ASSESSMENT REPORT

PART I

TITLE: 1981 GEOCHEMICAL SOIL SAMPLE SURVEY FOR Cu, Pb AND Zn AND LINECUTTING ON THE MCLAUGHLIN RIDGE PROPERTY, PORT ALBERNI, BRITISH COLUMBIA.

PART II

1981 INDUCED POLARIZATION AND RESISTIVITY SURVEY IN THE OETS, DEBBIE 1, 3, LUCY 2 AND JENNY CLAIMS.

PART III

1981 PULSE ELECTROMAGNETIC (DEEP EM) SURVEY IN THE STOKES, OETS, OETS 2, DEBBIE 3 AND JENNY CLAIMS.

CLAIMS INVOLVED: STOKES, OETS, OETS 2, DEBBIE 1, 2, 3, LUCY 1, 2, 3, COP AND JENNY.

TOTAL UNITS: 177

LOCATION: ALBERNI AND NANAIMO MINING DISTRICTS

49°13'N LATITUDE

124°41'W LONGITUDE

92F 2/E AND 92F/7E N.T.S. MAP NUMBERS

OWNER AND OPERATOR OF CLAIMS: WESTMIN RESOURCES LIMITED

REPORTS BY: PART I : G. BENVENUTO (WESTMIN RESOURCES)

PART II : PETER WALCOTT (PETER E. WALCOTT AND ASSOCIATES, LTD.)

PART III: DAVID ANDERSON (CRONE GEOPHYSICS, LTD.)

WORK PERIOD: MAY 4 TO MAY 29, 1981; JULY 18 TO AUGUST 7, 1981 AND SEPTEMBER 21 TO OCTOBER 15, 1981.

TABLE OF CONTENTS

PART I

TABLE OF CONTENTS (cont'd)

TABLES, FIGURES AND PLATES

TABLE OF CONTENTS (cont'd)

PART II

A REPORT ON AN INDUCED POLARIZATION SURVEY BY
PETER WALCOTT & ASSOCIATES LIMITED

TABLE OF CONTENTS (cont'd)

TABLE OF CONTENTS (cont'd)

SUMMARY

The Oets, Oets 2, Debbie 1, 2, 3, Lucy 1, 2, 3 and Jenny claims form a major part of the McLaughlin Ridge property staked by Westmin Resources Limited in 1979, 10 km east of Port Alberni, Vancouver Island, B.C. The Stokes (20 units) and Cop (10 units) were added onto the northern and western boundaries of the property in 1981, to cover the trend projections of geophysical anomalies. The property, now comprising 15 claims with 247 claim units, is underlain by heterolithic volcanic rocks of the upper Paleozoic Sicker Group.

Between May 4 and 25, 1981, 898 soil and silt samples were collected from the Debbie 1, 2, 3 and Lucy 3 claims along a 50 m by 200 m grid pattern and analyzed for Cu, Pb and Zn. Between September 21 and October 1, 1981, 746 soil and silt samples were collected from the Stokes and Cop claims on the same grid pattern. This sampling completes the reconnaissance-scale soil sampling survey for Cu, Pb and Zn on the entire McLaughlin Ridge property. A total 10 soil samples were collected with anomalous concentrations of Cu (greater than 200 ppm), 6 samples with anomalous Pb (greater than 43 ppm) and 20 samples with anomalous Zn (greater than 200 ppm). Only two samples contained anomalous concentrations of both Zn and Pb. In general, the anomalous soil samples were collected from widely scattered sites in all the claims sampled and do not delineate distinct, relatively restricted exploration target areas. However, the sites from which the more highly anomalous soil samples were collected, warrant follow-up prospecting.

Between May 25 and 28, 1981, Ashworth Exploration Services, Ltd. flagged 50 m-stations along a total of 19.4 km of grid line cut in 1980. On July 29 and between September 9 and 11, 1981, Martinson Linecutting and Staking, Ltd., added 2.4 km of cut lines to the Summit Main grid in Stokes and established the Regina grid in western Jenny in the area of the old Regina workings.

Peter Walcott and Associates, Ltd. conducted an induced polarization-resistivity survey on six grids for a total of 14.3 km of survey, between July 18 and August 7, 1981. The gradient array was employed on 9.6 km of the survey and the pole-dipole array on 4.7 km of survey line. The I.P. survey results were encouraging on four of the six grids. Zones of anomalously high chargeability and moderate apparent resistivity were detected along the central portion of the Summit Main grid in northwest Oets, at the east end of the Cameron Main road grid line in northern Debbie 3, and at the west end of the Regina grid in Jenny. These results suggest the presence of significant disseminated sulphides. On both of the Cop Creek grid lines in Lucy 2 and Cop, a broad to narrow zone of anomalously high chargeability and low resistivity was detected suggesting the presence of a good conductor at a shallow depth.

A pulse electromagnetic (DEEPEM) survey was conducted by Crone Geophysics, Ltd. along 13.4 km of line on three grids, between October 1 and 15, 1981. The survey was conducted on the same, and added portions of three of the grids surveyed with the I.P. method. One strong anomaly was detected on three lines 200 m apart on the Roger's Creek grid in northern Debbie 3, which coincides in part with a broad anomaly detected by an I.P. survey in 1980. However, soil samples collected over the area contain only background concentrations of Cu, Pb and Zn. No anomalies were detected by the pulse EM survey on the Summit Main grid in the Stokes and Oets claims or on the Regina grid on the Jenny claim. This appears to confirm the results of the I.P. survey on these two grids, that is that the anomalous I.P. response is indicative of disseminated rather than massive type mineralization.

PART I

1981 GEOCHEMICAL SOIL SAMPLE SURVEY FOR CU, PB, ZN ON STOKES, DEBBIE 1,2,3, LUCY 3, AND COP CLAIMS.

PART I

INTRODUCTION

LOCATION: 92 F2/E AND 92 F7/E

The McLaughlin Ridge property is located on southeastern Vancouver Island, British Columbia, about 10 air-kilometres southeast of Port Alberni (Figure 1). The property encompasses the northwest part of McLaughlin Ridge between Cameron River to the northeast and east and China Creek to the south, and the Summit Lake-Stokes Creek area to the north. The portions of the property involved in the soil sample and geophysical surveys comprise a total of about 9 square kms and extend from 49° 16.7'N to 49° 8.7'N latitude and from 124° 43.2'W to 124° 37.9'W longitude.

ACCESS

The northern part of the property is easily accessible via the Parksville-Port Alberni Highway No. 4 and is situated between 18 and 22 km from Port Alberni. The southern part is accessible from Port Alberni by a logging road along China Creek (Figure 1). The central portion is accessible by the Cameron Main logging road, and the Yellow Creek and Cop Creek logging road system.

PHYSIOGRAPHY AND GEOLOGY

The McLaughlin Ridge divides the property into rugged northeast-west- and southwest-facing slopes with relief of up to 1000 m. Numerous northerly and northwesterly trending creeks drain from the rather flat-topped ridge into the prominent valleys followed by the Cameron River to the northeast and China Creek to the south.

The Stokes, Oets and Oets 2 claims, which form the northern part of the property, encompass part of the drainage divide between the Cameron River on the east and the Alberni Valley on the west. This area contains several northeast-trending creeks, small lakes and swamps that separate several hills and ridges of moderate relief up to 400 m.

The vegetation is characterized by dense immature to mature forest growth of Douglas Fir, Balsam, Hemlock and Cedar that surrounds eight prominent logging slashes. The China Creek and Roger's Creek valleys contain narrow bands of mature Alder trees.

Most of the property is underlain by Upper Paleozoic metavolcaniclastic rocks and pillowed basalts of the Sicker Group. The centre half of the Oets and Oets 2 claims is underlain by a belt of Cretaceous conglomerates, sandstones and shales of the Nanaimo Group that unconformably overlies the Sicker Group.

PROPERTY DEFINITION

Westmin Resources Limited (prior to March 26, 1981, Western Mines Limited) of 1055 Dunsmuir Street, Vancouver, B.C. is the current owner and operator of the Stokes, Oets, Oets 2, Debbie 1, 2, 3, Lucy 1, 2, 3, Cop, and Jenny claims, which contain from 10 to 20 units. These claims, together with the Cam, Linda 1, 2, Lily 1, 2, and Loupy claims, also held by Westmin Resources Limited, form the McLaughlin Ridge property (Figure 2). The Stokes and Cop claims, with 20 and 10 units, respectively, were added to the property in August, 1981. The information for claims involved in the surveys is given in Table 1 below.

Two claims encompassed by the perimeter of the McLaughlin Ridge property are not held by Westmin Resources: Crown Land Grant L215G held by John McGoran of Vancouver, B.C., and the Yellow claim held by Silver Cloud Mines Ltd. of Surrey, B.C.

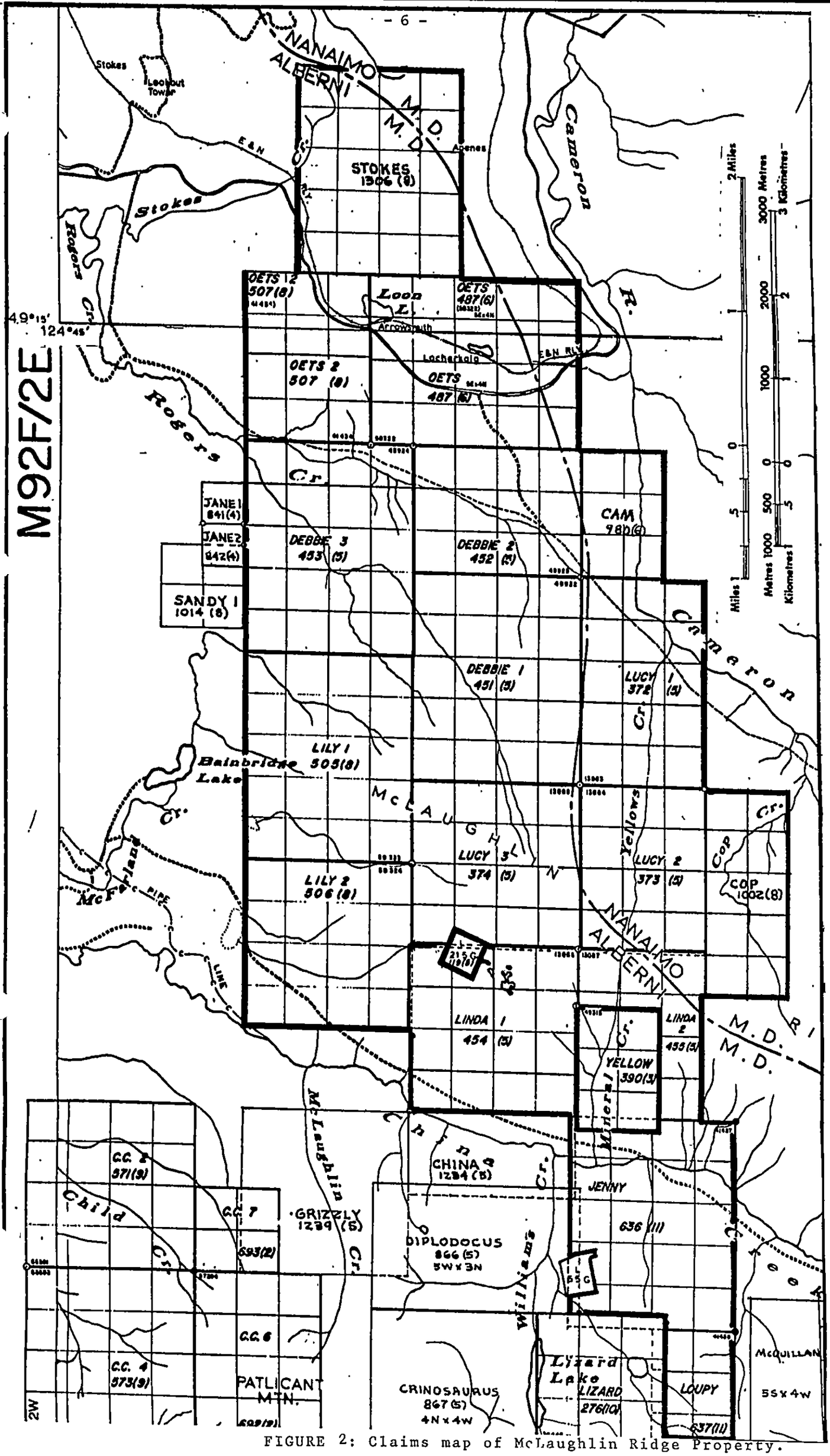


FIGURE 2: Claims map of McLaughlin Ridge Property.

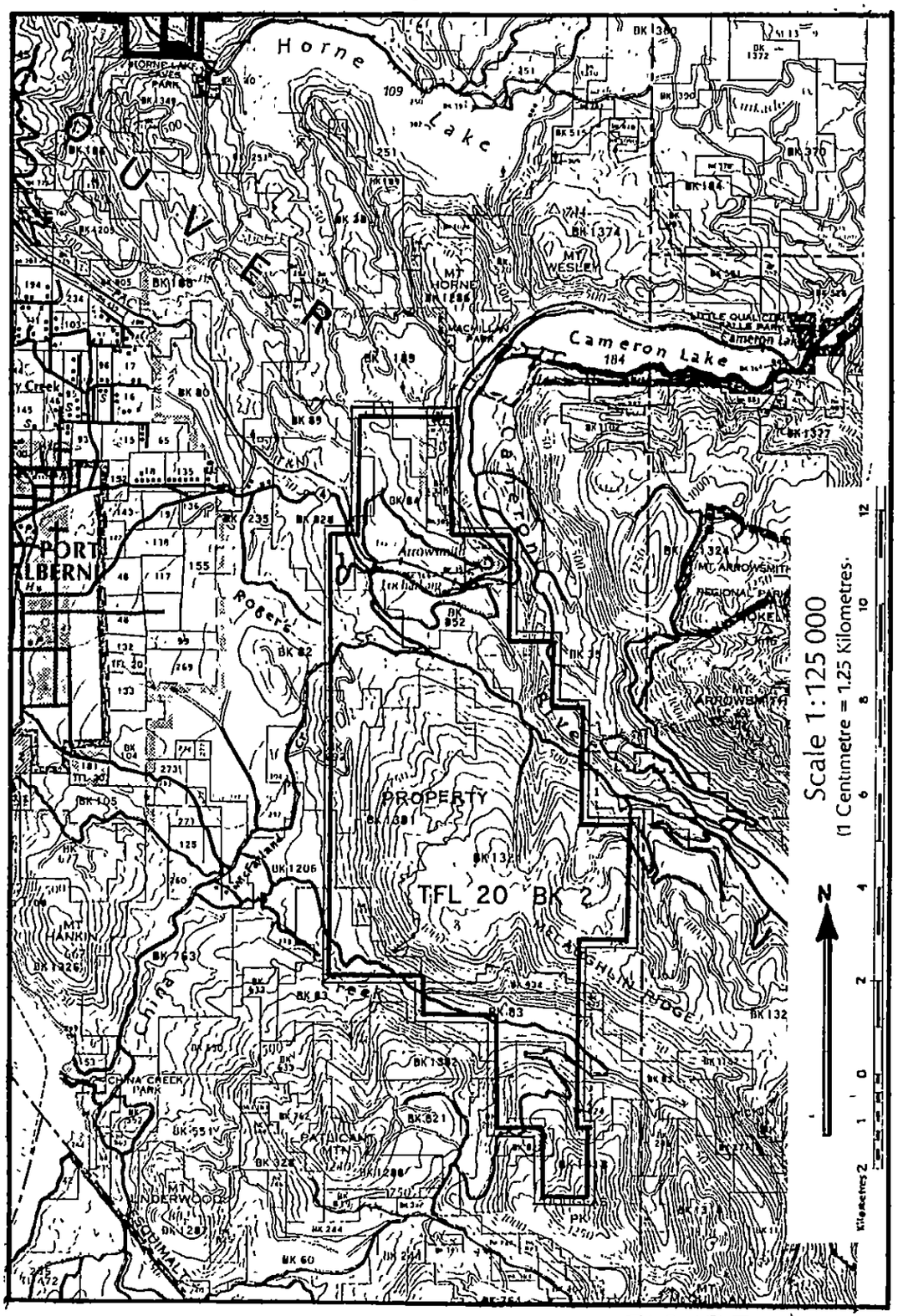


FIGURE :
LOCATION MAP OF McLAUGHLIN RIDGE PROPERTY, 1981.

TABLE 1

CLAIMS INFORMATION

CLAIM GROUP	CLAIM	UNITS	RECORD DATE	RECORD NO.	EXPIRY DATE
OETS	OETS	20	JUNE 28, 1979	487 (6)	JUNE 28, 1983
	OETS 2	12	AUG. 3, 1979	507 (8)	AUG. 3, 1985
	DEBBIE 1	20	MAY 2, 1979	451 (5)	MAY 2, 1984
	DEBBIE 2	12	MAY 2, 1979	452 (5)	MAY 2, 1984
	DEBBIE 3	20	MAY 2, 1979	453 (5)	MAY 2, 1984
LULIN	LUCY 1	15	MAY 2, 1979	372 (5)	MAY 2, 1984
	LUCY 2	12	MAY 2, 1979	373 (5)	MAY 2, 1984
	LUCY 3	16	MAY 2, 1979	374 (5)	MAY 2, 1984
LOU-JEN	JENNY	20	NOV. 13, 1979	636 (11)	NOV. 13, 1983
	STOKES	20	AUG. 24, 1981	1306 (8)	AUG. 24, 1982
	COP	10	AUG. 24, 1981	1002 (8)	AUG. 24, 1982

PROPERTY HISTORY - MINING AND STAKING

Small-scale placer mining and production from gold-bearing quartz veins along several of the tributaries of China Creek are recorded for infrequent intervals between 1862 and 1936. In the Yellow claim, along Mineral Creek, Vancouver Island Gold Mines Ltd., between 1933 and 1936 produced 403 tons of ore containing 303 oz. of gold and 52 oz. of silver, from quartz veins in sheared andesite flows and tuffs (Stevenson, 1944).

Westmin Resources Limited first became involved in mineral exploration in the area in February, 1973, when G.H. Scott staked the Amy claim of 12 units (area covered by the north third of Debbie 1 and south third of Debbie 2). In March, 1973, J. Szakacas staked the Sam claim for Keywest Resources Ltd. in the area surrounding Mineral Creek (Assessment Report No. 5443). Later, in August, 1976, G. Crooker re-staked the Amy claim and enlarged Western Mines holdings to include the Sultan, Rupert and Dog claims (covered approximately by the present Debbie 1, 2 and Lucy 1, 2 claims). In that same month, R. Tschach of Western Mines re-staked the southern part of the Sam claim as the Shannon and Tasha claims (covered by southeast Linda 1 and Jenny).

Geochemical soil and geologic mapping surveys were conducted at a reconnaissance scale by Western Mines in 1973 and 1976 on their claims (Assessment Reports Nos. 4875, 5594, 6153). These early surveys outlined several areas of high concentrations of copper and zinc in the soils. Re-evaluation of these results led Western Mines to re-stake an area of 217 units - the McLaughlin Ridge property (Assessment Reports submitted on soil sampling from Debbie 1, 2, 3, Lucy 1, 2, 3, Linda 1, 2, Oets, Oets 2, Lily 1, 2, Jenny and Loupy claims in 1980). Encouraging results from induced polarization surveys conducted on the Oets and Lucy 2 claims in 1981, provided the basis for staking adjoining ground, now comprising the Stokes and Cop claims, staked in August, 1981.

SUMMARY OF WORK DONE

1. GEOCHEMICAL SOIL SAMPLE SURVEYS

Between May 4 and 25, 1981, four soil samplers employed by Westmin Resources Limited, collected 898 soil samples from portions of the Debbie 1 and Lucy 3 claims and from the entire Debbie 2 and 3 claims, to complete the reconnaissance-scale soil sampling survey began on the property in 1980. The samples were collected with a mattock from the "B"-soil horizon at 50 m intervals along grid lines spaced 200 m apart and trending 058°, which is at right angles to the regional strike of schistosity and layering in the Sicker Group rocks.

Bema Industries Ltd. of 5780 - 203 Street, Langley, B.C., was contracted by Westmin Resources to conduct a soil sample survey on the recently staked Stokes and Cop claims. Four soil samplers from Bema Industries collected a total of 746 soil and silt samples from the two claims between September 21 and October 1, 1981. The two claims were sampled using the same technique and the same grid line pattern as that on the remainder of the claims in the property.

All the soil and silt samples were analyzed at Min-En Labs Limited, 705 West 15th Street, North Vancouver, B.C. At the lab, the samples were dried at 95°C and screened by an 80 mesh sieve. 1.0 gram of the sample was digested in a nitric and perchloric acid solution for 6 hours, then analyzed by an atomic absorption spectrophotometer using a CH_2H_2-air flame, for copper, lead and zinc (results are reported in parts per million-ppm, Plates I through IV).

2. LINECUTTING AND FLAGGING

In 1981 new grid lines were cut,and grid lines cut in 1980 were flagged in preparation for the induced polarization and pulse electromagnetic surveys conducted in 1981. On July 29, 1981, Martinson Linecutting and Staking, Ltd. of 203 Stafford Avenue, Courtney, B.C., cut three lines totalling 1.2 km,to establish the Regina grid in the Jenny claim (Plate V:B). Martinson returned to the property on September 9, 1981, and added cut lines to grids established in 1980 as follows. Between September 9 and 11, 1981, Martinson cut a total of 3 km of line, adding grid lines to the north and south of the previously established Regina grid in western Jenny (Plate V:8). Between September 11 and 12, 1981, Martinson added four cut lines totalling 2.4 km to the northwest end of the Summit Main grid in the recently staked Stokes claim (Plate V:A).

Between May 25 and 28, 1981, Ashworth Exploration Services, Ltd. of 1545 Marine Drive, West Vancouver, flagged stations at 50 m intervals along a total of 19.4 km of grid line cut by Martinson in 1980, as follows: stations were flagged on 6 km of line in the Summit Main grid in the Oets claim; 7.2 km were flagged on the Yellow Creek Main grid in Debbie 1 and Lucy 1; 4.4 km were flagged on the Yellow Creek 100 grid in Lucy 2; and 1.8 km were flagged (25 m stations) on the Cop Creek grid mostly in Lucy 2. In addition, Ashworth, on May 29, 1981, extended the Roger's Creek grid to the northwest by adding two cut lines totalling 1.6 km (Plate V:A).

In summary, a total of 7.2 km of lines were cut on three grids in 1981. In addition, 19.4 km of grid line was flagged to establish stations at 50 m intervals. The lines were cut to a width of 1 m with an axe and, where the underbrush was thick or deadfall extensive, with a chain saw. No evergreens were cut in relatively recently planted logging slashes.

3. GEOPHYSICAL SURVEYS

a. INDUCED POLARIZATION SURVEY (I.P.)

Between July 18 and August 7, 1981, Peter Walcott and Associates Ltd. of 605 Rutland Court, Coquitlam, B.C., conducted an I.P. survey on six grids for a total of 14.3 km of survey. The pole-dipole array (4 levels) was employed along 4.7 km of the survey and the gradient array was employed on the remaining 9.6 km of the survey. The individual grids surveyed by I.P. are shown in the table below:

GRID NAME	KM OF LINE SURVEY	I.P. ARRAY	STATION SPACING	CLAIM
Summit Main	4.0	gradient	50 m	Oets
Summit Main	0.6	pole-dipole	50 m	Oets
Cameron Main	1.1	pole-dipole	75 m	Debbie 3
Yellow Creek Main	3.2	gradient	50 m	Debbie 1, Lucy 1
Yellow Creek 100	2.4	gradient	50 m	Lucy 2
Cop Creek	1.8	pole-dipole	25 m; 50 m	Lucy 2
Regina	1.2	pole-dipole	25 m; 50 m	Jenny

b. PULSE ELECTROMAGNETIC (E.M.) SURVEY

A pulse EM survey was conducted on a total of 13.4 km on three grids by Crone Geophysics, Ltd., of 3607 Wolfedale Road, Mississauga, Ontario, between October 1 and 15, 1981. With the exception of four lines on the Summit Main grid and five lines on the Regina grid, the pulse EM survey was conducted on portions of the same grids as the I.P. surveys by P. Walcott in 1981 and Phoenix Geophysics in 1980 (Roger's Creek grid). The pulse EM survey was conducted at a reconnaissance scale, with readings taken at 50 m intervals on lines spaced 150 m to 270 m apart. The table below lists the grids surveyed by the pulse EM method.

GRID NAME	KM OF LINE SURVEYED	CLAIM(S)
Summit Main	5.2	Stokes, Oets, Oets 2
Roger's Creek	4.0	Oets 2, Debbie 3
Regina	4.2	Jenny

DETAILED TECHNICAL DATA AND INTERPRETATION

A. GEOCHEMICAL SOIL SAMPLE SURVEY

The purpose of the geochemical soil sample survey was to delineate areas within the Stokes, Debbie 1, 2, 3, Lucy 3 and Cop claims with the potential for Cu, Pb or Zn mineralization in the bedrock. The survey provided a preliminary basis for detailed prospecting which led, in some cases, to establishing geophysical grids.

RESULTS

Analyses of the soil samples show that the concentration of copper (Cu) in the soil ranges from 1 to 438 ppm, that of lead (Pb) from 2 to 114 ppm and that of zinc (Zn) from 9 to 860 ppm. Log probability plots have been constructed for the concentration of Cu, Pb and Zn in the soil samples collected from the McLaughlin Ridge property in 1979 and 1980. In order to determine the threshold between background and anomalous concentrations, the cumulative curves for Cu, Pb and Zn have been broken down into their component population according to the method outlined by Sinclair (1976) (see Figures 3, 4 and 5). Assuming the thresholds occur at cumulative percentages of 2 and 98 for the component populations, the following thresholds have been defined (Table 2, below).

TABLE 2: Thresholds for Cu, Pb, Zn concentrations in soil samples

	Cu		Pb		Zn	
	PPM	CUM. %	PPM	CUM. %	PPM	CUM. %
BACKGROUND	0-139	96.5	0-42	98.4	0-114	93.0
HIGH BACKGROUND	140-199	98.5			115-199	98.1
ANOMALOUS	$\geq$ 200		$\geq$ 43		$\geq$ 200	

Plates I through IV (in pocket) show the concentrations of Cu, Pb and Zn at each soil sample site on topographic maps and tracings of aerial photographs at a scale of 1:5,000. Note that analyses of soil samples collected from proximate areas in 1980 are shown on the margins of several of the maps. Also shown in the plates are the contour lines that enclose sample sites from which soils with anomalous concentrations of Cu, Pb or Zn were collected (for consistency with the results of the 1980 soil sampling survey the contour for anomalous Pb is drawn at 50 ppm rather than 43 ppm).

A total of 10 soil samples were collected with anomalous concentrations of Cu, 6 samples with anomalous Pb and 20 samples with anomalous Zn. Six of the samples with anomalous Cu were collected in Debbie 1, 2 in Debbie 2, 2 in Debbie 3, and 2 in Cop. One soil sample with anomalous Pb was collected in Debbie 2, one in Debbie 3, two in Stokes, and two in Cop. And 3 samples with anomalous Zn were collected in Lucy 3, 5 in Debbie 2, 5 in Debbie 3, 6 in Stokes and 1 in Cop.

In general, anomalous soil samples were collected from relatively widely scattered areas. In the southwest corner of Lucy 3 two samples collected 300 m apart, contained anomalous Zn (223 and 285 ppm). In the northwest corner of Lucy 3, a sample was collected that contains 284 ppm Zn. Soil sampling in the northwest corner of Debbie 1 and over the entire Debbie 2 claim delineated an area measuring 650 m (NW-SE) by 760 m (NE-SW) from which six soil and one silt sample were collected with anomalous concentrations of Cu (from 208 to 438 ppm).

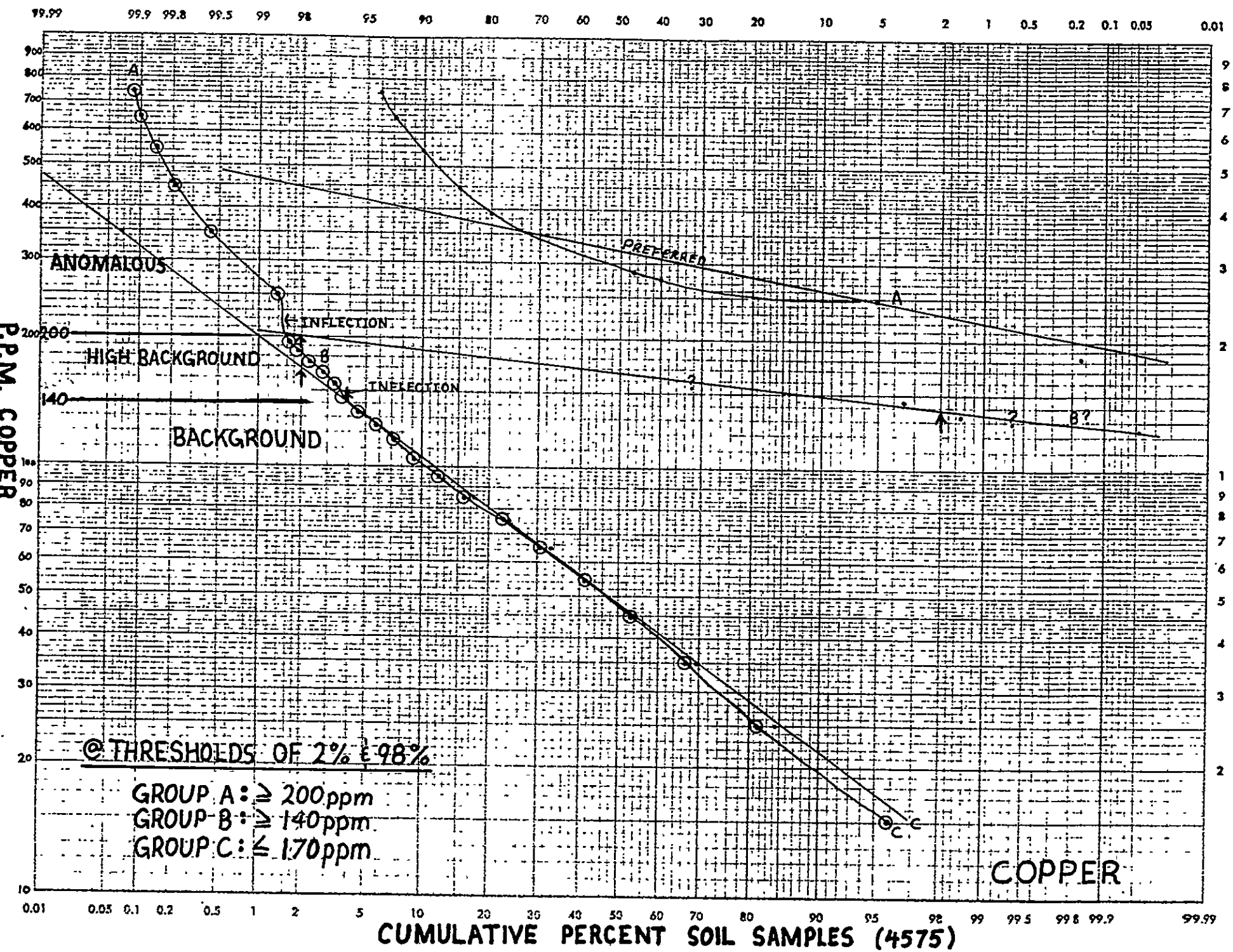


FIGURE 3- LOGARITHMIC PROBABILITY OF COPPER CONCENTRATION IN SOILS, McLAUGHLIN RIDGE, 1979, 1980

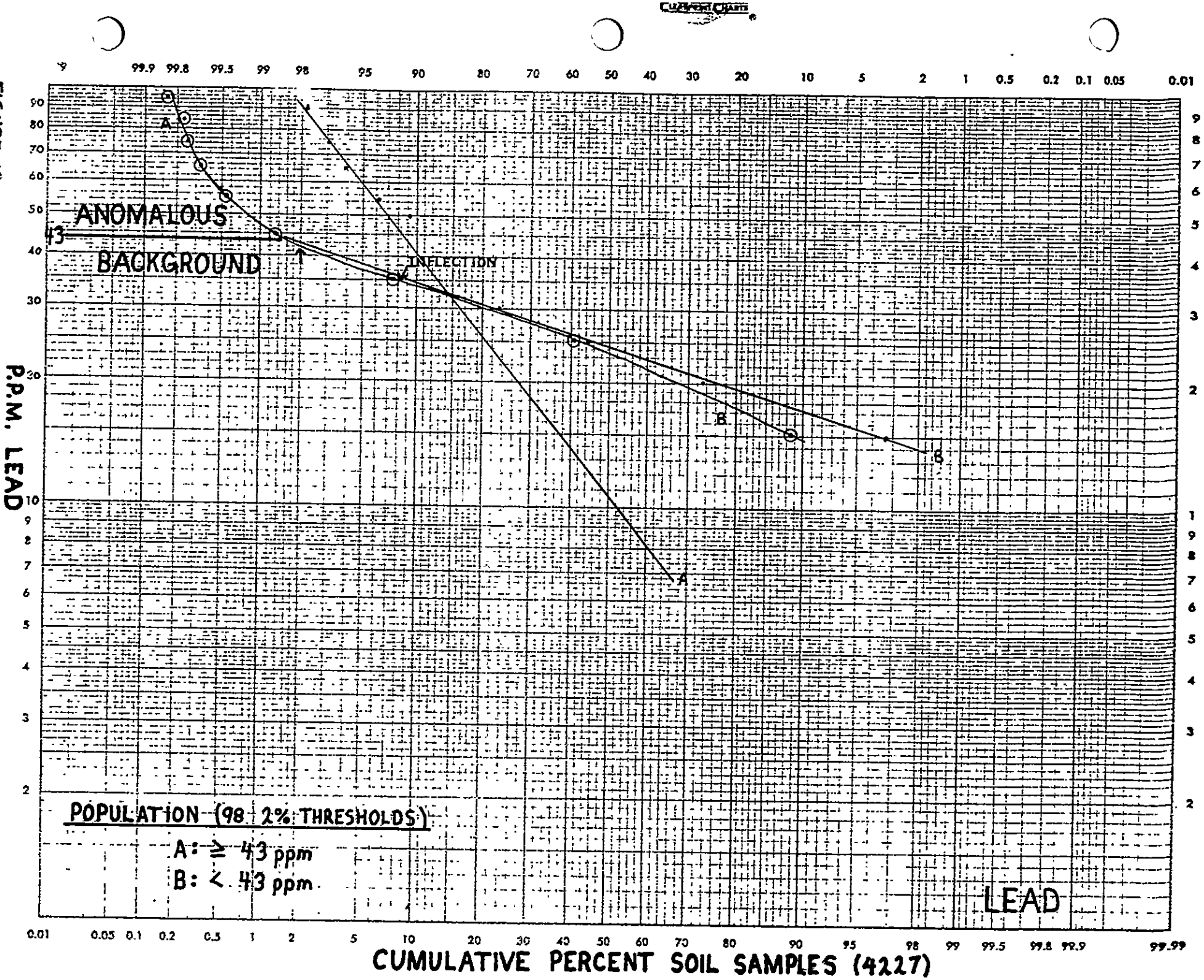


FIGURE 4: LOGARITHMIC PROBABILITY OF LEAD CONCENTRATION IN SOILS, McLAUGHLIN RIDGE, 1979, 1980

In southeast Debbie 2 a single sample with weakly anomalous Zn (218 ppm) was collected. More significantly, perhaps, in north-central Debbie 2 four samples with anomalous Zn (268, 730, 478 and 314 ppm) were collected from sites scattered about in an area 350 m (NE-SW dimension) by 375 m (NW-SE). One of these samples with anomalous Zn (314 ppm) also contained anomalous Pb (90 ppm).

In the southwest corner of Debbie 3 a single sample contained highly anomalous Zn (860 ppm). In the northwest corner of Debbie 3 a sample containing anomalous Cu (325 ppm) was collected 50 m southwest of a sample containing anomalous Zn (253 ppm) and Pb (77 ppm). In the north-central part of Debbie 3, a sample with a very high concentration of Cu (196 ppm) was collected 325 m to the north of two soil samples, 50 m apart, with weakly anomalous Zn (204 and 233 ppm). In the northeast corner of Debbie 3 one sample with anomalous Cu (383 ppm) was collected next to a major logging road.

Eight anomalous soil samples were collected from the Stokes claim, the northernmost claim of the property (Plate I). Four of these samples fall along a northwest-trending line in west-central Stokes: a sample with anomalous Zn (301 ppm) was collected 450 m northwest of another sample with anomalous Zn (360 ppm), which, in turn, was collected 400 m northwest of a sample with highly anomalous Pb (114 ppm). And 850 m to the southeast, along the same line another sample with anomalous Pb (64 ppm) was collected from south-central Stokes. In the southeast corner of Stokes a soil sample with slightly anomalous Zn (206 ppm) was collected about 130 m northwest of a strongly anomalous chargeability measurement at station 25 E on line 200 N of the Summit Main grid (see I.P. survey by P. Walcott and Associates, Part II). In the centre of Stokes a soil sample was collected with anomalous Zn (294 ppm). 900 m to the northwest, in the northwestern part of the claim, another sample with anomalous Zn was collected (319 ppm). This sample, however, is located between two samples, 50 m on either side of it, with high background concentrations of Zn (166 and 172 ppm). And finally, in the northeast part of Stokes a soil sample with slightly anomalous Zn was collected

along the two lines of the Cop Creek grid in eastern Lucy 2 and western Cop, detected a narrow (in the north) to broad (in the south) zone of anomalously high chargeabilities and low resistivities. These results suggest a relatively good conductor lies buried beneath the overburden in the Cop Creek valley, and is steeply dipping in the northwest but shallow-dipping in the southeast.

C. PULSE ELECTROMAGNETIC SURVEY

The results of the pulse EM survey conducted by Crone Geophysics, Ltd., on the Summit Main, Roger's Creek and Regina grids, are discussed in a report by David Anderson included as Part III. Only one strong anomaly was detected on these grids: on the Roger's Creek grid, on lines 300N, 500N and 700N a relatively wide, northwest-trending area is marked by a relatively high amplitudes of the vertical and horizontal components of measurement. It is significant that over the same area, an I.P. survey conducted by Phoenex Geophysics, Ltd. in 1980, detected a broad zone of anomalously high percent frequency effect and low resistivity measurements. This geophysical collaboration prompts follow-up work, even though soil sampling in the area in 1981 does not provide a coincident geochemical anomaly.

In general, the results of the pulse EM survey, which is designed to detect good conductors and massive-type mineralization, confirm the results of the I.P. survey. That is, the absence of well defined anomalies from the pulse EM method across the same areas where the 1981 I.P. survey detected anomalously high chargeabilities but only moderate resistivities, indicate the zones contain significant disseminated sulphides but not massive mineralization.

Gary Benvenuto
Project Geologist

GB:dt.

January 8, 1982

REFERENCES

Sinclair, A.J., 1976, Applications of Probability Graphs in Mineral Exploration, Spec. Vol. No. 4, Association of Exploration Geochemists, Canada, 95 p.

Stevenson, J.S., 1944, Geology and Ore Deposits of the China Creek Area, Vancouver Island, British Columbia, Report of Minister of Mines, 1944, pp. A.142 - G.161.

APPENDIX A

Detailed Expenditures for Geochemical Soil Sampling Surveys, Linecutting, Induced Polarization Surveys and Pulse Electromagnetic Surveys Conducted on the Stokes, Oets, Oets 2, Debbie 1, 2, 3, Lucy 1, 2, 3, Cop and Jenny Claims Between May 4 and October 15, 1981 and Paid for by Westmin Resources Limited

I. Geochemical Soil Sampling Survey on Debbie 1, 2, 3 and Lucy 3

A. Claims, Work Periods and Survey Details

Claim	Units	Number of Soil and Silt Samples	Work Period	Man-Days
Debbie 1	20	70	May 4 - 12, 1981	13
Debbie 2	12	248	May 12 - 15, 1981	30
Debbie 3	20	488	May 17 - 25, 1981	39
Lucy 3	16	92	May 10 - 11, 1981	6
Total		898		88

B. Wages and Type of Work

1. Gary Benvenuto, Senior Geologist, 3 days supervision; 3 days @ $122.00/day: $ 366.00 wages

2. Jeff Vezina, Geological Assistant, 2 days orientation and 23 days soil sampling; 25 days @ $68.00/day: 1,700.00 wages

3. Eden Wong, Geological Assistant, 2 days orientation and 25 days soil sampling; 25 days @ $58.50/day: 1,462.50 wages

4. Andrew Young, Geological Assistant, 1 day orientation and 18 days soil sampling; 19 days @ $59.70/day: 1,134.50 wages

5. Reg Milne, Geological Assistant, 1 day orientation and 18 days soil sampling; 19 days @ $50.00/day: 950.00 wages

Total Wages $5,613.00

C. Accommodation and Meals

1. Accommodation: $13.00/man-day x 91 man-days: $1,183.00
2. Food: $15.10/man-day x 91 man-days: 1,374.10

Total Cost: $2,557.10

D. Transportation

1. One truck rental: $787.40
2. Gas for 1 truck: 150.00

Total Cost: $937.40

E. Geochemical Soil Sample Survey Analyses by Min-En Labs

1. 898 soil and silt samples analyzed for Cu, Pb, Zn @ $4.65/sample:

Sub-total Cost: $4,175.70

2. Freight charges from Port Alberni to Vancouver: 29.25

Total Cost: $4,204.95

F. Field Equipment

Sample bags, thread, flagging, field books, etc:

Total Cost: $ 200.00

G. Report Preparation

1. Drafting of geochemical soil survey analyses map: Lovanne Mah: 3 days @ $55.00/day =

Sub-total Cost: $ 165.00

2. Preparation of assessment report: G. Benvenuto: 3 days @ $142.65/day:

Sub-total Cost: 428.00

Total Cost: $ 593.00

H. Total Cost of Geochemical Soil Sample Survey and Assessment Report on Debbie 1, 2, 3 and Lucy 3 Claims

Total Cost (B thru G above): $14,105.50

Cost per Soil Sample: $14,105.50/898 samples: $ 15.71

I. Apportionment of Geochemical Soil Survey to Claims on Cost/Sample Basis

Claim	Units	No. Samples Collected	Survey Costs
Debbie 1	20	70	$1,100
Debbie 2	12	248	$3,896
Debbie 3	20	488	$7,665
Lucy 3	16	92	$1,445

II. Geochemical Soil Sampling Survey on Stokes and Cop Claims

A. Claims Survey Information

Claim	Units	Number of Soil and Silt Samples	Work Period	Man-Days
Stokes	20	488	Sept. 25 - Oct. 1, '81	26
Cop	10	258	Sept. 21 - 25, 1981	15

Bema Industries Ltd. of 5780 - 203 St., Langley, B.C. was contracted by Westmin Resources Ltd. to conduct the soil sampling survey on Stokes and Oets. Westmin was billed by Bema Industries for the following costs. Westmin paid for the costs of food, accommodation, fuel and analyses also tabulated below.

B. Labour Supplied by Bema Industries

1. D. Lockwood, Field Supervisor, 11.5 days @ $175.00/day =	$2,012.50
2. D. Harris, Field Technician, 10.5 days @ $145.00/day =	1,522.50
3. D. Arthur, Field Technician, 11.5 days @ $145.00/day =	1,667.50
4. M. Allard, Field Technician, 9.5 days @ $145.00/day =	1,377.50
5. J. Mason, Warehouseman, 0.572 days @ $135.00/day =	77.22
Total Labour:	$6,657.22

C. Equipment Supplied by Bema Industries

1. Thread, flagging, sample bags, hand-held radios: $ 670.00
2. 4 x 4 truck from Cana Rentals: 629.73

Total Cost: $1,299.73

D. Miscellaneous

Travel expenses during mob. and demob., telephone: $ 139.50

E. Costs Incurred Directly by Westmin Resources

1. Labour

G. Benvenuto, Senior Geologist, supervision and packing and shipping samples, 3 days @ $122/day: $ 366.00 wages

2. Food

44 man-days x $15.10/man-day: Total Cost: $ 664.40

3. Accommodation

44 man-days x $13.00/man-day: Total Cost: $ 572.00

4. Fuel For Bema Truck: Total Cost: $ 50.00

5. Shipping of Samples to Vancouver: Total Cost: $ 41.24

6. Geochemical Analyses by Min-En Labs

746 soil and silt samples analyzed for Cu, Pb, Zn:
746 samples @ $4.65/sample: Total Cost: $3,468.90

7. Report Preparation

1. Drafting of geochemical soil survey analyses map:

a. Louanne Mah = 5 days @ $55.00/day: $ 275.00 wages
b. Telephone and courier service: Sub-total 22.00

2. Preparation of assessment report:

G. Benvenuto: 2 days @ $142.65/day: $ 285.00 wages

Total Cost: $ 582.00

F. Total Cost of Geochemical Soil Survey and Assessment Report on Stokes and Cop Claims

	Total Cost (B thru E)	$13,841.00
Cost per Soil Sample:	$13,841.00/746 samples:	$ 18.55

G. Apportionment of Geochemical Soil Survey to Claims on Cost/Sample Basis

Claim	Units	No. Samples Collected	Survey Costs
Stokes	20	488	$9,054
Cop	10	258	$4,787

III. Linecutting and Flagging

Linecutting and flagging stations by Martinson Linecutting and Staking Ltd. of Courtney, B.C. and Ashworth Exploration Services Ltd. of West Vancouver, to prepare grids for geophysical surveys, as follows:

Claim	Grid Name	Kms of Line Cut	Work Period	Company
Stokes	Summit Main	2.4	Sept. 11 - 12, 1981	Martinson
Jenny	Regina	1.2	July 29, 1981	Martinson
Jenny	Regina	3.0	Sept. 9 - 11, 1981	Martinson
Oets 2	Roger's Creek	1.6	May 29, 1981	Ashworth
		Kms of Station Flagged		
Oets	Summit Main	6	May 28, 1981	Ashworth
Debbie 1	Yellow Cr. Main	4	May 26 - 27, 1981	Ashworth
Lucy 1	Yellow Cr. Main	3.2	May 26 - 17, 1981	Ashworth
Lucy 2	Yellow Cr. 100	4.4	May 25, 1981	Ashworth
Lucy 2	Cop Creek	1.8	May 25, 1981	Ashworth

A. Cost of Linecutting by Martinson (less accommodation)

2 men for 6 days @ $185.00/man-day: Sub-total $2,220.00

B. Accommodation Supplied by Westmin Resources:

12 man-days @ 13.00/man-day: Sub-total $ 156.00

C. Total Cost of Linecutting by Martinson: $2,376.00

Cost/km of Linecutting: $2,376/6.6 km $ 360.00/km

D. Cost of Linecutting and Station Flagging by Ashworth (less accommodation and food):

21.0 km @ $122.00/km: Sub-total: $2,562.00

E. Food and Accommodation Supplied by Westmin Resources:

10 man-days @ $28.10/man-day: Sub-total: $ 281.00

F. Total Cost of Linecutting by Ashworth: $2,843.00

Cost/km of Linecutting: $2,843.00/21.0 km $ 135.40

G. Apportionment of Costs of Linecutting:

Claim	Grid Name	Kms of Grid Line	Cost
Stokes	Summit Main	2.4	$ 864
Oets	Summit Main	6.0	$ 812
Jenny	Regina	4.2	$1,512
Oets 2	Roger's Creek	1.6	$ 217
Debbie 1	Yellow Cr. Main	4.0	$ 542
Lucy 1	Yellow Cr. Main	3.2	$ 433
Lucy 2	Yellow Cr. 100 Cop Creek	6.2	$ 839

IV. Induced Polarization - Resistivity Surveys on Six Grids in the Oets, Debbie 1, 2, Lucy 1, 2 and Jenny Claims

A. General Information

Between July 18 and August 7, 1981, Peter Walcott and Associates Ltd. of 605 Rutland Court, Coquitlam, B.C. conducted an I.P. survey along 6 grids for a total of 14.3 km of survey. 4.7 km of the survey utilized the pole-dipole array survey (n = 4) and 9.6 km of the survey, the gradient array. Because the pole-dipole array survey took about twice as much time to conduct (0.5 km/day) as the gradient array survey (0.9 km/day), the costs of the survey are apportioned to the claims on the basis of a daily rate, calculated below.

B. Calculation of Costs of I.P. Surveys

1. Costs Billed by Peter Walcott: (Invoice #1555)

a.	Labour and equipment:	$16,375.00
b.	Mileage and gas for 4 x 4 trucks:	431.25
c.	Meals and travel expenses, mob. and demob:	164.55
d.	Interpretation and report writing:	450.00
e.	Drafting and report preparation:	1,332.00
	Sub-total Cost:	$18,752.80

2. Costs Incurred by Westmin Resources:

a.	Wages paid to worker to assist in I.P. survey: David B. Hopper, July 26, "pot man" @ $78.00/day:	$ 78.00
b.	Food: 91 man-days x $15.10/man-day:	1,374.00
c.	Accommodation: 91 man-days x $13.00/man-day:	1,183.00
	Sub-total Cost:	$ 2,635.00

3. Total Cost of I.P. Survey by P. Walcott:

a.	Total of 1. and 2. above: Total Cost:	$21,388.00
b.	Cost per day of survey: Total cost/number of days: $21,388/20 days:	$ 1,069.40/day

4. Apportionment of Costs of I.P. Survey to Grids:

Costs calculated on basis of cost/day rate of $1,037.20/day

Grid Name	Total Length (kms)	Type of Array	Days of Survey	Cost
Yellow Cr. 100	2.4	gradient	3	$3,208
Yellow Cr. Main	3.2	gradient	4	$4,278
Summit Main	4.0	gradient	4 } 5	$5,347
Summit Main	0.6	pole-dipole	1 }	
Cop Creek	1.8	pole-dipole	4	$4,278
Regina	1.2	pole-dipole	3	$3,208
Cameron Main	1.1	pole-dipole	1	$1,069

5. Apportionment of Costs of I.P. Survey to Claims:

(Note: Stokes and Cop Claims staked after survey completed)

Claim Name	Kms of Grid in Claim	Cost
Oets	4.6 kms, Summit Main	$5,347.00
Debbie 1	2.7 kms, Yellow Creek Main	$3,610.00
Lucy 1	0.5 kms, Yellow Creek Main	$ 668.00
Lucy 2	2.4 kms, Yellow Creek 100 1.8 kms, Cop Creek	$7,486.00
Jenny	1.2 kms, Regina	$3,208.00
Debbie 3	1.1 kms, Cameron Main	$1,069.00

V. Pulse E.M. Surveys (Deepem) by Crone Geophysics Ltd. on the Stokes, Oets, Oets 2, Debbie 3, and Jenny Claims

A. General Information

Between October 1 and 15, 1981 Crone Geophysics, Ltd. of 3607 Wolfedale Road, Mississauga, Ontario, conducted a pulse E.M. survey on three grids for a total of 13.4 kms of survey. Below, the costs as billed directly by Crone Geophysics and the costs directly incurred by Westmin Resources are tabulated. The fact that the progress rate varied considerably between survey grids, suggests the most reasonable method of apportioning costs is on the basis of cost per day.

B. Charges Billed by Crone Geophysics Ltd.:

1. Charges broken down by Crone Geophysics as follows (Invoice #'s 7301 and 7311):

a.	Labour (2 men) and equipment:	$ 9,210.00
b.	Expenses (airfare, freight, phone, taxi, misc.):	808.67
c.	Vehicle rental and gasoline:	987.51
d.	Meal and accommodation, in transit:	539.16
e.	15% handling on items b, c and d:	350.30
f.	Consulting charges (report writing):	300.00
g.	Plots of data:	420.00
	Sub-Total Cost:	$12,615.64

C. Expenses Incurred Directly by Westmin Resources:

a. Wages paid to men to assist Crone Geophysics' crew:

1. Blair Meadows, helper, 9 days @ $55.00/day: $ 495.00
2. Mike Tardif, helper, 3 days @ $55.00/day: 165.00

b. Food:
(2 men 15 days @ $15.70/man-day): 471.00

c. Accommodation:
(2 men 15 days @ $11.66/man-day): 349.80

d. Gasoline for geophysical crew 4 x 4 truck: 181.72

Sub-total Cost: $1,662.00

D. Total Cost of Pulse E.M. Survey:

Total Cost (Total of B. & C. above): $14,278.00

Cost of survey per day: total cost/number of days:
$14,278.00/15 days: $ 951.87/day

E. Apportionment of Costs of Pulse E.M. Survey to Claims

Claim	Kms of Grid Surveyed, Grid Name	No. of Days	Cost
Stokes	2.8 km, Summit Main	2.5	$2,380.00
Oets	2.2 km, Summit Main	2.3	$2,189.00
Oets 2	0.2 km, Summit Main 1.2 km, Roger's Creek	0.2 1.8	$1,904.00
Debbie 3	2.8 km, Roger's Creek	4.2	$3,998.00
Jenny	4.2 km, Regina	4.0	$3,807.00

IV: APPORTIONMENT OF COSTS OF GEOCHEMICAL SOIL SURVEYS, LINECUTTING AND GEOPHYSICAL SURVEYS

Claim Group	Claims in Group	Units	Cost of Soil Sample Survey	Cost of I.P. Survey	Cost of Pulse E.M. Survey	Cost of Linecutting	Cost
Oets	Oets	20	-	$ 5,347	$ 2,189	$ 812	$32,349
	Oets	12	-	—	$ 1,904	$ 217	
	Cam	6	-	-	—	—	
	Debbie 1	20	$ 1,100	$ 3,610	—	$ 542	
	Debbie 2	12	3,896	—	—	—	
	Debbie 3	20	7,665	$ 1,069	$ 3,998	—	
Lulin	Lucy 1	15	-	$ 668	—	$ 433	$10,871
	Lucy 2	12	-	$ 7,486	—	$ 839	
	Lucy 3	16	$ 1,445	-	—	—	
	Linda 1	16	-	-	—	-	
	Linda 2	12	-	-	-	-	
	Stokes	20	$ 9,054	-	$ 2,380	$ 864	$12,298
	Cop	10	$ 4,787	-	—	—	$ 4,787
Lou-Jen	Jenny	20	-	$ 3,208	$ 3,807	$1,512	$ 8,527
	Loupy	6	-	-			
	Total		$27,947	$21,388	$14,278	$5,219	$68,832

TOTAL

Claim Group	Claim	Units	Work Per Year to Main. Claim	Due Date Prior To Work Submission	Work Applied in 1982	Pac. Withdrawal (-)	Years Applied	Date of Claim
Oets	Oets	20	$4,000	June 28, 1983	$ 9,231	- $ 2,769	3	June 28, 1986
	Oets 2	12	$2,400	Aug. 3, 1985	$ 6,195	- $ 1,005	3	Aug. 3, 1988
	Cam	6	$1,200	June 20, 1985	$ 923	- $ 277	1	June 20, 1986
	Debbie 1	20	$4,000	May 2, 1984	$ 6,154	- $ 1,846	2	May 2, 1986
	Debbie 2	12	$2,400	May 2, 1984	$ 3,692	- $ 1,108	2	May 2, 1986
	Debbie 3	20	$4,000	May 2, 1984	$ 6,154	- $ 1,846	2	May 2, 1986
					$32,349: Total:	- $ 8,851		
Lulin	Lucy 1	15	$3,000	May 2, 1984	$ 2,308	- $ 692	1	May 2, 1985
	Lucy 2	12	$2,400	May 2, 1984	$ 1,846	- $ 554	1	May 2, 1985
	Lucy 3	16	$3,200	May 2, 1984	$1,787	- $ 1,413	1	May 2, 1985
	Linda 1	16	$3,200	May 2, 1983	$ 4,923	- $ 1,477	2	May 2, 1985
	Linda 2	12	$2,400	May 2, 1983	$ 1,794	- $ 606	1	May 2, 1984
	Cop	10	$1,000 ('81-'84)	Aug. 24, 1982	$ 3,000	0	3	Aug. 24, 1985
					$15,658: Total:	- $ 4,742		
	Stokes	20	$2,000 ('81-'84) $4,000 ('83-)	Aug. 24, 1982	$12,298	- $ 1,702	5	Aug. 24, 1987
Lou-Jen	Jenny	20	$4,000	Nov. 13, 1983	$ 6,154	- $ 1,846	2	Nov. 13, 1985
	Loupy	6	$1,200	Nov. 13, 1983	$ 2,373	- $ 27	2	Nov. 13, 1985
					$ 8,527: Total:	- $ 1,873		
				TOTAL	$68,832	- $17,168		

VII: APPORTIONMENT OF COST OF WORK TO CLAIMS

APPENDIX B

WESTMIN RESOURCES LIMITED

EXPLORATION VANCOUVER ISLAND REGION

STATEMENT OF QUALIFICATIONS

I, Gary Louis Benvenuto, of the town of Campbell River, British Columbia, hereby certify that:

1. I am a geologist, residing at 4125 Discovery Drive, #7, in Campbell River, B.C. with a business address of Westmin Resources Limited, P.O. Box 8000, Campbell River, B.C.

2. I graduated with a B.Sc. degree in geology from California State University at Los Angeles in 1972 and with a Ph.D. degree in geology from Queen's University, Kingston, Ontario in 1978.

3. I am an associate member of the Geological Association of Canada.

4. I have practiced exploration geology with Cominco Ltd. from May to October, 1979 and with Westmin Resources Limited from January, 1980 to present.

Dated: FEBRUARY 3, 1982

Signed: Gary Benvenuto

Gary Benvenuto
Project Geologist
Westmin Resources Limited

PART II

1981 INDUCED POLARIZATION AND RESISTIVITY SURVEY ON THE DEBBIE 13, LUCY 2, AND JENNY CLAIMS.

PETER E. WALCOTT & ASSOC. LTD.

A REPORT

ON

AN INDUCED POLARIZATION SURVEY

Alberni & Nanaimo Mining Districts
Vancouver Island, British Columbia

(49° 13'N, 124° 41'W)
N.T.S. 92F 2/E 27/E

Claims Surveyed: Stokes 1306(8), Oets 487(6), Oets 2 507(8)
Debbie1,451(5), Debbie 2 452(5), Debbie 3 453(5)
Lucy 1 372(5), Lucy 2 373(5), Jenny 636 (11)
Cop 100 2(8)

Survey Dates: July 17th - August 7th, 1981

FOR

WESTMIN RESOURCES LTD.

Vancouver, B.C.

BY

PETER E. WALCOTT & ASSOCIATES LIMITED

Vancouver, British Columbia

DECEMBER 1981

TABLE OF CONTENTS.

APPENDIX

ACCOMPANYING MAPS - Scale 1:5000 — MAP POCKET

INTRODUCTION.

Between July 17th and August 7th, 1981; at the request of Westmin Resources Ltd., Peter E. Walcott & Associates Limited carried out induced polarization surveying over parts of a property (ies) located near Port Alberni, on Vancouver Island.

The survey was undertaken on various parts of small grids located off the Cameron Main Road of the logging operations of MacMillan Bloedel.

Measurements of apparent resistivity and chargeability (the I.P. response parameter) were made using the "gradient" and/or "pole-dipole" method of surveying along the designated lines using a time domain system.

The data are presented either in contour form as pseudo-sections bound in this report or in profile and contour form on plan maps of the grid that accompany this report.

PROPERTY, LOCATION & ACCESS.

The claims are located in the Nanaimo and Alberni Mining Districts of British Columbia, and are situated off the Cameron Main Road of MacMillan Blodell's logging operation.

The claims involved in the I.P. survey were as follows:

Claim Name	Number
Stokes	1306(8)
Oets	487(6)
Oets	507(8)
Debbie 1	451(5)
Debbie 2	452(5)
Debbie 3	453(5)
Lucy 1	372(5)
Lucy 2	373(5)
Jenny	636(11)
Cop	1002(8)

Access is obtained by means of 4 wheel drive vehicle off the above mentioned Cameron Main Road which links up with the Nanaimo - Port Alberni Highway some 6 miles from the latter.

PREVIOUS WORK.

The reader is referred to material held by Westmin Resources Ltd.

GEOLOGY.

The writer has not been furnished with any geological data so the reader is referred to material held by Westmin Resources Ltd.

PURPOSE.

Presumably the purpose of the survey was to locate the presence of sulphide mineralization, the indication and/or suggestion of which has been previously observed on geological prospecting. However the writer has no idea as to the type or extent of the mineralization that is the object of the search.

SURVEY SPECIFICATIONS.

The induced polarization (I.P.) survey was carried out using a pulse type system, the principal components of which are manufactured by Huntec Limited and Phoenix Geophysics Limited of Metropolitan Toronto, Ontario.

The system consists basically of three units: a receiver (Huntec), a transmitter and a motor generator (Phoenix). The transmitter which provides a maximum of 3.0 kw d.c. to the ground, obtains its power from a 3.0 kw 400 c.p.s. three phase alternator driven by a gasoline engine. The cycling rate of the transmitter is 2 seconds "current-on" and 2 seconds "current-off" with the pulses reversing continuously in polarity. The data recorded in the field consists of careful measurement of the current (I) in amperes flowing through electrodes C_1 and C_2, the primary voltage (V) appearing between the two potential electrodes, P_1 and P_2, during the "curent-on" part of the cycle, and the apparent chargeability (M_a) presented as a direct readout using a 100 millisecond delay and a 1000 millisecond sample window.

The apparent resistivity (P_a) in ohm metres is proportional to the ratio of the primary voltage and the measured current, the proportionality factor depending on the geometry of the array used. The chargeability and resistivity are called apparent as they are values which that portion of the earth sampled would have if if were homogeneous. As the earth sampled is usually inhomogeneous the calculated apparent chargeability and resistivity are functions of the actual chargeability and resistivity of the rocks.

The survey was carried out using the "pole-dipole" and "gradient" method of surveying. In the former method the current electrode C_1, and the two potential electrodes, P_1 and P_2, are moved in unison along the survey lines. The spacing "na" (N an integer) between C_1 and P_1 is kept constant for each traverse at a distance roughly equal to the depth to be explored by that traverse, while that of P_1 to P_2 (the dipole) is kept constant at "a". The second current electrode C_2 is kept constant at "infinity".

Thus usually on a "pole-dipole" array traverse with an electrode spacing of 100 metres a body lying at a depth of 100 metres will produce a strong response, whereas the same body lying at a depth of 200 metres will only just be detected. By running subsequent traverses at different electrode separations, more precise estimates can be made of depth, width, thickness and percentage of sulphides of causative bodies located by the I.P. method.

SURVEY SPECIFICATIONS cont'd

In the gradient configuration the two current electrodes, C_1 and C_2, are embedded in favourable locations a distance 2 A apart. Readings are then taken with a dipole "a", $a \leq A/10$, on lines parallel to the line joining C_1 and C_2 and within a square block of dimension A located about the centre point of $C_1 - C_2$. The current array is then moved to an adjoining block if uniform coverage over a large area is desired.

The location of the receiver setups can be expressed as a function of distance along the line from the centre point of $C_1 - C_2$, and the distance of the line from the line joining $C_1 - C_2$, and thus the values of apparent resistivity can be obtained by computing the respective geometric factors or by taking them from standard graphs using these relationships.

On this survey gradient array surveys were done on the Yellow Creek Main, the Yellow Creek 100 and the Summit Main grids, while "pole-dipole" traverses were carried out on the Summit Main, the Regina, the Cameron Main and the Cop Creek grids respectively.

DISCUSSION OF RESULTS.

The I.P. results should be studied in conjunction with the known geology and the geochemical results to which the writer has no access. Accordingly he will make a few observations on the I.P. results on an individual grid basis assuming that the general I.P. background of the area to be in the order of 6 to 7 milliseconds as indicated by a cursory look at the results in general as the coverage is generally too small to assess individual backgrounds.

Yellow Creek Main - Map No. W-299-1

Here the chargeability values range from 13 to 21 milliseconds on the four lines covered by the gradient survey. However some pattern can be observed with two zones of higher readings trending across the lines on either side of the baseline. Very high resistivity readings are associated with the higher chargeability effects on the west.

Yellow Creek 100 - Map W-299-3

Here the chargeability values range from the sixes to the fifteens with a reasonably well defined high striking across the grid. The resistivity readings essentially follow the topography.

Summit Main - W-299-2

Here again high chargeability readings were obtained throughout the gradient survey with a pronounced zone of very high readings defined in the western part of the grid.

Detailed pole - dipole work on Line 200 N with a 50 metre dipole - see pseudo section - gave a typical buried horizontal slab response with a high on the pole side.

Regina - pseudo-sections.

Here three lines were traversed using the pole-dipole array, the outside lines with a 50 metre dipole and the central one with a 25 metre dipole. A strong I.P. response was noted on all lines over the showings west of the baseline.

DISCUSSION OF RESULTS cont'd

Cameron Main - pseudo-sections

One line was surveyed here with a dipole of 75 metres. Two zones of anomalous response are discernible - one on the eastern side and the other on the western side. Both of these zones are undefined at the extremities of the line, and both appear to be associated with lower resistivity values.

Cop Creek - pseudo-sections.

Two lines were surveyed here along the existing access road framework using dipoles of 25 and 50 metres respectively.

Four anomalous zones were observed on Line 1 centred about 0 + 20E, 3 + 10W, 5 + 50W and 700W respectively. The first of these zones is more complex and is presumably associated with a different rock type as suggested by the resistivity results. The other three, particularly the second and fourth, appear to be associated with resistivity lows - it should be mentioned that the geometric factors used in the resistivity calculations will be somewhat in error due to the meanderings of the roads.

On Line 2, surveyed with a 50 metre dipole, a large chargeability anomaly was observed covering most of the area surveyed. Its nature is of the type that could be associated with a flat body of limited depth response centred around 500W. It is also associated with a resistivity low, and the resistivity readings effectively mirror those of the chargeability. From the values but not character of its chargeability and resistivity responses it would appear to be part and parcel of the zone observed on 3 + 10W on Line 1 giving rise to an anomalous trend, the likes of which are also seen on the Yellow Creek Main and 100 grids respectively.

SUMMARY, CONCLUSIONS & RECOMMENDATIONS.

Between July 17th and August 7th, 1981, Peter E. Walcott & Associates Limited carried out limited induced polarization surveying over a property, located near Port Alberni, British Columbia, for Westmin Resources Ltd.

The surveys, carried out using gradient and pole-dipole methods of surveying, gave some interesting results as discussed.

These should be further studied in conjunction with the other essential data i.e. geological and geochemical results to more thoroughly evaluate their worthy before additional and consequent work be undertaken.

Respectfully submitted,

PETER E. WALCOTT & ASSOCIATES LIMITED

Peter E. Walcott, P.Eng.
Geophysicist

Vancouver,
British Columbia

December 1981

A P P E N D I X

COST OF SURVEY.

Peter E. Walcott & Associates Limited undertook the survey on a daily basis. Mobilization, draughting and resport writing costs were extra so that the total cost of services provided was ~~$18,202.20~~. $18,752.80 (CAD.)

PERSONNEL EMPLOYED ON SURVEY.

Name	Occupation	Address	Dates
Peter E. Walcott	Geophysicist	Peter E. Walcott & Assoc. 605 Rutland Court, Coquitlam, B.C. V3J 3T8	Jul 17 - 19, Nov. 25th, Dec. 8 1981
T. T. Kirby	Geophysical Operator	"	July 17 - Aug. 7 1981
R. Summerfield	"	"	"
S. Gibbons	"	"	July 28 - Aug. 7 1981
P. Charlie	"	"	July 28 - Aug. 1 1981
B. Pozsonyi	Helper	"	July 17th - 24th 1981
D. Mottle	"	"	July 27th - Aug. 6 1981
B. Neilsen	"	"	Aug. 3rd - 7th, 81
G. MacMillan	Draughting	"	Nov. 1st - 9th, 81
J. Walcott	Typing	"	Dec. 9th, 1981

CERTIFICATION.

I, Peter E. Walcott, of the Municipality of Coquitlam, British Columbia, hereby certify that:

1. I am a Graduate of the University of Toronto with a B.A.Sc. in Engineering Physics, Geophysics Option, in 1962.

2. I have been practising my profession for the last 19 years.

3. I am a member of the Association of Professional Engineers of British Columbia and Ontario.

4. I hold no interest, direct or indirect, in the securities and/or properties of Westmin Resources Ltd., nor do I expect to receive any.

Peter E. Walcott, P.Eng.

Vancouver,
British Columbia

December 1981

10,176

CRONE GEOPHYSICS LIMITED
FOR
WESTMIN RESOURCES
SUMMIT MAIN GRID
TRANSMITTER LOOP LOCATIONS
DEEPEM SURVEY
FIGURE 1

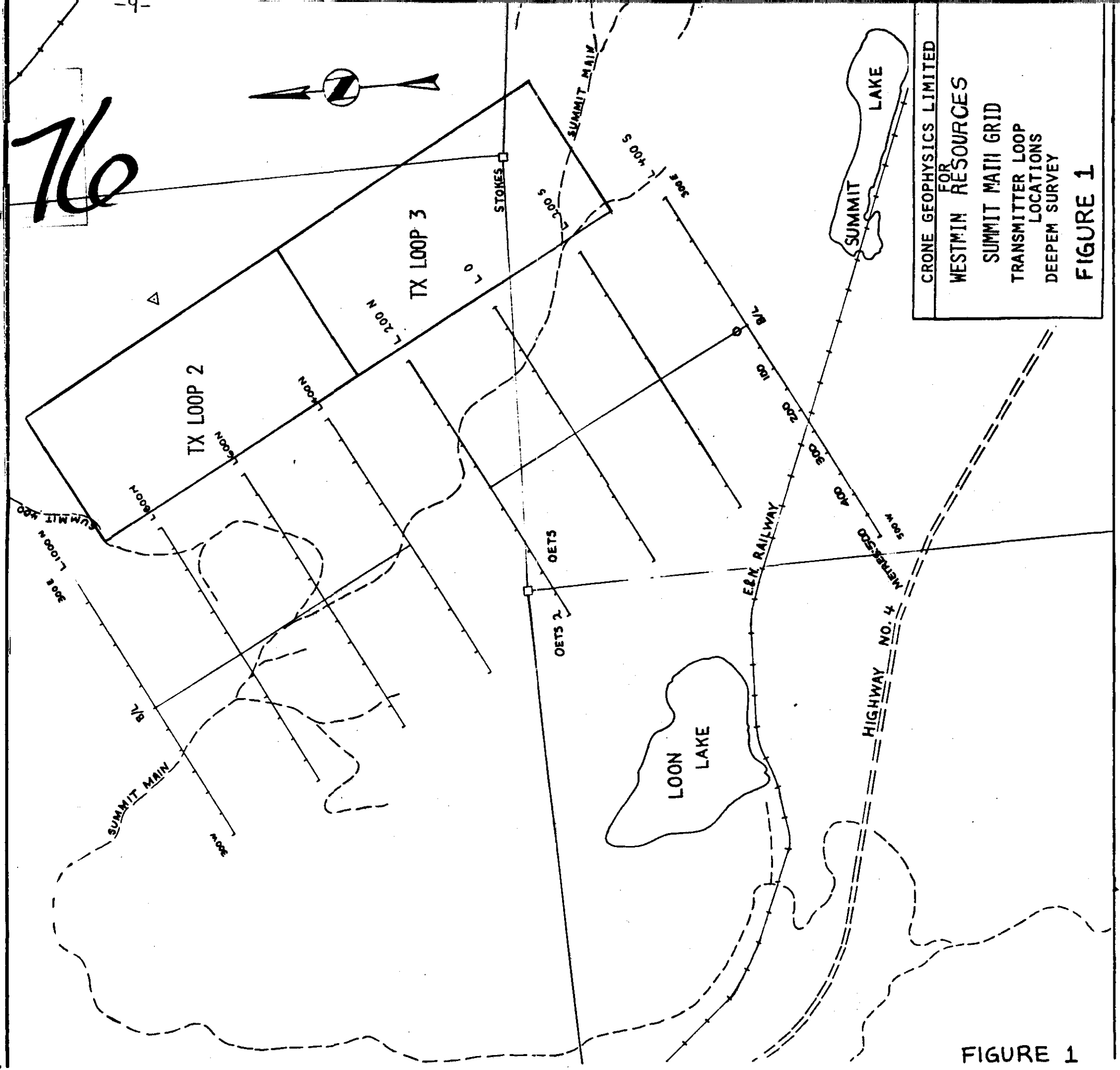


FIGURE 1

FIGURE 1

10,176

FIGURE 2

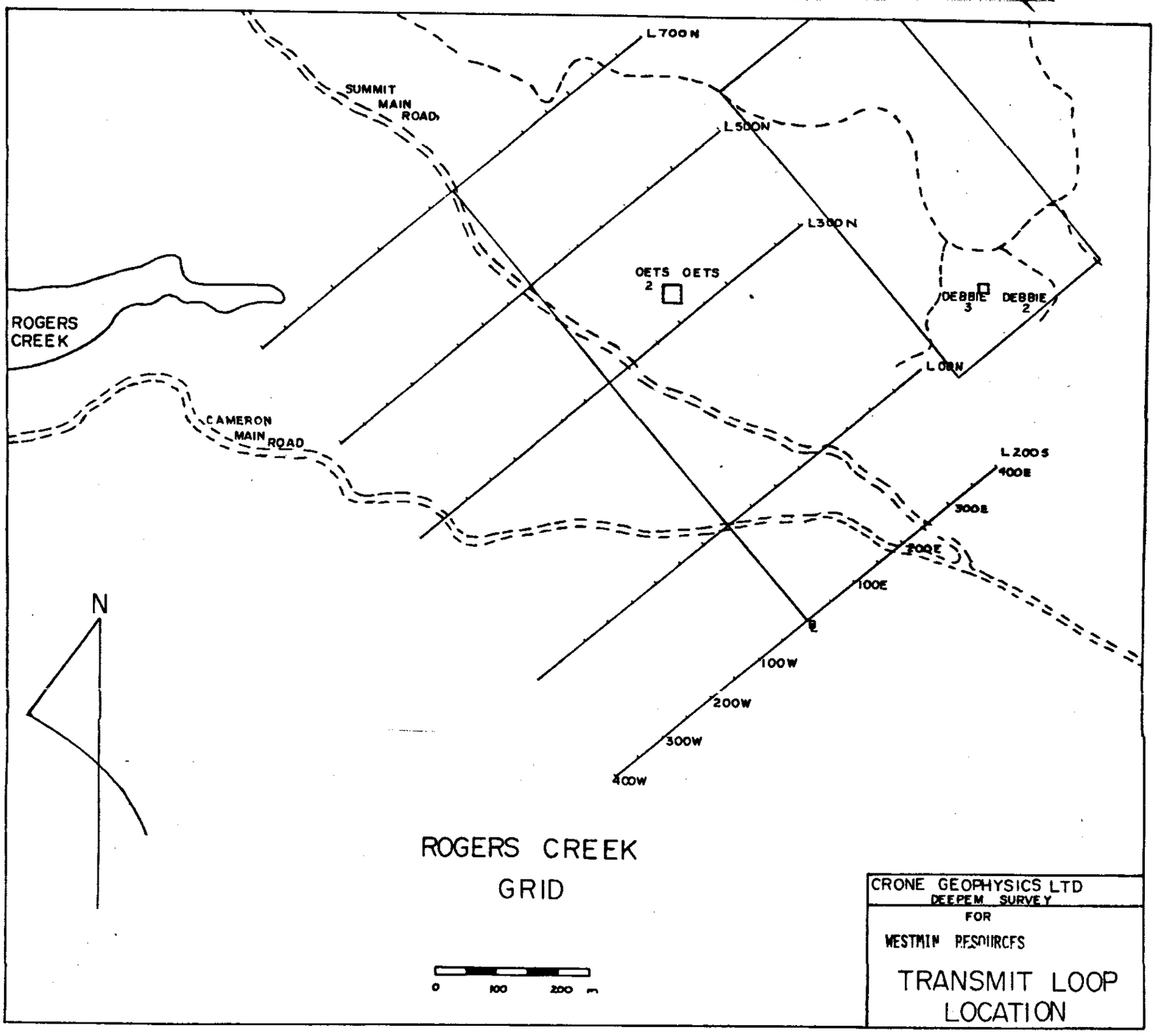


FIGURE 2

FIGURE 3

9176

CHINA CREEK ROAD

MINERAL CR.

CHINA CREEK

E LINE 350N

L. 250N

Tx LOOP #4

DUCK MAIN

W (E.M.) O

(EM)

L. 150 N

(EM & I.P.)

L.O

DIPLODOCUS CLAIM

WILLIAMS CREEK

(EM & I.P.)

L. 150 S

Tx LOOP #5

(EM & I.P.)

L55G

L. 420 S

L. 620 S MAIN

(EM.)

L. 770 S

E

O

(EM.)

JENNY CLAIM

C.R

W

(EM.)

C.P.

DUCK

LIZARD CLAIM

LIZARD LAKE

DUCK LAKE

LOUPY CLAIM

REGINA GRID
SOUTHWEST JENNY CLAIM
CHINA CREEK AREA

SCALE
0 50 100 200 400
METRES

⚒ : REGINA WORKINGS

FIGURE 4
SUMMIT MAIN GRID

WESTMIN RESOURCES
SUMMIT MAIN GRID
CRONE DEEPEM
GAIN 750
VERTICAL •—•—•
HORIZONTAL x—x—x
ICM= 50m
10/10/81

L400S

T5CL00P3

400S

10,176

RAILROAD LINE

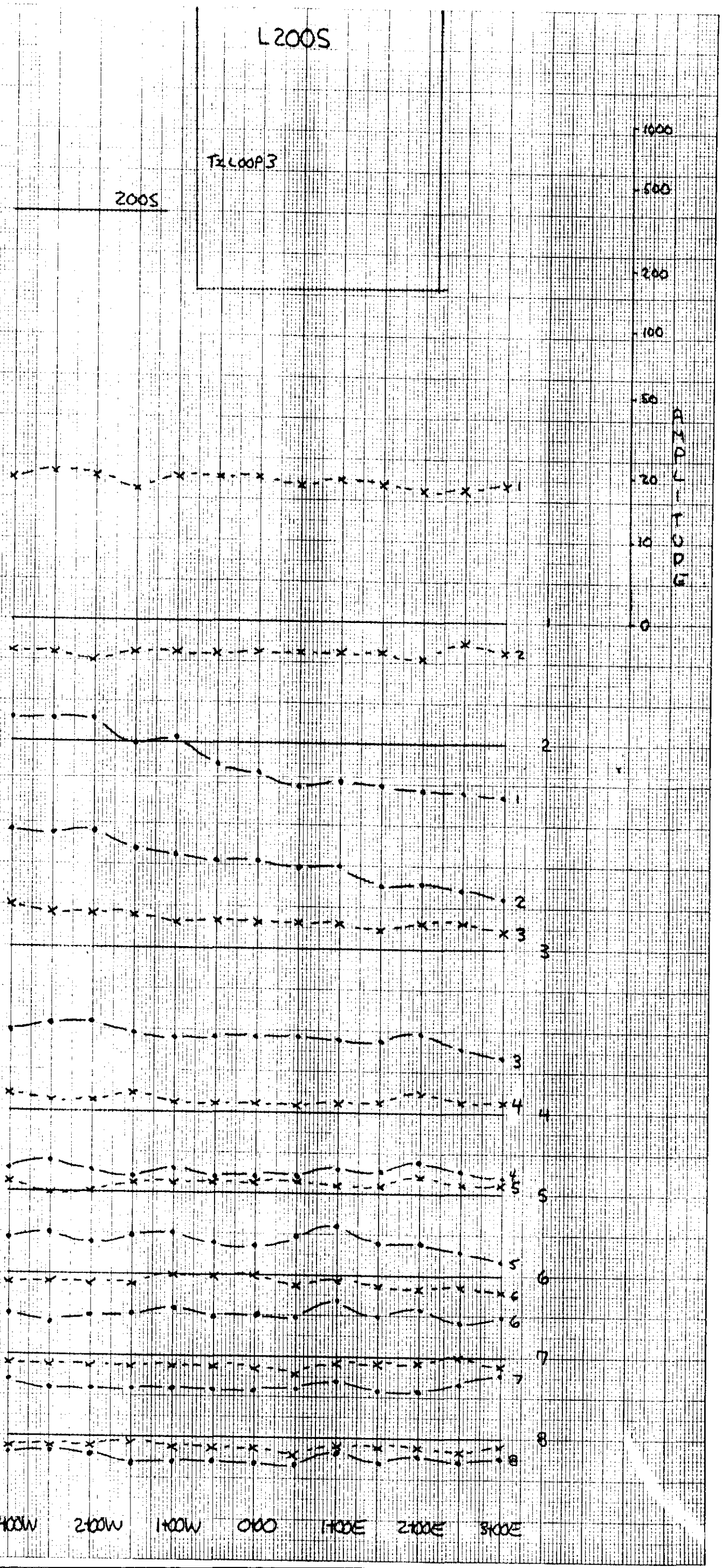
1000
500
200
100
50
20
10
0
AMPS-TURNS

1
2
2
3
3
4
4
5
5
6
6
7
7
8
8

5100W 4100W 3100W 2100W 1100W 0100 1100E 2100E 3100E

WESTMIN RESOURCES
SUMMIT MAIN GRID
CRONE DEEPEM
GAIN 750
VERTICAL •—•—•
HORIZONTAL x--x--x
1CM=50m
10/10/81

10.176



WESTMIN RESOURCES
SUMMIT MAIN GRID
CRONE DEEPEM
GAIN 750
VERTICAL •----•
HORIZONTAL x--x--x
1CM=50m
10/10/81

10,176

L000

Tx Loop 3

000

1000
500
200
100
50
20
10
0

APPARENT RESISTIVITY

1
2
3
4
5
6
7
8

3400W 2400W 1400W 0400 1600E 2600E 3600E

WESTMIN RESOURCES
SUMMIT MAIN GRID
CRONE DEEPEM
GAIN 750
VERTICAL •—•—•
HORIZONTAL x--x--x
1CM=50m
01018

10,176

L 200N

TX LOOP 3

200N

1000
500
200
100
50
20
10
0
AMPLITUDE

1
2
2
3
3
4
4
5
5
6
6
7
7
8
8

3400W 2400W 1400W 400W 600E 1600E 2600E 3600E

WESTMIN RESOURCES
SUMMIT MAIN GRID
CRONE DEEPEM
GAIN 750
VERTICAL ·--·--·
HORIZONTAL x--x--x
1CM = 50m
3/10/81

10,176

L 400N

900N

TX LOOP 2

1000
500
200
100
50
20
10
0
AMPLITUDE

1
2
3
4
5
6
7
8

3400W 2400W 1400W 0400 1400E 2400E 3400E

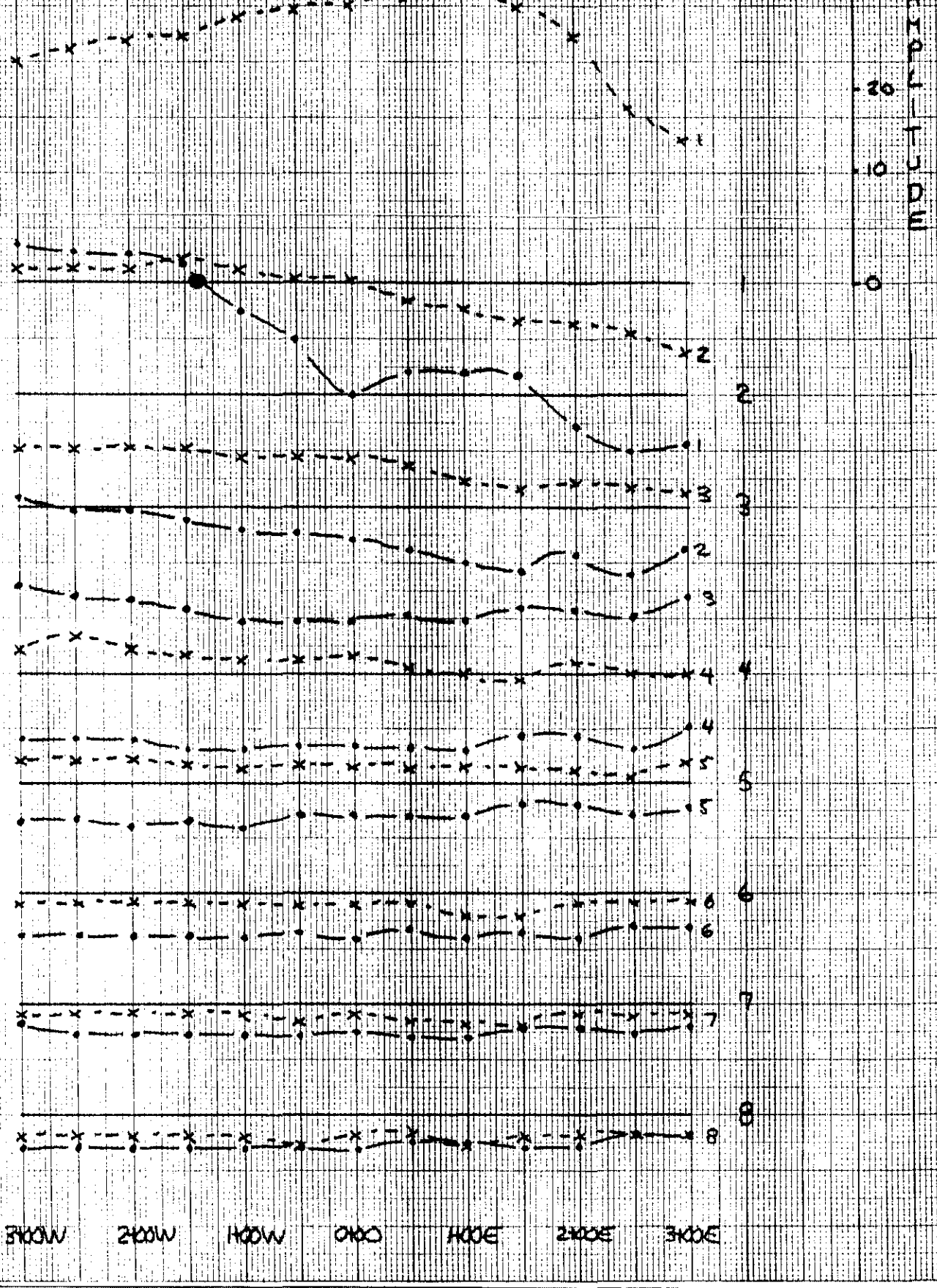
WESTMIN RESOURCES
SUMMIT MAIN GRID
CRONE DEEPEM
GAIN 750
VERTICAL ·—·—·
HORIZONTAL x–x–x
1CM=50m
8/10/81

L 600N

Tx=600Pd

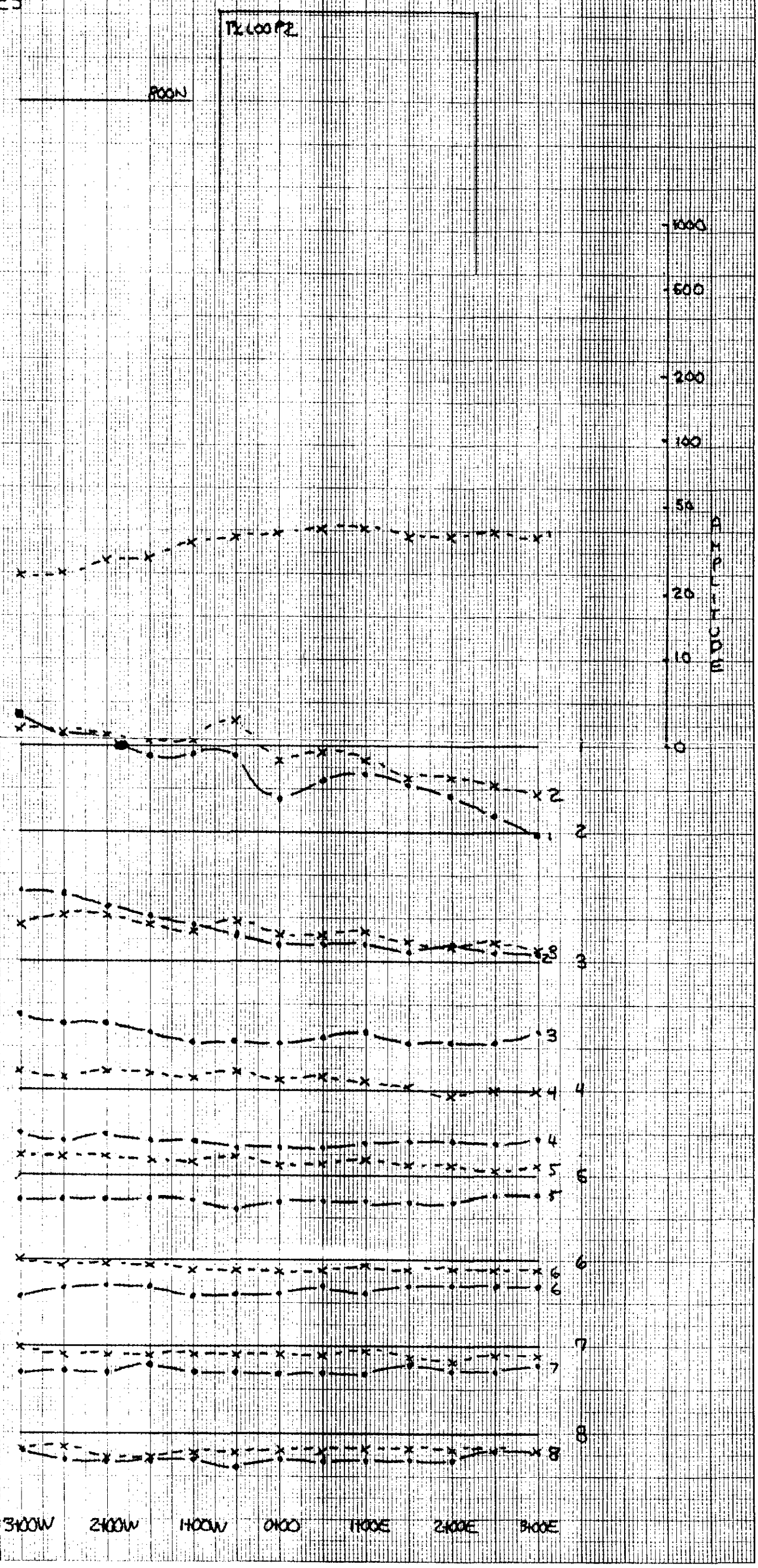
600N

10,176



WESTMIN RESOURCES
SUMMIT MAIN GRID
CRONE DEEPEM
GAIN 750
VERTICAL •—•—•
HORIZONTAL x--x--x
1CM=50m
8/10/81

10,176



WESTMIN RESOURCES
SUMMIT MAIN GRID
CRONE DEEPEM
GAIN 750
VERTICAL •—•—•
HORIZONTAL x--x--x
1CM=50m
8/10/81

10,176

L1000N

1000N

500N

Tx LOOP 2

1000
500
200
100
50
20
10
0

METRES DOWN

2
2
3
3
4
4
5
5
6
6
7
7
8
8

3400W 2400W 1400W 0400 1400E 2400E 3400E

FIGURE 5

ROGER'S CREEK GRID

WESTMIN RESOURCES
ROGERS CREEK GRID
CRONE DEEPEM
5/10/81
GAIN 750
Tx LOOP 1
HORIZONTAL x--x--x
VERTICAL •--•--•
ICM= 50M

LINE 2+00S

0+00

Tx LOOP 1

200S

1000
500
200
100
50
20
10
0

10,176

4100W 3100W 2100W 1100W 0+00 1100E 2100E 3100E 4100E

WESTMIN RESOURCES
ROGERS CREEK GRID
CRONE DEEPEM
3/10/88
GAIN 750
Tx LOOP 1
HORIZONTAL x--x--x
VERTICAL •-•-•
CM=50M

10,176

LINE 0+00

4+00E
0+00
Tx Loop 1
2+00S

1000
500
200
100
50
20
10
0
mV/A x Hz

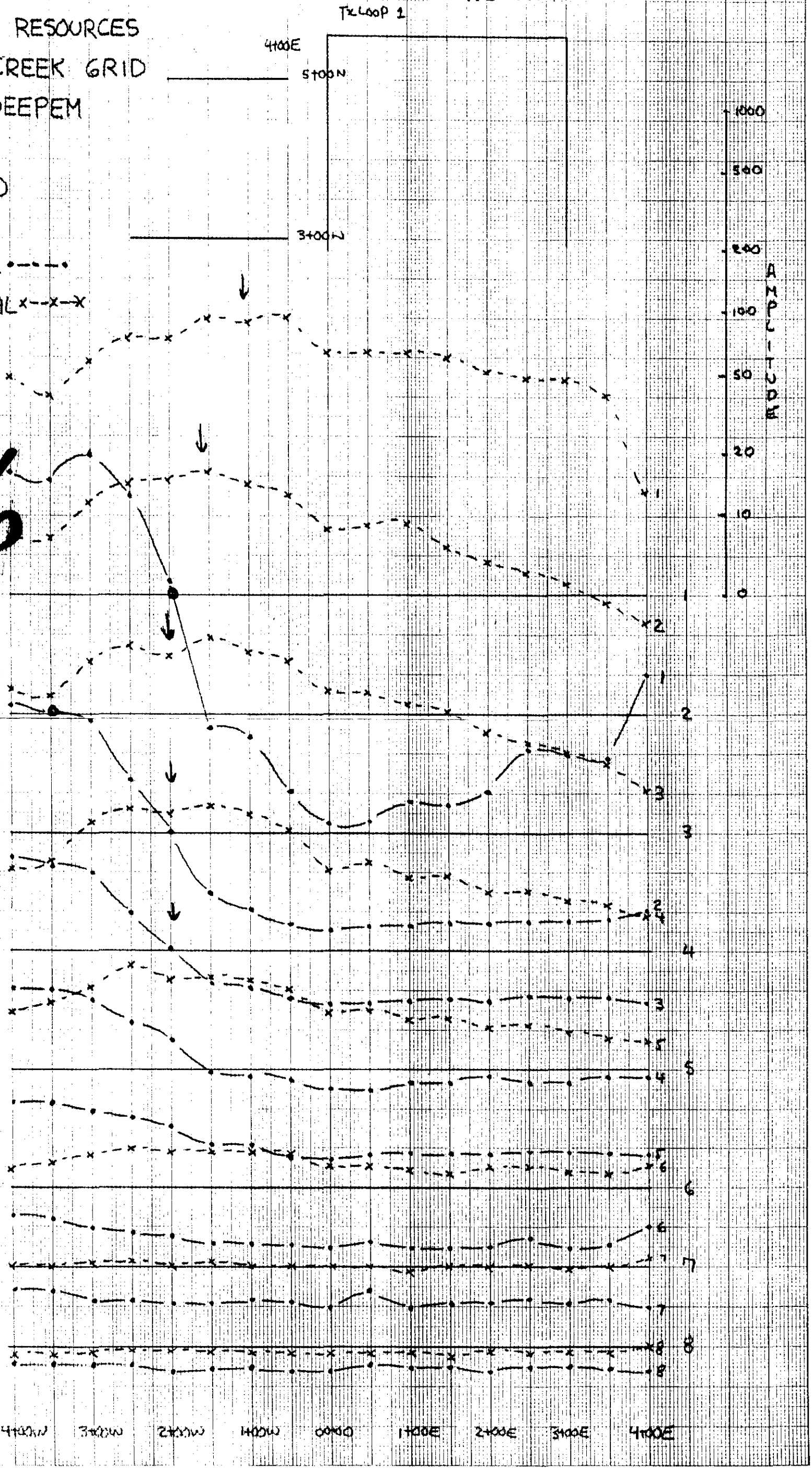
1
2
3
4
5
6
7
8

4+00W 3+00W 2+00W 1+00W 0+00 1+00E 2+00E 3+00E 4+00E

LINE 3+00N

WESTMIN RESOURCES
ROGERS CREEK GRID
CRONE DEEPEM
3/10/81
GAIN 750
Tx LOOP 1
VERTICAL •--•--•
HORIZONTAL x--x--x
1CM=50M

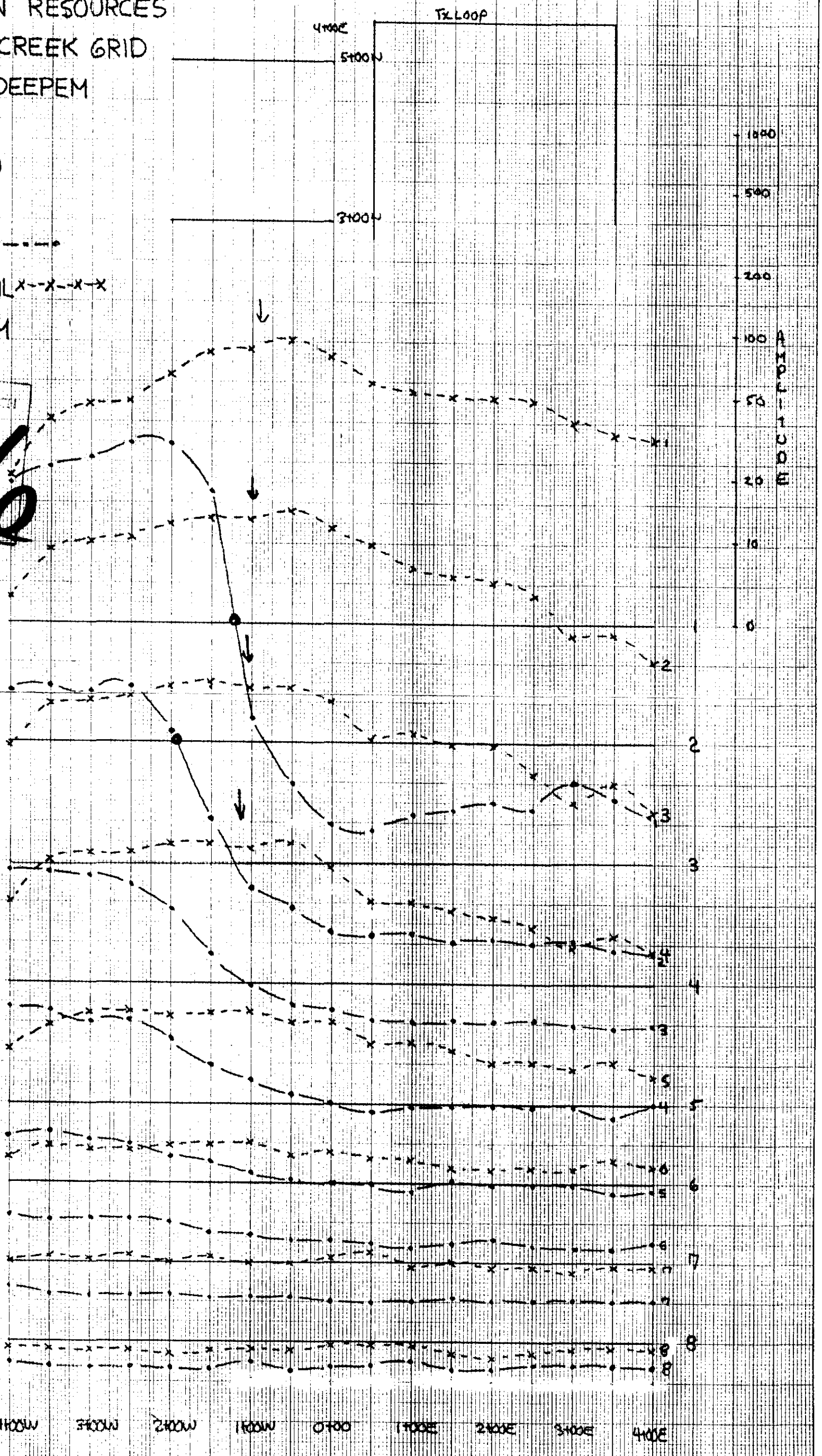
10,176



WESTMIN RESOURCES
ROGERS CREEK GRID
CRONE DEEPEM
2/10/81
GAIN 750
Tx Loop 1
VERTICAL •---•
HORIZONTAL x--x--x--x
1CM=50M

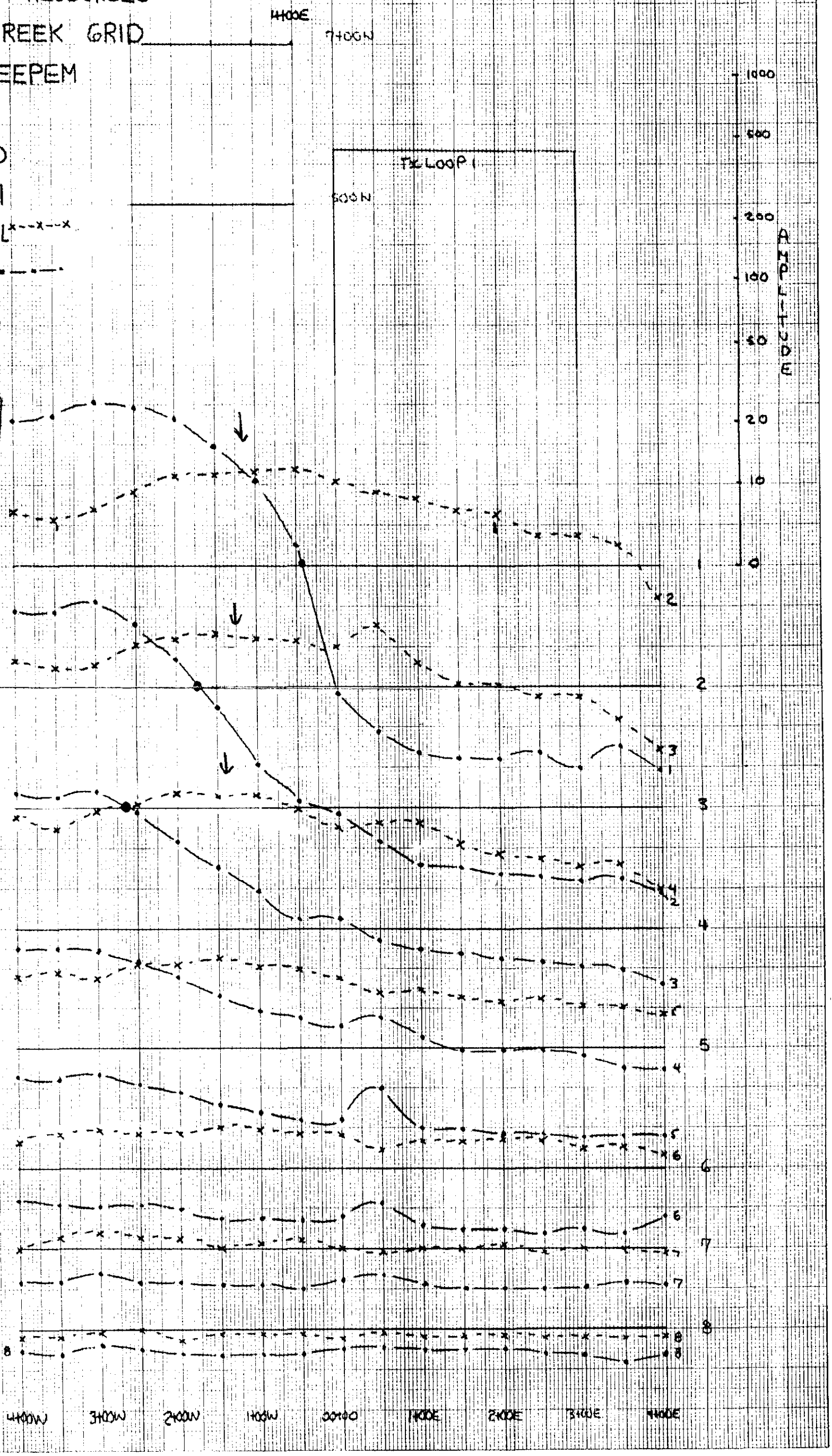
10,176

LINE 5+00N

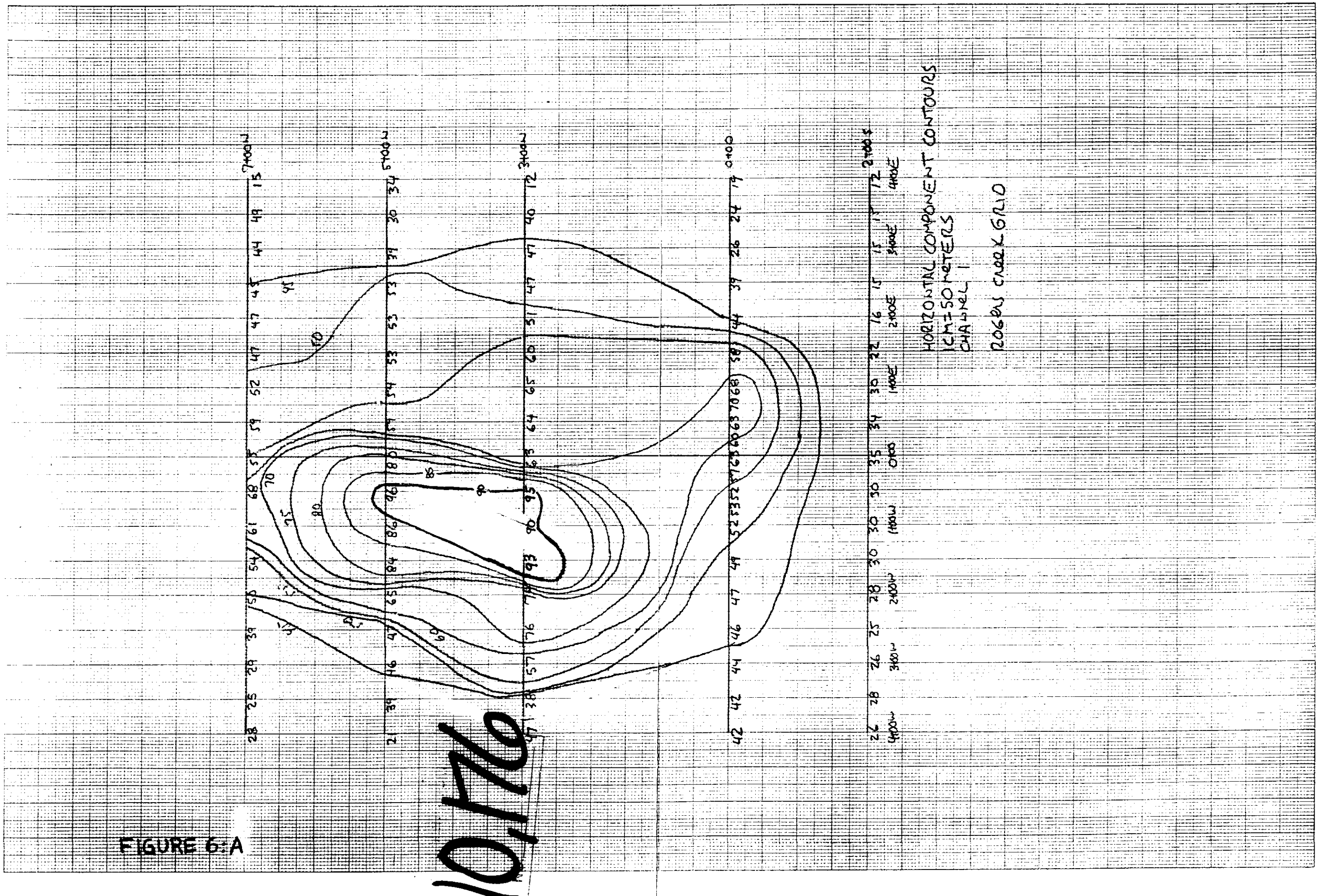


LINE 7+00N

WESTMIN RESOURCES
ROGERS CREEK GRID
CRONE DEEPEM
2110181
GAIN 750
Tx LOOP 1
HORIZONTAL x--x--x
VERTICAL •—•—•
1CM=50M

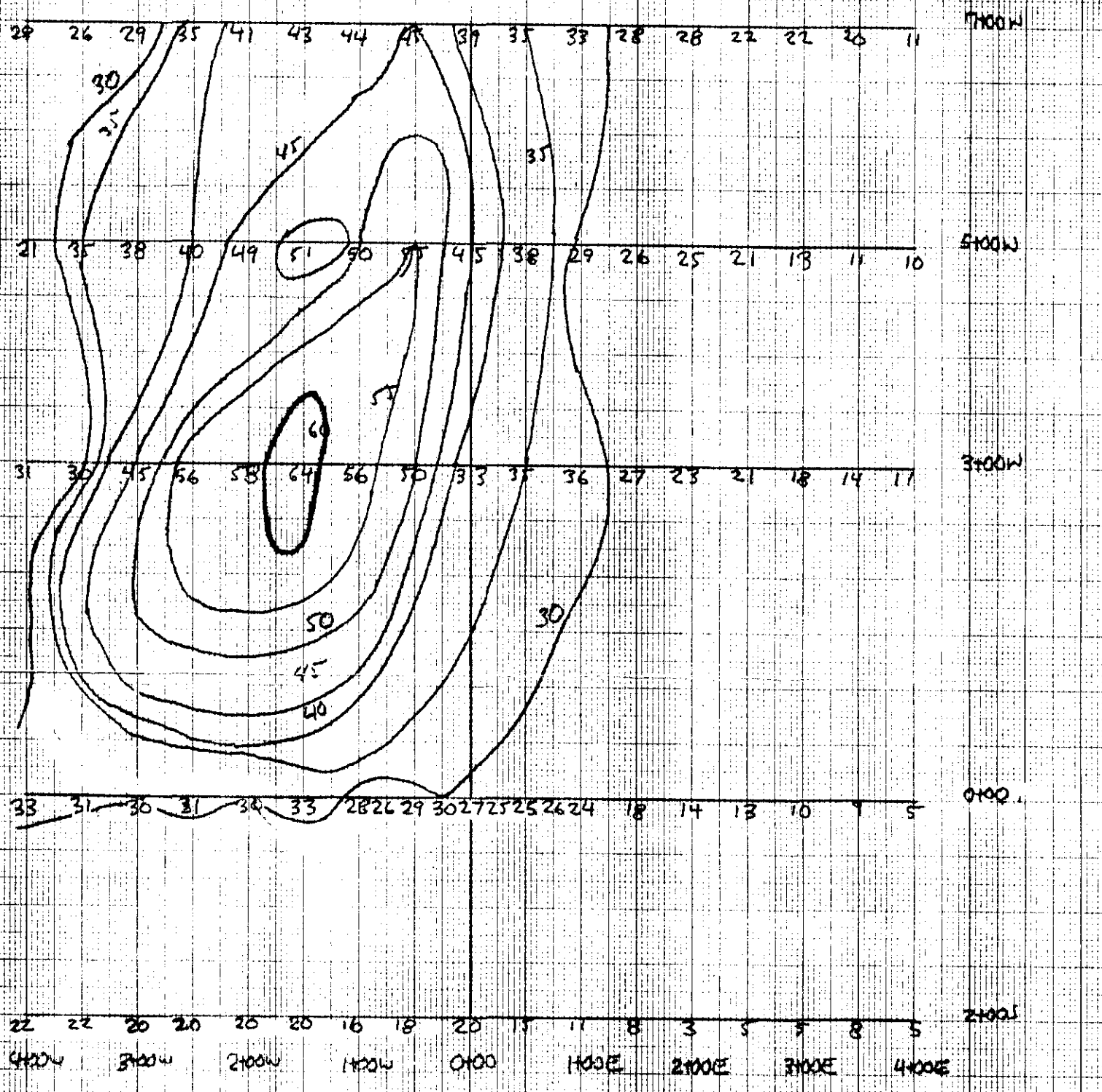


10,176


HORIZONTAL COMPONENT CONTOURS
ICM=SOMETERS
CHANNEL 1
ROCKY CREEK GRID
2400N
3400N
4400E
5400E
6400E
7400E
FIGURE 6:A

10,176

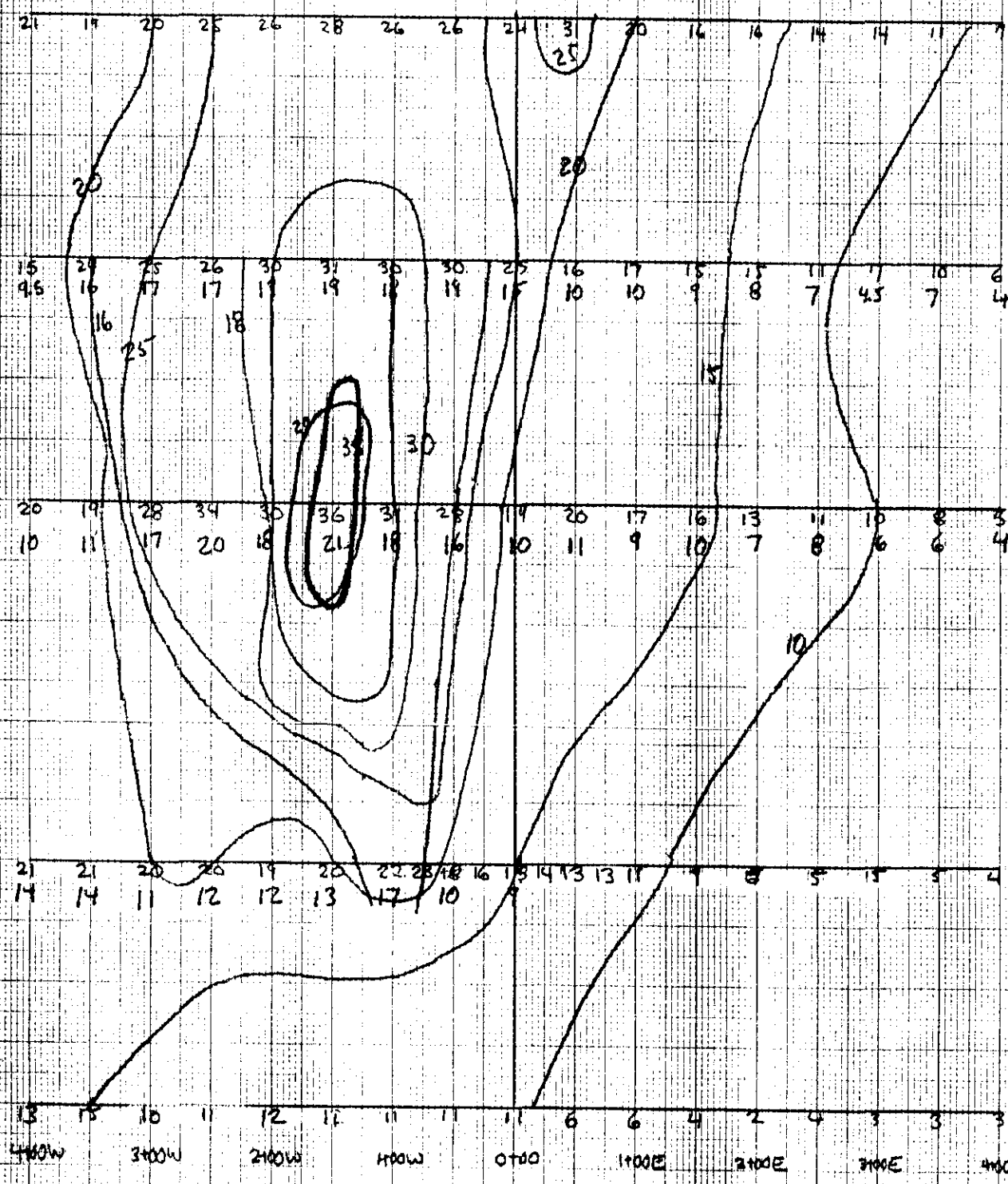
FIGURE 6.8



HORIZONTAL COMPONENT CONTOURS
1CM = 50 NETELS
CHANNEL 2
ROGERS CREEK GRID

10,176

FIGURE 6.C



HORIZONTAL COMPONENT CONTOURS

1CM=50METERS

CHANNEL 3,4

ROGERS CREEK GRID

FIGURE 7
REGINA GRID

WESTMIN RESOURCES
REGINA GRID
CRONE DEEPEM
GAIN 750
VERTICAL •—•—•
HORIZONTAL x--x--x
1CM=50m
14/10/81

10,176

7705

TX LOOPS

7705

AMPLITUDE

1000
500
200
100
50
20
10
0

1
2
2
3
3
4
4
5
5
6
6
7
7
8
8

500W 400W 300W 200W 100W 00 100E

WESTMIN RESOURCES
REGINAGRD
CRONE DEEPEM
GAIN 750
VERTICAL •—•—•
HORIZONTAL x--x--x
1CM=50m
4/10/81

10,176

620S

620S

T2LOOP5

1000
500
200
100
50
20
10
0

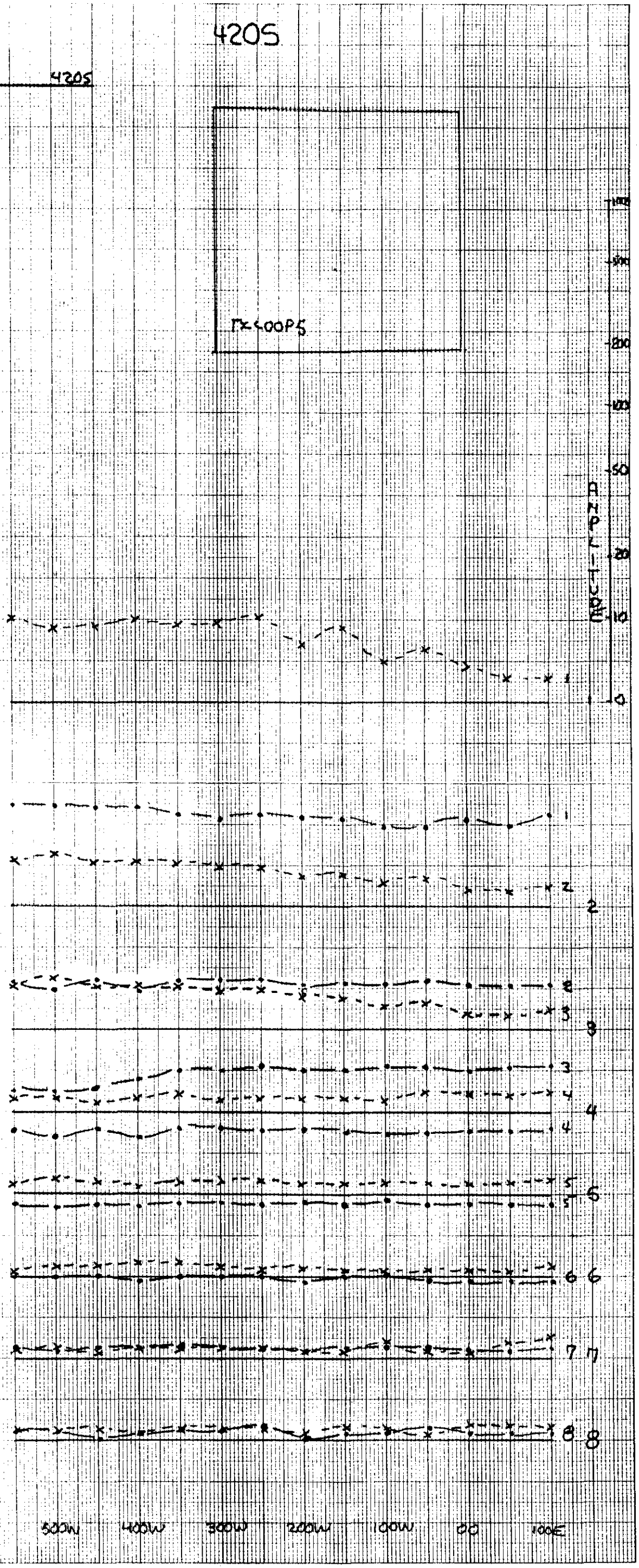
AMPLITUDE

1
2 2
3
4 4
4
5 5
6 6
7 7
8 8

500W 400W 300W 200W 100W 00 100E

WESTMIN RESOURCES
REGINA GRID
CRONE DEEPEM
GAIN 750
VERTICAL ·—·—·
HORIZONTAL x—x—x
1CM = 50m
14/10/81

10,176



WESTMIN RESOURCES
REGINA GRID
CRONE DEEPEM
GAIN 750
VERTICAL ·—·—·
HORIZONTAL x--x--x
1CM = 50m
12/10/81

150S

10,170

150S

Tx 400 P4

1000
500
200
100
50
20
10
0

AMPLITUDE

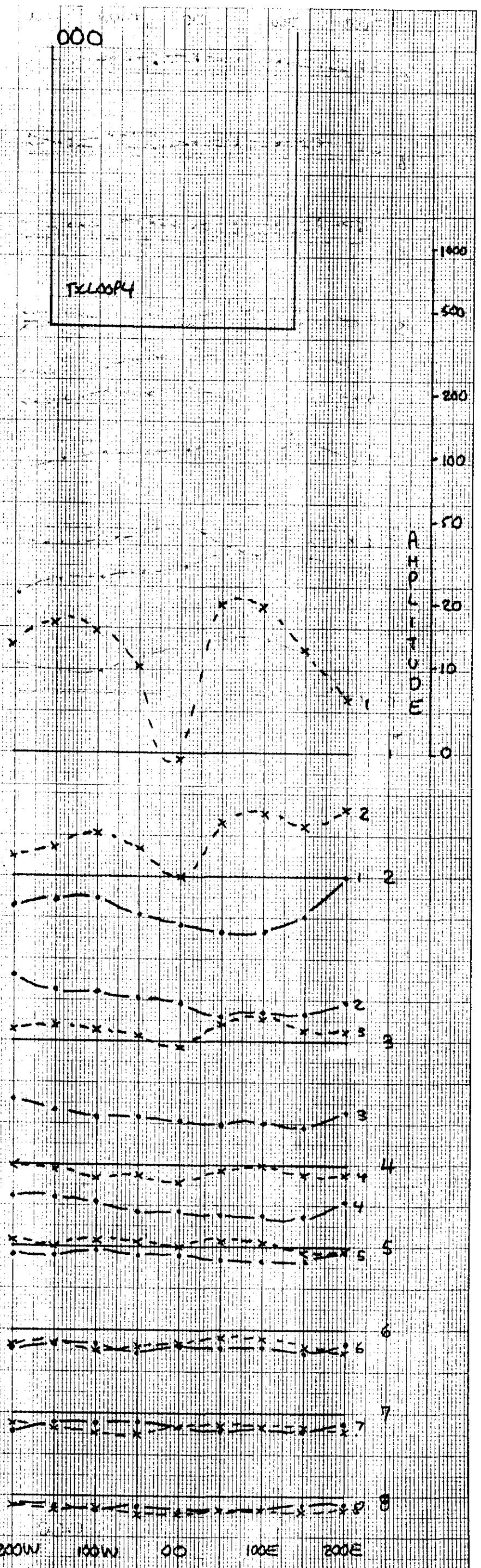
1
2
2
2
3
3
3
4
4
5
5
6
6
7
7
8
8

200W 100W 0 100E 200E

WESTMIN RESOURCES
REGINA GRID
CRONE DEEPEM
GAIN 750
VERTICAL •--•--•
HORIZONTAL x--x--x
1CM=50m
12/10/81

000

10,176



WESTMIN RESOURCES
REGINA GRID
CRONE DEEPEM
GAIN 750
VERTICAL •—•—•
HORIZONTAL x--x--x
1CM = 50m
12/10/81

10,176

150N

150N

Tx LOOP 4

1000
500
200
100
50
20
10
0

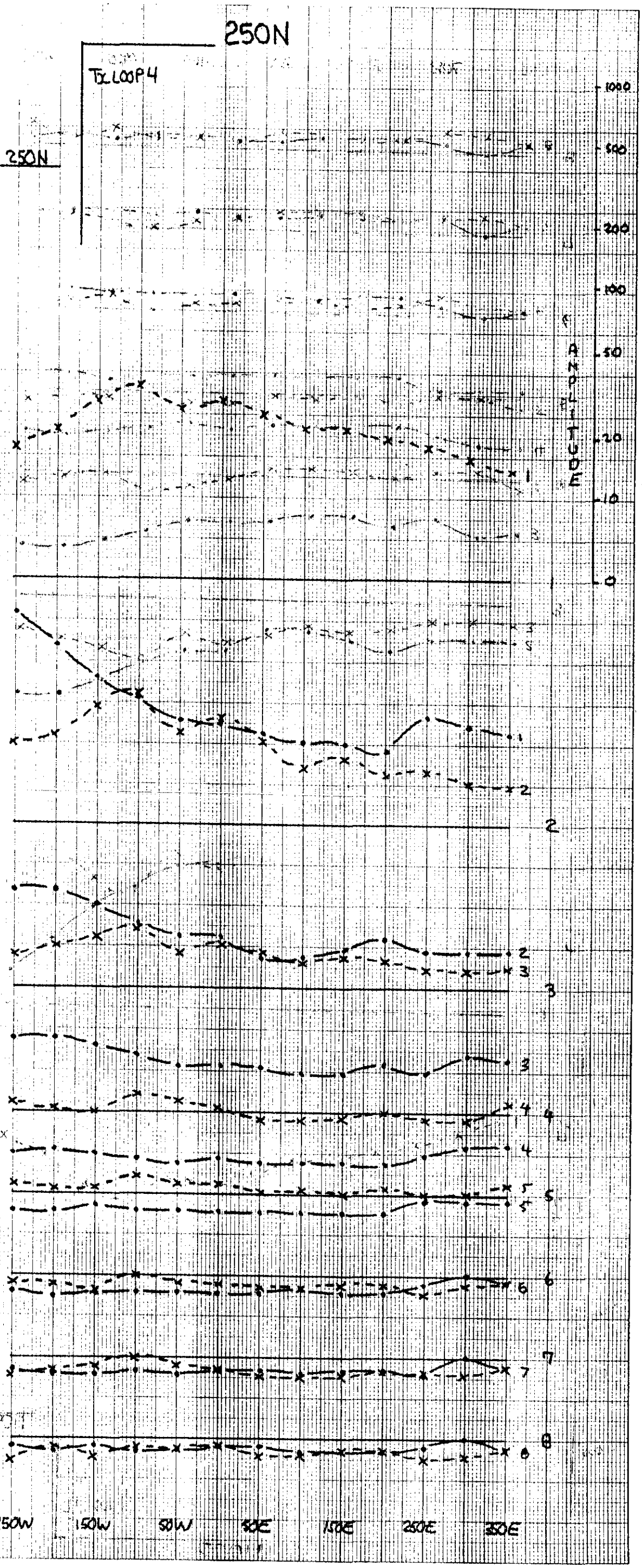
APPARENT RESISTIVITY

1
2
2
3
3
4
4
5
5
6
6
7
7
8
8

300W 200W 100W 00 100E 200E

WESTMIN RESOURCES
REGINA GRID
CRONE DEEPEM
GAIN 750
VERTICAL •—•—•
HORIZONTAL x--x--x
1CM = 50m
12/10/81

10,176



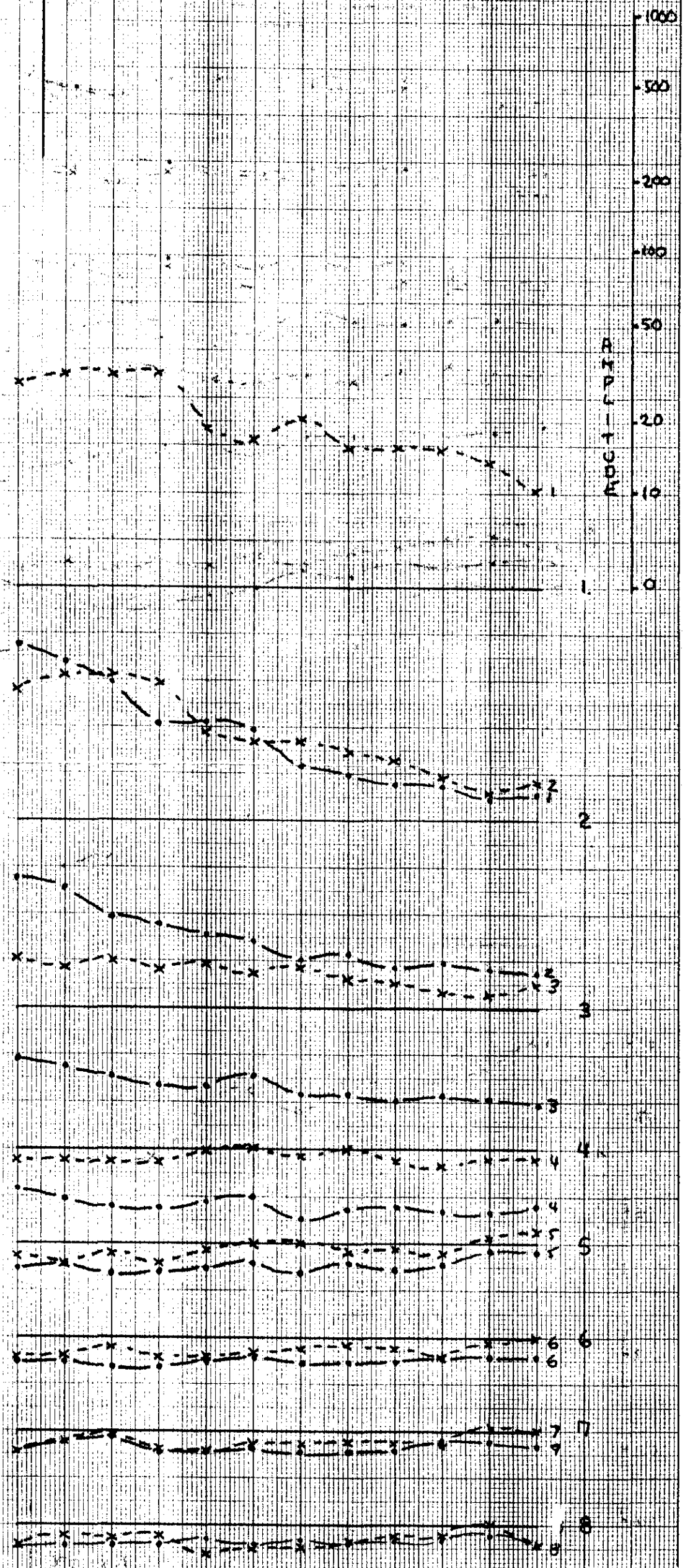
WESTMIN RESOURCES
REGINA GRID
CRONE DEEPEM
GAIN 750
VERTICAL •—•—•
HORIZONTAL x--x--x
1CM=50m
2/10/81

10,176

350N

350N

Tx LOOP 4



-38-

PLATE I

SOIL GEOCHEMISTRY OF STOKES CLAIM

PLATE II

10,176

CONTOURS
≥200 PPM
≥50 PPM
≥200 PPM

WESTMIN RESOURCES LTD.

SOIL GEOCHEMISTRY
1981
GRID
DEBBIE 1, 2, 3
McLAUGHLIN RIDGE, PORT ALBERNI AREA, B.C.
NORTH SHEET

SEPT. '81 L.A.M. PLATE II

ROGER'S CREEK

SUMMIT MAIN ROAD

CAMERON MAIN ROAD

DEBBIE 3

DEBBIE 2

DEBBIE 1

COLLECTED IN 1980

PLATE III

10,176

DEBBIE 1

LILY 1

LUCY 3

LUCY 3

LINDA 1

CONTOURS

Cu ≥200 PPM

Pb ≥50 PPM

Zn ≥200 PPM

Samples collected in 1981

WESTMIN RESOURCES LTD.

1981

LUCY 3

SEPT '81

LAM

PLATE III

10,176

PLATE V: B
REGINA GRID
LOCATION

CHINA CREEK ROAD

MINERAL CK

CHINA CREEK

DIPLODOCUS CLAIM

L55G

LINE 350N

L. 250 N

L. 150 N

L.0

L. 150 S

L. 420 S

L. 620 S

L. 770 S

DUCK MAIN

(E.M.)

(EM & I.P.)

CABIN

WILLIAMS CREEK

DUCK

JENNY CLAIM

LIZARD CLAIM

LOUPY CLAIM

LIZARD LAKE

DUCK LAKE

C.P.

REGINA GRID
SOUTHWEST JENNY CLAIM
CHINA CREEK AREA

SCALE 1:5000 (APPROX.)
0 50 100 200 400
METRES

⚒ : REGINA WORKINGS

PLATE IV
SOIL GEOCHEMISTRY OF COP CLAIM.

10,176

CAMERON MAIN

COP CLAIM

LCP CP

COP 130 100 150 75 50 PD

LUCY 2

LINDA 2

POND

LEGEND

- TOPOGRAPHIC HIGHS & PEAKS
- MARSH
- STREAM
- LOGGING ROAD
- CP — CLAIM POST
- LCP — LEGAL CORNER POST
- CL — CLAIM LINE
- \+ — SOIL SAMPLE LOCATION
- + 56, 10, 98 — ELEMENT CONCENTRATION IN PARTS PER MILLION
- SILT SAMPLE LOCATION

WESTMIN RESOURCES LTD.

SOIL GEOCHEMISTRY
1981
Cu , Pb Zn
COP CLAIM
McLAUGHLIN RIDGE, PORT ALBERNI AREA, B.C.

0 50 100 200 400 m
1 5000 (APPROX)

AUG. 81	DRAWN BY DBH	NTS 92F/2E	

PLATE V:A:
GEOPHYSICAL SURVEY GRIDS.

10,176

TO PORT ALBERNI

E & N RAILWAY

TO PARKSVILLE

HIGHWAY NO 4

ROGER'S CREEK

CAMERON MAIN

CAMERON RIVER

BAINBRIDGE LAKE

"BAINBRIDGE" CREEK

YELLOW CREEK

MINERAL CREEK

COP CREEK

CAMERON MAIN

SUMMIT (4 X 5 UNITS)

SUMMIT MAIN GRID

L 1000N
L 800N
L 600N
L 400N
L 200N
L 100N
LINE 0
L 100S
L 200S
L 400S
L 1000S
L 1100S

300 M
200 M
ROAD
500 M
600 M
100 M
BEARING: 061.5°
BEARING: 331.5°

LOON LAKE

SUMMIT LAKE GRID

620 M
650 M
850 M
850 M
BEARING: 061.5°

SUMMIT LAKE

DEBBIE 3

DEBBIE 2

DEBBIE 1

LUCY 1

LUCY 2

LUCY 3

L 1300N
L 1100N
L 900N
L 700N
L 500N
L 300N
400 M
(EM)

ROGER'S CREEK GRID
(EM.: L. 700N - 200S, IN 1981.
I.P. L. 900N - 700S, IN 1980)

CAMERON (I.P.) APPROX. MAIN GRID LINE
900 M

L700 S GRID LINE BEARING 047.5°
~430 M
0 BASE LINE BEARING 317.5°

YELLOW CREEK MAIN GRID
L 2700N
L 2500N
L 2300N
L 2100N
L 1900N
L 1700N
L 1500N
L 1300N
L 1100N GRID LINE BEARING 058°
~90M
225M
330M
700M
700N
500N
300N
200N
100N
LINE ON GRID LINE BEARING 072°
BASE LINE BEARING 328°
BASELINE BEARING 342°

YELLOW CREEK 100 GRID

COP CREEK GRID (I.P.)
LINE 1
LINE 2
200 M.E.
0 M.W.
800 M.E.
830 M.W.

COP
(2 X 5 UNITS)

LEGEND

- LOGGING ROAD OR HIGHWAY
- CLAIM CORNER POST AND CLAIM LINES
- GRID LINES AND BASELINE CUT IN 1980 FOR FUTURE GEOPHYSICAL SURVEY
- L 100 N — LINE 100 NORTH
- M — METRES

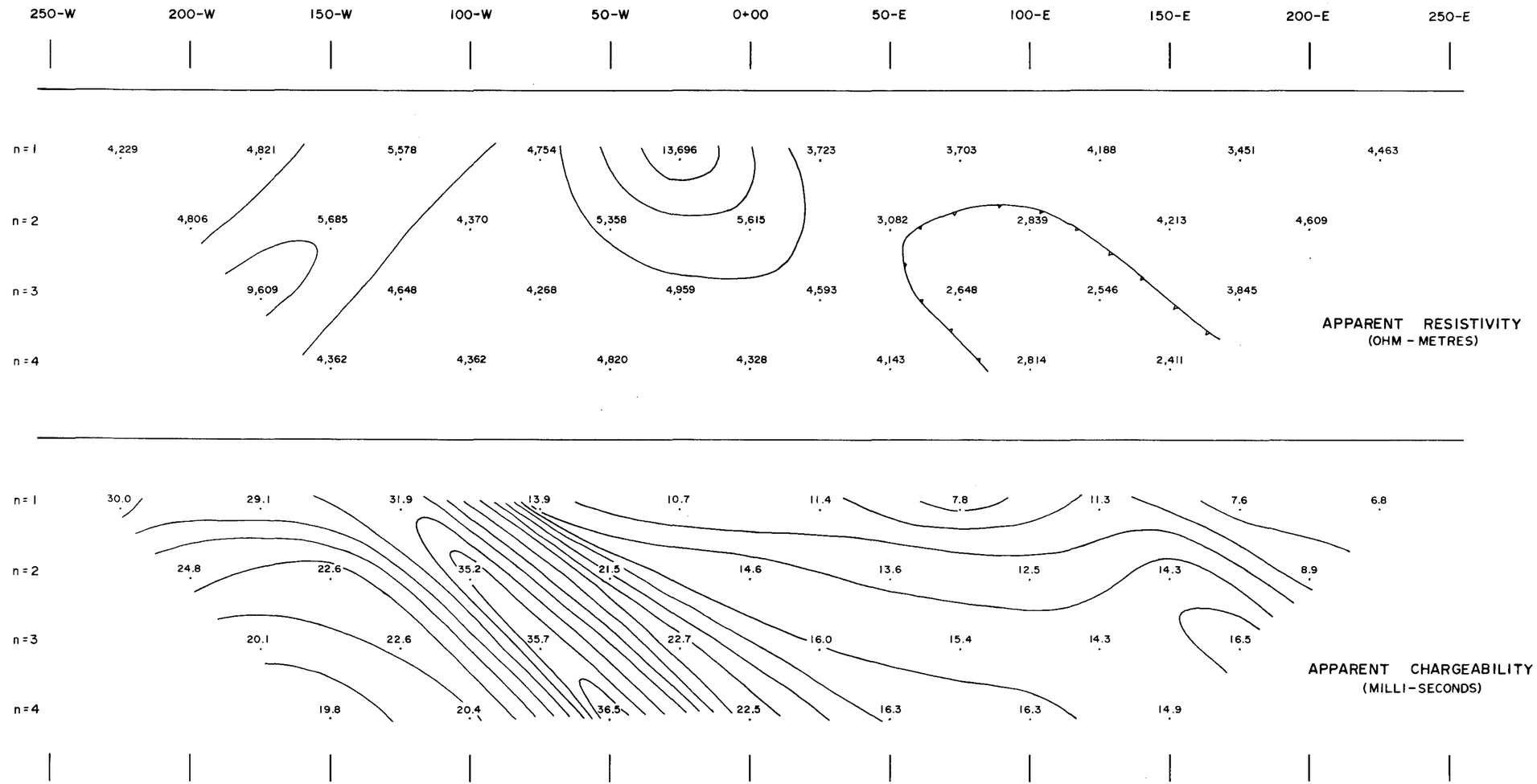
0 100 200 300 400 500 METRES

SCALE: 1:10,000
CONTOUR INTERVAL: 20 METRES
N.T.S. MAP AREA: 92 F/2E AND 92F/7E

NORTH

WESTMIN RESOURCES LIMITED
DRAWN BY: WA.W. AND G.L.B., JAN., 1982

PLATE V:B: GEOPHYSICAL SURVEY GRIDS



WEST MIN RESOURCES LIMITED

REGINA GRID

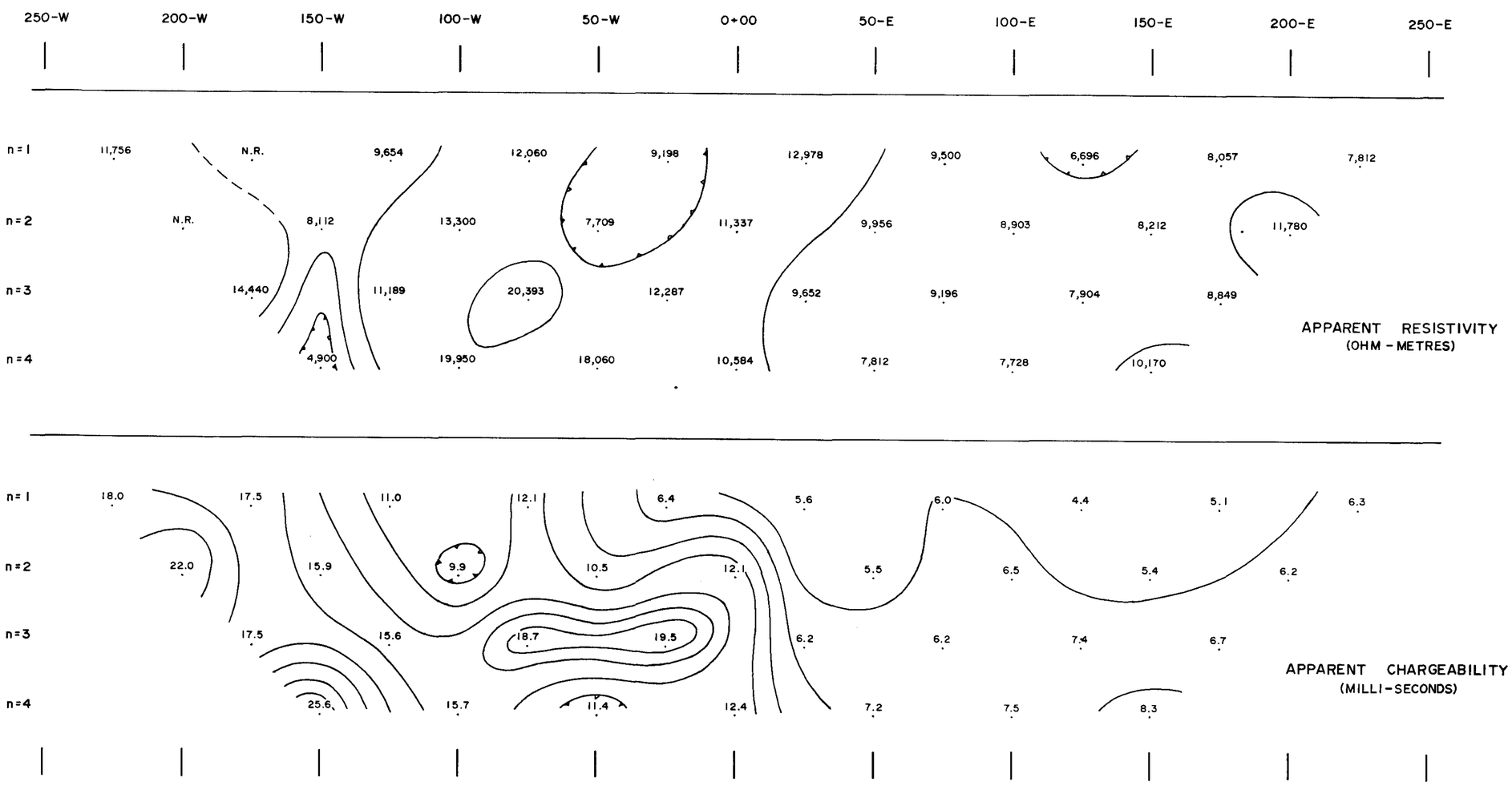
INDUCED POLARIZATION SURVEY

LINE 150-N

POLE - DIPOLE ARRAY
a = 50 metres

SCALE 1 : 1250

10,176



WEST MIN RESOURCES LIMITED

REGINA GRID

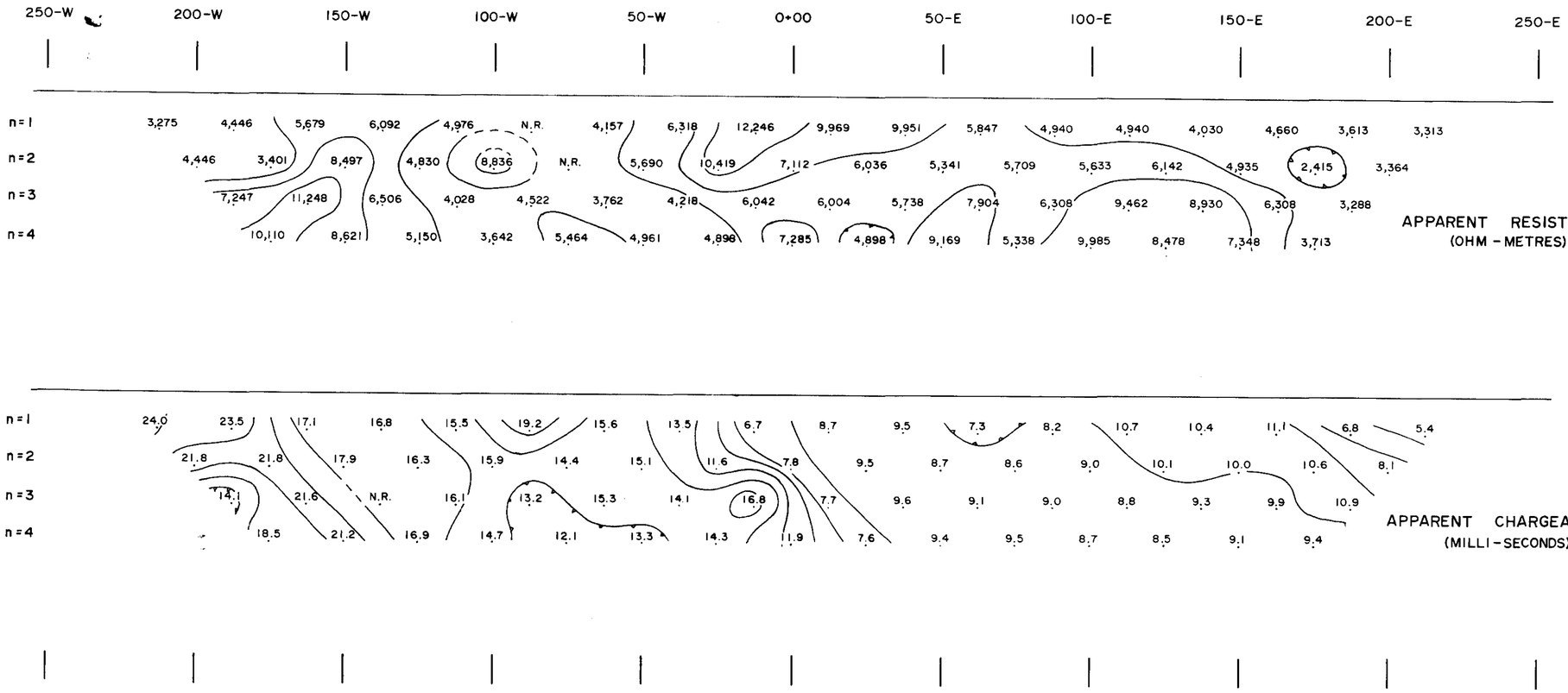
INDUCED POLARIZATION SURVEY

LINE 150-S

POLE - DIPOLE ARRAY
a = 50 metres

SCALE 1 : 1250

10,176



WEST MIN RESOURCES LIMITED

REGINA GRID

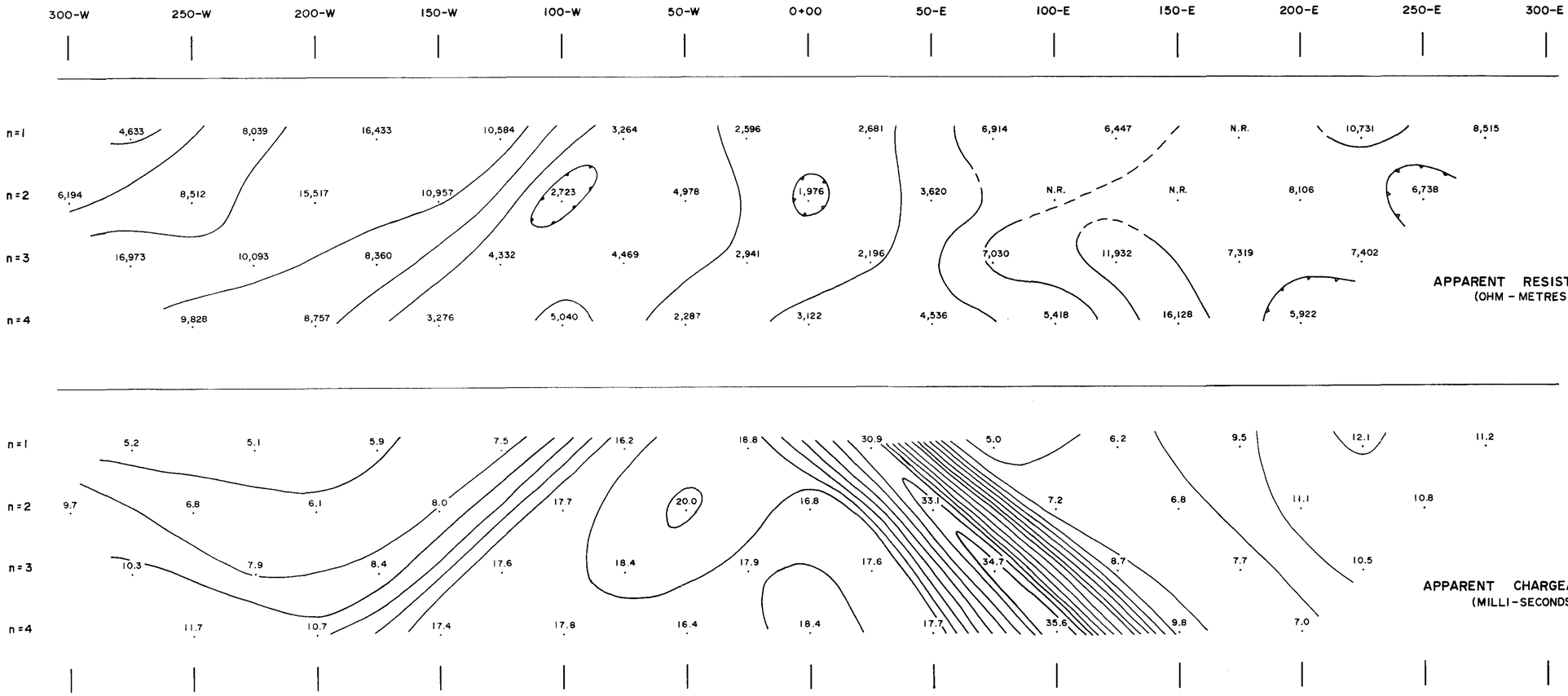
INDUCED POLARIZATION SURVEY

LINE 0+00

POLE - DIPOLE ARRAY
a = 25 metres

SCALE 1 : 1250

10,176



WEST MIN RESOURCES LIMITED

SUMMIT MAIN GRID

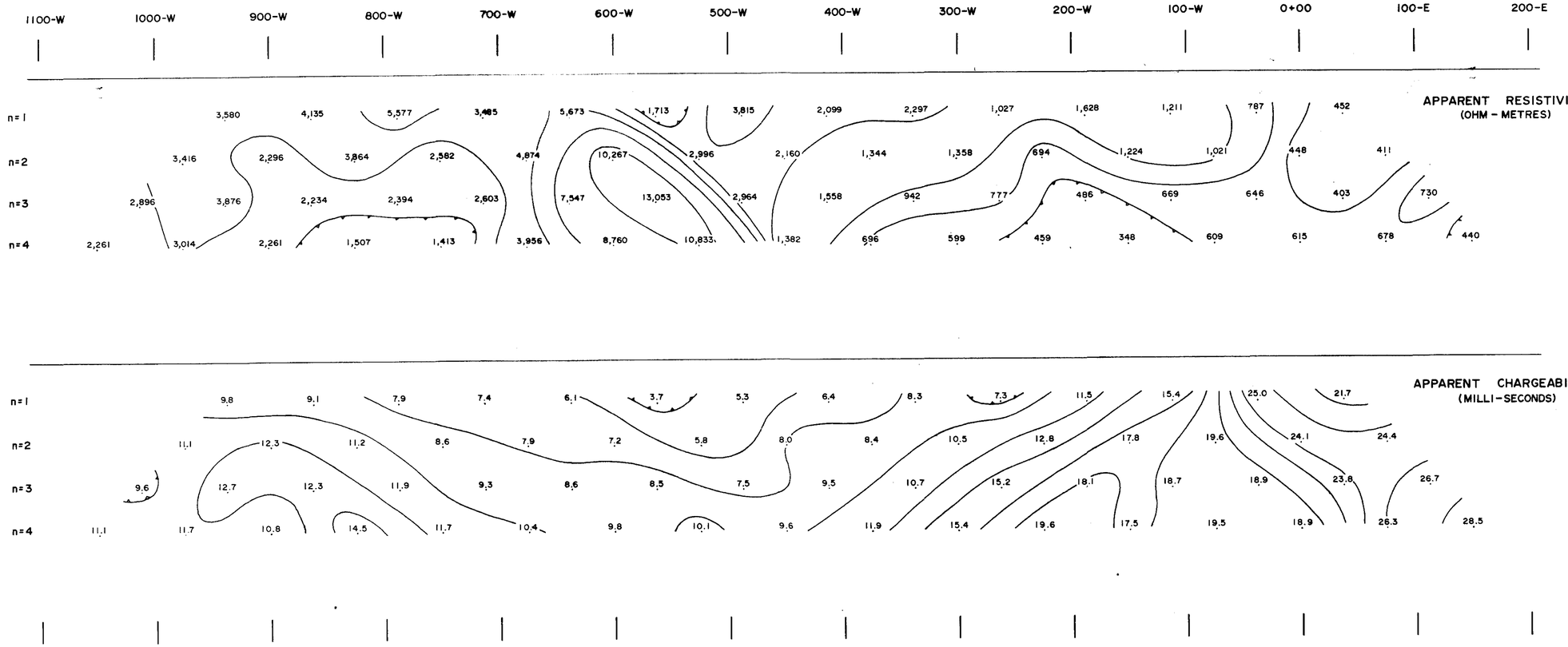
INDUCED POLARIZATION SURVEY

LINE 200-N

POLE - DIPOLE ARRAY
a = 50 metres

SCALE 1 : 1250

10,176



WEST MIN RESOURCES LIMITED

CAMERON MAIN GRID

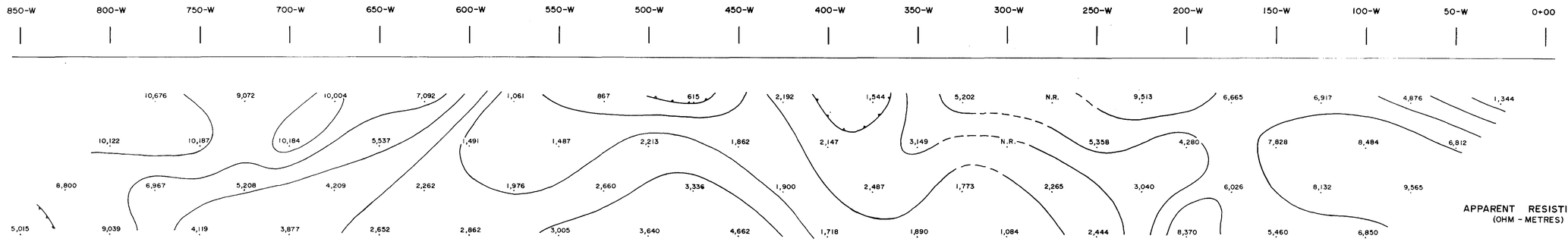
INDUCED POLARIZATION SURVEY

ROAD LINE # 1

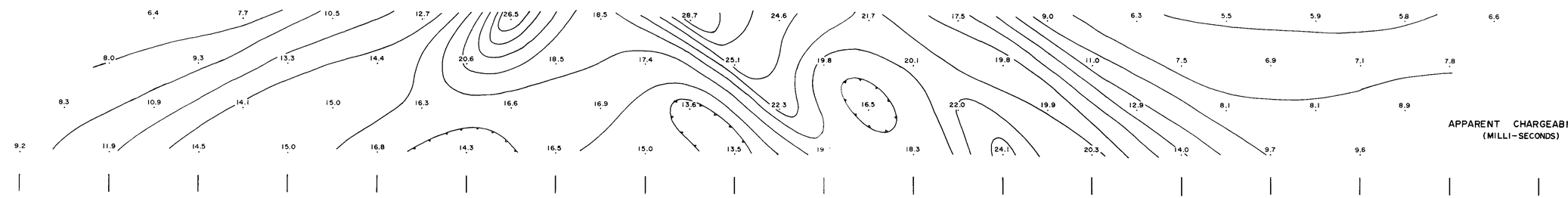
POLE - DIPOLE ARRAY
a = 75 metres

SCALE 1 : 2500

10,176



APPARENT RESISTIVITY
(OHM - METRES)



APPARENT CHARGEABILITY
(MILLI-SECONDS)

WEST MIN RESOURCES LIMITED

COP CREEK GRID

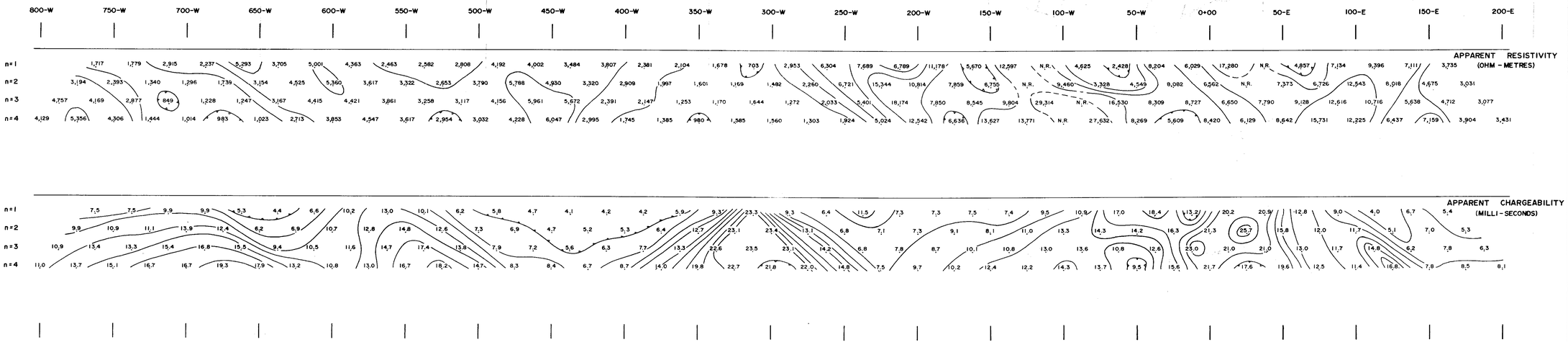
INDUCED POLARIZATION SURVEY

LINE # 2

POLE - DIPOLE ARRAY
a = 50 metres

SCALE 1 : 1250

10,176



WEST MIN RESOURCES LIMITED

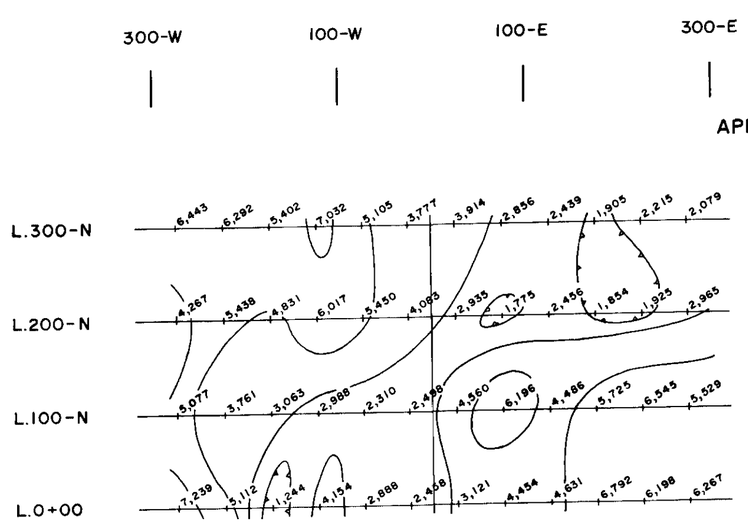
COP CREEK GRID

INDUCED POLARIZATION SURVEY

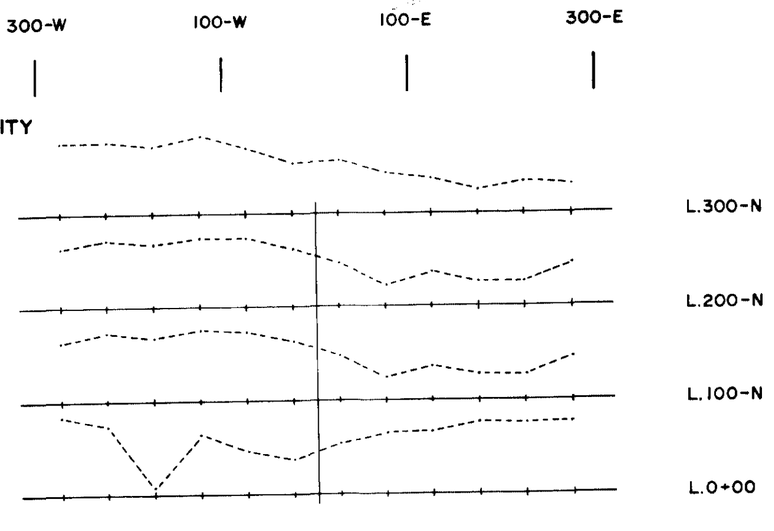
LINE # 1

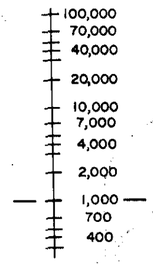
POLE - DIPOLE ARRAY
a = 25 metres

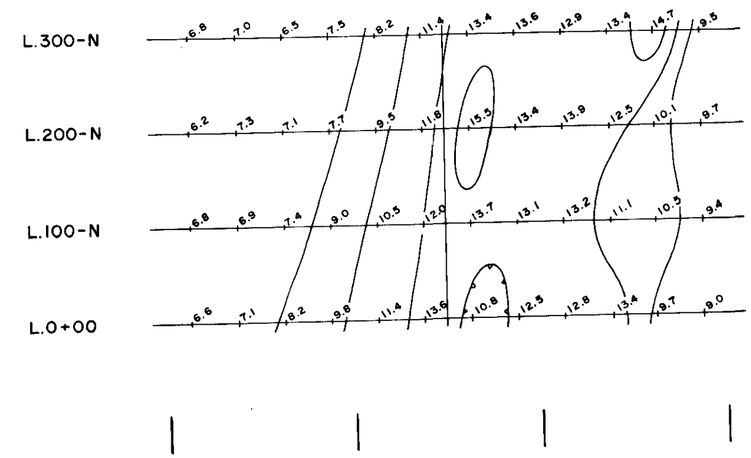
SCALE 1 : 1250



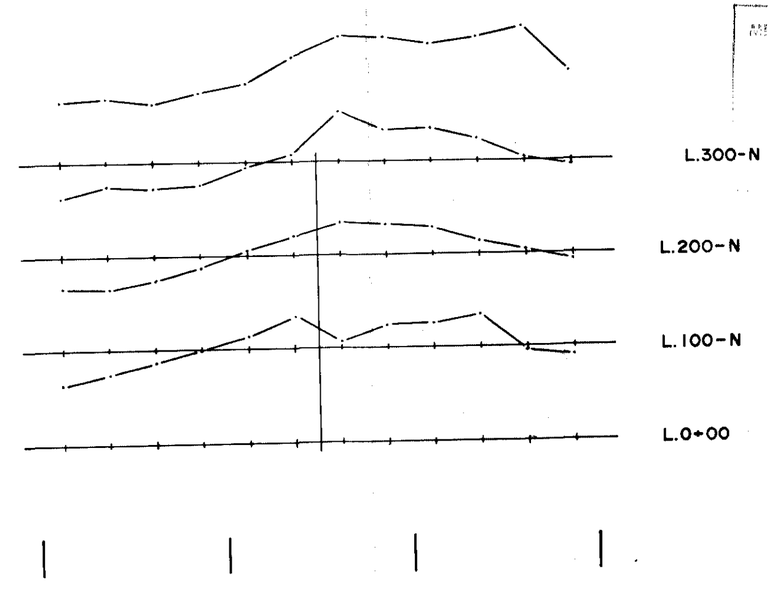
APPARENT RESISTIVITY
(OHM-METRES)

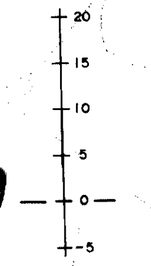






APPARENT CHARGEABILITY
(MILLI-SECONDS)





10,176

PROFESSIONAL ENGINEER
PROVINCE OF BRITISH COLUMBIA
PETER E. WALCOTT

WEST MIN RESOURCES LIMITED

YELLOW CREEK 100 ; ALBERNI M.D., B.C.

INDUCED POLARIZATION SURVEY

GRADIENT ARRAY

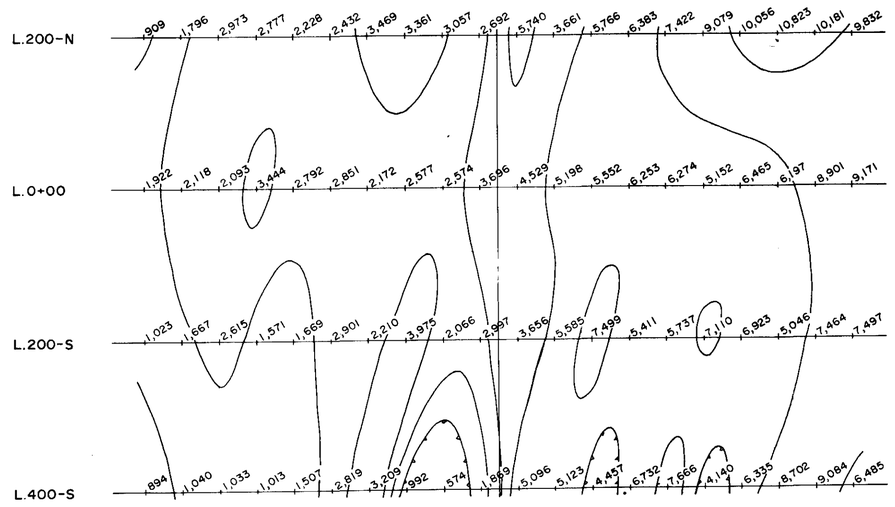
SCALE 1:5000

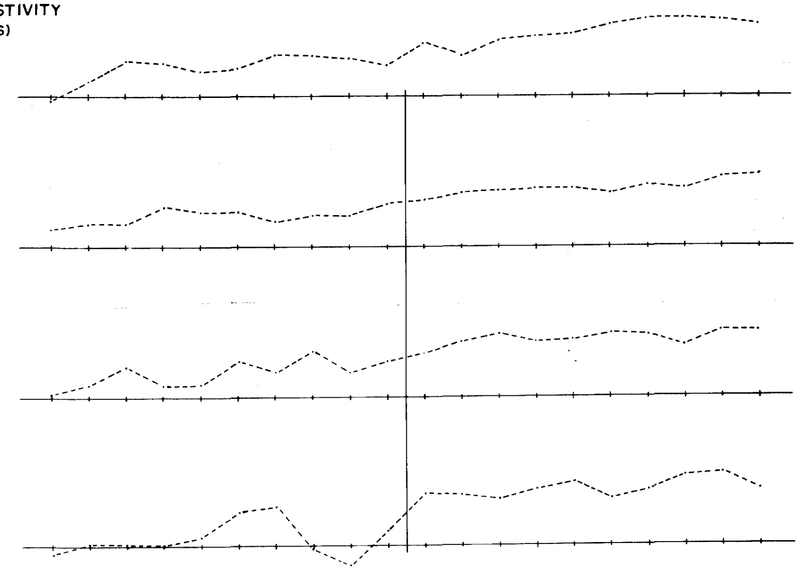
MAP No. W-299-3
TO ACCOMPANY A REPORT BY
PETER E. WALCOTT, P. Eng., NOVEMBER-1981

PETER E. WALCOTT & ASSOC. LTD.
AUGUST — 1981

500-W 300-W 100-W 100-E 300-E 500-E 500-W 300-W 100-W 100-E 300-E 500-E

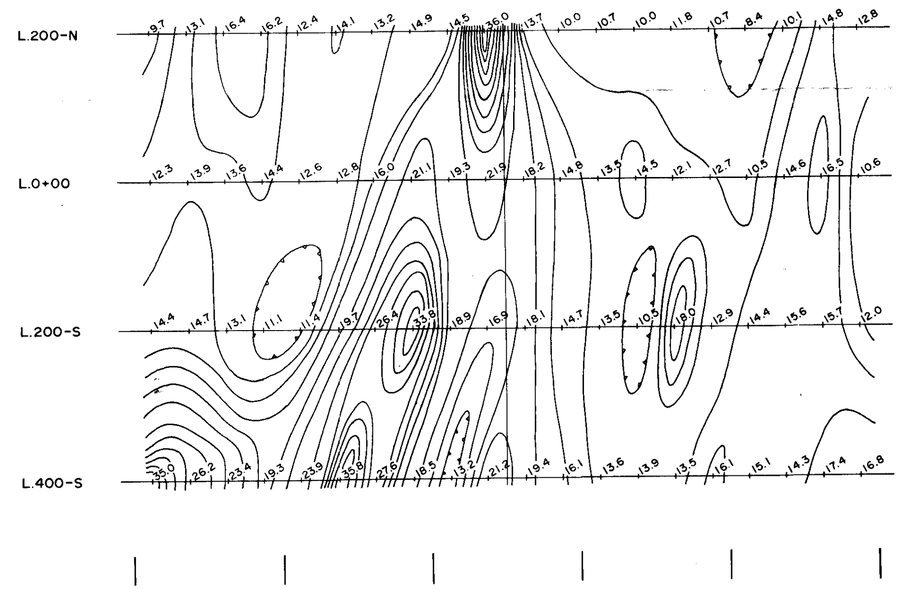
APPARENT RESISTIVITY
(OHM - METRES)

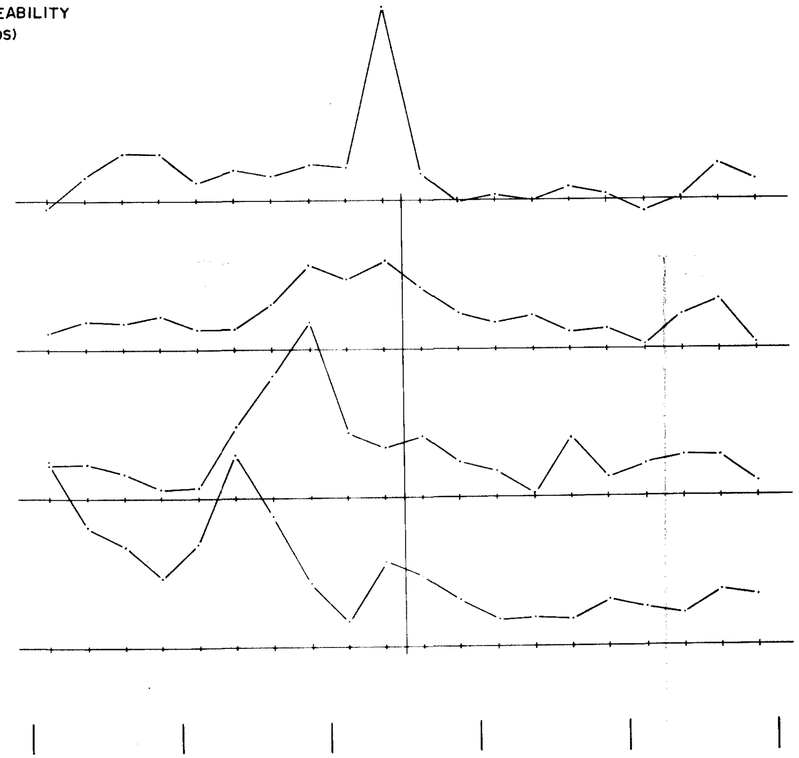




100,000
70,000
40,000
20,000
10,000
7,000
4,000
2,000
1,000
700
400

APPARENT CHARGEABILITY
(MILLI - SECONDS)





40
35
30
25
20
15
10
5

10,176

WEST MIN RESOURCES LIMITED

SUMMIT MAIN GRID ; ALBERNI M.D. , B.C.

INDUCED POLARIZATION SURVEY

GRADIENT ARRAY

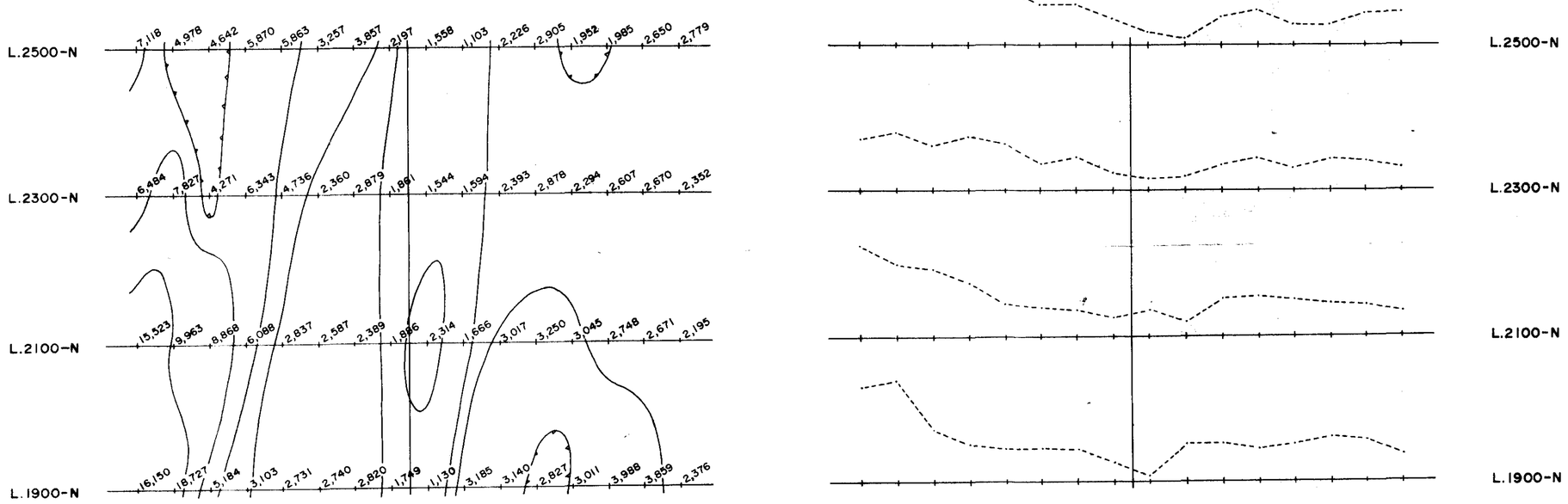
SCALE 1:5000

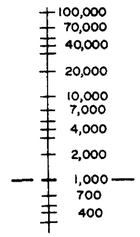
MAP No. W-299-2
TO ACCOMPANY A REPORT BY
PETER E. WALCOTT, P. Eng., NOVEMBER-1981

PETER E. WALCOTT & ASSOC. LTD.
AUGUST - 1981

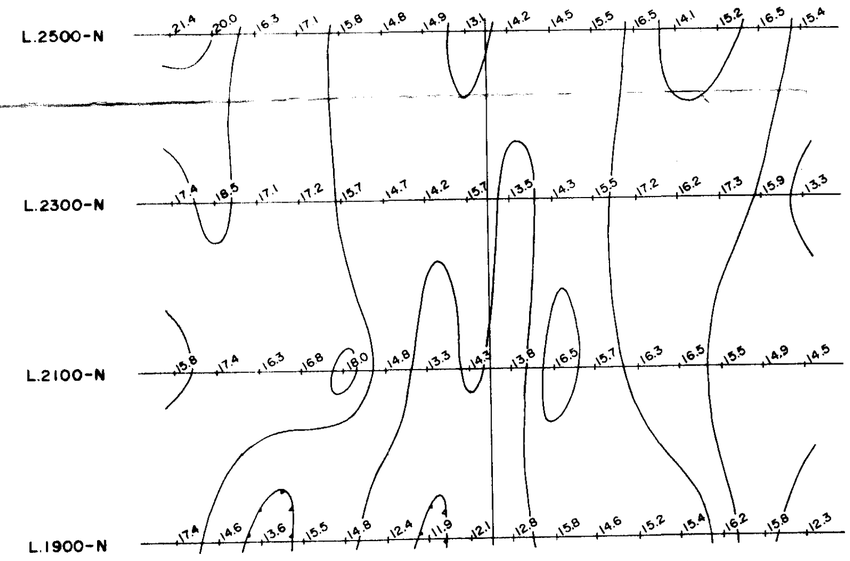
400-W 200-W 0+00 200-E 400-E 400-W 200-W 0+00 200-E 400-E

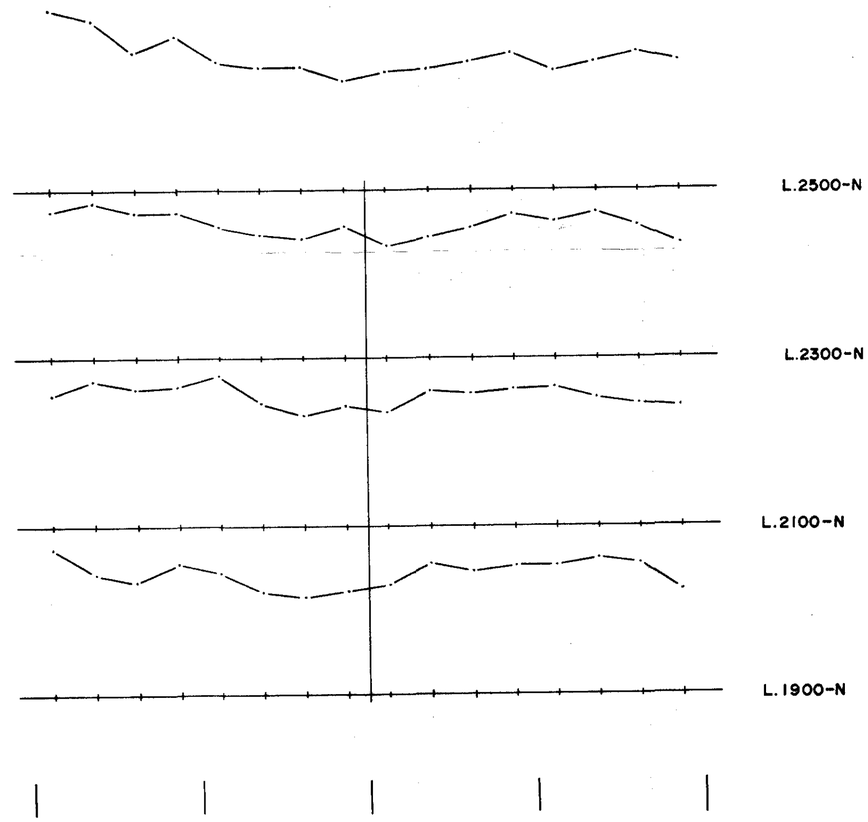
APPARENT RESISTIVITY
(OHM - METRES)

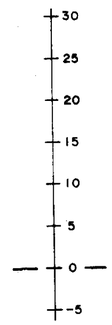




APPARENT CHARGEABILITY
(MILLI - SECONDS)







10,176

PROFESSIONAL ENGINEER
PROVINCE OF BRITISH COLUMBIA
PETER E. WALCOTT

WEST MIN RESOURCES LIMITED

YELLOW CREEK MAIN ; ALBERNI M.D., B.C.

INDUCED POLARIZATION SURVEY

GRADIENT ARRAY

SCALE 1:5000

MAP No. W-299-1
TO ACCOMPANY A REPORT BY
PETER E. WALCOTT, P. Eng., NOVEMBER-1981

PETER E. WALCOTT & ASSOC. LTD.
AUGUST - 1981

PART III

1981 PULSE ELECTROMAGNETIC SURVEY ON THE STOKES, QETS, QETS 2, DEBBIE N, AND JENNY CLAIMS.

REPORT FOR: Westmin Resources
COVERING : Crone Pulse Electromagnetic DEEPEM Survey
OVER THE : Summit, Rogers Creek and Regina Grids
SURVEY BY : Crone Geophysics Limited, Mississauga, Ontario
REPORT BY : David Anderson
DATED : November 13,1981

SURVEY DATA:

The DEEPEM survey utilized a 300m x 600m transmit loop with power being supplied by a 2 kilowatt generator. For a description of the DEEPEM method see Apendix A.

The survey was run by S. Parent of Crone Geophysics, from October 2nd to October 14th, 1981. A total of 13 line kilometers were completed.

INTERPRETATION:

For information pertaining to individual profiles consult the anomaly charts at the back of the report.

Summit Grid

No conductors were detected on the Summit Grid.

Rogers Creek Grid

A weakly conductive zone was traced from line 300N through 700N at approximately 1+50W. This is a small, near surface conductor. The migration of the vertical component cross-overs suggest that it could be related to an increase in conductivity of the overburden.

Regina Grid

No conductors were detected on the Regina Grid.

Respectfully Submitted,
CRONE GEOPHYSICS LIMITED

David Anderson,
Geophysicist.

WESTMIN RESOURCES

SUMMIT MAIN GRID

INTERPRETATION

DEEPEM SURVEY

Line No	Tx Loop	Meters Surveyed	Horizontal Peak	Vertical Component Cross-Over	σt mhos	Depth	Remarks
400S	3	800	2+00W	1+75S			Response related to railway tracks.
200S	3	600					
000	3	600					
200N	3	600					
400N	3	600					
600N	3	600	14+00E	1+50W			First sample cross-over related to surficial conductivity.
800N	2	600	?	2+00W			" " "
1000N	2	600	?	2+00W			" " "

INTERPRETATION

DEEPEM SURVEY

Line No	Tx Loop	Meters Surveyed	Horizontal Peak	Vertical Component Cross-Over	σt mhos	Depth	Remarks
200S	1	800					
000	1	800					
300N	1	800	2+00W	Migrating			Weakly conducting trend (surficial conductivity?)
500N	1	800	1+00W	Migrating			Weakly conducting trend (surficial conductivity?)
700N	1	800	1+25W	Migrating			

INTERPRETATION

DEEPEM SURVEY

Line No	Tx Loop	Meters Surveyed	Horizontal Peak	Vertical Component Cross-Over	σt mhos	Depth	Remarks
770S	5	600					
620S	5	600					
420S	5	600					
150S	4	400					
000	4	400					
150N	4	500					
250N	4	600					
350N	4	500					

APPENDIX "A"

DESCRIPTION OF THE DEEPEM PULSE EM METHOD

(1) This ground EM method is suited for deep penetration (50 to 200 meters) applications. In order to obtain deep penetration a strong primary field must be produced. This is achieved by using a larger area (usually 100M x 100M or greater) transmit loop consisting of a single turn of #10 AWG wire. The receiver coil takes both vertical and horizontal (directed along the survey line) measurements at stations 25 meters apart located on lines outside the Tx loop and perpendicular to it (as in a Turam survey). Unlike Turam, lines can be read beyond the edges of the Tx loop. The other horizontal component (perpendicular to the survey lines) should also be read in situations where the conductor is not a simple sheet like form, striking nearly perpendicular to the survey lines.

(2) Since the DEEPEM method measures only secondary fields it is not affected by rugged terrain unless the terrain itself is conductive. It has the disadvantage of any large loop system in that energizing the conductor is dependent on the primary field cutting the conductor at a good angle. If the conductor is not cut at a good angle it will not be energized and will not be detected. This blind spot can be eliminated by using two separate transmit loops on each side of the target area. In areas of very high surface conductivity ring currents occur outside the transmit loop and are concentrated in the area where survey measurements are made. In situations like this the DEEPEM method should not be used and the In-Loop Pulse EM method should be used instead.

(3) Interpretation of the DEEPEM results is by means of comparison with model study curves. The DEEPEM method is excellent in its ability to distinguish if a conductor is vertical, dipping or flat. With vertical conductors the vertical measurements produce a symmetrical cross-over anomaly and the horizontal component produces a positive peak at the cross-over point. For a flat con-

ductor the vertical component produces a positive anomaly and the horizontal component produces a cross-over. Dipping conductors produce patterns between the two extremes. Width of conductors is best determined by the use of two transmit loops on either side of the conductor. The method is very good at detecting deep small, lens-like conductors when the small conductor is not too far removed from the transmit loop (i.e. within 200 meters).

September 1979.

APPENDIX B

GEOPHYSICIST'S CERTIFICATE

I, DAVID C. ANDERSON of Mississauga, Ontario certify the following to be true.

(1) I am an employee of CRONE GEOPHYSICS LIMITED of Mississauga, Ontario.

(2) I have obtained a Bachelor of Science in Geophysics from the University of Calgary (1979).

(3) I have actively practiced my profession since graduation.

(4) I have no direct or indirect interest in the property being evaluated in this report.

(5) The information in this report is based solely on the results of my personal examination and interpretation of data received from our geophysical survey.

D. Anderson

DATED: NOVEMBER 13,1981

AT: MISSISSAUGA, ONTARIO

D.C. ANDERSON
GEOPHYSICIST