970) geochemical plot strongly suggests that the sampling was not consistantly carried out. The entire area should be re-surveyed.

8. GEOPHYSICAL SURVEYS

8.1 General

These surveys were not under the direction of the present writer, but the data is believed to be reliable, and is self-consistent, as well as agreeing with the air photo interpretation.

The field work was completed in the summer of 1989 prior to the present assessment year; however the plotting of data and interpretation was mostly carried out in this assessment year.

The grid area covered was also to the NW of the area geologically mapped and sampled. This NW grid is close to the LCP (See Figure 7)

8.2 Percent Frequently Effect (%F.E.) I.P. Surveys

Two levels (N=1 and N=2, with electrode spacing a=100 meters) were obtained across the suspected NW/SE trending zone on the 600S line (600 meters south of the LCP - Legal Claim Post - as shown on Figures 8, 9 and 10), and one level (N=1) on the 400S line.

Although a meaningful background level is difficult to determine from the data available, work by the same geophysical crew to the north suggests a % F.E. background in the 3 to 5% level, with anomalies 2 to 4 times background.

The 600S lines results suggest an anomalous zone running NW/SE which is strongest on the west side, drops sharply in the centre then climbs back up to about the same levels on the east side. An increase in IP effect with depth is indicated: N=1 values are up to 8% F.E., N=2 values up to 12% F.E. The N=2 zones appear somewhat wider, but this is often an effect of "sampling" more ground with the wider spacing.

On the 400S line the same general pattern is observed, but is weaker overall and shifted west (which confirms the NW/SE trend of the zone).

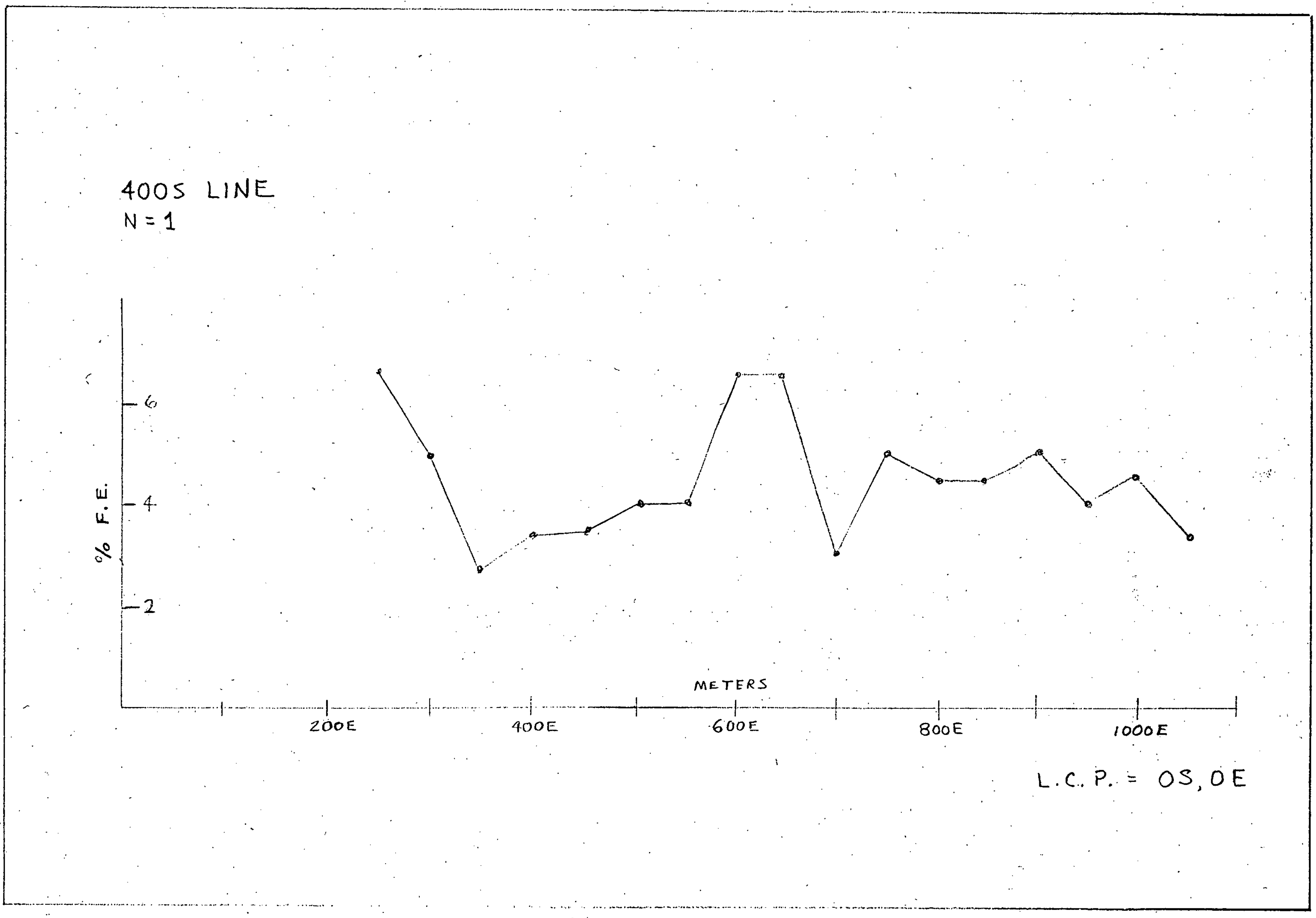

Figure 8: % F.E., NW Grid, 400S Line, N=1

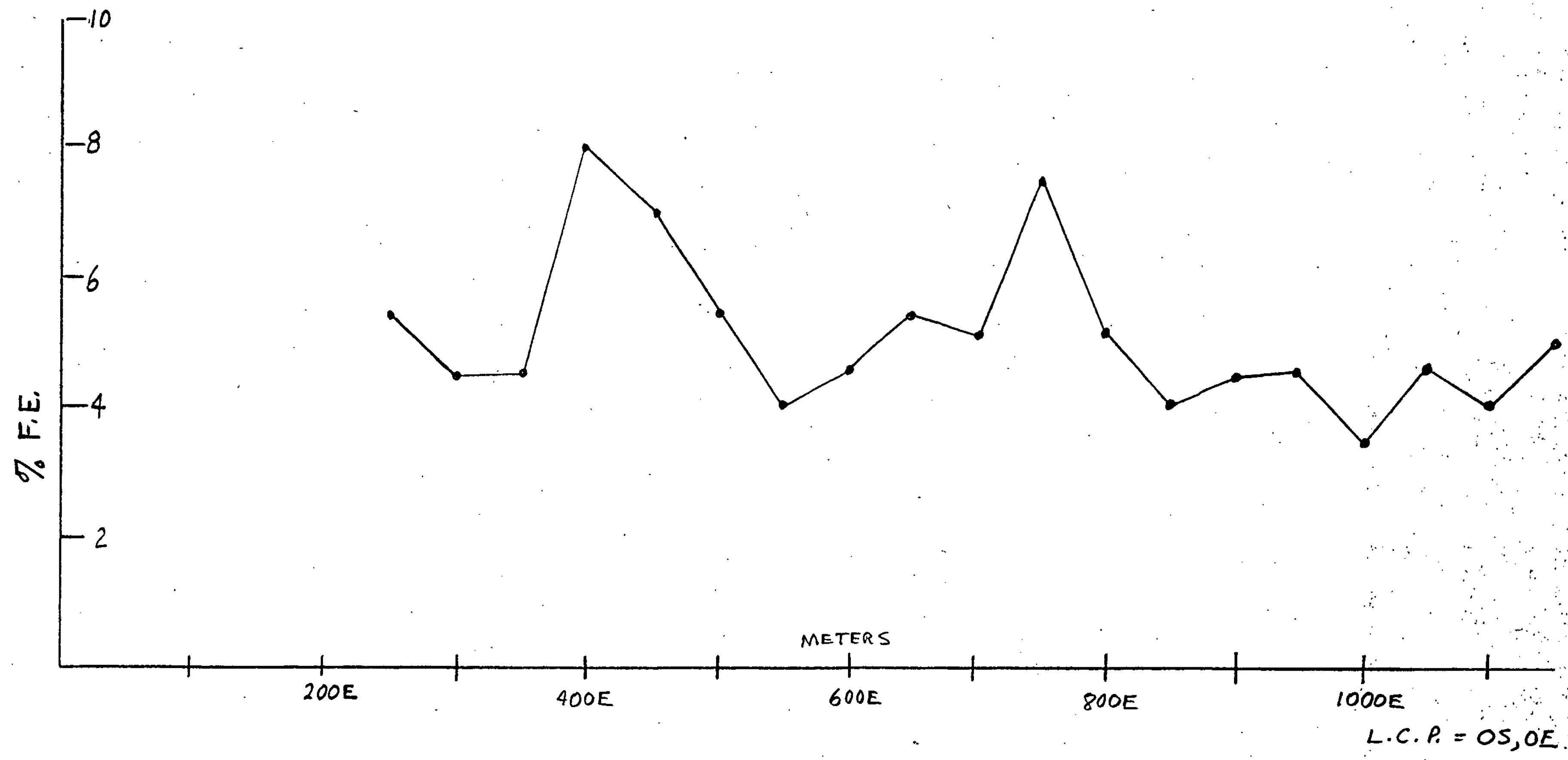

Figure 9: % F.E. ? NW Grid, 600S Line, N=1

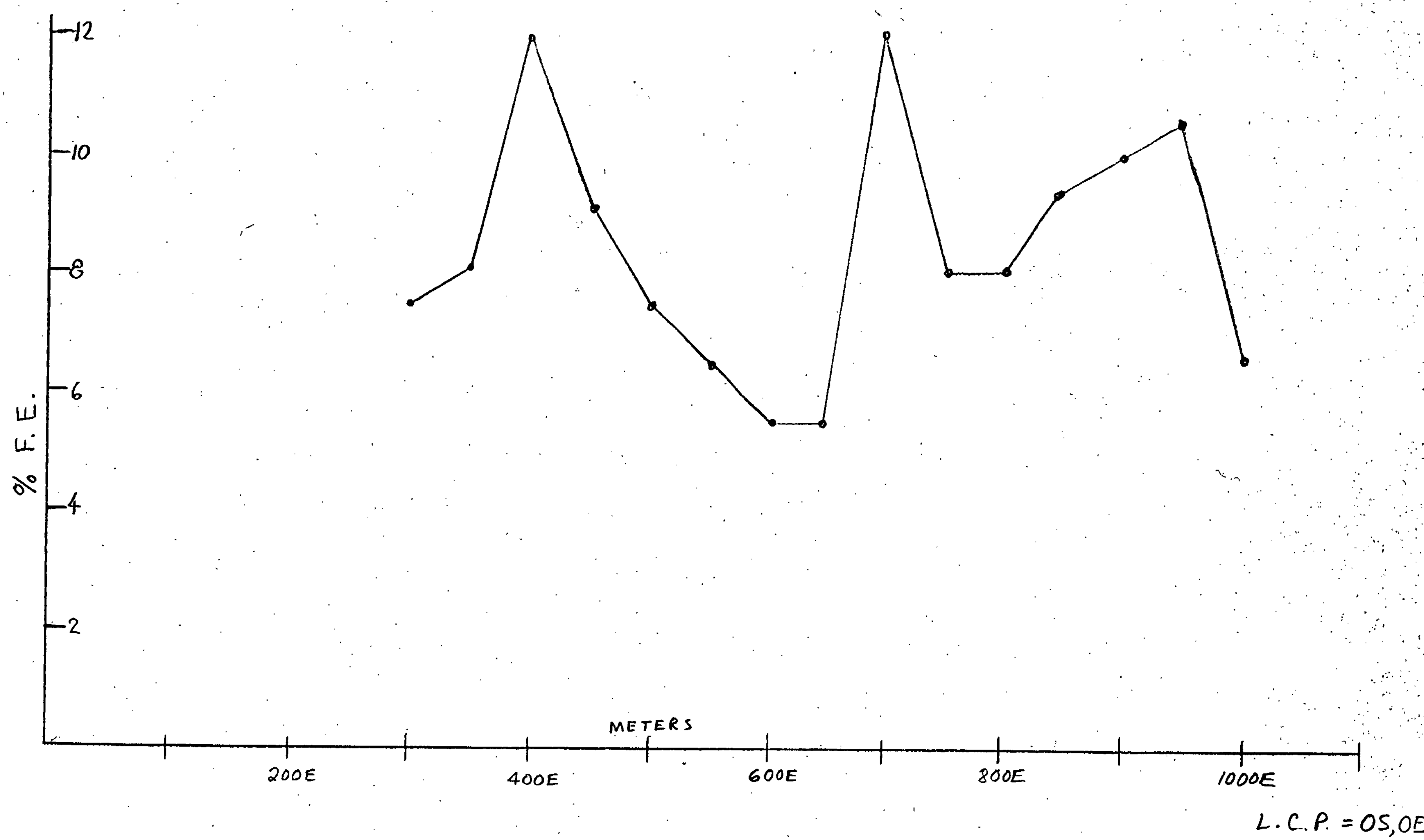

Figure 10: % F.E., NW Grid, 600S Line, N=2

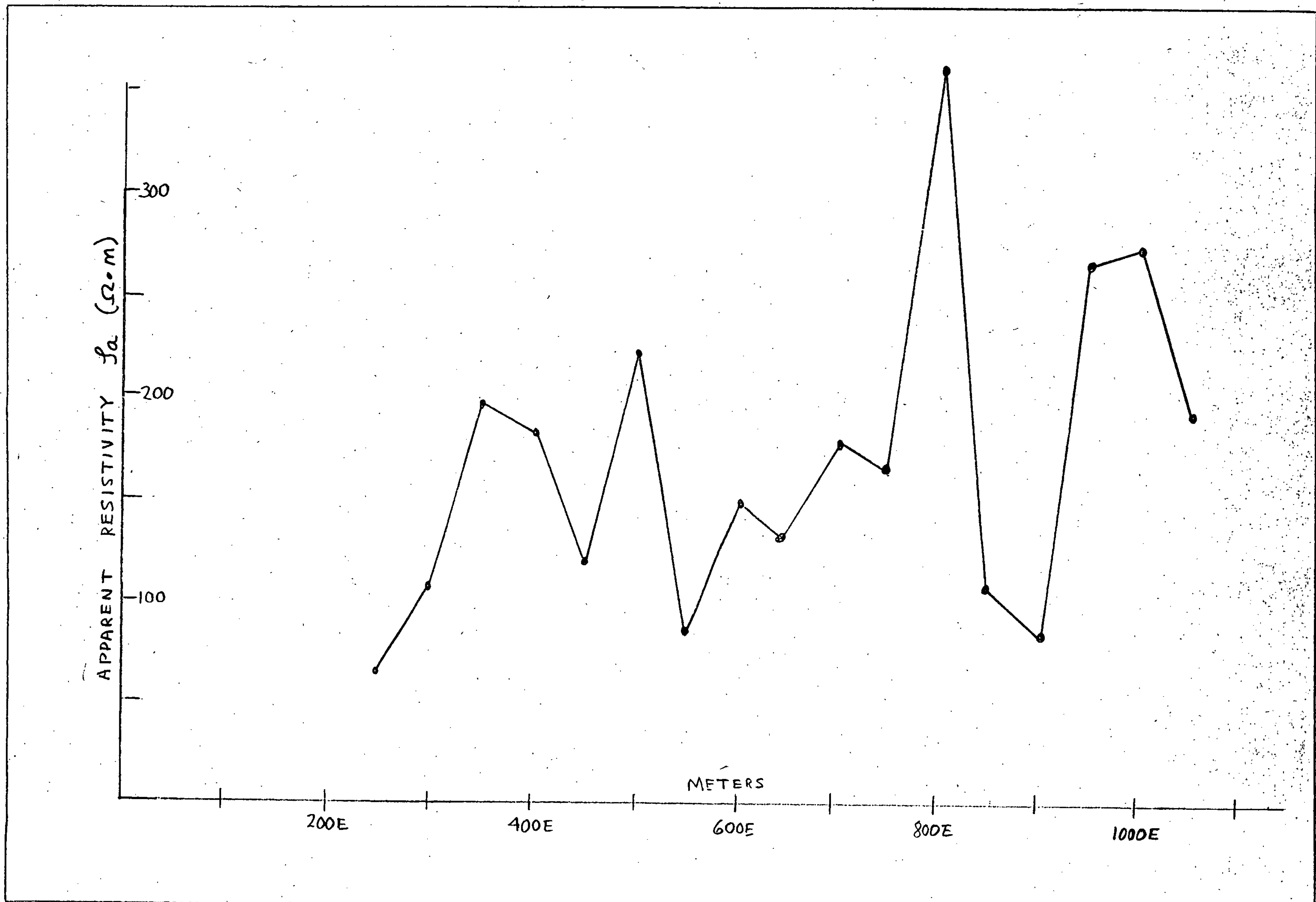

Figure 11: Apparent Resistivity, NW Grid, 400S Line, N=1

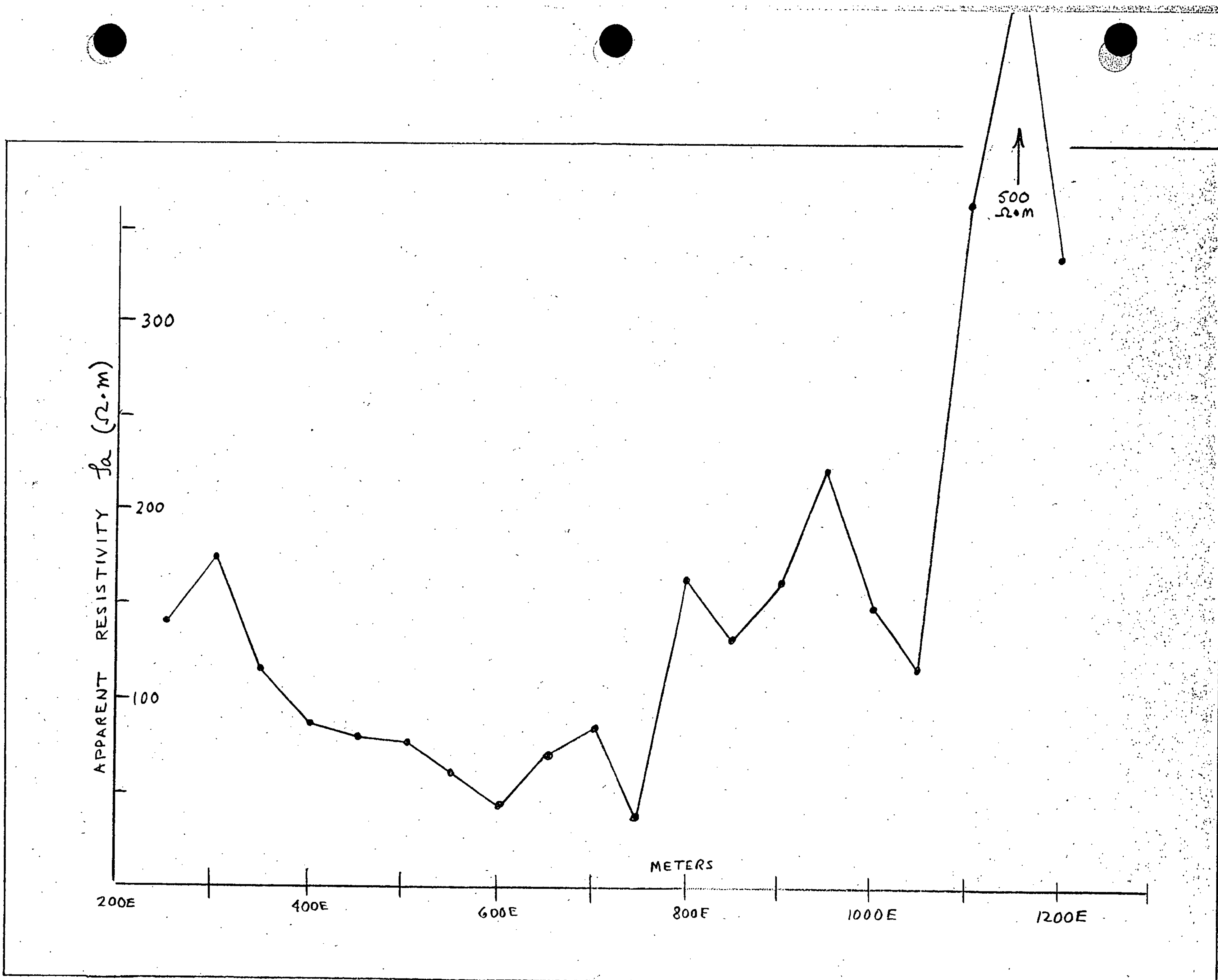

Figure 12: Apparent Resistivity, NW Grid, 600S Line, N=1

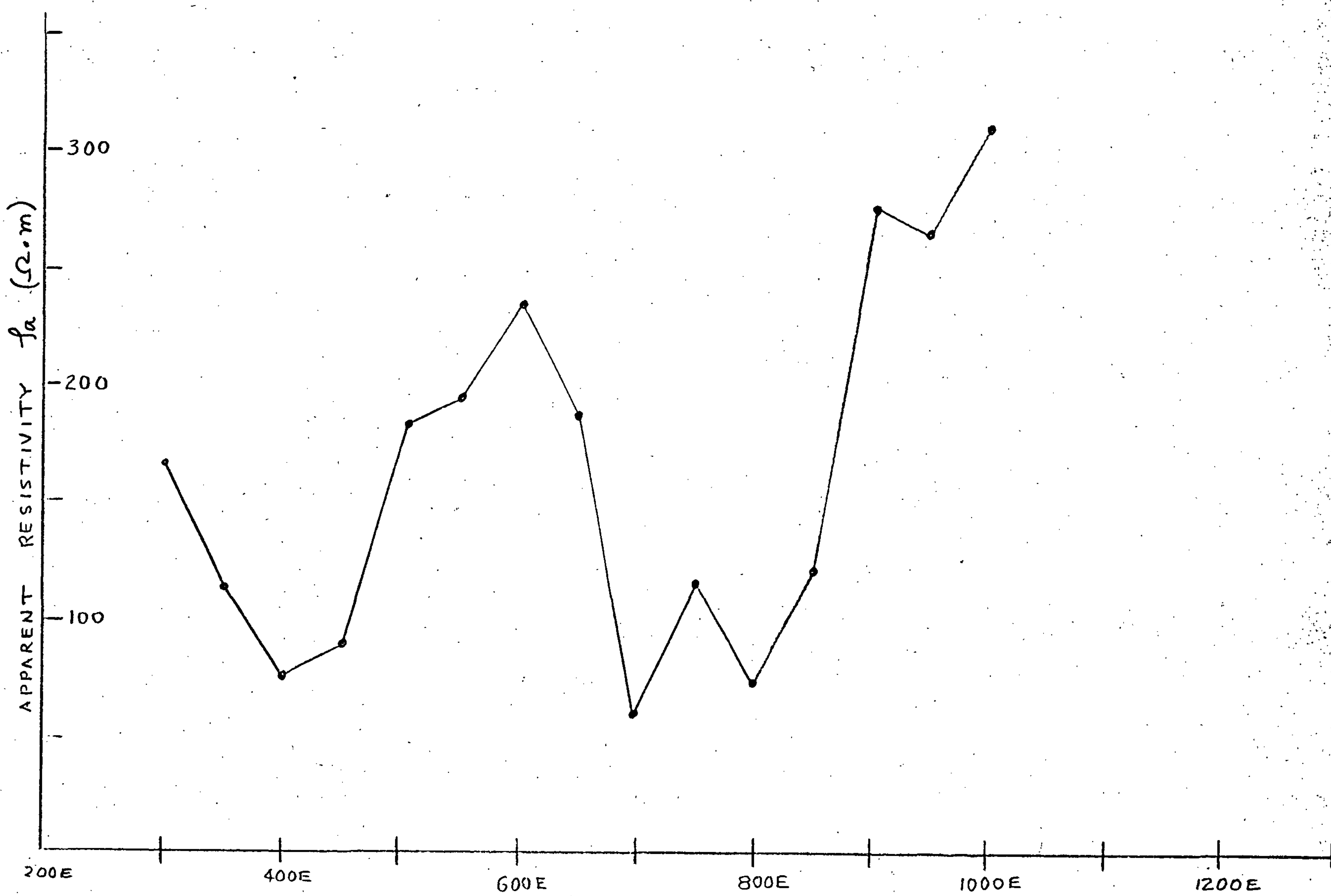

Figure 13: Apparent Resistivity, NW Grid, 600S Line, N=2

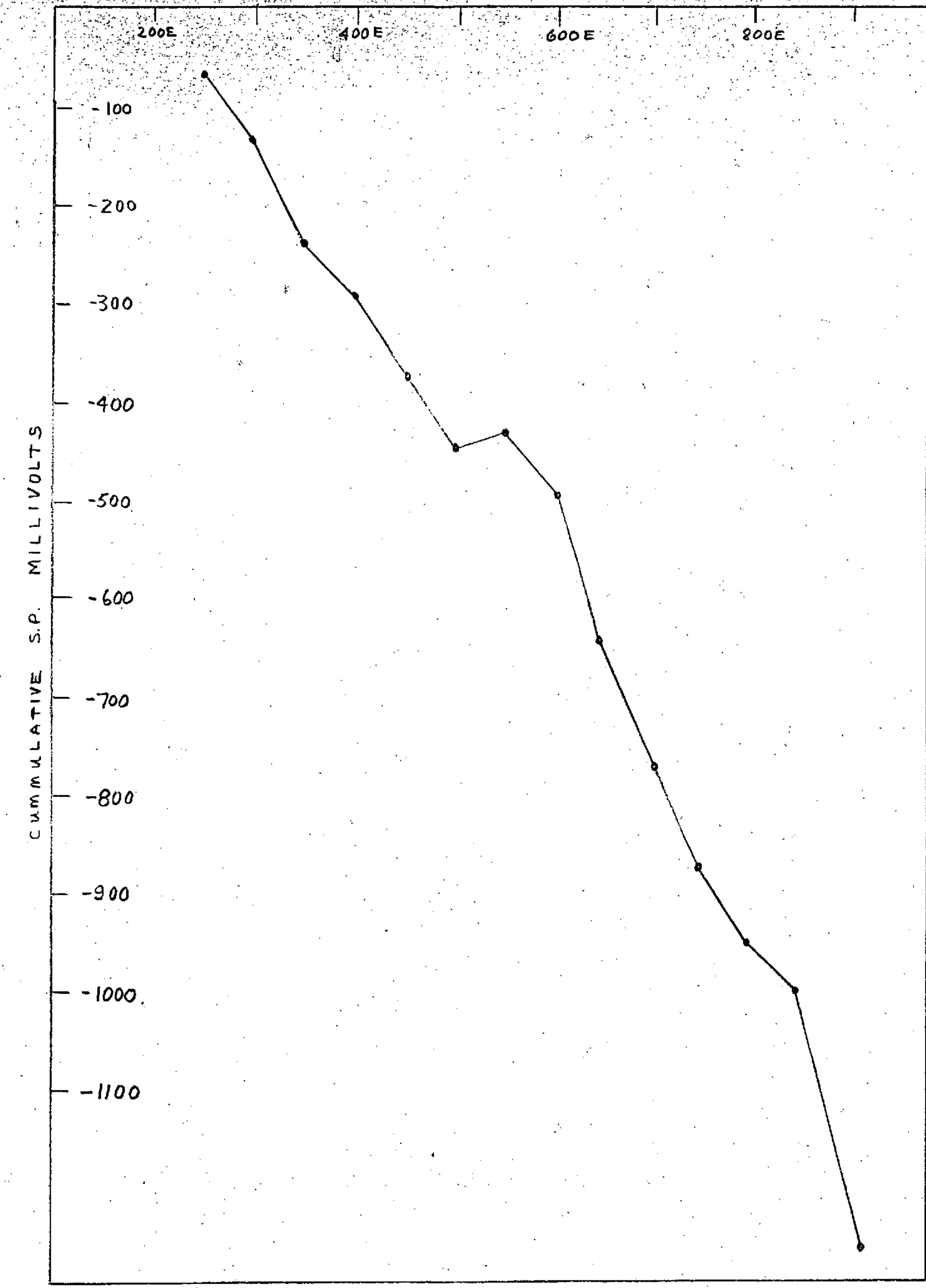

Figure 14: Cumulative S.P. Millivolts NW Grid, 400S Line, N=1

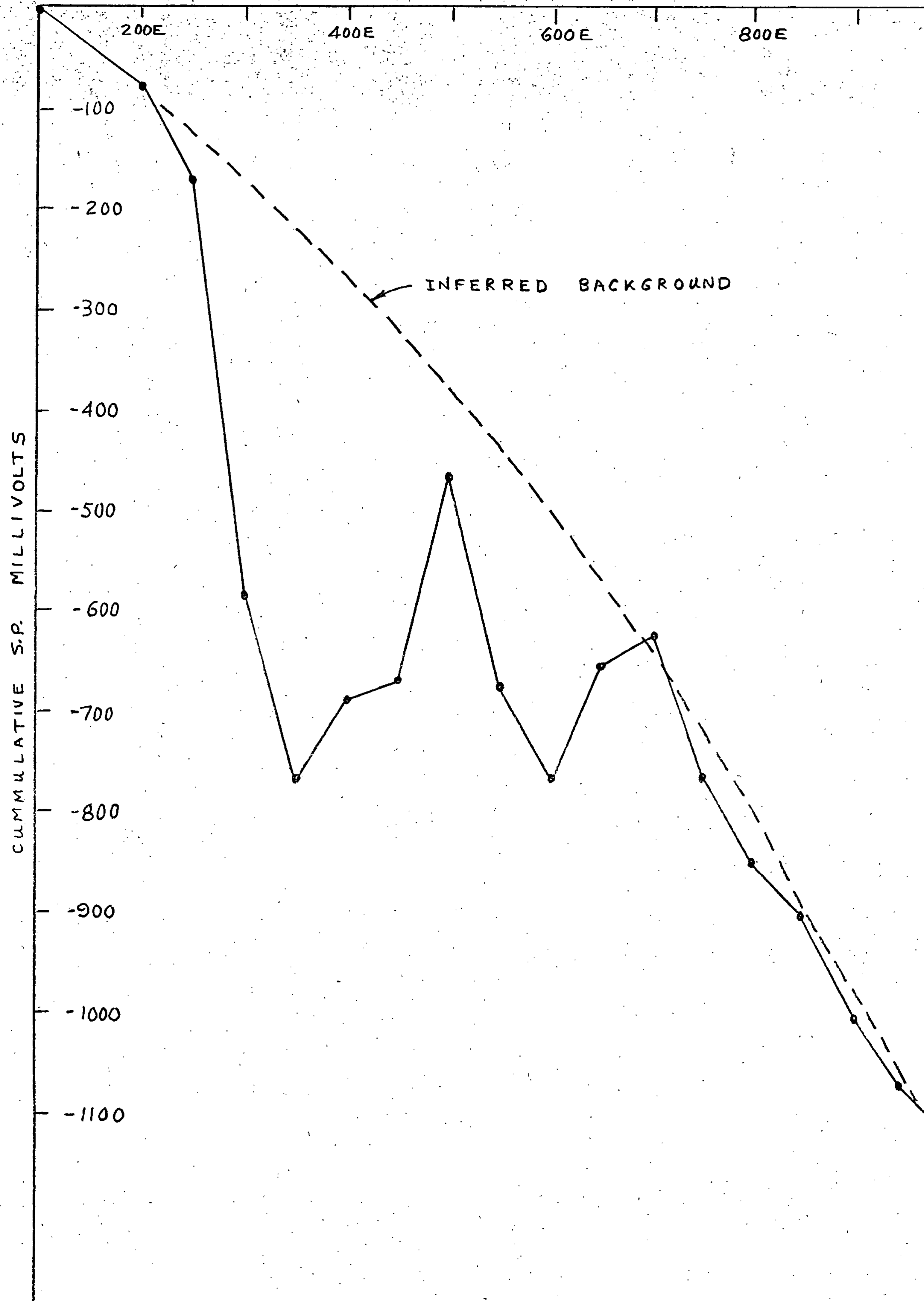

Figure 15: Cumulative S.P. Millivolts NW Grid, 600S Line, N=1 and 2 Averaged

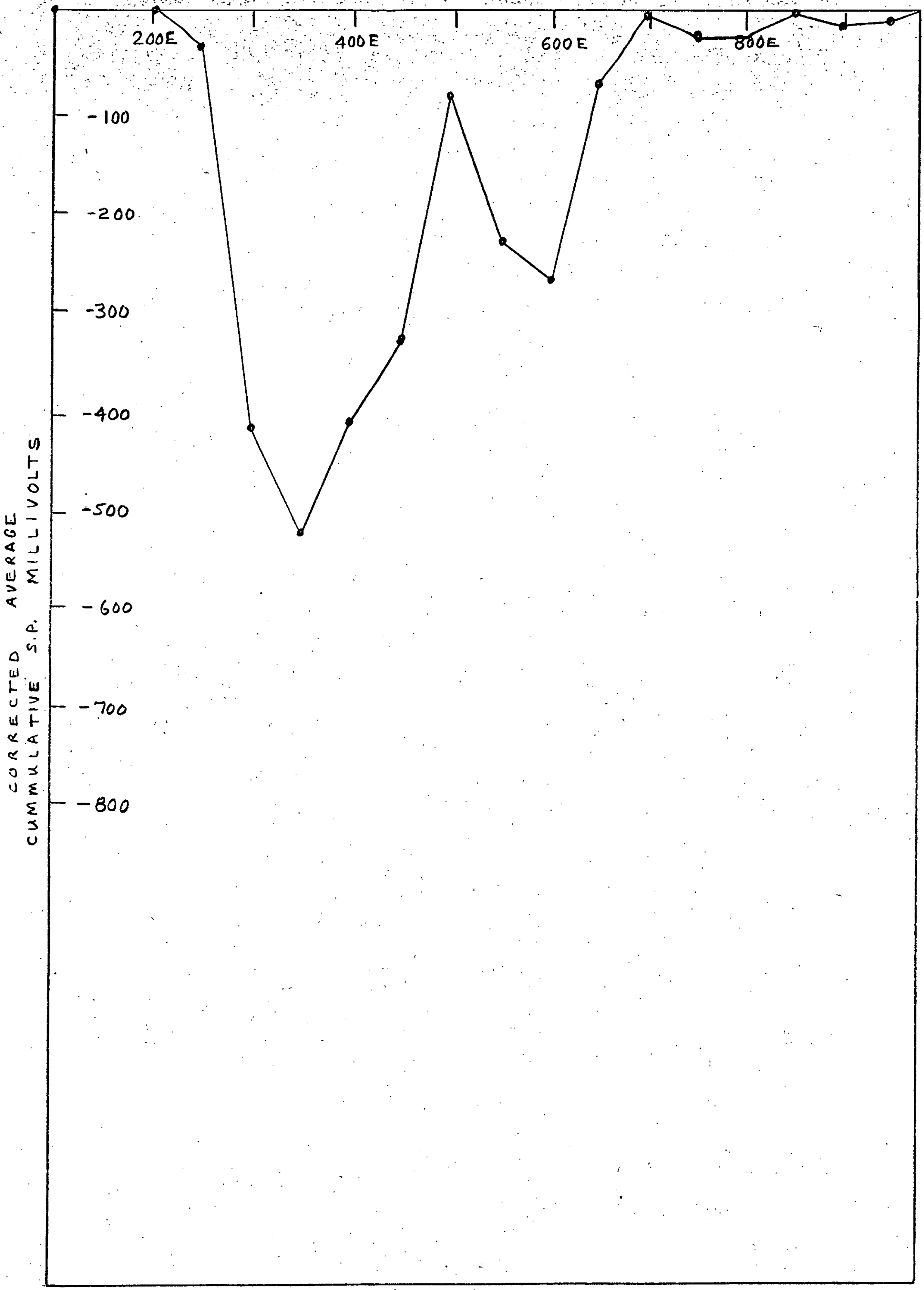

Figure 16: Corrected S.P. Millivolts. NW Grid. 600S Line. N= 1 and 2 Averaged

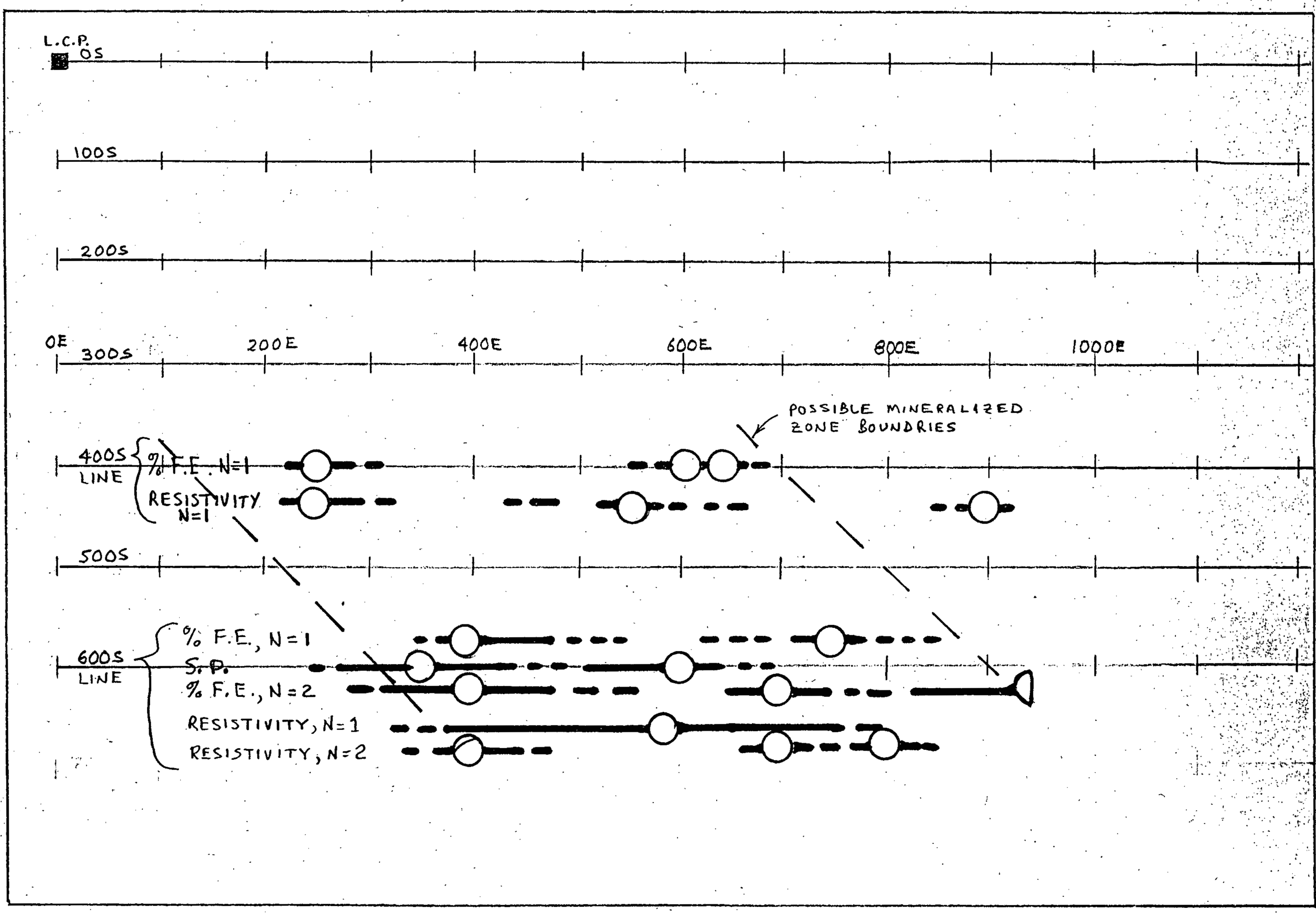

Figure 17: Summary Sheet, Anomalous Zones, NW Grid

8.3 Apparent Resistivity (I.P.) Results

Resistivity lows in this survey coincide generally with % F.E. highs (Figures 11, 12 and 13). This strongly suggests the presence of conductive disseminated sulfide mineralization.

On the 600S line at N=1, a very broad resistivity low is evident. At N=2, the zone appears to have split into two (eg an east and west side with a less conductive-more resistive-central region).

The 400S line data is very irregular and does not clearly define the two zones; however, it does not disagree with the 600S line.

8.4 Self Potential (S.P.) Results from the I.P. Survey

Two S.P. plots were made (Figures 14 and 15).

On the 600S line the S.P. data was then averaged for the N=1 and N=2 runs, converted to a cumulative value, and the background removed. (Figure 16) This result in a true S.P. profile referenced to 900W, 600s = 0 millivolts (eg 600 meters south and 100 meters east of the LCP). The S.P. values are very strong (>-500 millivolts), and negative as they should be if indicating mineralization. The largest value is on the west side of the anomalous zone, dropping sharply in the centre then climbing to about -250 millivolts on the east side.

The 400S line data did not indicate any major S.P. values. This may indicate a non-conductive overburden.

A very rough depth calculation was made assuming a spherical body (this does not quite fit the idea of an elongated zone). The result: 400 plus or minus 200 (?) feet to the centre. This should at least be useful as an order of magnitude guideline.

8.5 Summary of Results

The results of the various I.P. survey information are shown on Figure 17. Only the 600S line will be discussed.

On line 600S, all of the parameters and levels are anomalous, with 4 out of the 5 graphical plots (%F.E. = 2 plots at N=1 and N=2; S.P. = 1 plot; apparent resistivity = 2 plots) reaching "maximum" (+ or -; whichever is appropriate) values.

9. INTEGRATION AND INTERPRETATION OF THE RESULTS

9.1 General

Note that the road north of Ned Roberts Lake approximately divides (diagonally) the Ned Claim Group into NE and SW halves. This division appears to be geologically significant with the south half mountainous exposures of Nicola volcanics, and the north half altered Kamloops rocks with a potential for epithermal deposits. In between, there is an anomalous, possibly mineralized, zone.

9.2 NE Grid Epithermal Zone

An extensive epithermal system appears to be centered at about 1500 feet north of the west end of Ned Roberts Lake. This system may extend up to 1000 feet around the central location.

The evidence suggesting an epithermal deposit is as follows:

(1) Pervasive calcite and silica alteration, including massive chalcedony veins near the "central region".

(2) Several of the I.C.P. results were anomalous in arsenic and antimony.

(3) Epithermal textures are common - silica and calcite, cemented breccias, vuggy quartz veining, sintered quartz.

(4) Anomalous copper levels are also common in the I.C.P. results. In addition, malachite and azurite occurrences were found in two locations, and one assay result returned 0.79% copper (Cut #1)

9.3 NW/SE Mineralized Zone

An apparently mineralized zone with a NW/SE trend crosses the Ned Claim Group, just to the south, and parallel to, the road that bisects the Claim Group. This zone could represent the presence of the underlying intrusive rock as dykes, or may simply be a window to mineralized igneous rock exposed by the removal of the overlying volcanic by erosion, or may be mineralization along a shear zone parallel to the major fault to the north.

This apparently mineralized zone is seen as trending NW/SE in the vicinity of Ned Roberts Lake, then being offset to the north just past the west end of the lake by Fault F1 (Figure 7), continuing south of the road between F1 and F2, splitting into two zones NW of F2, possibly being buried deeply in the gap shown, then "surfacing" in the swampy area near the LCP.

9.4 Summary

The NW/SE mineralized zone may be related to the Iron Mask/Afton mineralizing episode since it appears likely that it is in the older Nicola volcanic rocks. It is probably quite unrelated to the epithermal mineralization to the north.

The epithermal mineralization north of Ned Roberts Lake cannot be related to the Afton mineralization, if the rocks are altered Kamloops volcanics as seems to be the case. One would have to look for Tertiary plutonic/mineralizing events contemporary, or younger than the Kamloops volcanics. It is possible that there is a deeper intrusive phase related to the Kamloops extrusive rocks, and later hydrothermal solutions derived from these altered the then recent volcanics. Alternatively, later subduction events (such as presently active along the Cascade Volcanic Range) may have provided the hydrothermal solutions.

It does appear that only the upper zones of the epithermal system is exposed on the Ned Group. A potential gold bearing zone could be 200 m below the surface.

10. RECOMMENDATIONS

10.1 A more detailed air photo analysis should be considered prior to the next phase of exploration.

10.2 A limited amount of field work in conjunction with 10.1 would allow the completion of the geological map for the whole claim group.

10.3 A more detailed petrographic examination of the rock samples collected to date, and those collected in 10.2 field work, should be undertaken to get a better understanding of the variations within the Kamloops Volcanic rock groups.

10.4 A ground geochemical survey should be carried out over the entire group, carefully monitored so that the "bullseye" pattern (an indication of questionable field sampling) does not occur. These samples should be subject to soil I.C.P. analysis and treated to a modern geochemical statistical analysis.

10.5 Follow up I.P. results should be conducted over areas showing good geochemical results.

10.6 Some preliminary drilling of the two zones showing mineral potential could be undertaken.

10.6.1 On the NE Grid, 7 drill holes (1000 feet, vertical) are recommended (See Figure 4; highest priority NE-1 lowest NE-7). Drilling should stop if Nicola volcanics are encountered, unless mineralization or epithermal ateration is present.

10.6.2 On the NW Grid, between 1 and 5 holes should be considered. A drill hole #1 (NW-1; Figure 17) should be drilled to about 700 feet (deeper if the core is encouraging at that depth), the core logged and assayed. If encouraging results are obtained and financing is available, still further drill hole data might be sought. These additional holes should be drilled in the following order of priority: one hole near the LCP; NW-2; one hole in the anomalous zone near Ned Roberts Lake (NW-3) and one between F1 and F2 (NW-4)(Figure 7).

The next best location (NW-5) occurs at about the 300W to 250E stations. Here only the S.P. values are not anomalous.

At the centre of the NW/SE zone on line 600S at about 400W (NW-5) the S.P. gives a smaller anomaly (~-250 millivolts) which correlates only with a resistivity low (N=1). No % F.E. values are noticeably anomalous at that location.

11. REFERENCES

Avery (1970) "Interpretations of Aerial Photographs" by T. E. Avery, Burgess Pub.

Holcapek (1970) Assessment Report 2262: "Geological, Geographical, and Geochemical Report on the Kon and Win Mineral Claims for Concorde Explorations Ltd." F. Holcapek, 1970.

Kwong (1987) B.C. Mineral Resources Division Bulletin 77: "Evolution of the Iron Mask Batholith and Its Associated Copper Mineralization." Y. T. J. Kwong, 1987.

Lattman and Ray (1965) "Aerial Photographs in Field Geology" by L. H. Lattman and R. G. Ray, Holt Pub.

Miller and Miller (1961) "Photogeology" by V. C. Miller and C. F. Miller, McGraw, Hill Pub.

Ray (1960) "Aerial Photographs in Geological Interpretation and Mapping", by R. G. Ray, U.S.G.S. Paper 373.

Reed (1976) Assessment Report 5852: "Geological, Geochemical, and Geophysical Report on the Hughes 1-6 Mineral Claims. " A. J. Reed, 1976.

Sabins (1978) "Remote Sensing", by F. F. Sabins, Jr., Freeman Pub.

Sandner (1972) Assessment Report 3593: "Assessment Work Report on an Induced Polarization Survey of Forty Claims Owned by Concorde Explorations Ltd." S. L. Sandner, 1972.

Siegal and Gillespie (1980) "Remote Sensing in Geology" by B. S. Siegal and A. R. Gillespie.

Swain and Davis (1978) "Remote Sensing - The Quantitative Approach" edited by P. Swain and S. Davis, McGraw Hill Pub.

12. APPENDICES

12.1 ROCK ICP RESULTS

COMP: RHINO RESOURCES INC.
PROJ:
ATTN: DR.A.B.L.WHITTLES

MIN-EN LABS — ICP REPORT

705 WEST 15TH ST., NORTH VANCOUVER, B.C. V7M 1T2
(604)980-5814 OR (604)988-4524

FILE NO: 0V-0596-RJ1
DATE: 90/06/05
* ROCK * (ACT:F31)

SAMPLE NUMBER	AG PPM	AL PPM	AS PPM	B PPM	BA PPM	BE PPM	BI PPM	CA PPM	CD PPM	CO PPM	CU PPM	FE PPM	K PPM	LI PPM	MG PPM	MN PPM	MO PPM	NA PPM	NI PPM	P PPM	PB PPM	SB PPM	SR PPM	TH PPM	U PPM	V PPM	ZN PPM	GA PPM	SN PPM	W PPM	CR PPM
KNE90W-1	1.2	20140	12	9	179	1.2	11	13470	.1	21	155	45630	4190	18	16470	795	1	1350	20	1580	19	1	42	1	1	198.9	59	1	1	1	52
KNE90-2	1.7	7070	13	8	150	1.3	3	61950	7.1	17	50	37450	990	5	55310	1413	1	140	5	340	10	1	42	1	1	109.7	47	1	3	1	60
KNE90W-12	.2	11550	15	12	658	.4	2	8710	.1	3	16	5800	3310	4	3340	253	3	40	4	660	10	1	18	1	1	23.5	23	1	1	1	140
KNE90W-14	1.3	13170	26	6	2415	1.3	4	44350	4.6	18	27	33410	1030	7	40330	936	1	110	5	530	15	5	149	1	1	128.2	46	1	2	1	45
KNE90W-17	2.7	1590	1	2	138	1.9	3	107300	9.3	20	8	36430	290	1	92060	1203	1	90	16	70	1	1	221	1	1	43.7	65	1	4	1	15
KNE90W-21	1.0	12720	17	6	94	1.4	7	36720	.5	20	127	50840	1820	11	10860	826	1	830	15	1570	22	1	17	1	1	212.1	64	1	1	1	80
KNE90W-24	1.5	5840	5	4	1558	1.2	3	52810	5.4	17	18	34810	390	4	44850	978	1	140	3	290	10	1	62	1	1	119.2	55	1	3	1	46
KNE90W-33	1.7	6040	13	3	155	1.6	4	53780	5.9	14	51	29490	390	3	47790	875	1	90	5	280	11	1	55	1	1	101.8	44	1	3	1	42
KNE90W-37	1.6	6530	66	6	154	1.5	4	68410	6.3	22	37	48040	710	3	51160	1096	1	230	3	410	11	3	40	1	1	179.2	77	1	3	1	33
KNI90W-22	2.3	42220	10	17	55	1.6	17	21960	.1	23	119	54540	1140	25	19200	809	1	16880	1	1710	19	2	69	1	1	268.1	51	3	1	1	27
KNI90W-32	2.0	32220	8	30	83	1.6	15	34920	.1	23	80	51580	2220	13	13740	974	1	6360	3	1640	22	1	19	1	1	219.5	57	2	1	1	42
KNI90W-39	.5	17200	24	10	150	2.1	4	32480	1.0	27	151	73690	1650	7	16090	1327	1	120	3	1450	22	8	146	1	1	271.3	71	1	1	1	42
KNI90W-41	.3	2860	17	1	28	.2	2	5520	.1	3	10	6450	470	3	1600	134	2	80	4	100	6	1	18	1	1	13.6	8	1	1	9	355
KNI90W-42	1.0	11890	365	14	407	1.2	4	32420	2.1	13	278	30580	2900	10	13550	867	4	70	6	1080	25	97	46	1	1	110.4	65	1	1	1	67
KME90W-1	1.9	10520	16	7	488	1.7	6	56770	4.5	20	65	43330	660	7	42730	954	1	200	8	790	15	2	67	1	1	171.9	66	1	2	1	39
KN13-7	2.1	6900	3	4	397	1.8	4	64790	5.9	16	16	34230	410	4	55710	1076	1	130	2	520	8	1	76	1	1	91.0	56	1	3	1	38
KN14-45	.8	11200	74	8	57	1.4	4	31700	2.2	17	37	39270	2600	5	14320	876	3	50	8	1230	23	3	39	1	1	151.4	49	1	1	1	54
KN1614	1.1	9100	22	9	611	1.5	6	34930	1.2	14	70	42370	2110	7	11050	940	1	530	1	1540	21	1	51	1	1	162.5	43	3	1	1	8
KN18/10	1.0	11430	26	5	554	1.2	5	34680	2.8	14	41	38580	330	10	18810	820	3	50	4	570	19	1	62	1	1	172.5	48	1	1	1	81
KN21/2	1.8	7840	10	5	58	1.4	4	54930	5.3	15	26	34720	820	4	52270	943	1	150	2	470	10	1	83	1	1	127.2	49	1	3	1	61
KPI89W-1	1.5	14830	28	2	64	1.0	8	15530	2.2	20	22	30640	1450	5	24760	533	2	2440	76	690	19	1	39	1	1	94.3	30	2	1	9	315

12.2 SOIL ICP RESULTS

COMP: RHINO RESOURCES INC.
PROJ:
ATTN: DR.A.B.L.WHITTLES

MIN-EN LABS — ICP REPORT

705 WEST 15TH ST., NORTH VANCOUVER, B.C. V7M 1T2
(604)980-5814 OR (604)988-4524

FILE NO: 0V-0596-SJ1
DATE: 90/06/04
* SOILS * (ACT:F31)

SAMPLE NUMBER	AG PPM	AL PPM	AS PPM	B PPM	BA PPM	BE PPM	BI PPM	CA PPM	CD PPM	CO PPM	CU PPM	FE PPM	K PPM	LI PPM	MG PPM	MN PPM	MO PPM	NA PPM	NI PPM	P PPM	PB PPM	SB PPM	SR PPM	TH PPM	U PPM	V PPM	ZN PPM	GA PPM	SN PPM	W PPM	CR PPM
400N-0W	.4	20050	9	8	192	1.5	4	9190	.6	16	107	40100	3180	9	11500	792	1	180	24	1320	20	1	27	1	1	136.7	63	1	1	1	31
690N-0W	.6	25150	17	7	173	1.8	5	8000	.1	18	108	45150	3370	15	8800	878	1	130	18	700	18	1	17	1	1	128.3	64	1	1	1	33
700N-300W	.9	27720	1	7	222	1.5	7	6840	.1	13	64	39820	2880	13	6740	410	1	250	13	490	16	1	19	1	1	109.4	56	1	1	1	26
1050N-200W	1.4	27130	16	10	215	1.7	9	8120	.1	17	84	48110	3010	13	8100	576	1	280	20	500	19	1	24	1	1	145.7	70	2	1	1	48
1600N-1400W	.6	23490	17	13	343	2.0	6	7400	.1	17	130	55280	4050	8	6830	556	1	150	8	980	19	1	30	1	1	164.0	87	1	1	1	25
1700N-1300W	.6	29080	9	15	169	2.2	6	13270	.1	23	148	60080	3900	12	10880	826	1	120	19	1080	18	1	28	1	1	209.6	76	2	1	2	61
1700N-1400W	.2	20790	13	18	574	2.0	2	11010	.1	16	153	46940	4660	12	3910	478	1	50	2	1190	14	1	18	1	1	144.6	79	1	1	1	2
1700N-1500W	1.2	31580	1	9	198	1.7	8	8150	.1	14	79	40710	4140	12	8380	383	1	390	23	370	15	1	25	1	1	112.0	64	1	1	1	41
1800N-1400W	.8	30560	2	13	354	2.1	6	8190	.1	16	113	54350	5050	10	7790	427	1	230	9	750	17	1	27	1	1	146.7	83	1	1	1	22

12.3 COPPER AND GOLD ASSAYS

MINERAL ENVIRONMENTS LABORATORIES
(DIVISION OF ASSAYERS CORP.)

SPECIALISTS IN MINERAL ENVIRONMENTS
CHEMISTS • ASSAYERS • ANALYSTS • GEOCHEMISTS

VANCOUVER OFFICE:
705 WEST 15TH STREET
NORTH VANCOUVER, B.C. CANADA V7M 1T2
TELEPHONE (604) 980-5814 OR (604) 988-4524
FAX (604) 980-9621

THUNDER BAY LAB.:
TELEPHONE (807) 622-8958
FAX (807) 623-5931

SMITHERS LAB.:
TELEPHONE/FAX (604) 847-3004

Assay Certificate

0V-0596-RA1

Company: RHINO RESOURCES INC.
Project:
Attn: DR.A.B.L.WHITTLES

Date: JUN-07-90
Copy 1. RHINO RESOURCES INC., VANCOUVER, B.C.

We hereby certify the following Assay of 2 ROCK samples submitted JUN-01-90 by DR.A.B.L.WHITTLES.

Sample Number	AU G/TONNE	AU oz/ton	CU %
KNI90W-38B	.02	.001	.006
KNI90W-45B	.02	.001	.790

Certified by ________________

MIN-EN LABORATORIES

12.4 Cost Analysis

Field Engineer ($500/day for 6 days, May 23, 24, 25, 26, 27 and 28, 1990)	$3000.00
Field Helper ($150/day for 6 days)	900.00
Accommodation and meals (2 men, 6 days at $1000/day)	600.00
Travel Costs (including Ferry)	200.00
Assay Costs	300.00
Word Processing, Blue prints, duplicating	250.00
Air Photos, maps	50.00
Interpretation/Report writing (6 days @ $500/day)	3000.00
	8300.00
(Portion Claimed for Assessment =	3600.00)

12.5 Resume of Technical and Field Experience of Dr. A. B. L. Whittles, P.Eng.

(1) University training at the University of B.C. and the University of Toronto, with the completion of a PhD in Physics (Geophysics Section) in 1964, from U.B.C.

(2) 25 years of teaching (B.C. Institute of Technology, Malaspina College, University of B.C.) of a variety of geological, geophysical, and electronics courses.

(3) Consulting experience during the past 25 years with companies in Vancouver, Victoria, Calgary and Edmonton, in Canada and the U.S., including field supervision and interpretation.

(4) Currently Head, Department of Geology, Malaspina College, Nanaimo, B.C.

(5) Registered with the Association of Professional Engineers of B.C. since 1986.

12.6 Engineers' Declaration

The reader of this report should be aware that the writer (Dr. A. B. L. Whittles) is a Director of Rhino Resources Inc., and holds shares in that company. Rhino Resources Inc. is the owner of the Ned Claim Group, the subject of this report.

Signed
Dr. ABL Whittles, P.Eng.
(Dr. A. B. L. Whittles, P. Eng.)

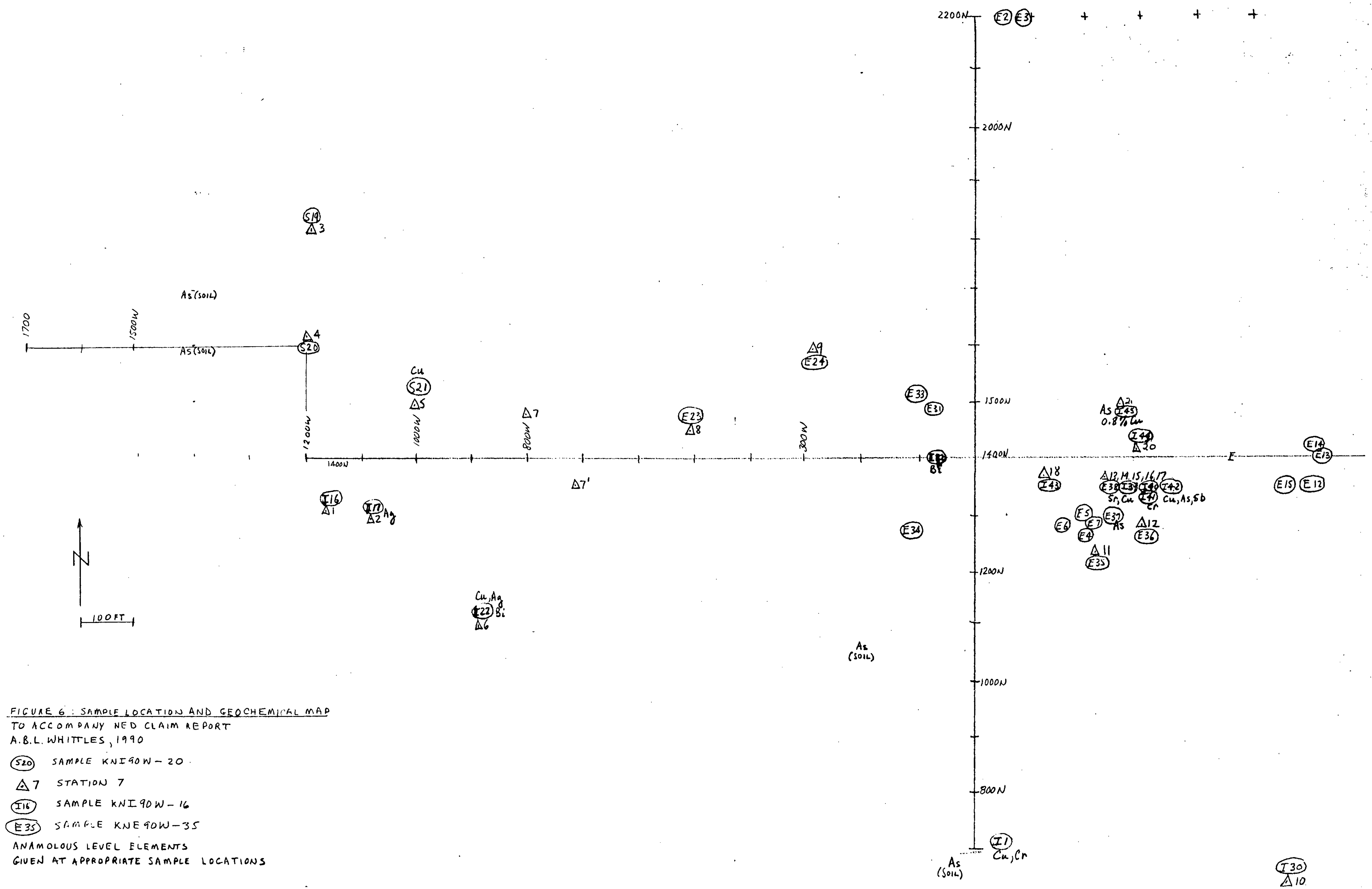

FIGURE 6 : SAMPLE LOCATION AND GEOCHEMICAL MAP
TO ACCOMPANY NED CLAIM REPORT
A.B.L. WHITTLES, 1990

(S20) SAMPLE KNI90W – 20

Δ7 STATION 7

(I16) SAMPLE KNI90W – 16

(E35) SAMPLE KNE90W – 35

ANAMOLOUS LEVEL ELEMENTS
GIVEN AT APPROPRIATE SAMPLE LOCATIONS

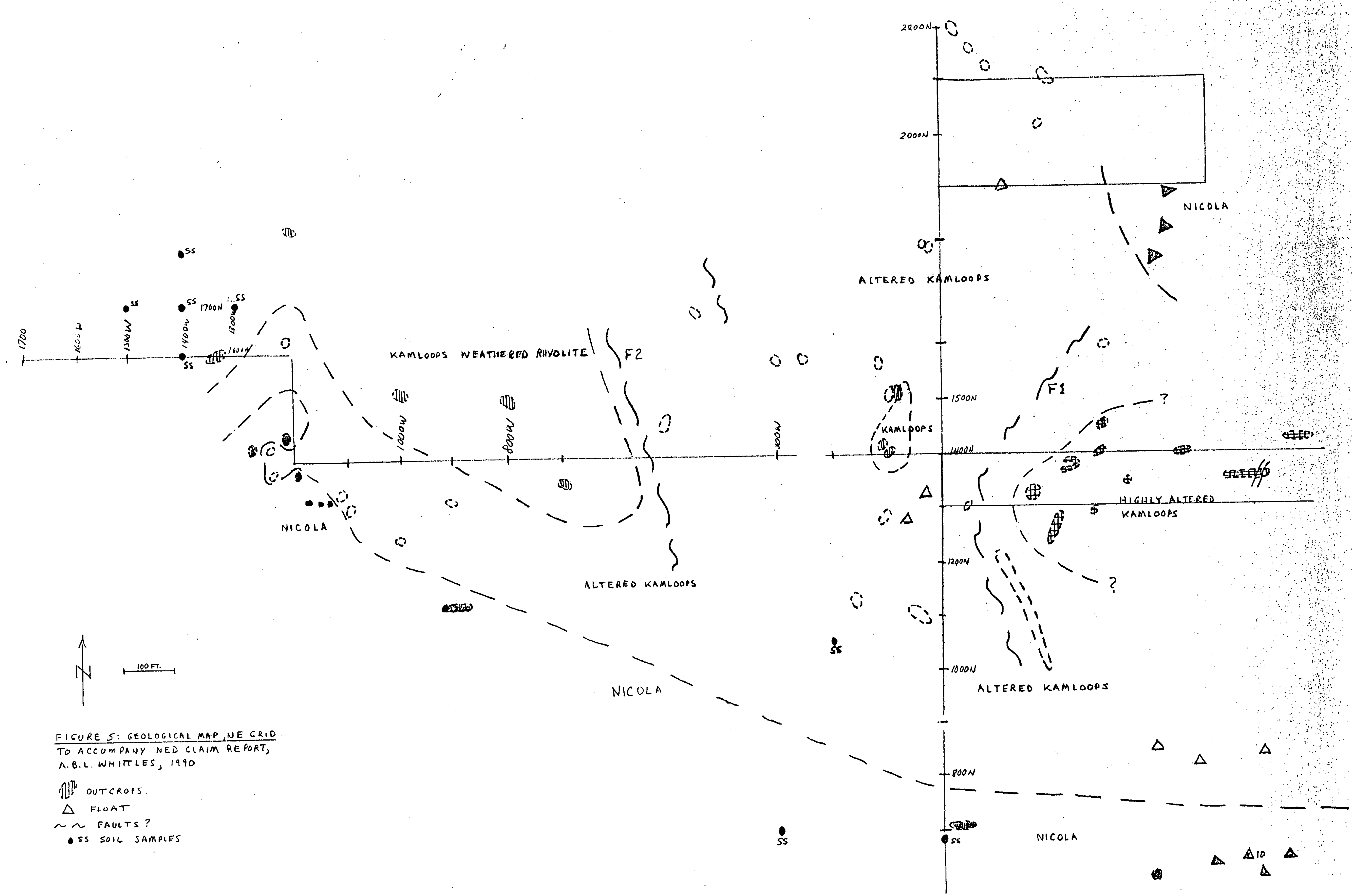

FIGURE 5: GEOLOGICAL MAP, NE GRID
TO ACCOMPANY NED CLAIM REPORT,
A.B.L. WHITTLES, 1990

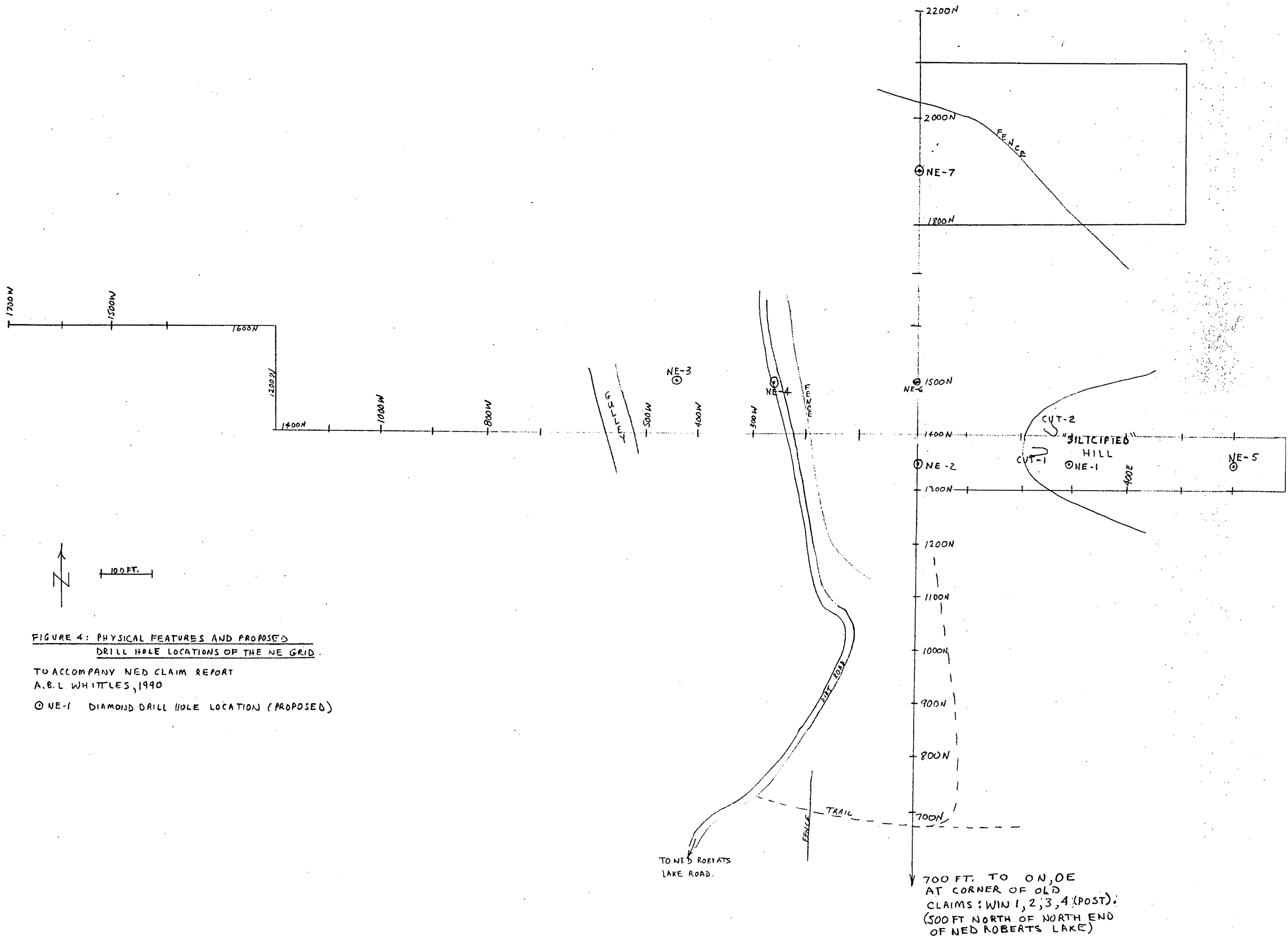

FIGURE 4: PHYSICAL FEATURES AND PROPOSED DRILL HOLE LOCATIONS OF THE NE GRID.

TO ACCOMPANY NED CLAIM REPORT
A.B.L. WHITTLES, 1990

⊙ NE-1 DIAMOND DRILL HOLE LOCATION (PROPOSED)