COMINCO LTD.

EXPLORATION

WESTERN DISTRICT

1986 FAME REPORT

SULLIVAN MINE AREA

KIMBERLEY, B.C.

N.T.S. 82F/9; 82F/16

LAT: 49° 45′ N

LONG: 116° W

OWNER:

COMINCO LTD.
BOX 2000
KIMBERLEY, B.C.
V1A 2G3

Work Performed during 1986

COMINCO LTD.

EXPLORATION

WESTERN DISTRICT

1986 FAME REPORT

SULLIVAN MINE AREA

PART A: GEOLOGY AND GEOCHEMISTRY

OWNER:

COMINCO LTD.
BOX 2000
KIMBERLEY, B.C.
V1A 2G3

Work Performed during 1986

Report by: P.W. Ransom
Project Geologist

TABLE OF CONTENTS

COMINCO LTD.

EXPLORATION | WESTERN DISTRICT

1986 FAME REPORT

PART A

GEOLOGY AND GEOCHEMISTRY

Fort Steele Mining Division

January, 1987

P.W. Ransom

1.00 INTRODUCTION

1.10 Specific Location

The work being reported on was done in the Mark and Matthew Creek areas west and northwest of Kimberley, B.C. Access to these areas is by logging and exploration roads.

1.20 Property Description

The property being investigated forms part of the Sullivan Mine claim group, owned by Cominco Ltd. Cominco has operated the mine for about 75 years. The Sullivan stratiform Ag-Pb-Zn-Fe sulphide deposit is one of the most important of its type worldwide and has contributed significantly to the mineral wealth generated in the province of British Columbia.

1.30 Mapping and Soil Sampling

Geological mapping, primarily structural, was done in three separate areas, the northeast fork of Matthew creek, west of Matthew Creek, and northwest of Mark Creek. Soil sampling was done in the northeast fork of Matthew Creek.

1.40 Claims Explored

Claims in portions of the Late, Mat, Clair and Bad groups, parts of the Sullivan Mine claim group, were explored.

2.00 DETAILED TECHNICAL DATA AND INTERPRETATION

2.10 Geological Mapping

2.11 Objective

Geological mapping, in particular for structural information, was collected in the northeast fork of Matthew Creek, west of the main fork of Matthew Creek and in the northwest fork of Mark Creek (See Index Map - Page 13). Work in the first two areas was done to define geometric properties of regional scale folds prior to drilling. Work in the latter area was done to test a theory that a major west-dipping thrust fault was present there.

2.12 (a) Northeast Fork of Matthew Creek - Results

Possible broken rock in the fold core in the northeast fork of Matthew Creek was considered to be a potential source of drilling trouble. Detailed structural measurements were collected predominantly from the west side of the structure and near where the drill hole was planned (Fig. 2.1-1). The data are plotted on equal area stereonets, Figures 2.1-2, 2.1-3, and 2.1-4. The fold is a relatively upright and open structure, in contrast to most folds in the region; the axial plane dips 80° toward 265° and the axis plunges 20° toward 345°. The fold axial plane, where crush zones and broken rock would be most likely, was deemed to be east of the planned 650 m long hole. As is turned out no serious drilling problems were encountered.

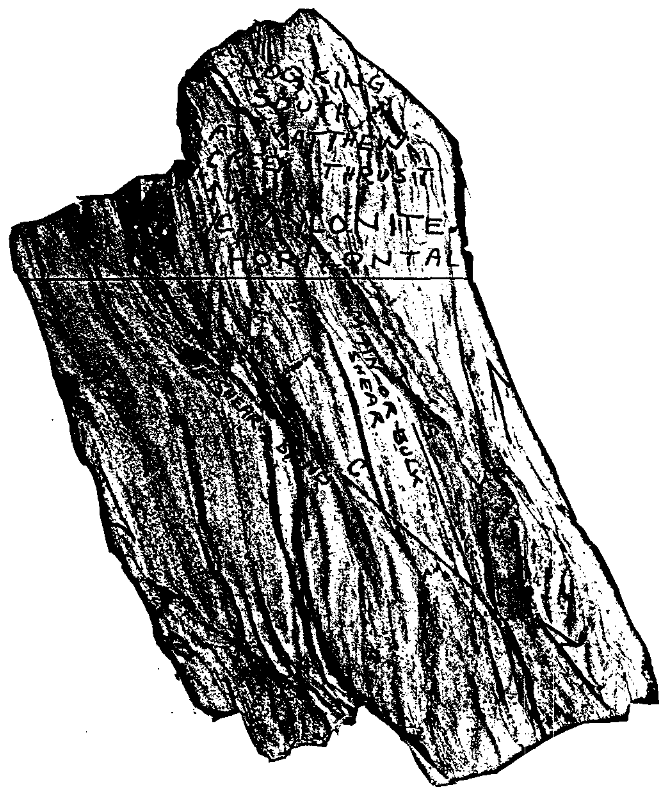
- Interpretation

This fold is relatively open and plunges gently NNW compared with overturned folds that have gentle N to NNE plunges that are typical regionally. This structure is interpreted to be a hangingwall anticline developed over an inclined "ramp" to "flat" inflection in a fault surface; the "ramp" being the west-dipping Matthew Creek Thrust and the "flat" being the north-dipping Kimberley Fault.

2.12 (b) West of Matthew Creek - Results

Mapping west of the main (south flowing) part of Matthew Creek identified a major west-dipping thrust zone, predicted by theory based on past mapping. This fault is named the Matthew Creek Thrust (Fig. 2.1-5). The thickest, continuous interval of sheared rock is 60 meters wide.

Measurements of shearing and associated lineations (slickenside and crenulation) along the northern 5 km of the Matthew Creek Thrust are summarized on an equal area stereo net (Fig. 2.1-6). Rocks in the thrust zone are mylonitic and display good S/C fabrics S/C fabric is in outcrop and hand specimen (Fig. 2.1-7). The intersection of two shears which blend in a characteristic fashion.



2 cm

Full Size

Figure 2.1-7 S/C fabric in sawn specimen from the Matthew Creek Thrust. (Two shear directions.)

- Interpretation

The mylonitic rocks mapped at several localities west of the main fork of Matthew Creek are interpreted to represent a west-dipping thrust zone. Steepening of an initial shallow dip by underthrusting may explain the present apparently steep (60°) dip; alternatively this part of the fault may be a steep ramp. At the northern end this fault swings to the east and merges with the Kimberley Fault on Mark Hill. To the south the fault disappears into the St. Mary River valley and is inferred to link with the St. Mary Fault.

2.12 (c) Northwest Mark Creek - Results

Mapping in a part of the northwest Mark Creek area was undertaken to develop an understanding of structures that might project southerly into areas where drilling is being considered. Rocks in the area mapped (Fig. 2.1-8) belong primarily to the Upper Aldridge Formation. The dominant rock types are argillite and subwacke to wacke that is rust weathering; the argillite is medium grey, the subwacke-wacke is genrally dark grey to black, rarely white; the argillite is uniform or massive, the subwacke-wacke is usually very finely internally laminated; the subwacke-wacke contains very fine silt grains in an argillaceous matrix; these lithotypes are laminated to very-thin bedded with respect to each other, bed contacts are sharp and flat; pyrrhotite and pyrite (about 1 or 2% of the rock in places) is restricted to the subwacke-wacke lithotypes.

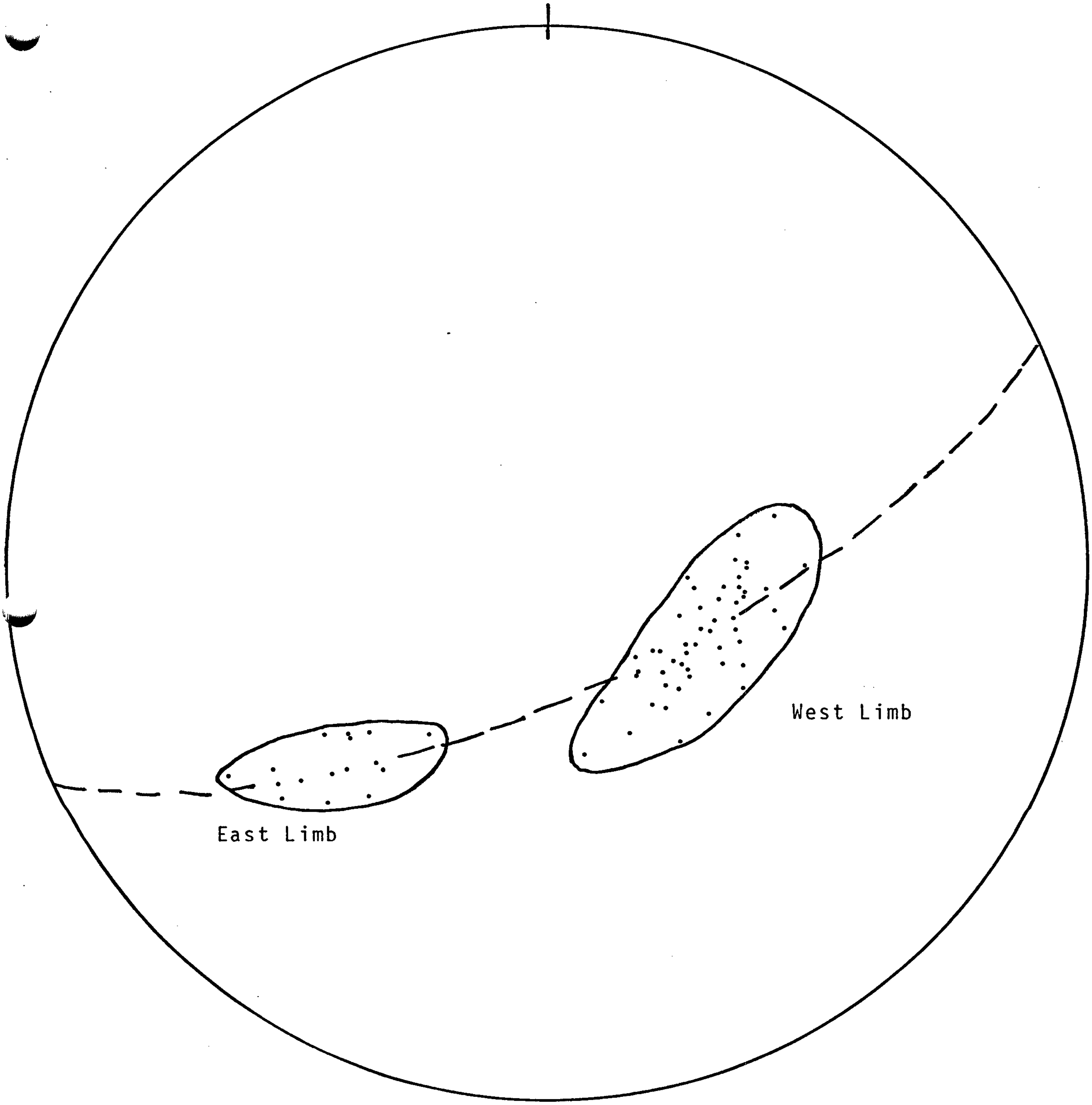
Folds were observed in Upper Aldridge strata only. Adjacent formations were not sufficiently exposed to reveal structures in the area mapped. The folds observed are developed on the limbs of larger structures. Folds are overturned with axial planes that dip moderately ($\pm 41^{\circ}$) west and axes that plunge gently north (Figures 2.1-9,-10 and -11). The folds have gentle east-dipping limbs and steep, overturned, west-dipping limbs. The largest steep limb (containing numerous small folds) has a veritical extent greater than 250 m. Assymmetry of small folds in this limb indicates a major anticline axial plane is to the west and a corresponding syncline axial plane is to the east (small folds are "S" when viewer faces down plunge).

- Interpretation

Outcrop distribution is poor but it is apparent that major overturned fold limbs occur no more than one kilometer apart. It should be possible to position drill sites a kilometer or two south so that the hole is collared in the desired part of a structure, however because the axial planes dip about 41° west, any hole more than 700 metres long will drill through major folds.

2.13 Conclusions

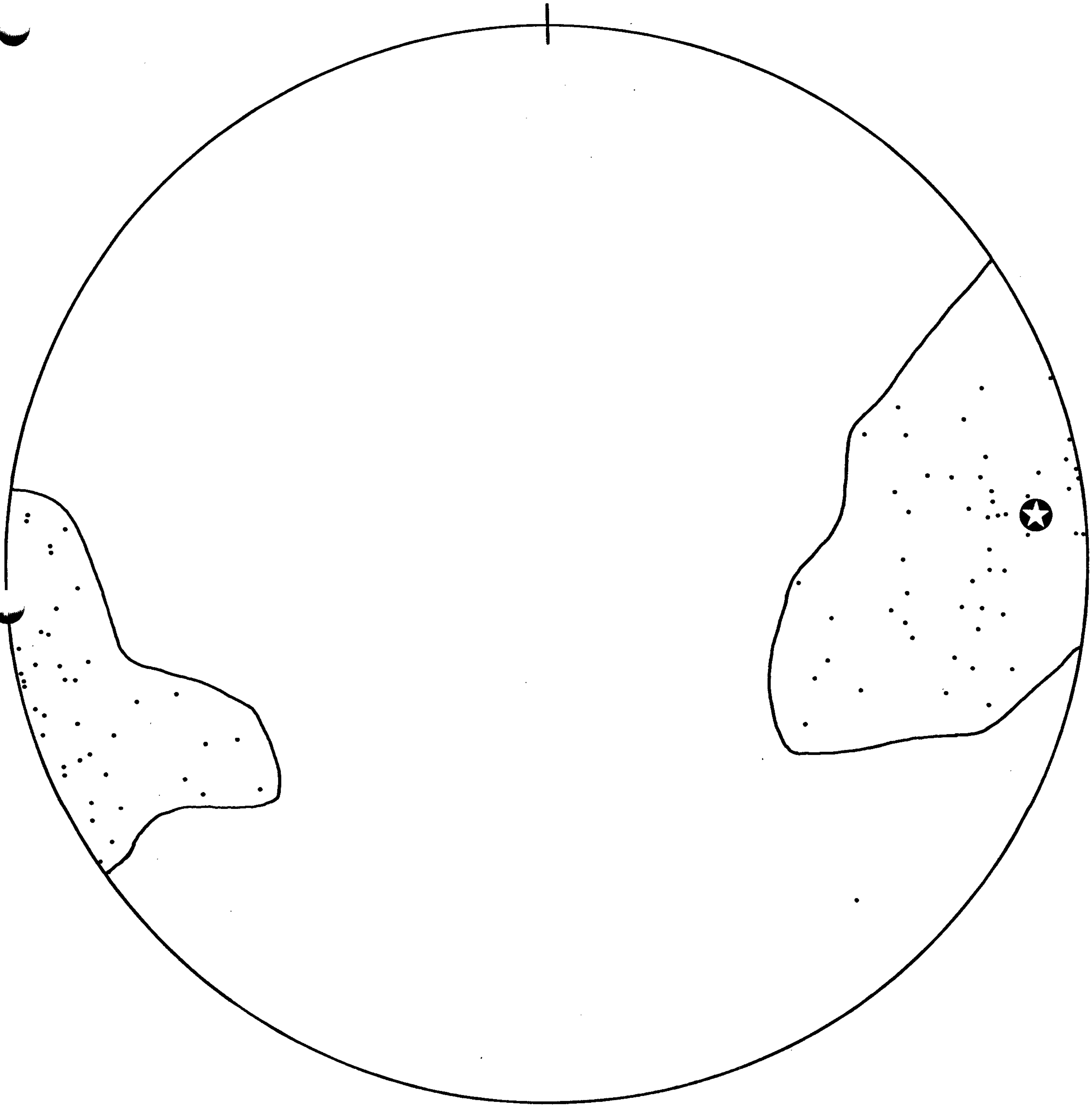
The anomalous fold in the northeast fork of Matthew Creek is a hangingwall anticline developed above the inclined surface of the Matthew Creek Thrust-Kimberley Fault system. A west dipping fault west of the main fork of Matthew Creek is a thrust of regional significance. Folding in the northwest fork of Mark Creek is extensive and will likely result in drilling problems in that area.



This pattern indicates little variation in the fold limbs.

FIGURE 2.1-2

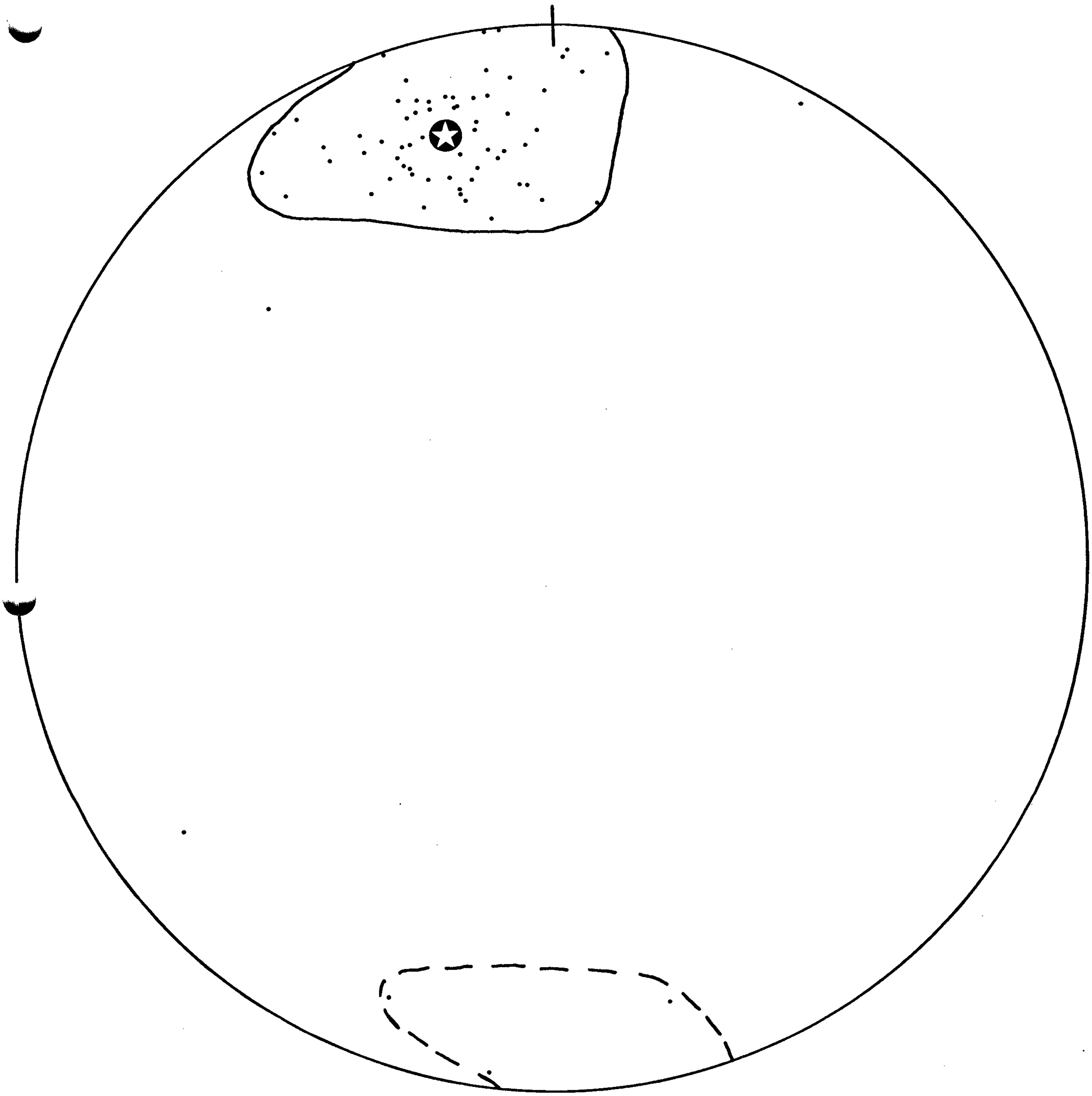
NE Fork of Matthew Creek
Poles to Bedding
Equal Area Net



Mid-Range Point
80° ⟶ 265°
Approximation of
Fold Axial Plane.

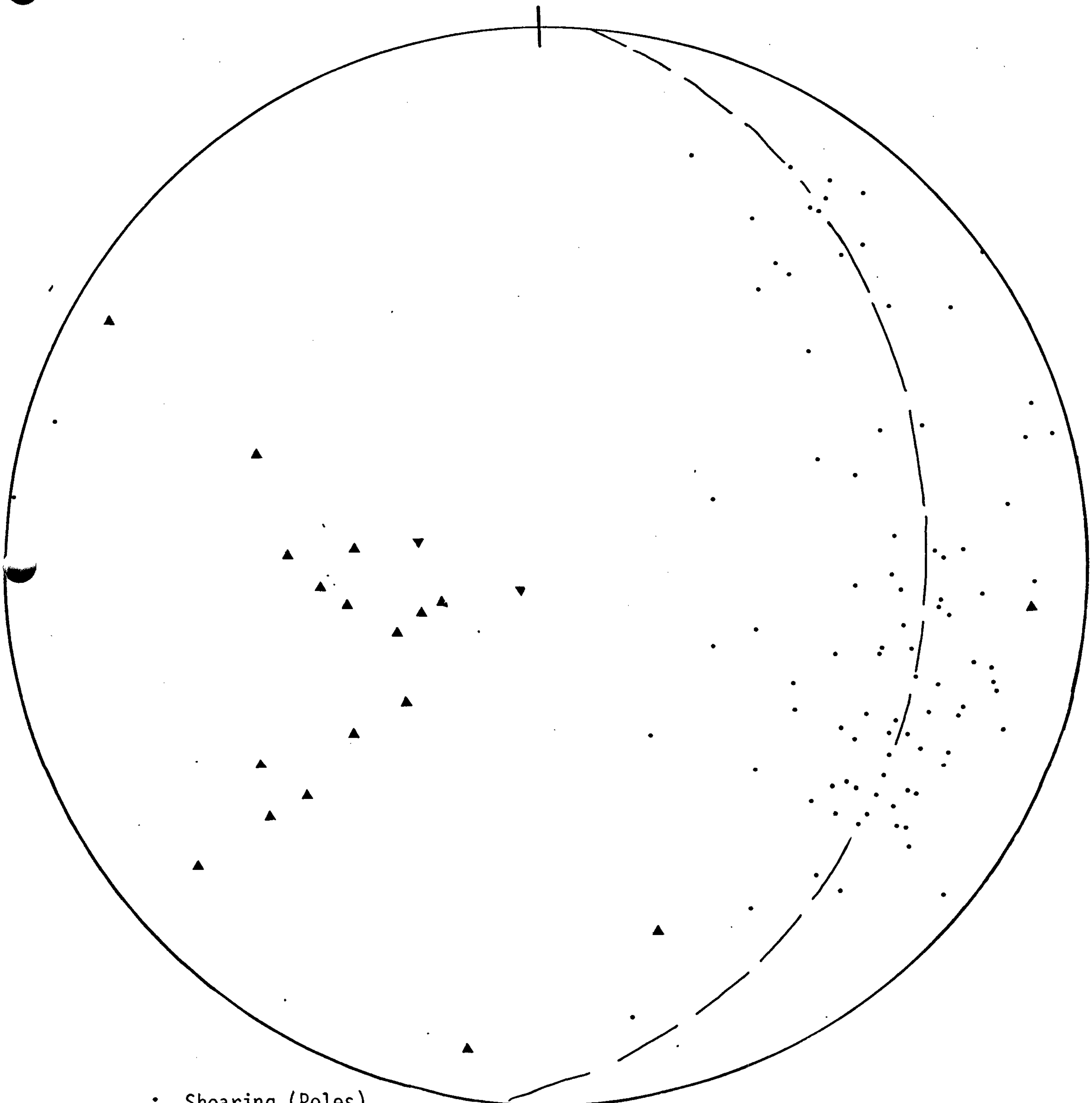
FIGURE 2.1-3

NE Fork of Matthew Creek
Poles to Cleavage
Equal Area Net



(star symbol) Mid-Range Point
20° → 345°
Approximation of
Fold Plunge.

FIGURE 2.1-4
NE Fork of Matthew Creek
Bedding/Cleavage Intersections
Equal Area Net



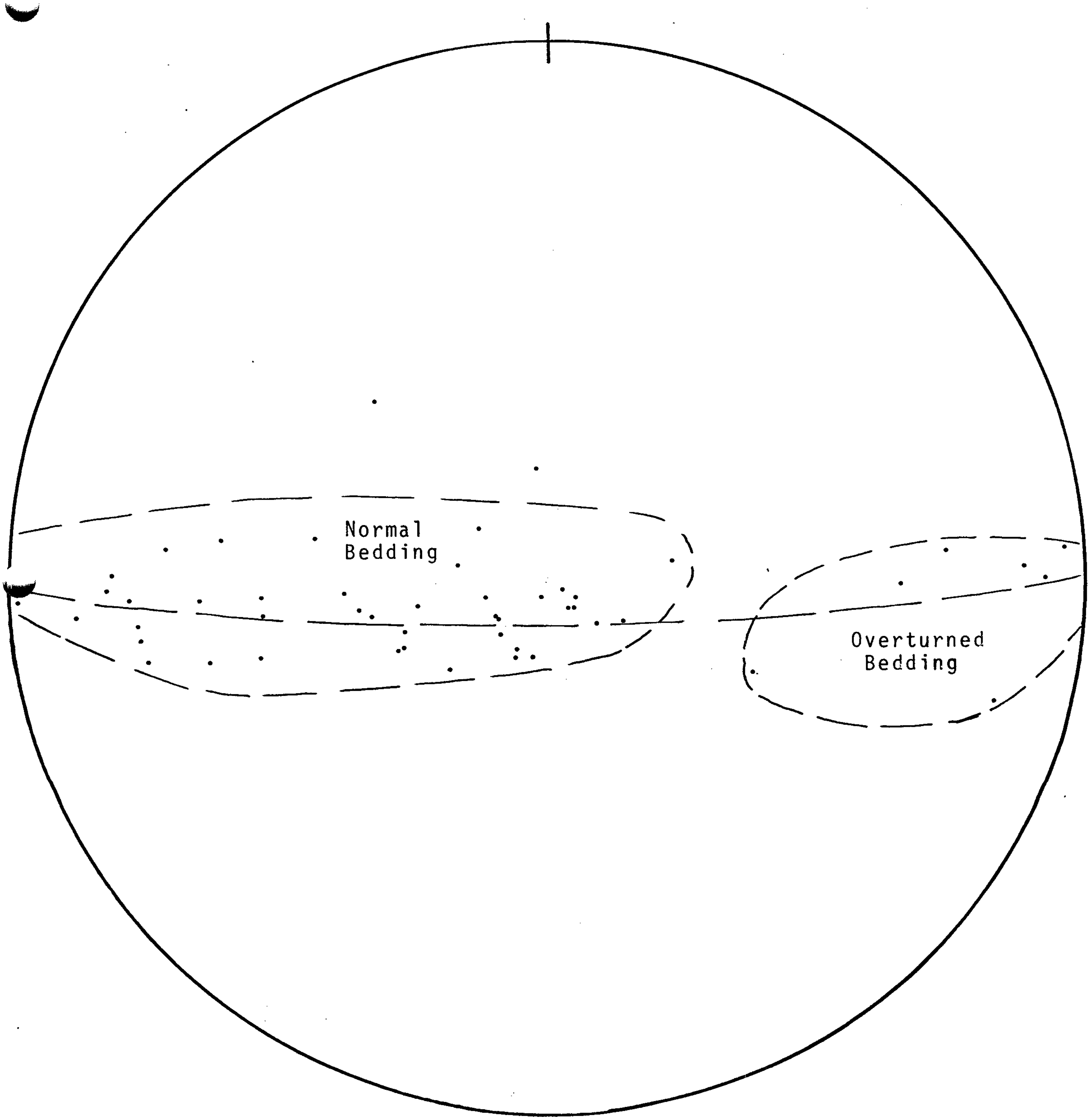
· Shearing (Poles)

▲ Slickenside and Crenulation Lineations

Great circle indicates shear zone to dip approximately 60^o toward 275^o.

FIGURE 2.1-6

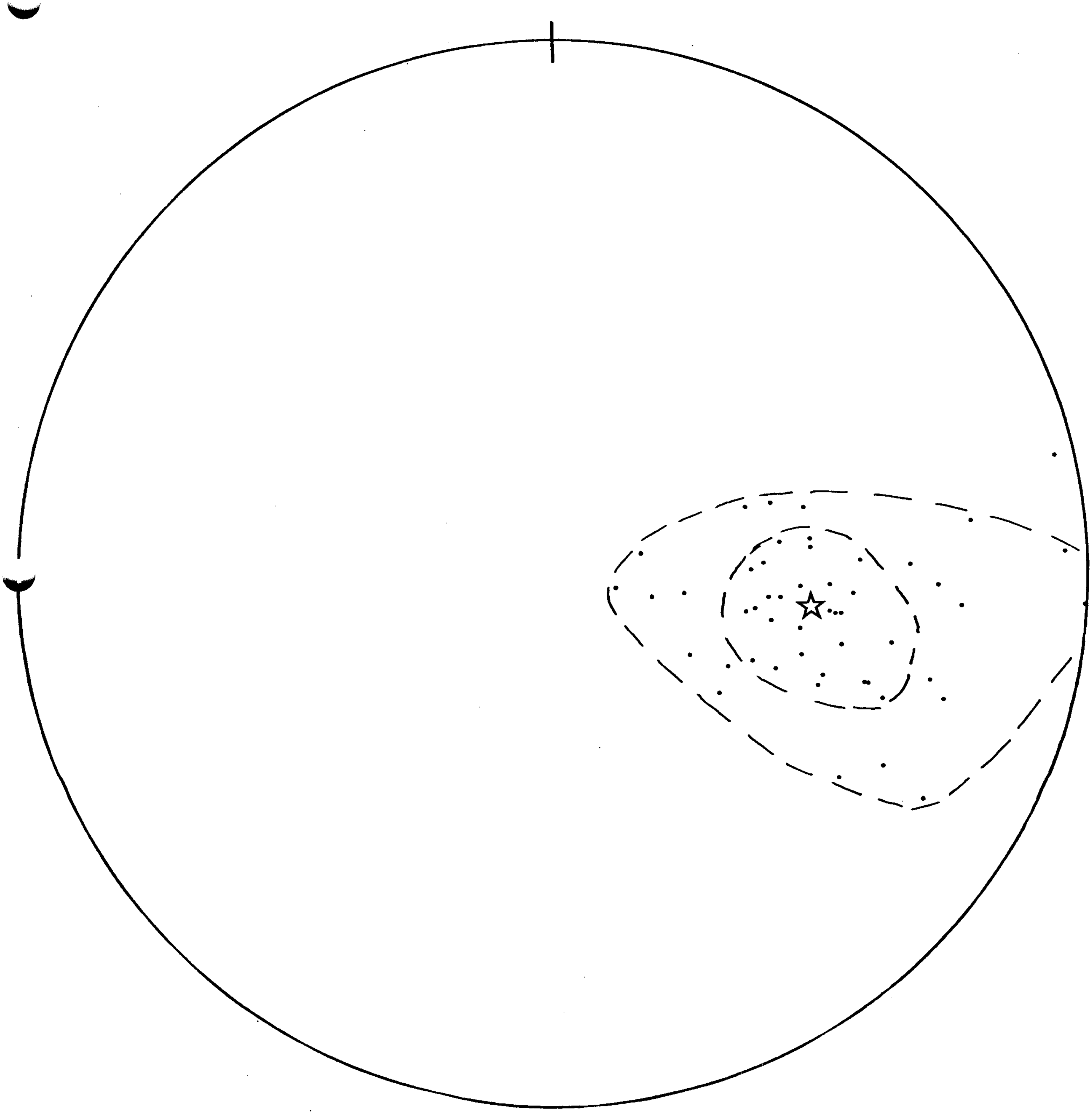
Matthew Creek Thrust Zone
Structural Data
Equal Area Net



Great circle drawn perpendicular to bedding/cleavage intersection of 07° toward 359°.

FIGURE 2.1-9

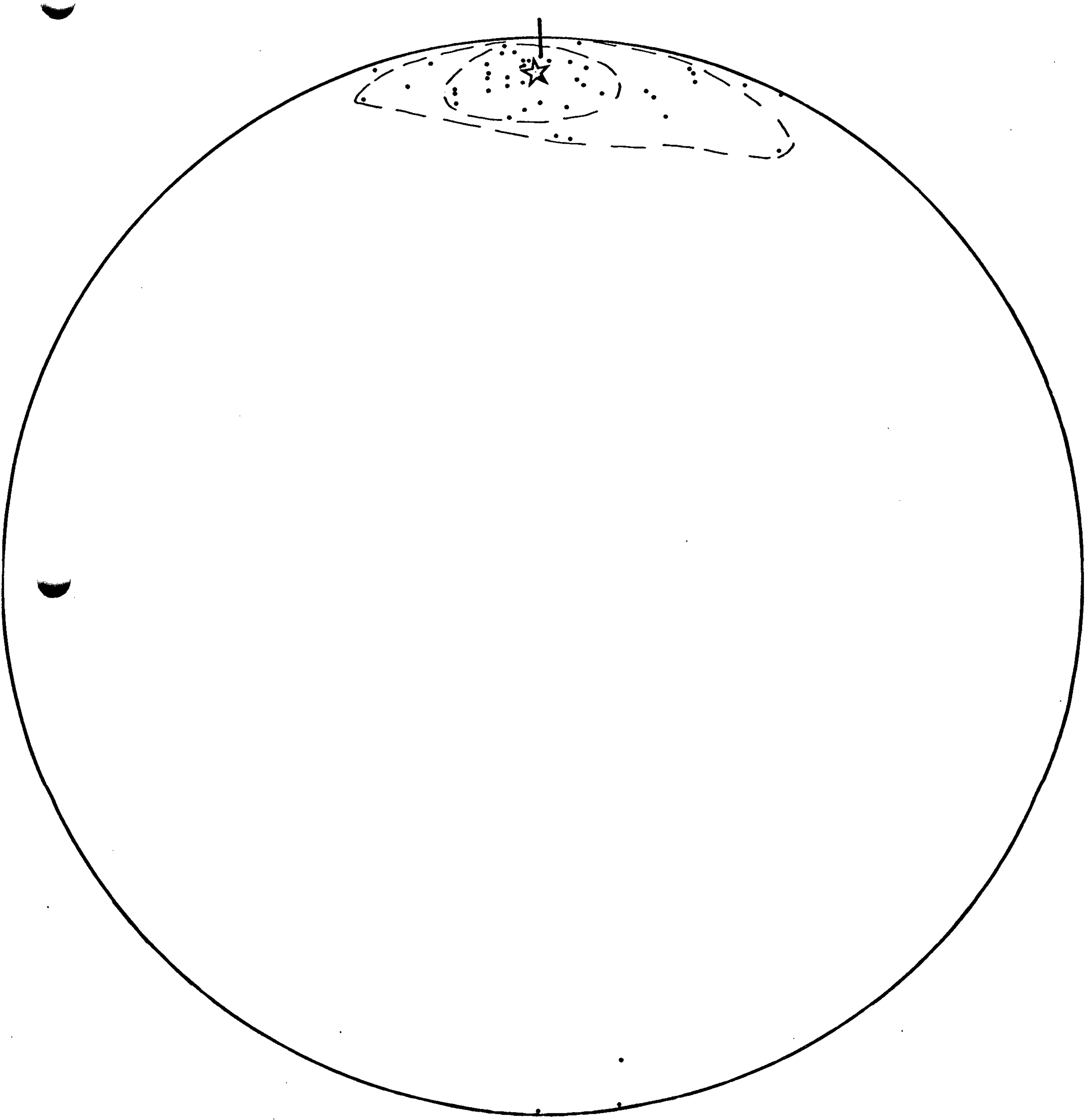
Northwest Mark Creek
Poles to Bedding
Equal Area Net



☆ Mid-Range Point indicates approximate dip of cleavage and fold axial planes to be 41° toward 263°.

FIGURE 2.1-10

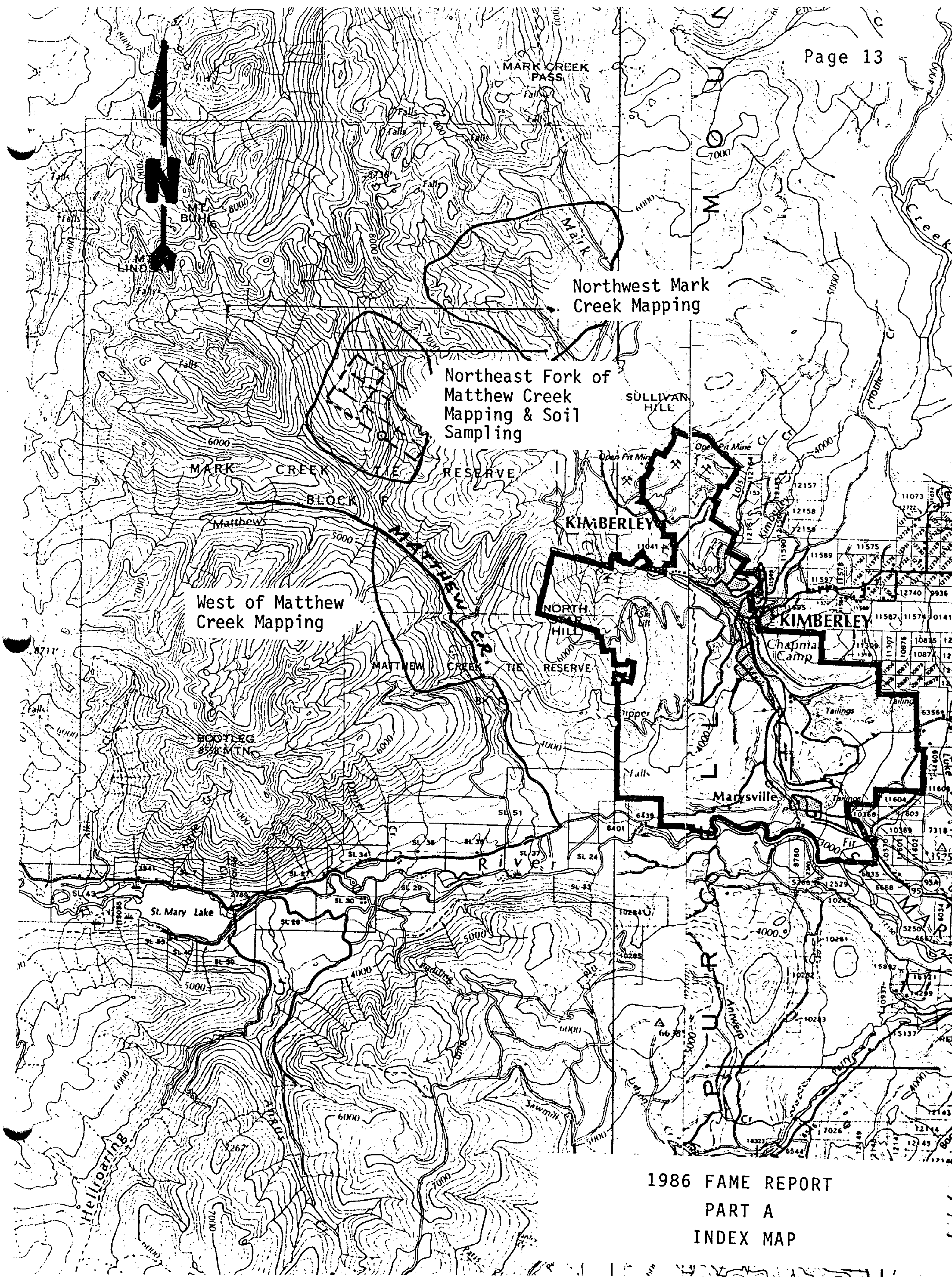
Northwest Mark Creek
Poles to Cleavage
Equal Area Net



☆ Mid-Range Point indicates structual plunge to be 07° toward 359°

FIGURE 2.1-11

Northwest Mark Creek
Bedding/Cleavage Intersections
Equal Area Net



1986 FAME REPORT
PART A
INDEX MAP

2.00 DETAILED TECHNICAL DATA AND INTERPRETATION - Cont'd.

2.20 Geochemistry

2.21 Ojective

The objective of this work was to locate exploration targets.

2.22 Results

Ninety soil samples collected at 50 m intervals along parts of both sides of the northeast fork of Matthew Creek were analyzed for copper, lead and zinc. Sampled lines and start and end point sample numbers are shown in Figure 2.2-1; The data is shown in Table 2.2-1. Material sampled was B Horizon, 15 to 25 cm deep, overburden material is glacially transported only a very short distance, as most rock fragments are angular.

2.23 Interpretation

Results are about what would be expected as background for this area. The highest values for the three elements are considered to be elevated but not anomalous and it is inferred that these higher values represent statistical variation only.

2.24 Conclusion

There are no anomalies in this survey that require follow-up.

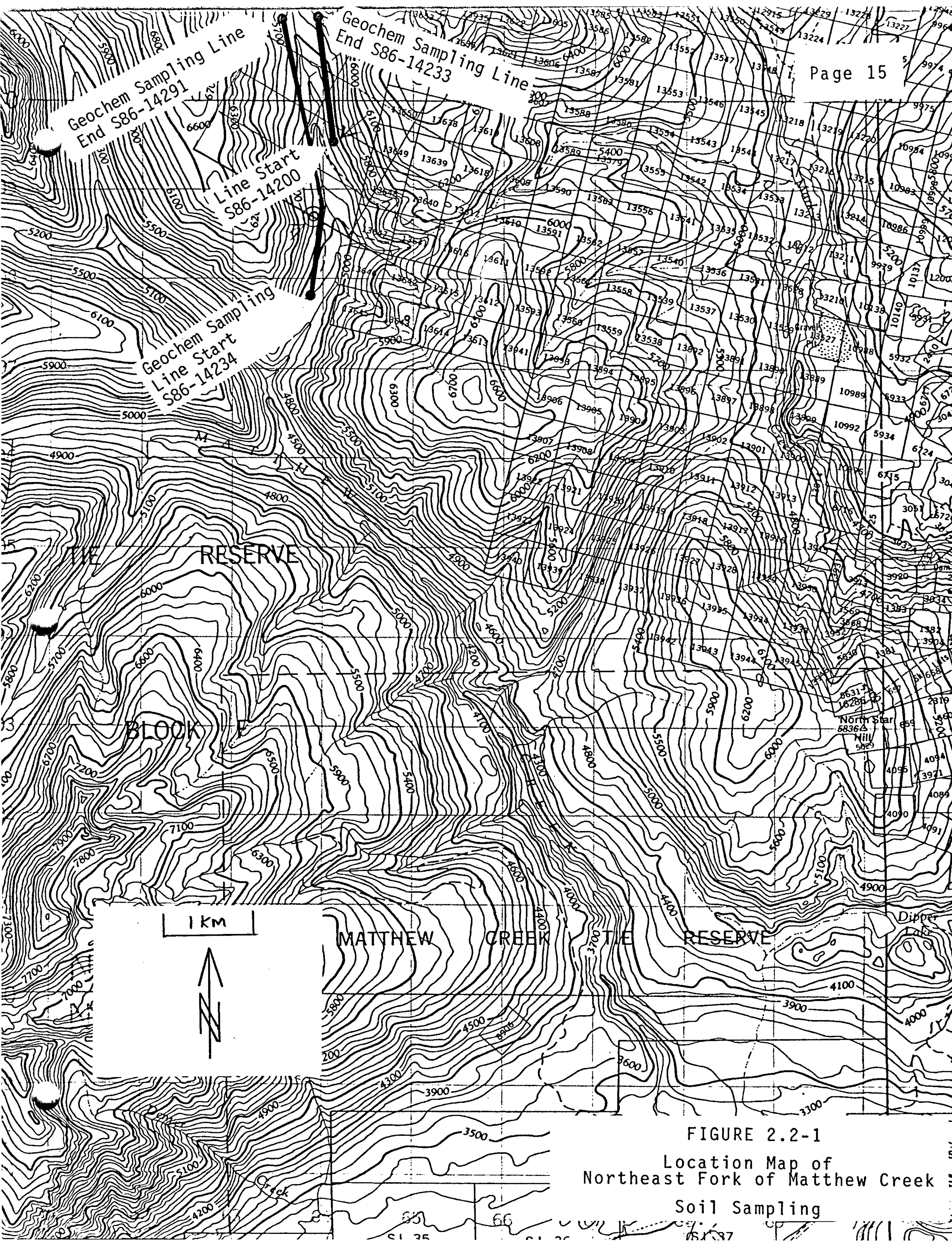


FIGURE 2.2-1

Location Map of
Northeast Fork of Matthew Creek

Soil Sampling

TABLE 2.2-1

SULLIVAN EXPL. -MD

JOB V 86-05615
REPORT DATE 10 NOV 1986

LAB NO	FIELD NUMBER	East+ West-	North+ South-	Cu PPM	Pb PPM	Zn PPM
S8614200	DC86-1	21520-	18055+	22	25	48
S8614201	DC86-2	21505-	18210+	21	17	73
S8614202	DC86-3	21495-	18360+	12	17	50
S8614203	DC86-4	21480-	18520+	20	18	62
S8614204	DC86-5	21475-	18680+	12	17	53
S8614205	DC86-6	21470-	18830+	46	20	77
S8614206	DC86-7	21465-	18985+	21	18	63
S8614207	DC86-8	21470-	19135+	14	19	38
S8614208	DC86-9	21470-	19290+	28	15	45
S8614209	DC86-10	21475-	19450+	34	13	64
S8614210	DC86-11	21475-	19605+	24	16	82
S8614211	DC86-12	21475-	19765+	52	22	77
S8614212	DC86-13	21475-	19915+	87	17	72
S8614213	DC86-14	21480-	20060+	26	12	43
S8614214	DC86-15	21480-	20215+	35	13	52
S8614215	DC86-16	21495-	20370+	24	21	80
S8614216	DC86-17	21530-	20520+	28	22	103
S8614217	DC86-18	21580-	20705+	14	15	83
S8614218	DC86-19	21545-	20800+	10	13	103
S8614219	DC86-20	21540-	20930+	11	17	67
S8614220	DC86-21	21595-	21085+	11	21	66
S8614221	DC86-22	21610-	21235+	12	16	74
S8614222	DC86-23	21620-	21400+	60	32	95
S8614223	DC86-24	21630-	21560+	23	24	79
S8614224	DC86-25	21665-	21715+	35	48	117
S8614225	DC86-26	21700-	21880+	30	32	74
S8614226	DC86-27	21780-	22030+	20	16	31
S8614227	DC86-28	21855-	22170+	15	26	89
S8614228	DC86-29	21965-	22290+	19	28	88
S8614229	DC86-30	22040-	22430+	10	19	80
S8614230	DC86-31	22080-	22590+	12	13	39
S8614231	DC86-32	22140-	22725+	12	14	74
S8614232	DC86-33	22185-	22890+	13	9	47
S8614233	DC86-34	22320-	23000+	16	18	48
S8614234	DC86-101	21695-	14020+	19	19	53
S8614235	DC86-102	21655-	14170+	11	12	62
S8614236	DC86-103	21600-	14335+	15	19	41
S8614237	DC86-104	21550-	14480+	15	17	95
S8614238	DC86-105	21565-	14640+	9	12	56
S8614239	DC86-106	21590-	14800+	13	15	35
S8614240	DC86-107	21565-	14985+	20	33	52
S8614241	DC86-108	21595-	14130+	11	13	40
S8614242	DC86-109	21635-	15290+	15	9	29
S8614243	DC86-110	21665-	15450+	16	39	115
S8614244	DC86-111	21700-	15615+	20	24	73
S8614245	DC86-112	21730-	15775+	14	20	118
S8614246	DC86-113	21750-	15935+	11	21	37
S8614247	DC86-114	21795-	16075+	17	13	42
S8614248	DC86-115	21895-	16205+	19	17	77
S8614249	DC86-116	21020-	16320+	36	32	47
S8614250	DC86-117	22145-	16440+	19	13	39

LAB NO	FIELD NUMBER	EAST+ WEST-	NORTH+ SOUTH-	CU PPM	PB PPM	ZN PPM
S8614251	DC86-118	22250-	16560+	11	13	32
S8614252	DC86-119	22320-	16710+	22	31	81
S8614253	DC86-120	22335-	16870+	15	15	49
S8614254	DC86-121	22360-	17030+	10	17	33
S8614255	DC86-122	22380-	17190+	17	48	94
S8614256	DC86-123	22390-	17355+	32	54	100
S8614257	DC86-124	22410-	17525+	13	29	66
S8614258	DC86-125	22425-	17685+	20	23	60
S8614259	DC86-126	22485-	17850+	20	23	67
S8614260	DC86-127	22480-	18010+	11	17	41
S8614261	DC86-128	22465-	18170+	11	16	60
S8614262	DC86-129	22455-	18345+	28	31	81
S8614263	DC86-130	22455-	18505+	28	28	69
S8614264	DC86-131	22450-	18670+	12	18	64
S8614265	DC86-132	22450-	18830+	14	15	40
S8614266	DC86-133	22465-	18995+	8	17	45
S8614267	DC86-134	22505-	19155+	13	15	37
S8614268	DC86-135	22535-	19315+	10	16	52
S8614269	DC86-136	22560-	19480+	23	32	70
S8614270	DC86-137	22570-	19645+	22	25	39
S8614271	DC86-138	22595-	19810+	29	18	50
S8614272	DC86-139	22590-	19975+	13	13	42
S8614273	DC86-140	22590-	20140+	22	17	96
S8614274	DC86-141	22600-	20305+	10	17	62
S8614275	DC86-142	22610-	20470+	11	16	58
S8614276	DC86-143	22625-	20630+	30	16	119
S8614277	DC86-144	22640-	20790+	7	17	35
S8614278	DC86-145	22665-	20955+	12	22	80
S8614279	DC86-146	22690-	21115+	10	19	104
S8614280	DC86-147	22720-	21280+	11	19	60
S8614281	DC86-148	22755-	21435+	9	18	60
S8614282	DC86-149	22785-	21595+	12	24	103
S8614283	DC86-150	22835-	21760+	15	15	49
S8614284	DC86-151	22890-	21925+	10	23	107
S8614285	DC86-152	22930-	22070+	15	19	49
S8614286	DC86-153	22980-	22240+	14	27	88
S8614287	DC86-154	23025-	22405+	16	23	89
S8614288	DC86-155	23070-	22550+	16	26	91
S8614289	DC86-156	23115-	22720+	17	61	111
S8614290	DC86-157	23170-	22875+	15	22	60
S8614291	DC86-158	23210-	23025+	12	18	66

I=INSUFFICIENT SAMPLE X=SMALL SAMPLE E=EXCEEDS CALIBRATION C=BEING CHECKED R=REVISED
IF REQUESTED ANALYSES ARE NOT SHOWN ,RESULTS ARE TO FOLLOW

ANALYTICAL METHODS

		Range	Cu	Pb	Zn
Cu	20% HNO3 DECOMPOSITION / AAS	Range	7 to 87	9 to 54	29 to 119
Pb	20% HNO3 DECOMPOSITION / AAS				
Zn	20% HNO3 DECOMPOSITION / AAS				

APPENDIX A

SULLIVAN MINE GROUP OF MINERAL CLAIMS

NOVEMBER 27, 1986

			Number of Units
1.	Crown-Granted M.C.		680
2.	Held by Assessment:		
	2(a) TWO POST CLAIMS		
	Luke Group	75	
	Rho Group	20	
	Med Group	15	
	Donna, Etc. Group	15	
	Uke Group	11	
	Mar Group	17	
	Bad Group	36	
	Late Group	91	
	Mat Group	268	
	Jackpot	1	549
	2(b) REVERTED CROWN GRANTED MINERAL CLAIMS		
	Tip 4-12	9	
	Hope 2-12	11	
	Sun 2-12	11	
	Cue 2-12	11	
	B.C., Silver Bell, Tarrant	3	
	Black Hills, Yankee Girl, Wasp Fr.	3	
	Blue Dragon	1	49
	2(c) MINERAL CLAIMS (54)		
	Dip 1-8	56	
	Fal 1-14	84	
	Golf 1-3	17	
	Quark 1&2	12	
	Fin 1-3	18	
	Mead 1-3	36	
	Gin 1-9	110	
	Clair 24-32	56	
	Mark 1-3	17	406
3.	Greenhorn Mineral Lease		1
	GRAND TOTAL (1 + 2 + 3)		1,685

PWR/lrm

APPENDIX B

1986 FAME REPORT PART A - GEOLOGY AND GEOCHEMISTRY

STATEMENT OF EXPENDITURES

Mapping	37 field days
Plotting	19 days estimate (1/2 day per field day)
Draw Nets	2 days estimate
Prepare Report	6 days
Total	64 days

Costs:

64 days @ $255/day		$16,320.00
37 truck days @ $40/day		1,480.00
Soil Sampling		297.50
Analyses		455.40
	Total	$18,552.90

P. Ransom

P.W. RANSOM
Project Geologist

APPENDIX C

PART A: GEOLOGY AND GEOCHEMISTRY

IN THE MATTER OF THE

B.C. MINERAL ACT

AND

IN THE MATTER OF A GEOLOGY AND GEOCHEMISTRY PROGRAMME

CARRIED OUT ON PARTS OF THE SULLIVAN
GROUP OF MINERAL CLAIMS

KIMBERLEY AREA

in the Fort Steele Mining Division of
the Province of British Columbia

More Particularily N.T.S. 82F/9 & 82F/16

A F F I D A V I T

I, P.W. Ransom, of the rural district of Wycliffe, in the Province of British Columbia, make Oath and say:

1. That I am employed as a Geologist by Cominco Ltd. and as such, have a personal knowledge of the facts to which I hereinafter depose:

2. That annexed hereto and marked as Appendix B to this my Affidavit is a true copy of expenditures incurred on a Geology and Geochemistry programme, on parts of the Sullivan group of mineral claims.

3. That the said expenditures were incurred between the 1st day of May, 1986 and the 31st day of October, 1986 for the purpose of mineral exploration on the above mentioned claim group.

P. Ransom

P.W. RANSOM
PROJECT GEOLOGIST

APPENDIX D

STATEMENT OF QUALIFICATIONS

As author of this report, I, Paul W. Ransom, certify that:

I am a geologist active in minerals exploration.

I am a graduate of McGill University with a degree of Bachelor of Science.

I have been continuously engaged in mining and exploration since 1966.

I am a member of the Geological Association of Canada.

I supervised Cominco Ltd.'s Sullivan Mine area exploration program in 1986.

P. Ransom

P.W. RANSOM, G.A.C.

<u>COMINCO LTD.</u>

<u>EXPLORATION</u> <u>WESTERN DISTRICT</u>

1986 FAME REPORT

SULLIVAN MINE AREA

<u>PART B</u>: <u>DIAMOND DRILLING REPORT</u>

OWNER:

COMINCO LTD.
BOX 2000
KIMBERLEY, B.C.
V1A 2G3

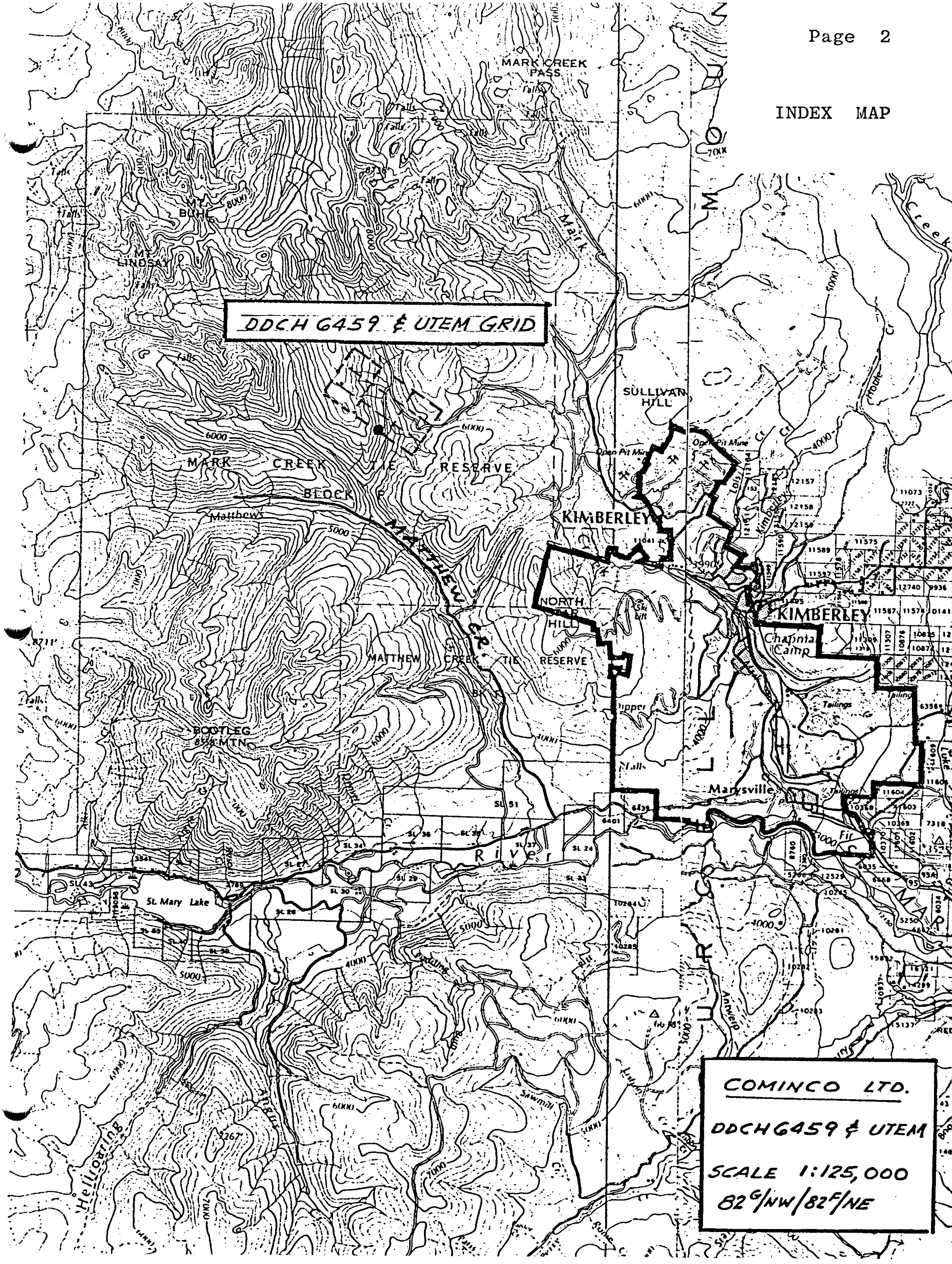
Work performed during June and July, 1986

Report by:

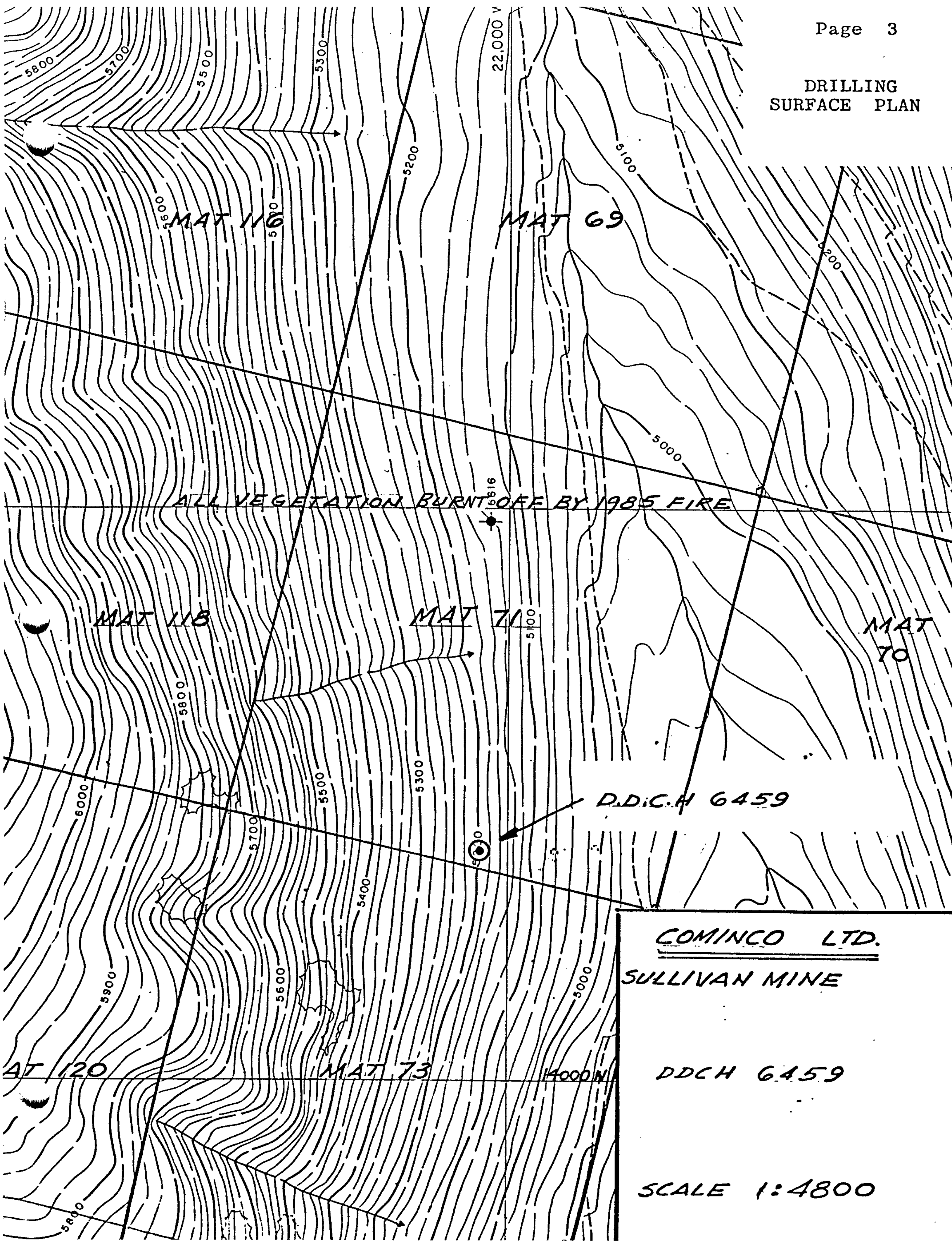
P.W. Ransom
Project Geologist

TABLE OF CONTENTS

INDEX MAP


DDCH 6459 & UTEM GRID
MARK CREEK PASS
MT. BUHL
MT. LINDSAY
MARK CREEK TIE RESERVE
BLOCK
Matthews
MATTHEW CR.
MATTHEW CREEK TIE RESERVE
BOOTLEG MTN
SULLIVAN HILL
Open Pit Mine
KIMBERLEY
NORTH STAR HILL
Chapman Camp
Tailings
Marysville
River
St. Mary Lake
Hellroaring
Sawmill
COMINCO LTD.
DDCH6459 & UTEM
SCALE 1:125,000
82G/NW/82F/NE

DRILLING SURFACE PLAN



2.00 DETAILED TECHNICAL DATA AND INTERPRETATION

2.10 Drilling

2.11 Objective

The objective of drilling DDH 6459 was to locate stratiform Ag-Pb-Zn-Fe sulphide ore.

2.12 Results

DDH 6459 intersected siliciclastic sedimentary rocks typical of the area. Pyrrhotite was noted locally, disseminated as an accessory mineral. Argillite with sparse weakly laminated and disseminated pyrrhotite was noted from 600 to 607 metres.

2.13 Interpretation

0.0 - 12.5 m	Overburden
12.5 - 650.0 m	Siliciclastic sedimentary rocks, Aldridge Formation.

2.14 Conclusion

DDH 6459 intersected siliciclastic sediments of turbidite and related origin, typical of the Middle Proterozoic Aldridge Formation.

Report by: [signature]
P.W. Ransom
Project Geologist
Cominco Ltd.

Endorsed by: [signature]
J.M. Hamilton
Manager, Exploration
Western Canada
Cominco Ltd.

APPENDIX A

Diamond Drill Geological Log For D.D.H. 6459

LAT. 14800' DEP. -22,100' ELEV. 5,200'
DIP: -90° AZIM.: --- LENGTH: 2,133'
HORIZ. COMP. 544' VERT. COMP. 2,072'
DATE COLLARED: June 27, 1986 DATE COMPLETED: July 19, 1986
CORE STORAGE: Cominco core storage in Kimberley, B.C.
D[illegible] ON CLAIM(S): Mat 71
O[illegible]IVE: To explore for ore north of the Kimberley Fault.

PLANNED LENGTH: 2,100'
TERMINATION COMMENTS: No ore intersected.

DRILLED BY: Longyear
TYPE DRILL: 44
CORE SIZE: HQ to 1,045', NQ 1045' to 2,133'.
PERFORMANCE COMMENTS:
Excellent productivity and core recovery.

CASING REMAINING IN HOLE (LENGTH & SIZE): 45' of HW

TYPE CAP & SEALING METHOD: 5' piece of HW with welded plate.

OTHER MATERIAL REMAINING IN HOLE:

SURVEY INSTRUMENT USED: Sperry Sun

ADDITIONAL DOWN HOLE TESTS: Down Hole UTEM
Test of 20° and 90° Sperry Sun units near drill set-up.

Unit	Brunton	Sperry Sun Disc	Correction
20	-72° dip, 091 Azimuth	-71.9° dip, 082.5 Azimuth	add 8.5° to azm
90	-68° dip, 084 Azimuth	-68.0° dip, 078.0 Azimuth	add 6.0° to azm

GENERAL COMMENTS: Lithology is generally based on a hardness determination by scratching core with a hacksaw blade. Quartz arenite cannot be scratched; quartzitic wacke can be scratched using moderate pressure; wacke is easily scratched; subwacke is soft but presence of silt grains can be sensed; argillite is very soft. The possibility is that some of the beds called quartz arenite, especially in the bottom 300 feet or so, are silicified quartzitic wacke.

SURVEYS: Depth	Dip	Azimuth	Instrument	Corrected Azimuth
0	-90.0	---	---	---
57	-88.1	071	20	079.5
264	-85.5	089	20	097.5
479	-84.5	095	6	103.5
729	-82.5	098	20	106.5
1014	-79.9	092.5	20	101.0
1269	-75.9	088.9	20	097.4
1529	-73.0	087	20	095.5
1749	-71.2	086	20	094.5
2009	-65.8	082	90	088.0

LOG LEGEND

BED THICKNESS CLASSIFICATION

BEDS	Very Thick Bedded
	— 100 cm —
	Thick Bedded
	— 30 cm —
	Medium Bedded
	— 10 cm —
	Thin Bedded
	— 3 cm —
	Very Thin Bedded
	— 1 cm —
LAMINAE	Laminated
	— 0.3 cm —
	Thinly Laminated

LITHOLOGY ABBREVIATIONS

OQ - Orthoquartzite
QA - Quartz arenite
QW - Quartz Wacke
QCW - Quartzitic Wacke
W - Wacke
SW - Sub Wacke
AG - Argillite

D.D.H. 6 4 5 9

Scale
Colour Plot & Dips

Drill Hole Record

Page 1

Property	MAT 71 (Sullivan)	District	Western	Hole No.	6459
Commenced	June 27, 1986	Location		Tests at	Hor. Comp. 544'
Completed	July 19, 1986	Core Size	HQ to 1045', NQ to 2133'	Corr. Dip -90°	Vert. Comp. 2072'
Co-ordinates	Lat. 14800' Dep. -22,100 (Sullivan Mine Grid)			True Brg.	Logged by P.W. Ransom
Objective	To explore for ore north of the Kimberley Fault.			% Recov. Est. 95%	Date December, 1986

Analysis: Claim | T Brg. | Collar Dip | Elev. | Length

Footage (meters) From To	Description
0 to 41 (12.5)	Overburden
to 95 (29.0)	Quartzitic wacke (50%), wacke (30%), argillite (20%); medium to light grey, fine grained; thick and very thick bedded, generally massive beds with graded upper portions; bedding contacts sharp and flat; laminations in some argillaceous beds; cross bedding noted in a medium wacke bed at 84'; rip-up clasts noted near top of 3 m thick bed at 72', this thick bed may be amalgamated. About half of the quartzitic wacke is moderately calcareous. Bedding to core 66° @ 44', 70° @ 49', 70° @ 63', 65° @ 84'.
to 98.5 (30.0)	Subwacke, argillite and wacke; medium grey; laminated to thin bedded, one medium wacke bed; contacts flat and sharp; graded; one cross bed. Bedding to core 66° @ 95'.
to 119.5 (36.4)	Quartzitic wacke, calcareous, minor wacke and argillite; medium, some dark and some light grey; very fine grained; bedding contacts sharp, generally flat, some wavy; beds generally massive, graded tops. Bedding to core 61° @ 109', 58° @ 112'.
to 162 (49.4)	Wacke (50%), subwacke, argillite, quartzitic wacke; medium grey (rarely light or dark); thick and medium bedded with thin bedded zones; bedding contacts sharp and flat throughout; bases of most thick beds are quartzitic wacke (a few are calcareous); some wacke zones are even, parallel laminated. Bedding to core 65° @ 120', 71° @ 137', 65° @ 146', 73° @ 149', 69° @ 154', 70° @ 154', 70° @ 159'.
to 260 (79.3)	Quartz arenite (60%), quartzitic wacke (10%); medium to light grey; fine to very fine grained; wacke, subwacke and argillite as graded tops and in medium to thin bedded (rarely laminated) zones up to 4 feet thick; medium grey; bedding contacts sharp and usually flat (a few are wavy or irregular); most beds massive, a few have rip-up clasts and laminations. Bedding to core 70° @ 177', 65° @ 194', 63° @ 200', 72° @ 201', 70° @ 204', 75° @ 208', 70° @ 213', 70° @ 219', 69° @ 226', 71° @ 229', 75° @ 235', 66° @ 244', 70° @ 247'.

811-6

Drill Hole Record

Property MAT 71 (Sullivan) District Western Hole No. 6459
Commenced Location Tests at Hor. Comp.
Completed Core Size Corr. Dip Vert. Comp.
Co-ordinates True Brg. Logged by
Objective % Recov. Date

Footage (meters) From To	Description
to 295 (89.9)	Argillite and subwacke (50%), medium grey, thin bedded to laminated, contacts sharp and generally flat (some wavy); 292 to 295 has several thin cross-laminated beds; quartz arenite (40%), wacke (10%), medium grey, fine grained, two beds medium grained; AB and B turbidites; bedding contacts sharp, generally flat (some wavy). Bedding to core 70° to 261', 71° @ 269', 75° @ 284', 67° @ 287'.
to 331 (100.9)	Quartz arenite, minor wacke and argillite; medium grey; thick bedded; fine (one bed medium) grained; bedding contacts sharp, generally flat; most beds massive, rare rip-ups and faint laminae and one cross lamina. Bedding to core 75° @ 302', 65° @ 308'.
to 343 (104.6)	Wacke and sub wacke, minor argillite and quartzitic wacke; medium grey; bedding contacts sharp and flat; thin to very thin bedded, few medium and thick beds; bedding to core 71° @ 336'.
to 362 (110.4)	Quartz arenite (85%), medium (some light, dark) grey; thick bedded; fine grained; bedding contacts sharp and flat; beds massive. Argillite and wacke; medium grey; thin bedded to laminated and graded tops of some thick beds; bed contacts sharp and flat, laminations even and parallel, one set of cross laminations; bedding to core 60° @ 345', 84° @ 348', 60° @ 350', 80° @ 353'.
to 393 (119.8)	Quartz arenite and quartzitic wacke (40%), wacke (40%), subwacke/argillite (20%); medium grey; thick bedded; bed contacts sharp and flat; beds massive with graded tops; one ABDE and one BD turbidite; four beds have calcareous zones; bedding to core 75° @ 368', 75° @ 378', 70° @ 390'.
to 414 (126.2)	Quartz arenite; medium to light grey; fine grained thick bedded with some softer (poorly sorted) bases and graded tops; bed contacts generally sharp and flat (one wavy, one with ball and pillow base); bedding to core 65° @ 398', 74° @ 407', 70° @ 414'.

Claim	T Brg.	Collar Dip	Elev.	Length	Hole No.

Analysis

Drill Hole Record

Property MAT 71 (Sullivan) District Western Hole No. 6459
Commenced Location Tests at Hor. Comp.
Completed Core Size Corr. Dip Vert. Comp.
Co-ordinates True Brg. Logged by
Objective % Recov. Date

Footage From To	Description
to 452.5 (138.0)	Wacke, subwacke and argillite (75%); medium grey; thin bedded to laminated; bed contacts sharp and flat, and laminations even parallel. Quartz arenite and quartzitic wacke (25%); medium to light medium grey; thick and medium bedded; bedding contacts sharp and flat (2 wavy); bedding to core 70° @ 420', 70° @ 448'.
to 475 (144.8)	Quartz arenite, medium to light medium grey; fine grained; thick bedded; some graded tops; bed contacts sharp and flat where observed. Core condition deteriorates to badly broken over the interval.
to 502 (153.0)	Fault zone. Fault rock cohesive 475 - 485 and 493 - 502; schistose 475 - 485, 492.6 - 494 and 500 - 501.6; badly broken QW/QA 485 - 493; crush zone 494 - 500. Schist is greenish grey, very soft (like argillite), minor calcium carbonate parallel to schistosity; gouge noted; schistosity variable from 0° to 60° to core.
to 580 (176.8)	Wacke, subwacke and argillite (70%); medium grey; medium, thick (& one very thick) bedded; bed contacts sharp and flat; quartzitic wacke and quartz arenite (30%); medium to light medium grey; fine (few medium) grained; bed contacts sharp and flat (one wavy, one with flames); beds massive, few with rip-ups; bedding to core 75° @ 503', 75° @ 504', 70° @ 509', 74° @ 516', 77° @ 525, 74° @ 533', 70° @ 543', 67° @ 544', 74° @ 554', 72° @ 562', 80° @ 574', 75° @ 578'. Proportion of quartzitic rocks increases downward, in this interval although lowest 3 feet is mostly argillite. There are several narrow intervals of even parallel laminated wacke.
to 597.5 (182.2)	Quartz arenite, minor quartzitic wacke, wacke and argillite; light medium to medium grey; fine grained; thick and medium bedded; beds generally massive, bed contacts generally sharp and flat (some wavy or irregular); some thin and very thin beds; bedding to core 75° @ 597'.
to 610 (186.0)	Wacke (50%); argillite (30%); quartz wacke and arenite (20%); medium to medium dark grey; most beds medium, one very thick (5') wacke with QW central

Claim	T Brg.	Collar Dip	Elev.	Length

Analysis

Drill Hole Record

Property MAT 71 (Sullivan) District Western Hole No. 6459

Commenced | Location | Tests at | Hor. Comp.
Completed | Core Size | Corr. Dip | Vert. Comp.
Co-ordinates | True Brg. | Logged by
Objective | % Recov. | Date

Footage From To	Description
to 610 (186.0) Cont'd.	portion; contacts sharp and flat to irregular; thick bed is laminated throughout (very fine, faint, closely spaced laminite); pyrrhotite flecks noted aligned along cleavage; bedding to core 73° @ 608'.
to 642 (195.7)	Quartz arenite 80%; argillite tops and a group of very thin beds over 1.5 feet, a few medium wacke beds; light medium grey; fine grained; thick bedded; beds generally massive, grading near the tops, poor sorting (softer) bases of some; bed contacts sharp and flat; bedding to core 71° @ 621', 71° @ 626', 63° @ 630', 73° @ 638'. From 635 to 642' beds are quartzitic wacke and some wacke, with argillaceous tops; fine grained; medium bedded.
to 652.5 (198.9)	Argillite and wacke; medium to dark grey; thin to very thin bedded; bed contacts sharp and wavy; cross laminated throughout lower two-thirds of interval, even parallel laminated in upper part; some lithic clasts in a single wacke bed; bedding to core 70° @ 642'.
to 680.5 (207.5)	Quartz arenite; light medium grey; fine grained; massive beds; bed contacts generally sharp and flat; some beds have poorly sorted bases; intervals less than 35 cm of argillite/subwacke of very thin to laminated beds, one set of cross laminae; bedding to core 78° @ 665'.
to 705 (214.9)	Wacke (50%), argillite-subwacke (30%), quartz arenite (20%); medium grey; fine grained; medium and thick bedded (W & QW), thin bedded to laminated (A/SW); some faint laminae in thick wacke; flecks of pyrrhotite in cleavage; bedding to core 69° @ 686', 73° @ 697'.
to 724 (220.7)	Quartz arenite; light medium and medium grey; fine grained; thick and medium bedded; bed contacts sharp and generally flat, some wavy, flames noted; beds massive; bases of some poorly sorted; bedding to core 76° @ 714', 70° @ 721'.
to 745 (227.1)	Wacke, subwacke and argillite (80%), quartzitic wacke and quartz arenite (20%); medium grey (some dark); a few beds fine grained; most beds thin to very thin

Claim | T Brg. | Collar Dip | Elev. | Length
Analysis

Drill Hole Record

Property MAT 71 (Sullivan) District Western Hole No. 6459

Commenced | Location | Tests at | Hor. Comp.
Completed | Core Size | Corr. Dip | Vert. Comp.
Co-ordinates | True Brg. | Logged by
Objective | % Recov. | Date

Footage From To	Description
to 745 (227.1) Cont'd.	bedded, arenaceous beds are medium bedded; bed contacts are sharp and flat (one 45 cm interval wavy); most beds massive; bedding to 79° @ 729', 76° @ 737'.
to 802 (244.5)	Quartz arenite (40%), wacke (30%), subwacke and argillite (20%); medium grey (some medium dark & med. light); fine grained; the arenaceous rocks and some wackes are thick bedded, most of these are massive; some arenaceous rocks, wackes and subwackes are thin bedded, a few wackes, subwackes and argillites are laminated; bed contacts are sharp and usually flat, a few are wavy or irregular; bedding to core 70° @ 765', 77° @ 782', 66° @ 802'.
to 826 (251.8)	Quartz arenite (80%), wacke and argillite (20%), mostly as bed tops, very weakly calcareous (hand lens needed to see effervescence with HCl); fine and medium grained; thick bedded; beds generally massive; bed contacts sharp and flat; bedding to core 71° @ 824'.
to 915 (279.0)	Quartz arenite (50%), wacke (30%), subwacke and argillite (20%); medium (some dark, light) grey; the quartz arenite is fine grained or very fine grained; thick and in a few cases medium bedded generally isolated or in small groupings less than 10 feet overall; contacts are sharp and generally flat, a few have wavy or flame bases; some rip-up clasts observed; the beds are massive; some are very weakly calcareous; the other rock types are medium to thin bedded, some intervals are laminite wacke over several feet (829.5 - 832) or alternating with massive wacke (908 - 915); bed contacts are sharp & flat; bedding to core 71° @ 831', 65° @ 851', 81° @ 850', 68° @ 873', 76° @ 893', 76° @ 901', and 75° @ 908'. Pyrrhotite noted weakly disseminated in some bed tops near 885'.
to 947.5 (288.9)	Quartz arenite; very weakly calcareous; medium grey; fine grained; thick and very thick bedded; bed contacts sharp and generally flat (one wavy, two slightly irregular); most beds massive; 50 cm argillite interval at 934' is very thin bedded with internal cross laminae; slight sericitic alteration in many of the beds; bedding to core 65° @ 942'.

Claim | T Brg. | Collar Dip | Elev. | Length
Analysis

Drill Hole Record

Cominco — Page 6

Property MAT 71 (Sullivan) District Western Hole No. 6459

Commenced | Location | Tests at | Hor. Comp.
Completed | Core Size | Corr. Dip | Vert. Comp.
Co-ordinates | True Brg. | Logged by
Objective | % Recov. | Date

Claim | T Brg. | Collar Dip | Elev. | Length | Analysis

Footage From To	Description
to 989.5 (301.7)	Quartz arenite and quartzitic wacke (40%), wacke (40%), argillite (20%); the quartzitic beds are thick and very thick and all the argillite and some wacke form graded tops to these beds; medium grey; medium, fine and very fine grained; bedding contacts sharp and flat (One wavy); wacke is medium, thin, very thin and laminated; medium dark grey; bed contacts and laminations sharp and generally flat (a few are irregular); bedding to core 65° @ 947.5', 75° @ 957', 73° @ 973', 74° @ 989'.
to 1004 (306.1)	Quartz arenite; medium grey; fine grained; thick, one very thick, and a few medium bedded; massive; bed contacts sharp and generally flat (two irregular).
to 1032 (314.6)	Wacke (60%), argillite (20%), quartz arenite and quartzitic wacke (20%); medium to medium dark grey; medium to thin bedded (a few thick beds); bed contacts sharp and generally flat, a few are wavy; some wacke intervals continuously even parallel laminated; a few cross laminae below 1024'; bedding to core 73° @ 1025'; 80° @ 1027'.
to 1046.5 (319.1)	Quartz arenite; light medium grey; fine grained; thick, few medium, bedded; bed contacts sharp and flat; beds massive. Switch from HQ to NQ at 1045'.
to 1055 (321.6)	Wacke, minor subwacke and argillite; medium grey; medium to thin bedded; beds massive; bed contacts sharp and flat; bedding to core 68° @ 1050'.
to 1082 (329.9)	Quartz wacke (70%), wacke, subwacke and argillite (30%); medium grey; fine grained; quartz wacke beds are massive, other parts of beds or separate beds display faint laminations; bedding contacts sharp and flat; bedding to core 68° @ 1058', 70° @ 1068', 80° @ 1077'.
to 1086.5 (331.3)	Wacke (50%), argillite and subwacke; dark medium grey; thin, very thin bedded and laminated, near continuously even flat parallel laminated wacke 1082 - 1084.5; intense cleavage developed in thin argillite beds at base; bedding to core 75° @ 1084'.

811-8

Drill Hole Record

Cominco — Page 7

Property MAT 71 (Sullivan) District Western Hole No. 6459

Commenced | Location | Tests at | Hor. Comp.
Completed | Core Size | Corr. Dip | Vert. Comp.
Co-ordinates | True Brg. | Logged by
Objective | % Recov. | Date

Claim | T Brg. | Collar Dip | Elev. | Length | Analysis

Footage From To	Description
to 1106.5 (337.3)	Quartz arenite and quartzitic wacke (70%); tops and interbeds graded from wacke through subwacke to argillite; light medium grey; medium to thick beds; interbeds thin, very thin and laminated; bedding contacts sharp and flat; minor cross laminae developed in some of the thin interbeds; bedding to core 73° @ 1097'.
to 1111.5 (338.9)	Wacke, subwacke and argillite; medium to dark medium grey; thin to very thin bedded and laminated; bed contacts sharp and flat (some modified by shearing); most beds massive, some grading, possible internal lamination in one may be result of shearing; bedding to core 67° @ 1107'.
to 1119.5 (341.3)	Wacke (50%), quartzitic wacke (30%), subwacke/argillite (20%); medium grey and light medium grey; medium bedded (one thick QW), and a few thin to very thin beds and laminae in cluster; bedding contacts sharp and flat; sub-rectangular shaped calcareous phenocrysts(?) noted in subwacke; bedding to core 72° @ 1115'.
to 1164 (354.9)	Quartz arenite and quartzitic wacke (60%), wacke (20%), subwacke and argillite (20%); light medium to medium grey; predominantly thick bedded with clusters of medium and thin beds (usually wacke or more argillaceous); most beds have top portions graded to argillite; bed contacts sharp and generally flat, some flame structures noted; bedding to core 78° @ 1131', 74° @ 1146', 75° @ 1160'.
to 1171 (357.0)	Wacke, subwacke and argillite; medium grey; medium and thin bedded with short laminated zones; bed contacts sharp and flat (probably tectonically disturbed at 1168'); mica and possibly some pyrrhotite in subwacke to argillite graded tops of two beds; bedding to core 74° @ 1167'.
to 1200.5 (366.0)	Quartz arenite and quartzitic wacke (75%); wacke, subwacke and argillite (25%), generally as graded tops of beds; light medium grey; thick bedded; bed contacts sharp and generally flat; one cm of gouge at 1188.5' at top of 90 cm thick argillite subwacke interval that is very thin bedded to laminated, many of the bed contacts are wavy; bedding to core 80° @ 1180', 70° @ 1199'.

Drill Hole Record

Property	MAT 71 (Sullivan)	District	Western	Hole No.	6459
Commenced		Location		Tests at	Hor. Comp.
Completed		Core Size		Corr. Dip	Vert. Comp.
Co-ordinates				True Brg.	Logged by
Objective				% Recov.	Date

Footage From To	Description
to 1208 (368.3)	Wacke (70%), subwacke and argillite (30%); medium grey; medium bedded, some of argillite and subwacke is irregularly laminated, probably very low angle cross laminae within a bed top.
to 1220 (372.0)	Wacke (80%) plus subwacke and argillite; light medium grey; thick bedded with some medium beds; some beds (or portions) are internally laminated; bed contacts and laminae are sharp and flat; cross laminae noted in a single QA bed at 1209'; bedding to core 77° @ 1215'.
to 1226.5 (373.9)	Wacke, subwacke and argillite (85%), quartzitic wacke (15%); medium grey; thin bedded with some very thin beds and laminations plus two medium beds; bed contacts sharp and flat; two rip-up clasts noted; bedding to core 70° @ 1224'.
to 1287.5 (392.5)	Quartz arenite and quartzitic wacke (60%), wacke (25%), subwacke and argillite as bed tops (15%); light medium grey; thick bedded with clusters of medium and thin beds over 1 or 2 feet, bed contacts are sharp and generally flat; beds usually massive, rare internal laminae; bedding to core 78° @ 1233', 73° @ 1252', 69° @ 1262', 65° @ 1286'.
to 1303 (397.3)	Subwacke and argillite (85%), single thick bed of wacke 1299 - 1301; very thin and thin bedded with laminated intervals; bed contacts sharp and flat; bedding to core 75° @ 1292', 69° @ 1303'.
tp 1314 (400.6)	Single 3.1 meter true thickness bed from quartzitic wacke to quartz arenite composition; light grey; medium grained; mildy calcareous.
to 1335.7 (407.2)	Quartz arenite with lesser quartzitic wacke and wacke, all with tops of wacke, subwacke and argillite; medium grey; thick bedded with few medium and thin beds; beds massive; bed contacts sharp and generally flat; subwacke/argillite interlaminations in tops of some beds; bedding to core 69° @ 1314'.

Claim	T Brg.	Collar Dip	Elev.	Length
Analysis				

811-84

Drill Hole Record

Property	MAT 71 (Sullivan)	District	Western	Hole No.	6459
Commenced		Location		Tests at	Hor. Comp.
Completed		Core Size		Corr. Dip	Vert. Comp.
Co-ordinates				True Brg.	Logged by
Objective				% Recov.	Date

Footage From To	Description
to 1341.5 (409.0)	Subwacke and argillite with two medium beds of quartzitic wacke; medium grey; thin and very thin bedded to laminated; contacts flat and sharp; low angle cleavage and some minor tight folds; bedding to core 80° @ 1337'.
to 1386 (422.6)	Quartzitic wacke and quartz arenite (70%), wacke, subwacke and argillite (30%) both as graded bed tops and individual beds; medium grey; thick bedded with zones up to two feet of medium to thin beds; core is variably but not badly broken and shattered; bed contacts sharp or distinct, usually flat, some irregular; bedding to core 73° @ 1344', 56° @ 1362', 68° @ 1372', 43° @ 1383.5', 21° (vague and irregular) @ 1386'.
to 1509 (460.0)	Core is parallel to bedding in large fold. From 1386' - 1414' is predominantly quartz arenite with some quartzitic wacke and minor wacke of a single bed; medium grey; massive; bedding to core 12° @ 1414'. From 1414 - 1441.5' single bed; argillite and subwacke to 1419', wacke to 1423', quartzitic wacke to 1427', quartz arenite to 1439.5', mixed W/QW and QA to 1441.5'; medium grey; massive; bedding to core curves through 0° @ 1418', is 18° at 1441.5'. From 1441.5 - 1458' back into same bed (overturned); light medium grey; massive; bedding to core 0° @ 1442.5, 10° in opposite sense to that at 1441.5' at 1443'. From 1458' to 1509' mostly wacke, subwacke and argillite with quartzitic wacke below 1500'; core intermittently broken, often with slickensides and minor gouge; medium to dark medium grey; some, if not all, overturned; bedding contacts sharp to vague, flat to irregular to deformed or broken; bedding to core 20° @ 1469', folded @ 1485', 60° @ 1500' (probably right way up), very irregular near 0° @ 1509'.
to 1521 (463.7)	A couple of beds of quartzitic wacke followed by wacke, subwacke and argillite; medium grey; medium to thin bedded, some thin laminated zones; bed contacts generally sharp and flat; beds massive, graded; some have fine disseminated pyrrhotite; bedding to core 83° @ 1513'.

Claim	T Brg.	Collar Dip	Elev.	Length
Analysis				

811

Drill Hole Record

Property	MAT 71 (Sullivan)	District	Western	Hole No.	6459
Commenced		Location		Tests at		Hor. Comp.
Completed		Core Size		Corr. Dip		Vert. Comp.
Co-ordinates				True Brg.		Logged by
Objective				% Recov.		Date

Footage From	To	Description	Claim	T Brg.	Collar Dip	Elev.	Length
	to 1528.5 (466.0)	Quartz arenite, quartzitic wacke, wacke with minor subwacke/argillite graded tops; medium grey; medium bedded; bed contacts sharp and flat; beds generally massive, one with internal laminations; bedding to core 65° @ 1527'.					
	to 1536 (486.3)	Subwacke and argillite (50%), dark medium grey; thin bedded, some medium beds; bed contacts vague; and wacke and quartzitic wacke (50%); medium grey; medium bedded; most beds massive, some have clasts; bed contacts sharp and flat; bedding to core 76° @ 1530'.					
	to 1553.5 (473.6)	Wacke (80%), quartz arenite and quartzitic wacke near top of interval; medium grey; medium to thick bedded with some thin beds; vaguely bedded and intermittently laminated 1541 - 1550'; bed contacts sharp and flat, laminations flat; fine pyrrhotite concentrated in zones parallel to bedding, but individual grains all aligned parallel to cleavage; bedding to core 80° @ 1545'. Core brecciated in lowest 30 cm.					
	to 1559 (475.3)	Fault; argillaceous zones are sheared (1553.5 - 1554.5', 1555.5 - 1556.5', 1558 - 1559') @ 70°; gouge 1557.5 - 1558; broken quartzitic wacke 1554.5 - 1555.5'.					
	to 1641.5 (500.5)	Wacke, subwacke and argillite, minor quartzitic wacke; medium grey; bedding to core angles variable indicating folding throughout; a few slickensides, especially 1595 - 1612'; gouge and angular rock fragments 1601 - 1602'; bedding to core 25° @ 1565', 0° @ 1568', 20° @ 1580', 29° @ 1593', 17° @ 1629', very irregular near 0° @ 1640'.					
	to 1663 (507.0)	Wacke, subwacke and argillite; medium grey; medium, thin and very thin bedded; bed contacts sharp to diffuse, flat to wavy and irregular; bedding to core 65° @ 1652'.					
	to 1696 (517.1)	Quartz arenite with lesser quartzitic wacke more abundant in lower third of interval (65%), wacke, subwacke and argillite as bed tops and in medium and thin beds; medium grey; thick bedded, some medium and thin beds; bed contacts from sharp to vague; bedding to core 75° @ 1674', 65° @ 1687'.					

211-045

Drill Hole Record

Property	MAT 71 (Sullivan)	District	Western	Hole No.	6459
Commenced		Location		Tests at		Hor. Comp.
Completed		Core Size		Corr. Dip		Vert. Comp.
Co-ordinates				True Brg.		Logged by
Objective				% Recov.		Date

Footage From	To	Description	Claim	T Brg.	Collar Dip	Elev.	Length
	to 1705 (519.8)	Argillite, minor subwacke and wacke; medium grey; thin, very thin bedded and faintly laminated; bed contacts and laminae generally sharp and flat but variably deformed by low angle cleavage and crenulation cleavage; bedding to core 60° @ 1701'.					
	to 1714 (522.6)	Wacke, minor subwacke and argillite; medium grey; medium (some thick) bedded; bed contacts sharp and flat to vague; some bed thickness and contacts not well defined; some beds or zones very faintly laminated; bedding to core 74° @ 1712'.					
	to 1767.8 (539.0)	Quartz arenite, minor quartzitic wacke (70%), wacke, subwacke and argillite in graded tops and clusters of medium, thin, very thin and laminated beds up to 4 feet long; medium to light medium grey; thick and medium bedded; bed contacts sharp, flat to wavy, possible tiny cross laminae but weak shearing present in many argillite and subwacke laminated zones; bedding to core 65° @ 1720', 65° @ 1744', 75° @ 1758'.					
	to 1772.5 (540.4)	Wacke, subwacke and argillite; dark medium grey; medium and thin bedded with a few faint very thin beds; bed contacts gradational, flat to wavy; faint lamination in argillite disturbed by sub-parallel cleavage; bedding to core 66° @ 1769'.					
	to 1814.5 (553.2)	Quartz arenite, minor quartzitic wacke and wacke, minor wacke, subwacke and argillite as graded tops and in clusters of thin and very thin to laminated beds; medium and light medium grey; thick bedded with a few medium beds; some wacke units are laminated throughout; bed contacts and laminations are sharp and flat; most beds massive, some have very weak disseminated pyrrhotite; bedding to core 71° @ 1795', 71° at 1814.5'.					
	to 1834.5 (559.3)	Wacke (60%), quartzitic wacke and quartz arenite (20%), subwacke and argillite (20%); dark medium grey; primarily medium bedded, the wacke is in thick zones that may or may not consist of several beds, within these zones the wacke is either massive, vaguely laminated or faintly but well laminated; the argillite and subwacke are generally faintly thin and very thin bedded; bedding to core 75° @ 1833'.					

211-4

Drill Hole Record

Property MAT 71 (Sullivan) | District Western | Hole No. 6459

Commenced | Location | Tests at | Hor. Comp.

Completed | Core Size | Corr. Dip | Vert. Comp.

Co-ordinates | True Brg. | Logged by

Objective | % Recov. | Date

Claim | T Brg. | Collar Dip | Elev. | Length

Analysis

Footage (From – To)	Description
to 1864.4 (568.4)	Quartz arenite (80%); quartzitic wacke (10%); subwacke and argillite as graded tops and with wacke in thin and very thin beds (10%); light medium grey; thick with a few medium beds; bases usually poorly sorted, bed contacts sharp to gradational and flat; bedding to core 81° @ 1854'.
to 1880 (573.2)	Subwacke and argillite with minor wacke; medium grey; varies from apparently medium thickness and massive beds through weakly laminated medium thickness beds to thin and very thin bedded to laminated; bed contacts and laminations from distinct to vague, generally flat, some affected by low angle shearing; tight fold at 1870'; bedding to core 75° @ 1868'.
to 1941.5 (591.9)	Quartzitic wacke and quartz arenite (60%), wacke (25%), subwacke and argillite (15%); medium grey; thick and medium bedded; short sections thin bedded; beds have massive bases and graded (some up to 50% of total thickness of bed) tops; bed contacts usually sharp or distinct, some are vague, and flat (some slightly irregular); minor faulting with minor shearing 1898-1900', folding 1900-1909'; bedding to core 73° - 85° near 1887', variable 1900-1909'; bedding to core 85° @ 1979', 70° @ 1937.5'.
to 1949.5 (594.4)	Wacke, medium to dark medium grey; medium to thin bedded; beds or portions of beds vaguely laiminated; bed contacts indistinct or vague and flat; minor fine sericite.
	upper laminite
to 1962.5 (598.3)	Argillite; medium grey; massive to vaguely bedded, trace of pyrrhotite flecks aligned in discontinuous fashion parallel to bedding and in fractures.
to 1971.3 (601.0)	Wacke with minor quartzitic wacke; dark medium grey; vaguely bedded and faintly laminated in places.
to 1977.0 (602.7) *middle unit*	Subwacke to wacke; dark medium grey; massive to vaguely bedded; weakly disseminated pyrrhotite, about half of which is in discontinuous laminations, at 1974' is 10 cm with 15% pyrrhotite both in fine laminae and cross-cutting veinlets.

Drill Hole Record

Property MAT 71 (Sullivan) | District Western | Hole No. 6459

Commenced | Location | Tests at | Hor. Comp.

Completed | Core Size | Corr. Dip | Vert. Comp.

Co-ordinates | True Brg. | Logged by

Objective | % Recov. | Date

Claim | T Brg. | Collar Dip | Elev. | Length

Analysis

Footage (From – To)	Description
to 1986.7 (605.7)	Wacke and quartzitic wacke; dark medium grey; vaguely bedded; massive to intermittent vaguely laminated. Predominantly wacke 1983.8' to end.
to 1993.2 (607.7) *CHH*	Argillite and subwacke with minor wacke and one continuous wacke interval 1990.2 - 1992.0'; dark medium grey; vaguely very thin to medium bedded with pyrrhotite weakly disseminated in lamintions and irregular elongate clusters parallel to bedding, some pyrrhotite in vague narrow cross-cutting zones and in disaggregated laminations. Bedding to core 75° @ 1992'.
to 2017.0 (614.9)	Wacke; medium grey; thin bedded, a few medium beds; bed contacts generally sharp; beds are often graded and most are separated from adjacent beds by a dark medium grey laminite 1 to 3 cm thick. Pyrrhotite is weakly disseminated in some beds.
to 2041.0 (622.3)	Wacke and subwacke, minor quartzitic wacke; medium grey; medium bedded, some thick and some thin beds; beds commonly graded, some have internal hardness variations; bed contacts are often indistinct or vague to distinct, most appear to be flat; pyrrhotite is irregularly but weakly disseminated; bedding to core 81° @ 2028'.
to 2077.0 (633.2)	Quartzitic wacke and quartz arenite (60%), wacke (30%), subwacke and argillite (10%); medium grey; medium bedded with a few groupings of thin beds, some thick beds; beds often graded, many have vague internal variations in composition; bed contacts from sharp (most) to vague; faint internal lamination in some beds; coarse sericite present throughout some beds; pyrrhotite disseminated throughout wacke parts of thin beds and in some wacke or subwacke upper parts of medium beds and concentrated in basal few millimetres of many beds; bedding to core 85° @ 2057'.
to 2097.0 (639.3)	Wacke; medium grey to dark medium grey; portions of some beds as hard as quartzitic wacke; medium bedded, a few thin beds; many beds faintly laminated throughout; bed contacts generally sharp and flat, a few are vague; coarse sericite noted; pyrrhotite is very weakly disseminated in places; bedding to core 84° @ 2079', 82° @ 2094'.

Drill Hole Record

Scale

Colour Plot & Dips

Property MAT 71 (Sullivan)	District Western	Hole No. 6459	
Commenced	Location	Tests at	Hor. Comp.
Completed	Core Size	Corr. Dip	Vert. Comp.
Co-ordinates		True Brg.	Logged by
Objective		% Recov.	Date

Claim | T Brg. | Collar Dip | Elev. | Length

Analysis

Footage From	To	Description
	to 2133.0 (650.3)	Quartzitic wacke with minor quartz arenite (70%), wacke (20%), subwacke and argillite (10%); medium grey to dark medium grey; medium bedded with a few thick beds, and very few thin beds; beds are usually graded, some are faintly laminated throughout, small cross-laminated base of bed noted at 2126'; minor coarse sericite noted; pyrrhotite is weakly disseminated only in parts of some beds; bedding to core 80° @ 2110', 80° @ 2133'.

*****END OF HOLE AT 2133' (650.3 m)*****

811-84

SULLIVAN EXPL. -WD

JOB V 86-0494R
REPORT DATE 6 OCT 1986

LAB NO		FEET From	To	PB PPM	ZN PPM
R8609851	14801	1939.3	1939.9	12	42
R8609852	14802	1941.5	1944.5	16	81
R8609853	14803	1944.5	1949.0	14	56
R8609854	14804	1949.0	1953.5	<4	55
R8609855	14805	1953.5	1957.5	<4	54
R8609856	14806	1957.5	1960.0	<4	54
R8609857	14807	1960.0	1963.0	<4	52
R8609858	14808	1963.0	1970.0	31	55
R8609859	14809	1970.0	1971.3	25	78
R8609860	14810	1971.3	1972.5	206	234
R8609861	14811	1972.5	1974.0	4	57
R8609862	14812	1974.0	1974.3	404	904
R8609863	14813	1974.3	1976.0	8	94
R8609864	14814	1976.0	1978.1	37	161
R8609865	14815	1978.1	1980.0	102	298
R8609866	14816	1980.0	1982.0	144	480
R8609867	14817	1982.0	1983.3	130	403
R8609868	14818	1983.3	1984.7	87	141
R8609869	14819	1984.7	1985.8	71	220
R8609870	14820	1985.8	1986.7	81	263
R8609871	14821	1986.7	1987.6	55	131
R8609872	14822	1987.6	1988.5	66	137
R8609873	14823	1988.5	1989.3	67	112
R8609874	14824	1989.3	1990.6	32	99
R8609875	14825	1990.6	1991.8	21	171
R8609876	14826	1991.8	1992.8	7	175
R8609877	14827	1992.8	1993.7	31	69
R8609878	14828	1993.7	1995.0	42	73
R8609879	14829	1995.0	1997.0	17	58
R8609880	14830	1997.0	1998.1	4	38

I=INSUFFICIENT SAMPLE X=SMALL SAMPLE E=EXCEEDS CALIBRATION C=BEING CHECKED R=REVISED
IF REQUESTED ANALYSES ARE NOT SHOWN ,RESULTS ARE TO FOLLOW

ANALYTICAL METHODS

PB AQUA REGIA DECOMPOSITION / AAS
ZN AQUA REGIA DECOMPOSITION / AAS

APPENDIX B

SULLIVAN MINE GROUP OF MINERAL CLAIMS

			NOVEMBER 27, 1986
			Number of Units
1.	Crown-Granted M.C.		680
2.	Held by Assessment:		
	2(a) TWO POST CLAIMS		
	Luke Group	75	
	Rho Group	20	
	Med Group	15	
	Donna, Etc. Group	15	
	Uke Group	11	
	Mar Group	17	
	Bad Group	36	
	Late Group	91	
	Mat Group	268	
	Jackpot	1	549
	2(b) REVERTED CROWN GRANTED MINERAL CLAIMS		
	Tip 4-12	9	
	Hope 2-12	11	
	Sun 2-12	11	
	Cue 2-12	11	
	B.C., Silver Bell, Tarrant	3	
	Black Hills, Yankee Girl, Wasp Fr.	3	
	Blue Dragon	1	49
	2(c) MINERAL CLAIMS (54)		
	Dip 1-8	56	
	Fal 1-14	84	
	Golf 1-3	17	
	Quark 1&2	12	
	Fin 1-3	18	
	Mead 1-3	36	
	Gin 1-9	110	
	Clair 24-32	56	
	Mark 1-3	17	406
3.	Greenhorn Mineral Lease		1
	GRAND TOTAL (1 + 2 + 3)		1,685

PWR/lrm

APPENDIX C

STATEMENT OF EXPENDITURES

DIRECT COSTS

Contractor: Longyear Canada Inc.
721 Aldford Avenue, Annacis Island,
Westminster, B.C. V3M 5P5

Item	Invoice No.	Amount
0-2133 ft (0-650m) coring	8854	$39,891.40
	8855	6,110.40
Mobilization	8854	1,800.00
Move In	"	1,395.00
Move From (false start)	"	775.00
Move to storage (part)	8855	2,092.50
Reaming	8854	884.40
Reaming	"	186.00
Hole Reduction	"	1,323.00
Standby	"	1,896.00
Surveys	"	372.00
Surveys	8855	46.50
Casing left in hole	"	980.45
Demobilization	9104	1,800.00
Hole Reduction (Remove HQ)	"	558.00
Move Out	"	1,550.00
	TOTAL =	$61,660.65

INDIRECT COSTS

Salaries			
P.W. Ransom - Geologist - Supervision, core logging, report writing		36 days @ $250/day	9,000.00
Mobilization			
Cominco Ltd., Kimberley, B.C. - Cat and operator			1,168.00
Henderson Heavy Hauling, Cranbrook, B.C.			1,085.00
Wright Contracting, Cranbrook, B.C. - Bulldozer			910.00
S+D Hunt Logging, Cranbrook, B.C. - Bulldozer			300.00
Mountain Meadows, Fort Steele, B.C. - Bulldozer			1,511.25
Transportation	4X4 truck - 14 days @ $40/day		560.00
Supplies	Core Boxes	64 X $5.50	352.00
	Drill Mud - Gel	240 X $5.50	1,320.00
	- Trol	22 X $98.00	2,156.00
	- Oil	3 X $267.00	801.00
	Sperry Sun survey equipment		62.54
		TOTAL	$80,886.44

Signed: P. Ransom
P.W. RANSOM, Project Geologist

APPENDIX D

IN THE MATTER OF THE

B.C. MINERAL ACT

AND

IN THE MATTER OF A DIAMOND DRILL PROGRAMME

CARRIED OUT ON THE MAT 71 CLAIM GROUP

MATTHEW CREEK AREA

in the Fort Steele Mining Division of
the Province of British Columbia

More Particularily N.T.S. 82F/9

A F F I D A V I T

I, P.W. Ransom, of the rural district of Wycliffe, in the Province of British Columbia, make Oath and say:

1. That I am employed as a Geologist by Cominco Ltd. and as such, have a personal knowledge of the facts to which I hereinafter depose:

2. That annexed hereto and marked as Appendix C to this my Affidavit is a true copy of expenditures incurred on a Diamond Drill programme, on the Mat 71 mineral claim group.

3. That the said expenditures were incurred between the 27th day of June, 1986 and the 10th day of October, 1986 for the purpose of mineral exploration on the above noted claim group.

P. Ransom

P.W. RANSOM
PROJECT GEOLOGIST

APPENDIX E

STATEMENT OF QUALIFICATIONS

As author of this report, I, Paul W. Ransom, certify that:

I am a geologist active in minerals exploration.

I am a graduate of McGill University with a degree of Bachelor of Science.

I have been continuously engaged in mining and exploration since 1966.

I am a member of the Geological Association of Canada.

I supervised Cominco Ltd.'s Sullivan Mine area exploration drilling program in 1986.

P. Ransom

P.W. RANSOM, G.A.C.

COMINCO LTD.

EXPLORATION

WESTERN DISTRICT

1986 FAME REPORT

SULLIVAN MINE AREA

PART C: GEOPHYSICS REPORT

OWNER:

COMINCO LTD.
BOX 2000
KIMBERLEY, B.C.
V1A 2G3

Work performed between July and September, 1986

Work performed by:

S.J. Visser
J. Vyselaar
J.J. Lajoie
COMINCO LTD.

TABLE OF CONTENTS

COMINCO LTD.

EXPLORATION WESTERN DISTRICT

NTS: 82F/9

GEOPHYSICAL REPORT
ON A
UTEM SURVEY ON THE
MAT 71 GROUP OF CLAIMS
FORT STEELE MINING DIVISION, B.C.

LIST OF CLAIMS

Claims as shown in accompanying report by P. W. Ransom.

INTRODUCTION

The Borehole (DDCH 6459) and UTEM grid, on the Mat 71 Group of Claims, are located approximately 7 km west of the Sullivan Mine at Kimberley, B.C. Access to the grid from Kimberley, B.C. is via St. Marys River road,to Matthew Creek, then by logging road to the grid (Plate 313-86-1).

The Mat 71 Group of Claims are underlain by the clastic sediments of the Middle and Lower Aldridge formation of Proterozoic age. The sediments of the Aldridge formation are known to host the Sullivan orebody.

The purpose of the UTEM survey, which includes a borehole survey, grid survey, and reconnaissance road survey, is to explore for massive sulphide deposits.

DESCRIPTION OF UTEM SYSTEM

UTEM is an acronym for "University of Toronto ElectroMagnetometer". The system was developed by Dr. Y. Lamontagne (1975) while he was a graduate student of that University.

The field procedure consists of first laying out a large loop of single strand insulated wire and energizing it with current from a transmitter which is powered by a 1.7 kW motor generator. Survey lines are generally oriented perpendicular to one side of the loop and surveying can be performed both inside and outside the loop. The field procedure is similar to Turam, a better known electromagnetic surveying method.

The transmitter loop is energized with a precise triangular current waveform at a carefully controlled frequency (30.974 Hz for this survey). The receiver system includes a sensor coil and backpack portable receiver module which has a digital recording facility on cassette magnetic tape. The time synchronization between transmitter and receiver is achieved through quartz crystal clocks in both units which must be accurate to about one second in 50 years.

The receiver sensor coil measures the vertical magnetic component of the electromagnetic field and responds to its time derivative. Since the transmitter current waveform is triangular, the receiver coil will sense a perfect square wave in the absence of geologic conductors. Deviations from a perfect square wave are caused by electrical conductors which may be geologic or cultural in origin. The receiver stacks any pre-set number of cycles in order to increase the signal to noise ratio.

The UTEM receiver gathers and records 9 channels of data at each station. The higher number channels (7-8-9) correspond to short time or high frequency while the lower number channels (1-2-3) correspond to long time or low frequency. Therefore, poor or weak conductors will respond on channels 9, 8, 7 and 6. Progressively better conductors will give responses on progressively lower number channels as well. For example, massive, highly conducting sulphides or graphite will produce a response on all nine channels.

It was mentioned above that the UTEM receiver records data digitally on a cassette. This tape is played back into a computer at the base camp. The computer processes the data and controls the plotting on an 11" x 15" graphics plotter. Data are portrayed on data sections (D.S.) as profiles of each of the nine channels, one section for each survey line.

The UTEM Borehole system uses the same transmitter, receiver and loop layout as the surface survey, and a downhole sensor probe linked by fibre optic cable to a surface controller unit. The controller unit operates the winch, for lowering and raising the borehole coil, and converts the incoming digital signal to the analog form required by the receiver. The data is plotted similar to the surface system.

FIELD WORK

A borehole survey was completed from Loop #1 (Plate 313-86-3) in late July. The borehole was surveyed from the remaining 3 loops at the end of August. The HQ drill rods were left in the borehole. down to approx. 320 m, to prevent caving of the borehole. The borehole was then surveyed down to approx. 620 m with a station spacing of 10 metres and 5 metres for detailing. Because of the high sensitivity of the borehole coil and associated electronics, many hours of surveying time was lost due to sferic noise produced by electrical storms.

A UTEM grid (Plate 313-86-2), which consists of four lines each 3 km in length, with line spacing of 500 m and station spacing of 50 m, was cut by B. Read in early August. This grid was surveyed with UTEM, from two separate loops (Plate 313-86-5) in the latter part of August and early part of September.

In addition to the Borehole and Grid surveys, approx. 11 km, using a station spacing varying from 50 m to 200m, was surveyed along roads from three separate loops (313-86-5).

DATA PRESENTATION

The results of the survey are presented on one location map, one claim, grid and borehole location map, one borehole loop location map, one borehole section, one compilation map and 32 data sections.

The maps are listed as follows:-

Plate 313-86-1	DDCH 6459 and UTEM Grid Location Map Scale 1:125,000
313-86-2	MAT 71 Group (Claims) DDCH 6459 and UTEM Grid Location Map Scale 1:24,000
313-86-3	DDCH 6459 Borehole UTEM Survey Loop Location Map Scale 1:24,000
313-86-4	DDCH 6459 Vertical Section on Azimuth 292 Scale 1:4,800
313-86-5	UTEM Survey Grid and Compilation Map Scale 1:24,000

Legends for both UTEM compilation map and the data sections are also attached.

In order to reduce the field data, the theoretical primary field of the loop is calculated at each station. The normalization of the data is as follows:-

$$\%\ \text{Ch.n anomaly} = \frac{(\text{Ch.n} - \text{P})}{\text{Ni}} \times 100$$

where Ch.n = the observed amplitude of the n^{th} channel

P = I) Total Field
P = 0

II) Secondary Field

1) Channel 1 reduced:
P = Ch.1 for channels > 1
(Channel 1 is primary field reduced)

2) Primary Field reduced:

a) Surface System
P = the calculated primary field
(same component as the observed field
from the loop at the observed station)

b) Borehole System
P = the axial component of the
calculated primary field from the
loop at the observed station

N = I) Ch.1 normalized
Ni = Ch.1 for Channel > 1
(Channel 1 is primary field normalized)

II) Primary field normalized
Ni = absolute value of the total
calculated primary field

1) continuous normalized
i = observed station
(each reading normalized by a
different primary field)

2) point normalized
i = station below the arrow
on the data section
(each reading is normalized by the
primary field at that one station)

All the data normalized as above is plotted as profiles on data sections, using the symbols as shown in the legend. Profiles plotted with no symbols for:

I) Surface data:
   a) on bottom axis = elevation

II) Borehole data;
   a) on bottom axis = (Ch.1/N) x 100/5

   b) on top axis = (P/N) x 100/5

where Ch.1 = Channel 1 data
P = calculated component of primary field
N = absolute value of total calculated primary field

INTERPRETATION

Borehole

The Borehole data shows a weak conductor at a depth of approx. 595 m (D.S. 1-4 and 1a-4a). This correlates fairly closely to the weakly laminated and disseminated pyrrhotite noted at 600-607 m in the drill core (P.W. Ransom). The apparent slight difference in depth is possibly due to two different methods used in measuring this depth; one with drill rods and the other with the down-hole UTEM system.

Surface Data

There is a feature that can be correlated from line to line in the data from Loop 2 (D.S. 5-8, 5a-8a) at approx. 6500E. This feature is probably a contact or conductive fault with the west side being more conductive. A flat-lying conductor is noticed on Line 5500N between 6350E and 6650E (D.S. 8, 8a). This same feature can be seen at the beginning of the recce survey on Road 65 (D.S. 16 & 16a) and Trail R2 (D.S. 15 & 15a).

CONCLUSIONS

A weak conductor that correlates with a thin, laminated pyrrhotite zone is recognized in the borehole data.

In the surface data a lineation crosses the grid at approx. 6500E with an associated shallow, flat-lying conductor on Line 5500N.

Report by: ____________________
Syd J. Visser
Geophysicist
S.J.V. Consultants Ltd.

Approved for Release: ____________________
J. M. Hamilton, P.Eng.
Manager, Exploration
Western Canada
Cominco Ltd.

REFERENCES

Lamontagne, Y., 1985	Application of Wideband, Time Domain EM Measurements in Mineral Exploration: Doctoral Thesis, University of Toronto
Ransom, P.W., 1986	Accompanying Report

APPENDIX I

LEGEND

UTEM DATA SECTIONS

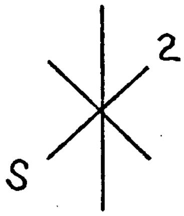
ORDINATE: Amplitude scale is given in %

ABSCISSA: Station or Picket Numbers in Hundreds of Meters

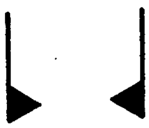
SYMBOL	CHANNEL	MEAN DELAY TIME	
		15 Hz	30 Hz
|	1	25.6 ms	12.8 ms
/	2	12.8	6.4
\	3	6.4	3.2
□	4	3.2	1.6
Σ	5	1.6	0.8
Δ	6	0.8	0.4
7	7	0.4	0.2
⧗	8	0.2	0.1
△	9	0.1	0.05
◇	10	0.05	0.025

LEGEND

UTEM COMPILATION MAPS

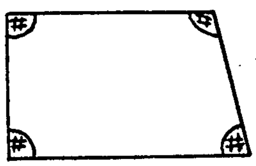


Axis of a crossover anomaly. The number indicates the latest anomalous channel.

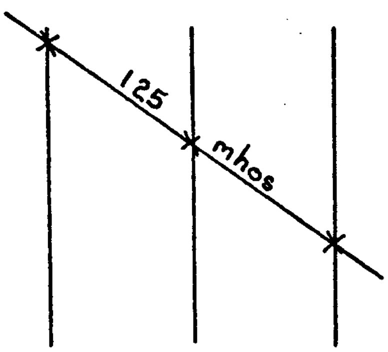


Area where conductivity is higher than average background.

Depth indicated by:	S - Shallow	(< 50 m)
	M - Moderate	(50-100 m)
	D - Deep	(> 100 m)



Outline of a transmitter loop.

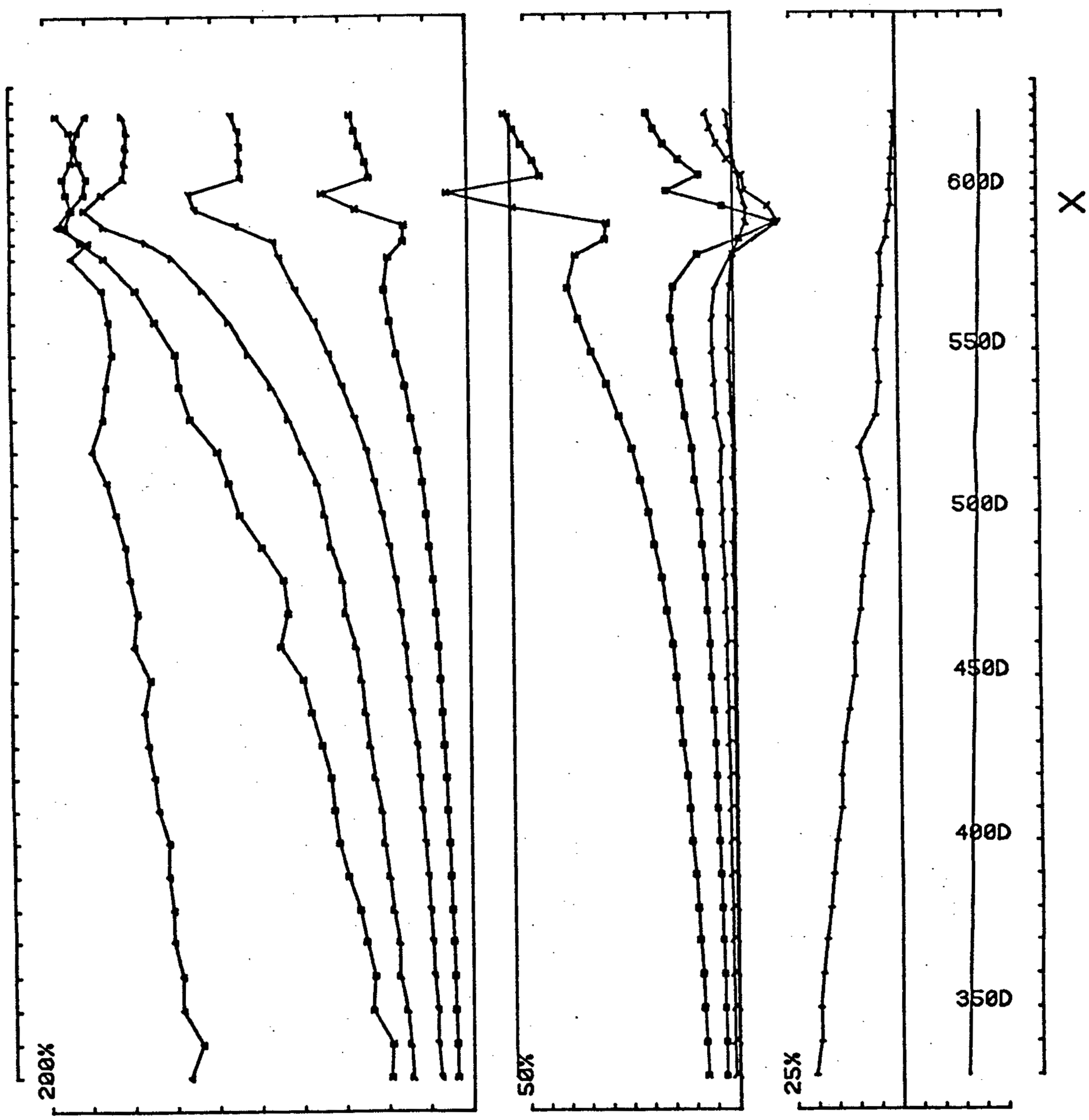


Conductor axis located by crossover anomalies with a conductance determination. The conductance is the interpreted conductivity x thickness of the conductor in mhos (same as Siemens).

Only the principal crossovers are indicated.

APPENDIX II

DATA SECTIONS

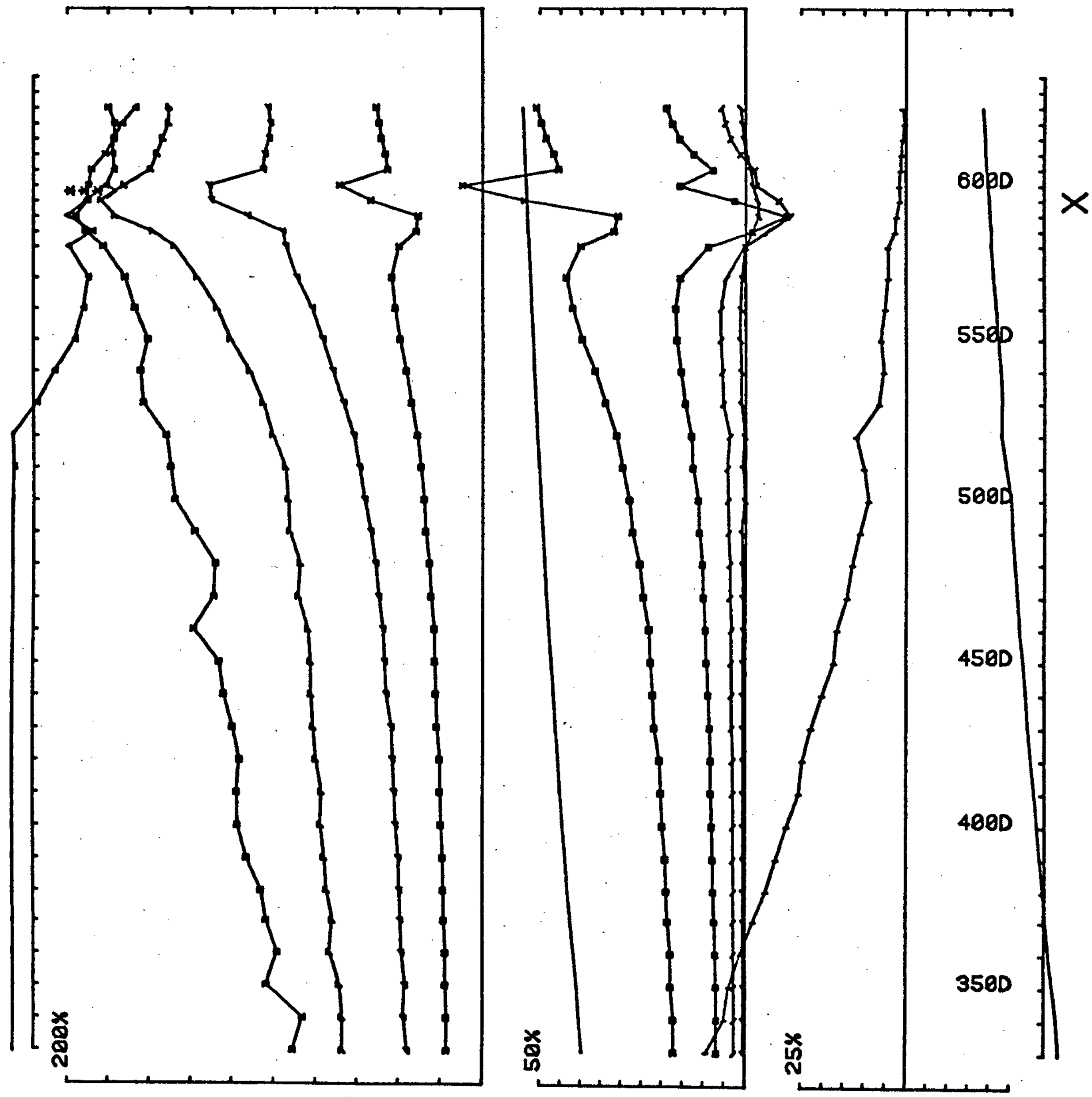


Area Matthew Ck Cominco operator JJL freq(hz) 30.974

Loopno 1 DDH 8459 component Axial secondary

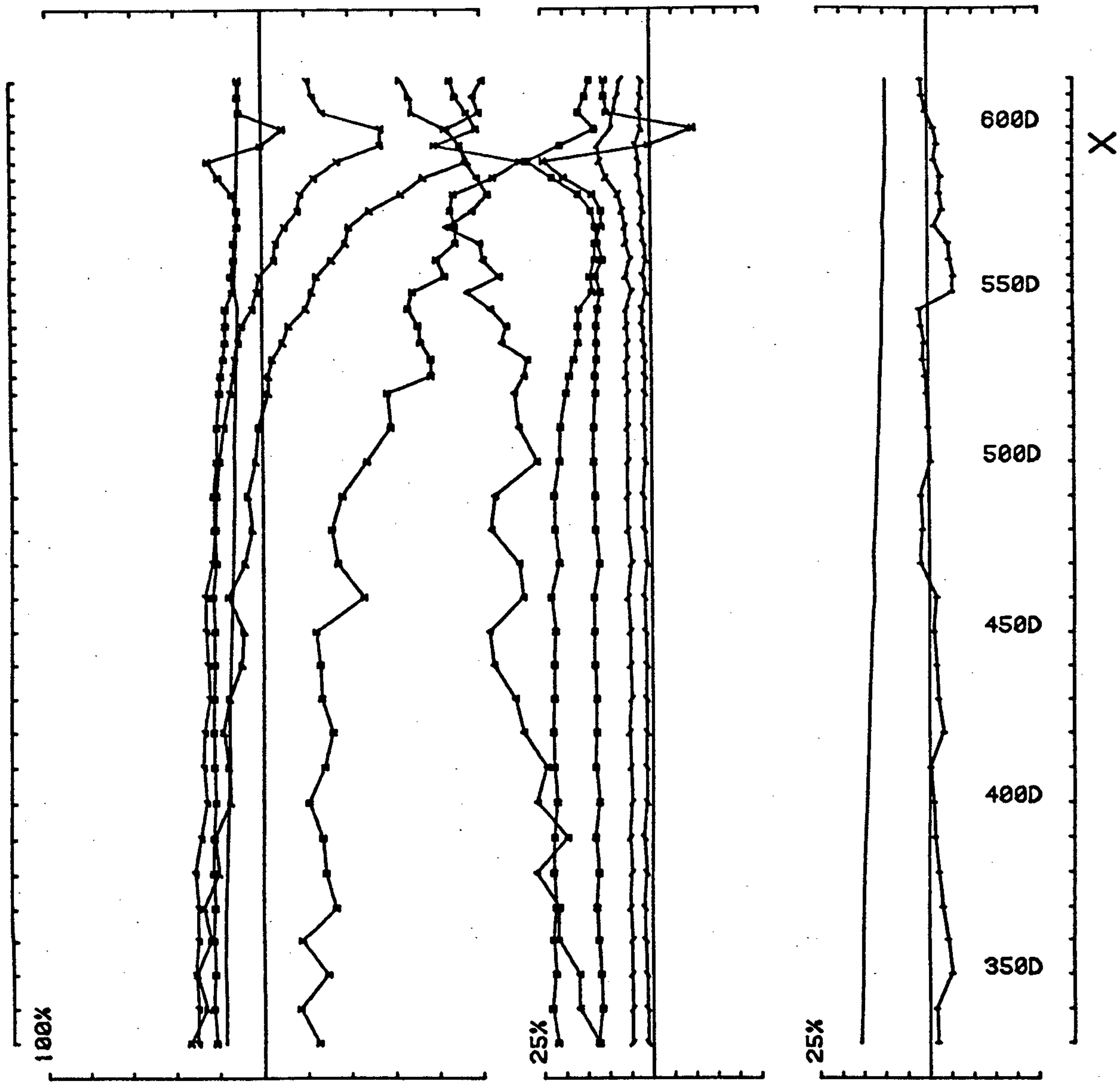
ABS(total field) CONTINUOUS normalized CH 1 reduced

DS 1



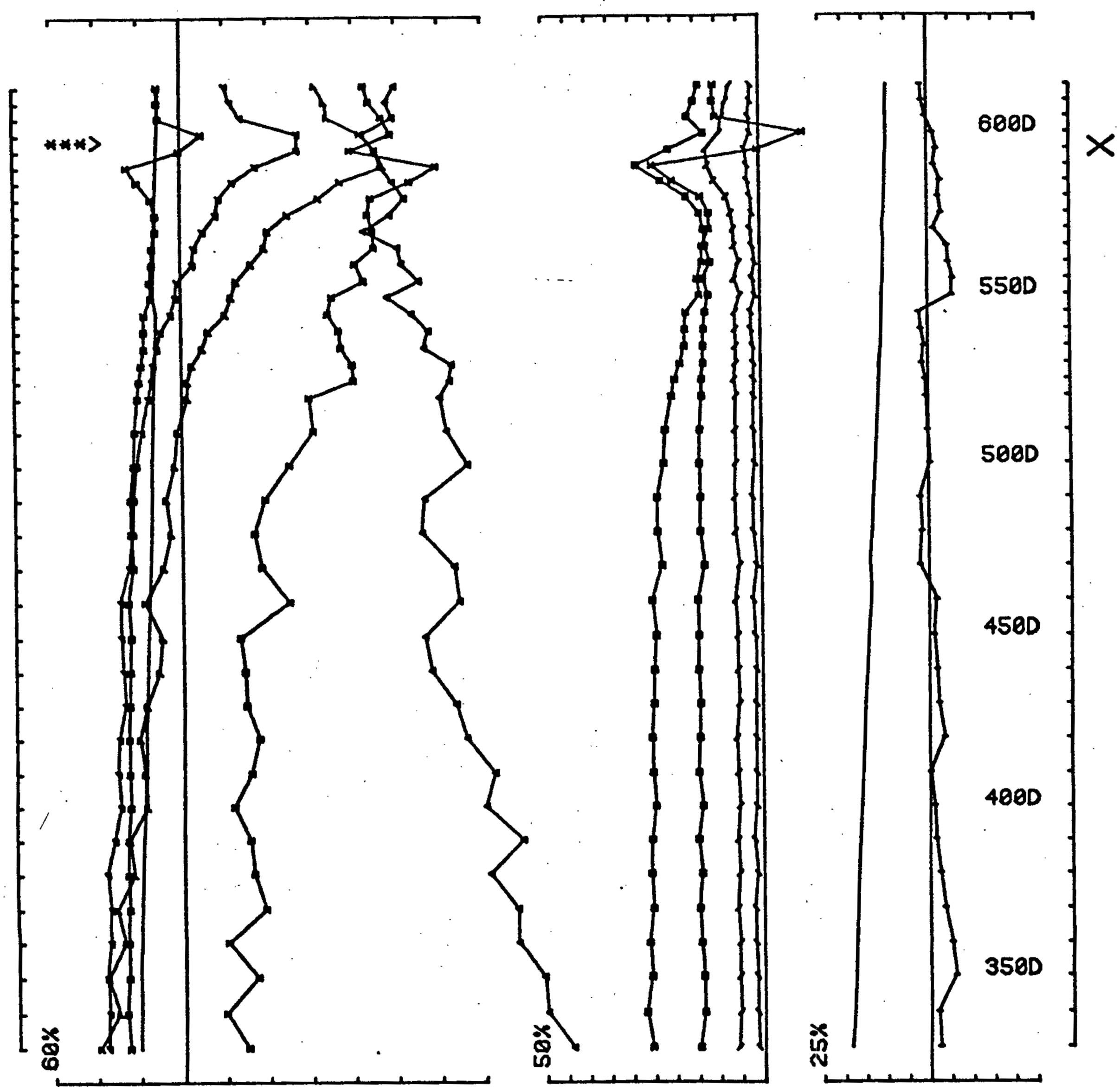
Area Matthew Ck Cominco operator JJL freq(hz) 30.974
Loopno 1 DDH 6459 component Axial secondary
ABS(total field) POINT normalized CH 1 reduced

DS Ia



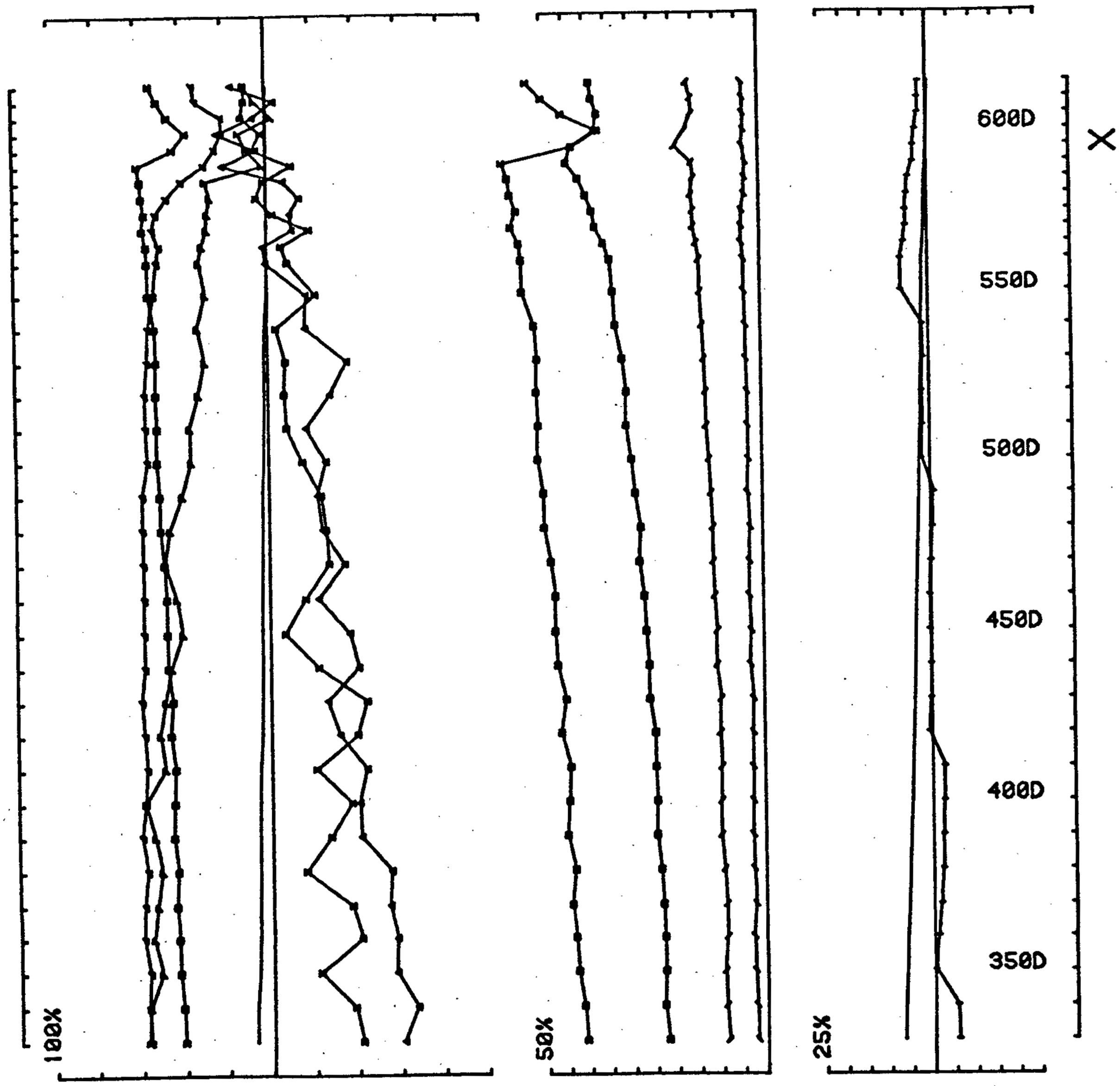
Area Matthew Ck ComInco operator SJV freq(hz) 30.974
Loopno 2 DDH 6459 component Axial secondary
ABS(total field) CONTINUOUS normalized CH I reduced

DS 2

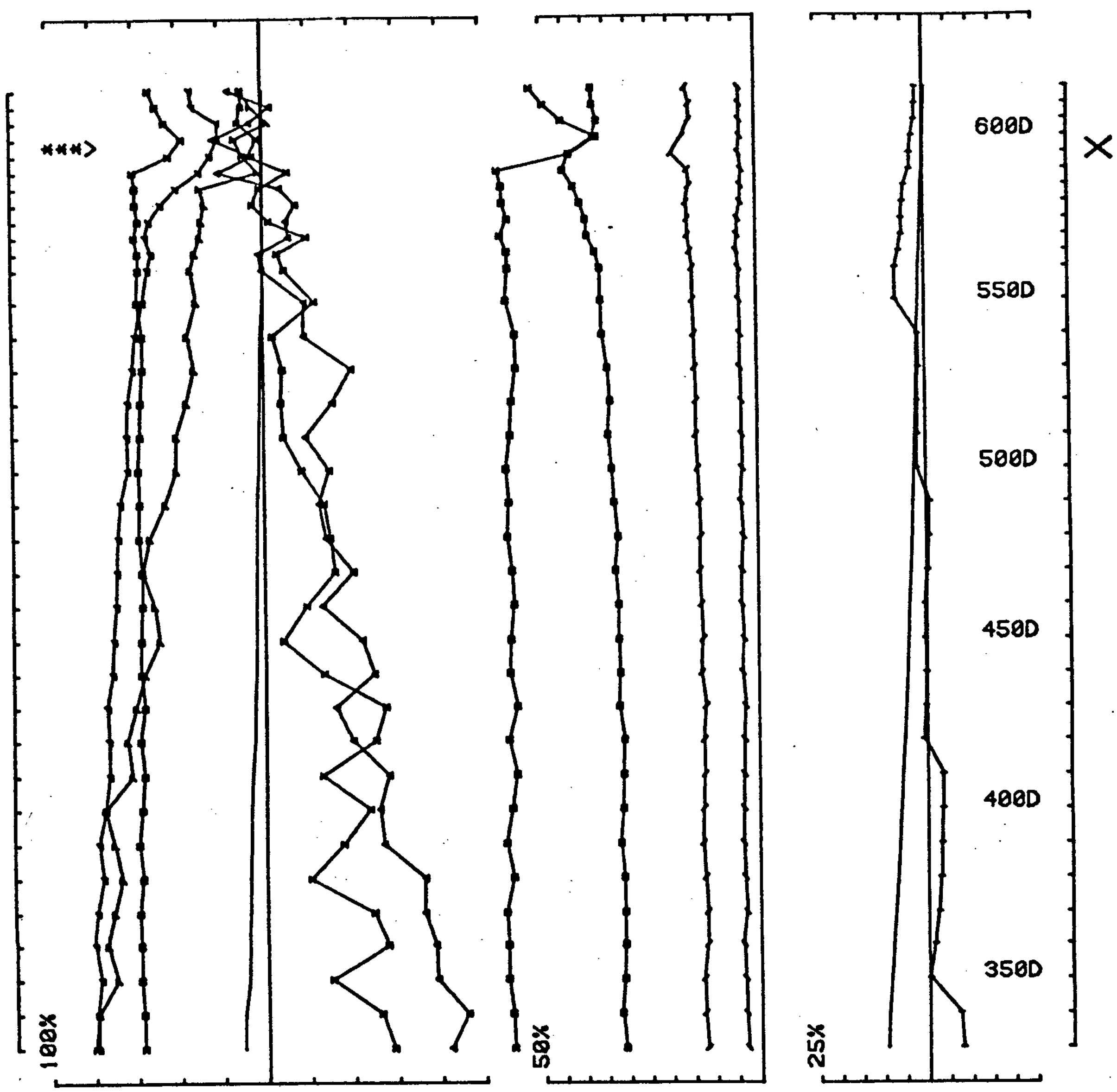


Area Matthew Ck   Cominco   operator SJV   freq(hz) 30.974
Loopno 2   DDH 8459 component Axial secondary
ABS(total field) POINT normalized   CH I reduced

DS 2a

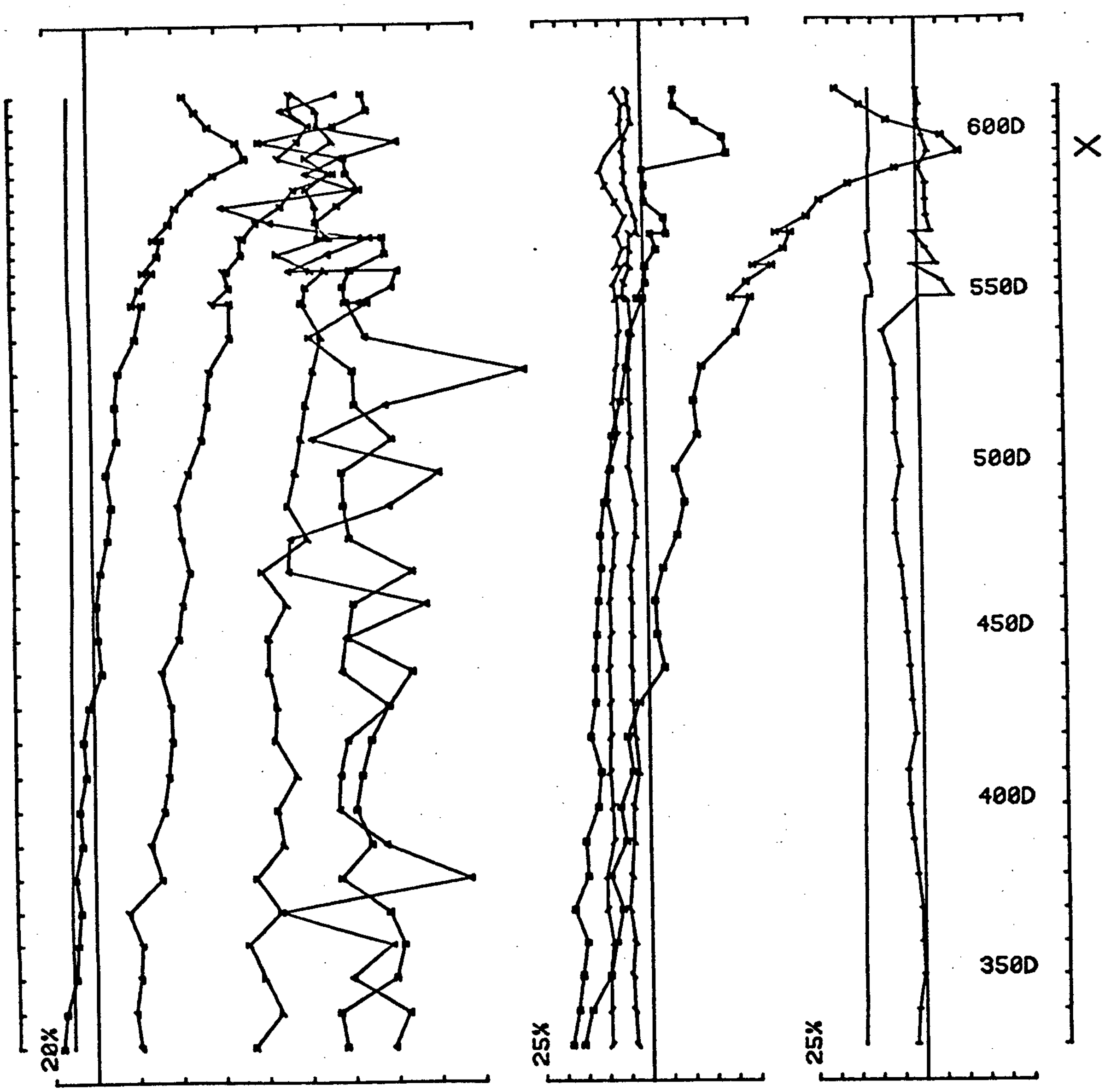


Area Matthew Ck Cominco operator SJV freq(hz) 30.974
Loopno 3 DDH 6459 component Axial secondary
ABS(total field) CONTINUOUS normalized CH I reduced



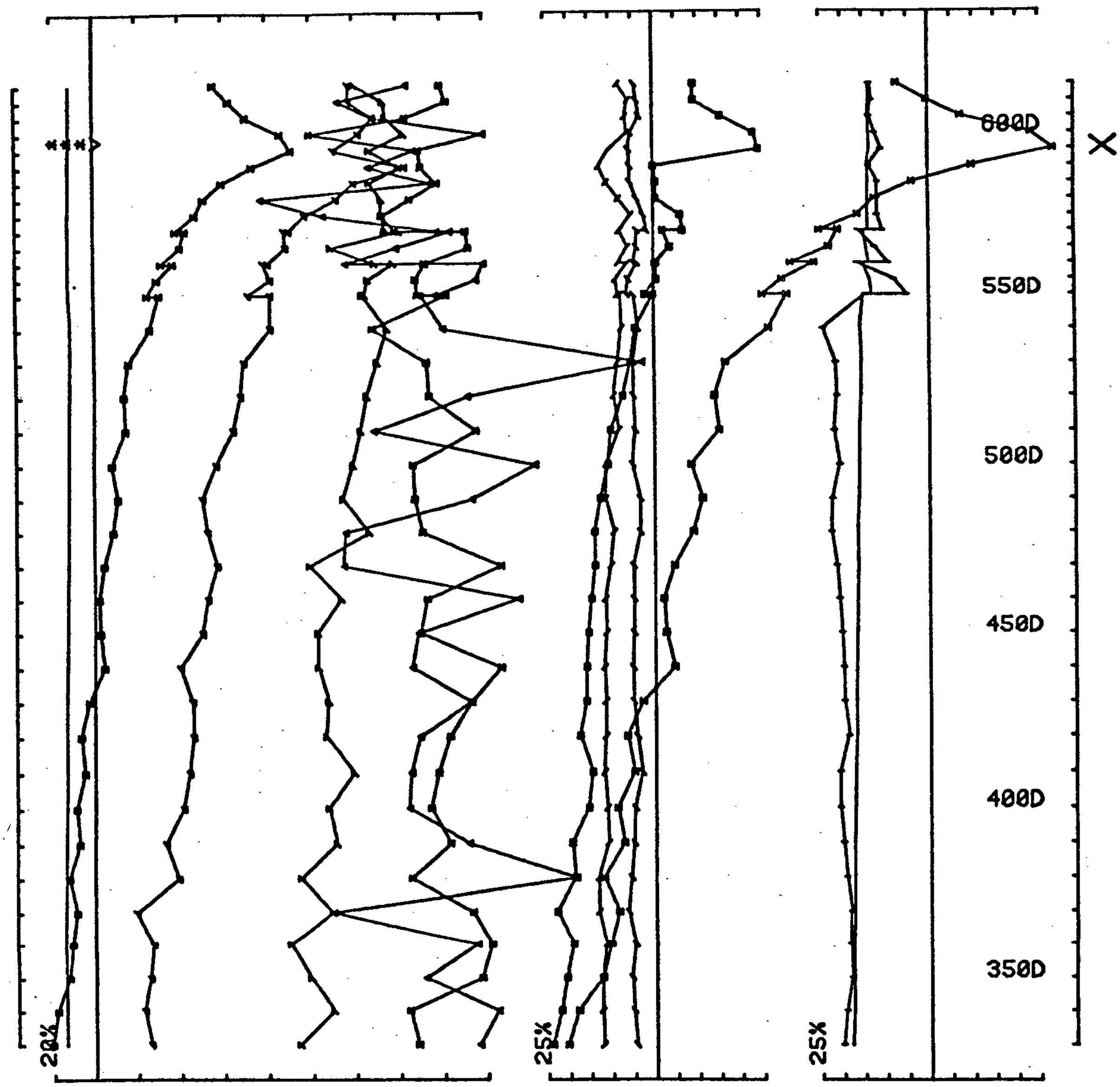
Area Matthew Ck Cominco operator SJV freq(hz) 30.974
Loopne 3 DDH 6459 component Axial secondary
ABS(total field) POINT normalized CH I reduced

DS 3a



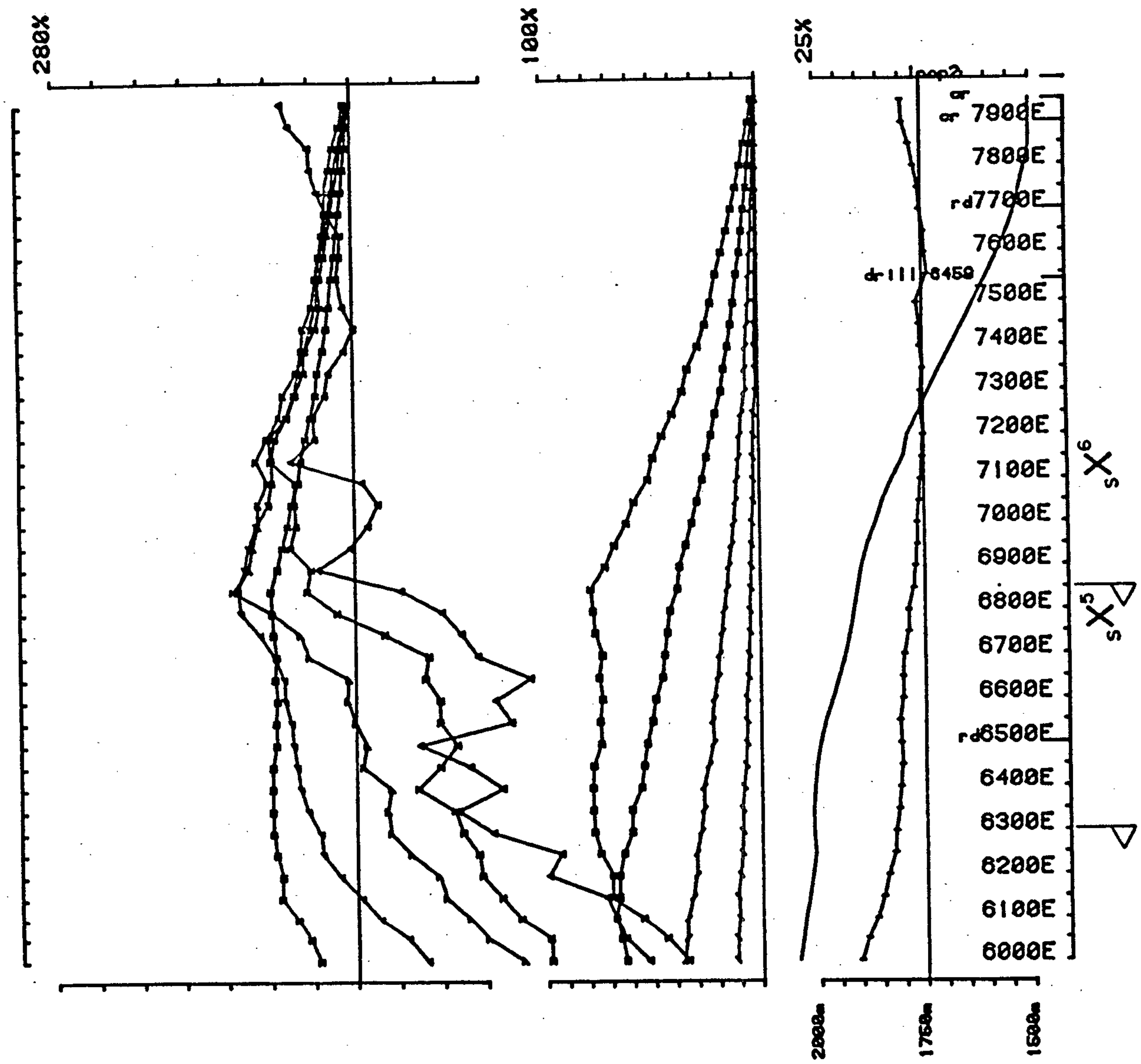
Area Matthew Ck Cominco operator SJV freq(hz) 30.974
Loopno 4 DDH 6459 component Axial secondary
ABS(total field) CONTINUOUS normalized CH 1 reduced

DS 4



Area Matthew Ck Cominco operator SJV freq(hz) 30.974
Loopno 4 DDH 6459 component Axial secondary
ABS(total field) POINT normalized CH I reduced

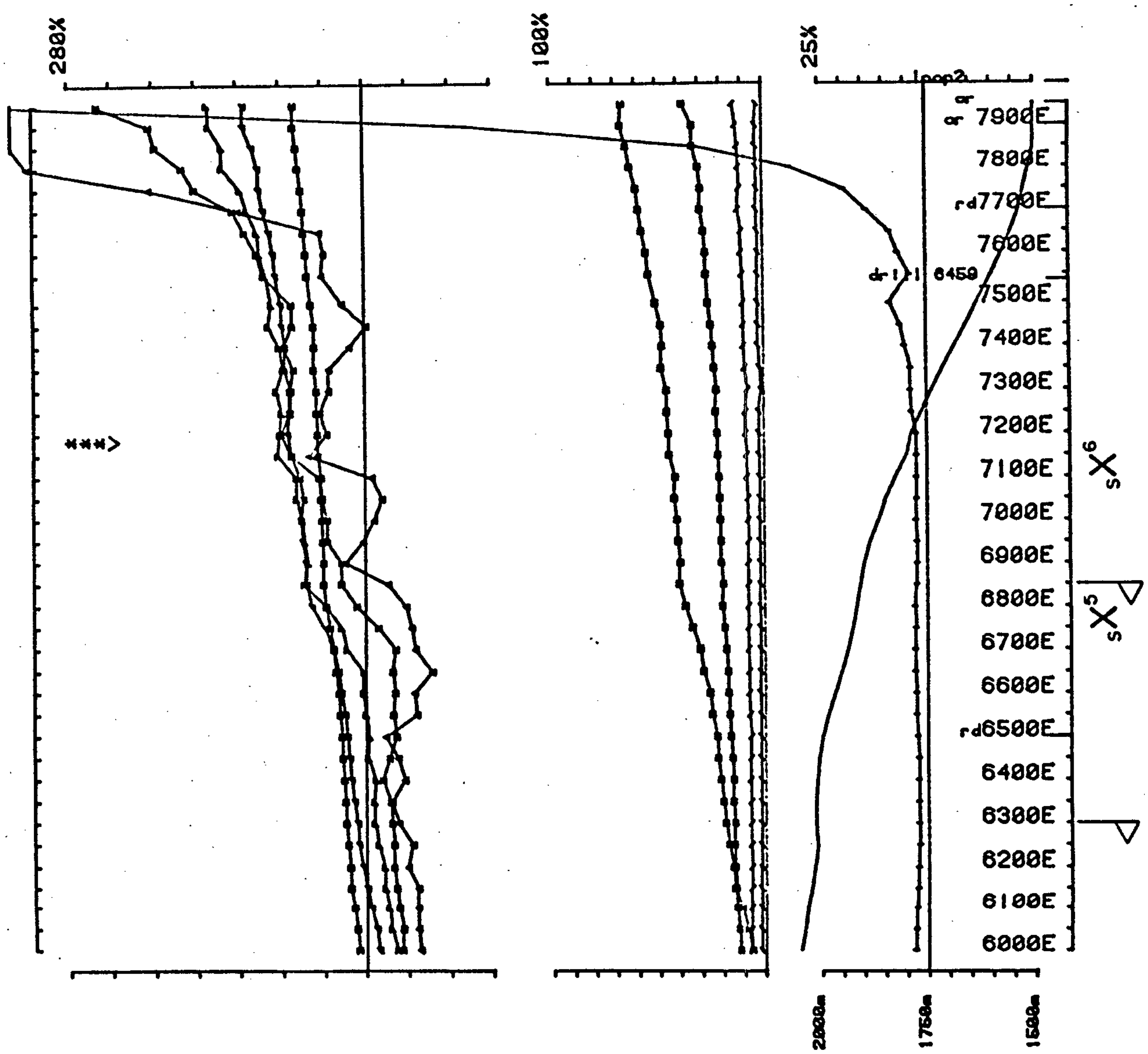
DS 4a



Area MATTHEW CREEK 1986 Cominco operator SJV & JV freq(hz) 30.974

Loopno 2 Line 4000N component Hz secondary Ch 1 normalized Ch 1 reduced

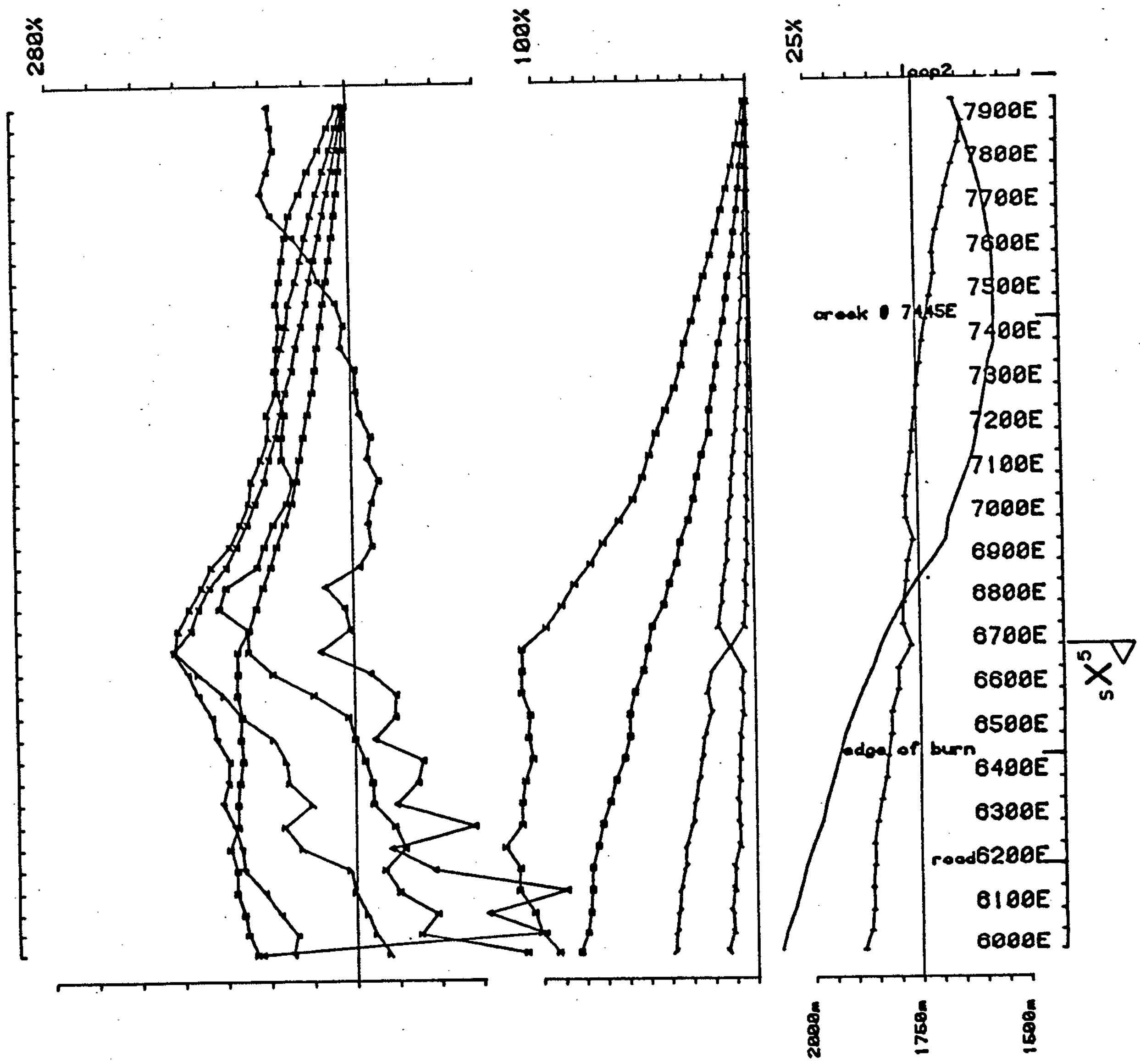
DS 5



Area MATTHEW CREEK 1986 Cominco operator SJV & JV freq(hz) 30.974

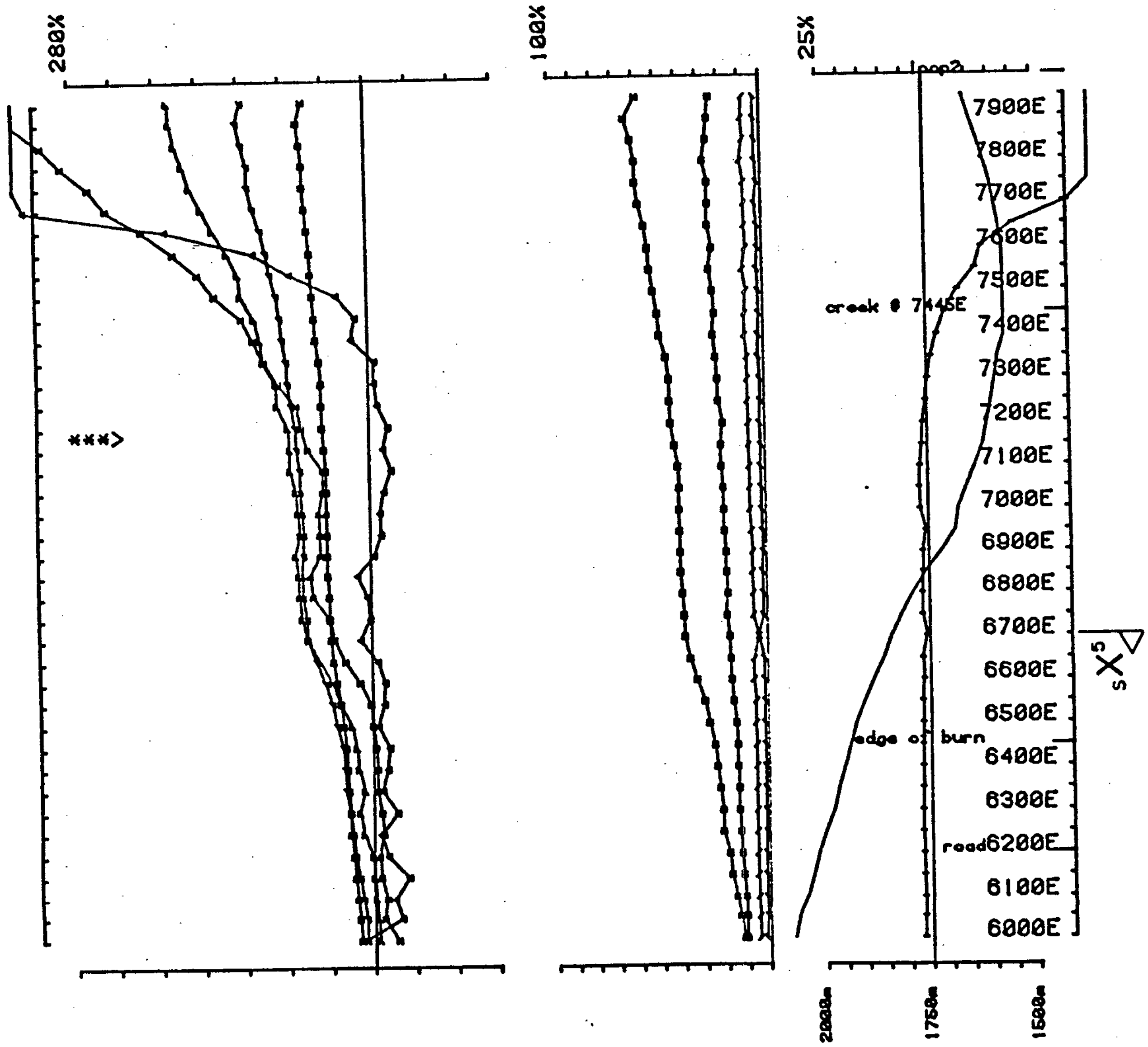
Loopno 2 Line 4000N component Hz secondary Ch 1 normalized Ch 1 reduced

DS 5a



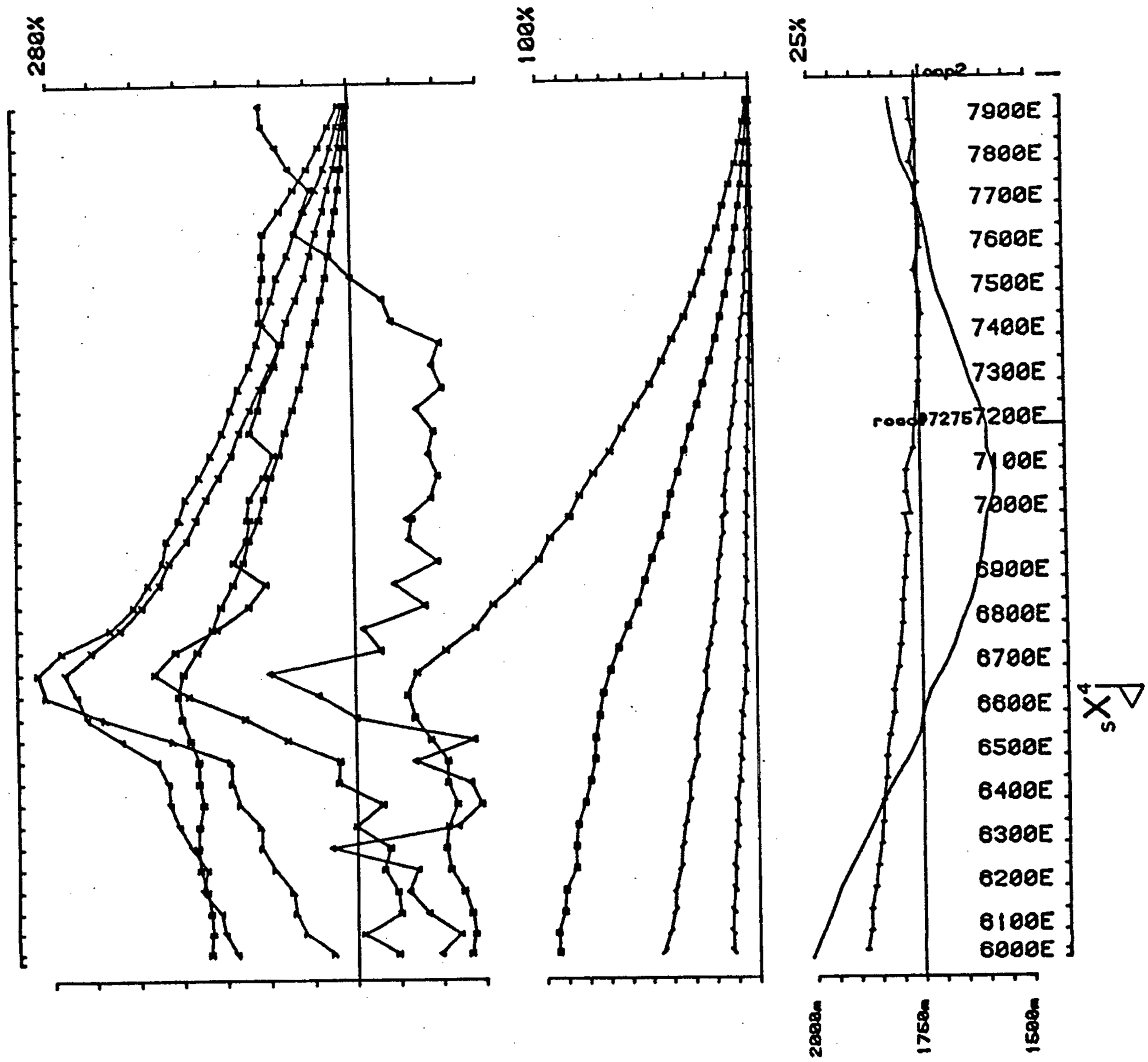
Area MATTHEW CREEK 1986 Cominco operator SJV & JV freq(hz) 30.974
Loopno 2 Line 4500N component Hz secondary Ch 1 normalized Ch 1 reduced

DS 6



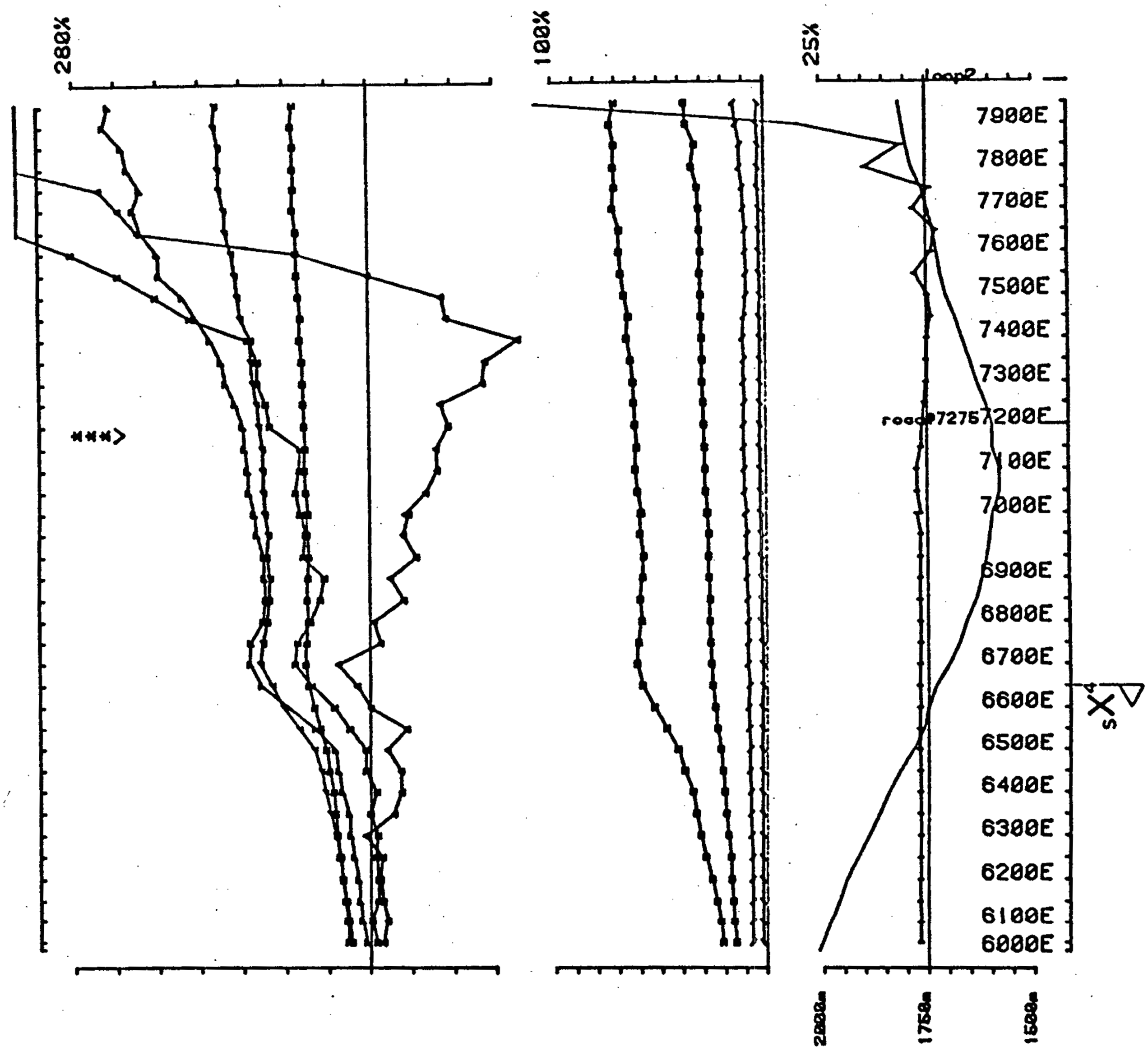
Area MATTHEW CREEK 1986 Cominco operator SJV & JV freq(hz) 30.974
Loopno 2 Line 4500N component Hz secondary Ch I normalized Ch I reduced

DS 6a



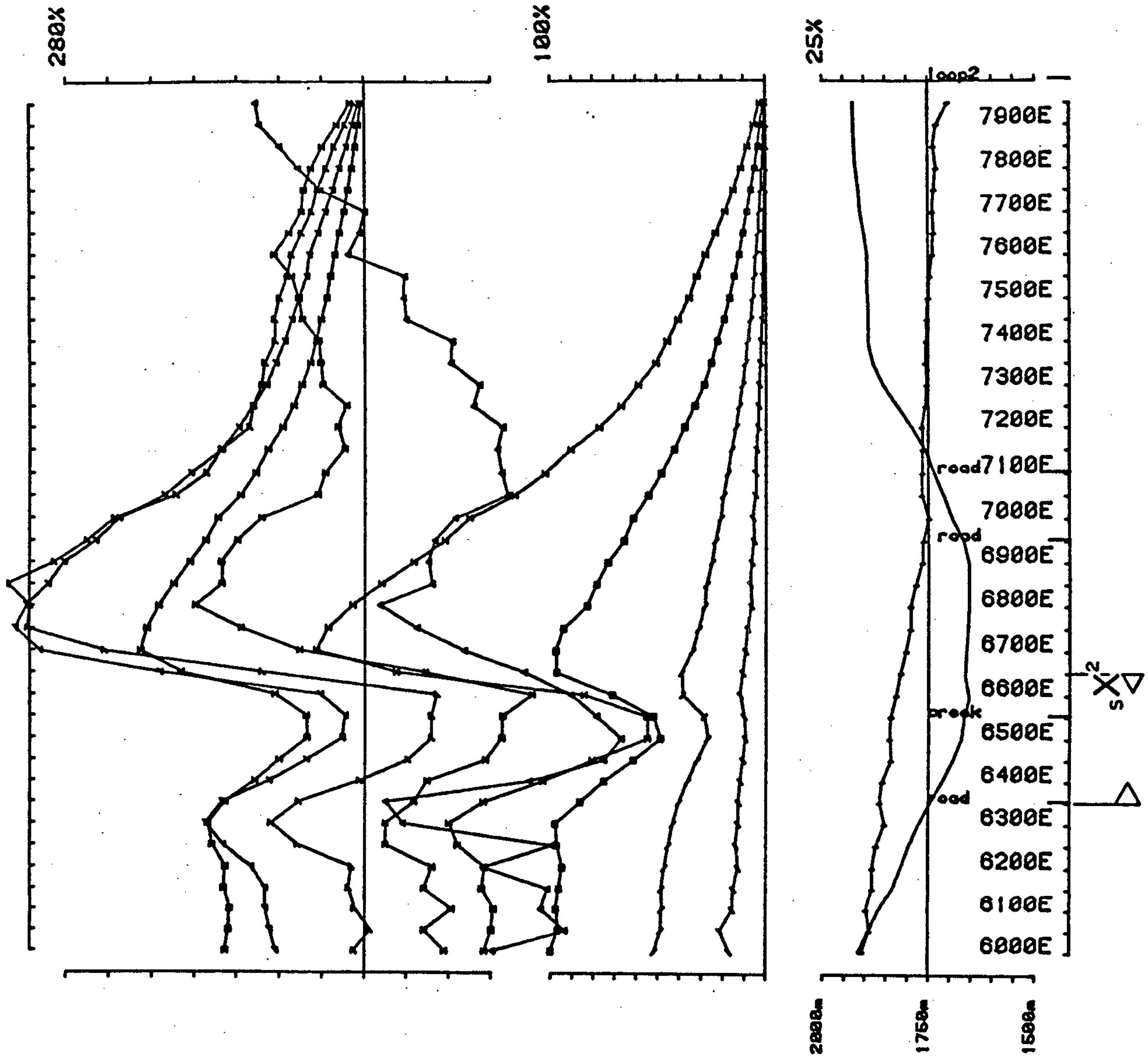
Area MATTHEW CREEK 1986 Cominco operator SJV & JV freq(hz) 30.974
Loopno 2 Line 5000N component Hz secondary Ch I normalized Ch I reduced

DS 7

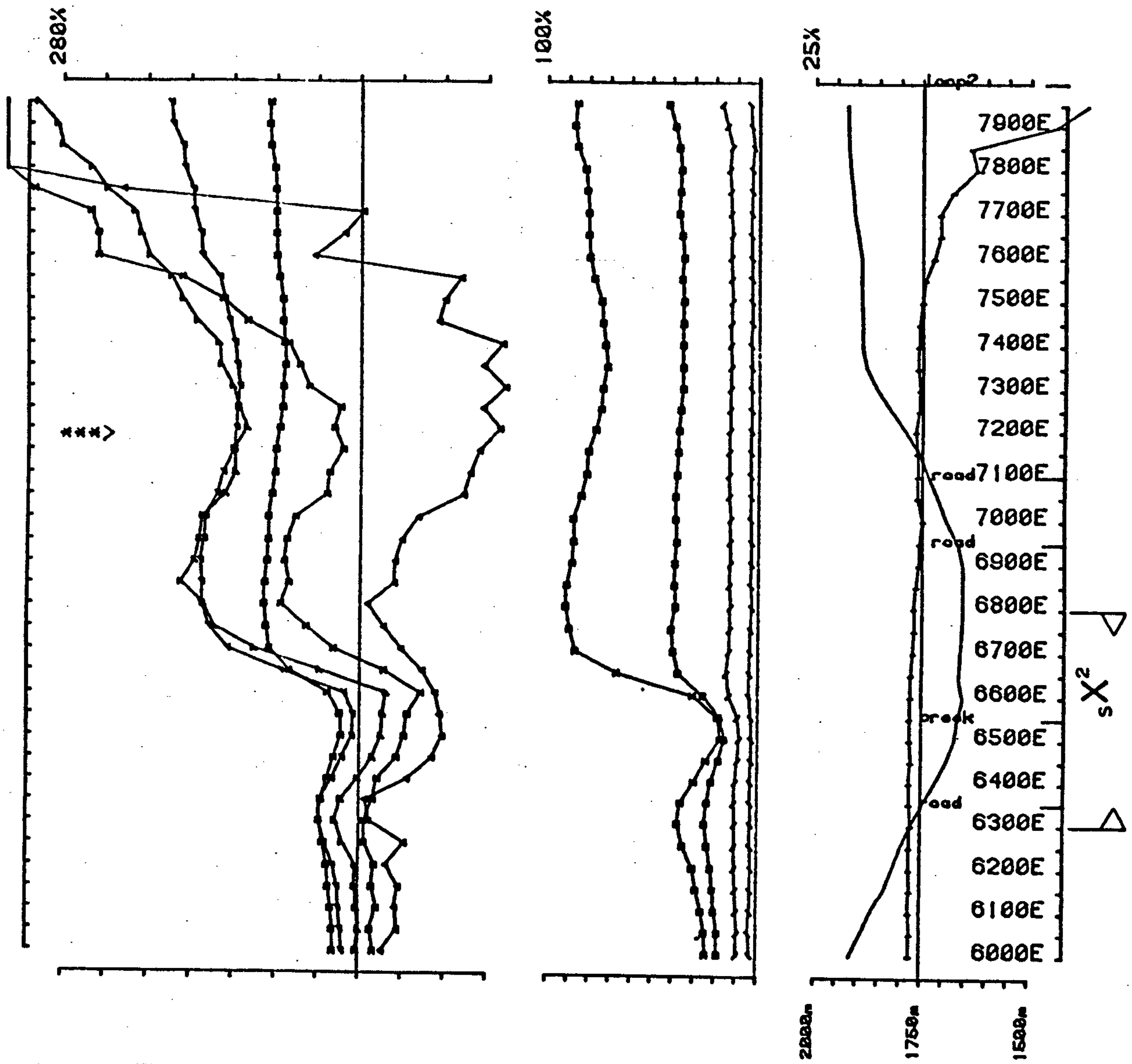


Area MATTHEW CREEK 1986 Cominco operator SJV & JV freq(hz) 30.974
Loopno 2 Line 5000N component Hz secondary Ch I normalized Ch I reduced

DS 7a

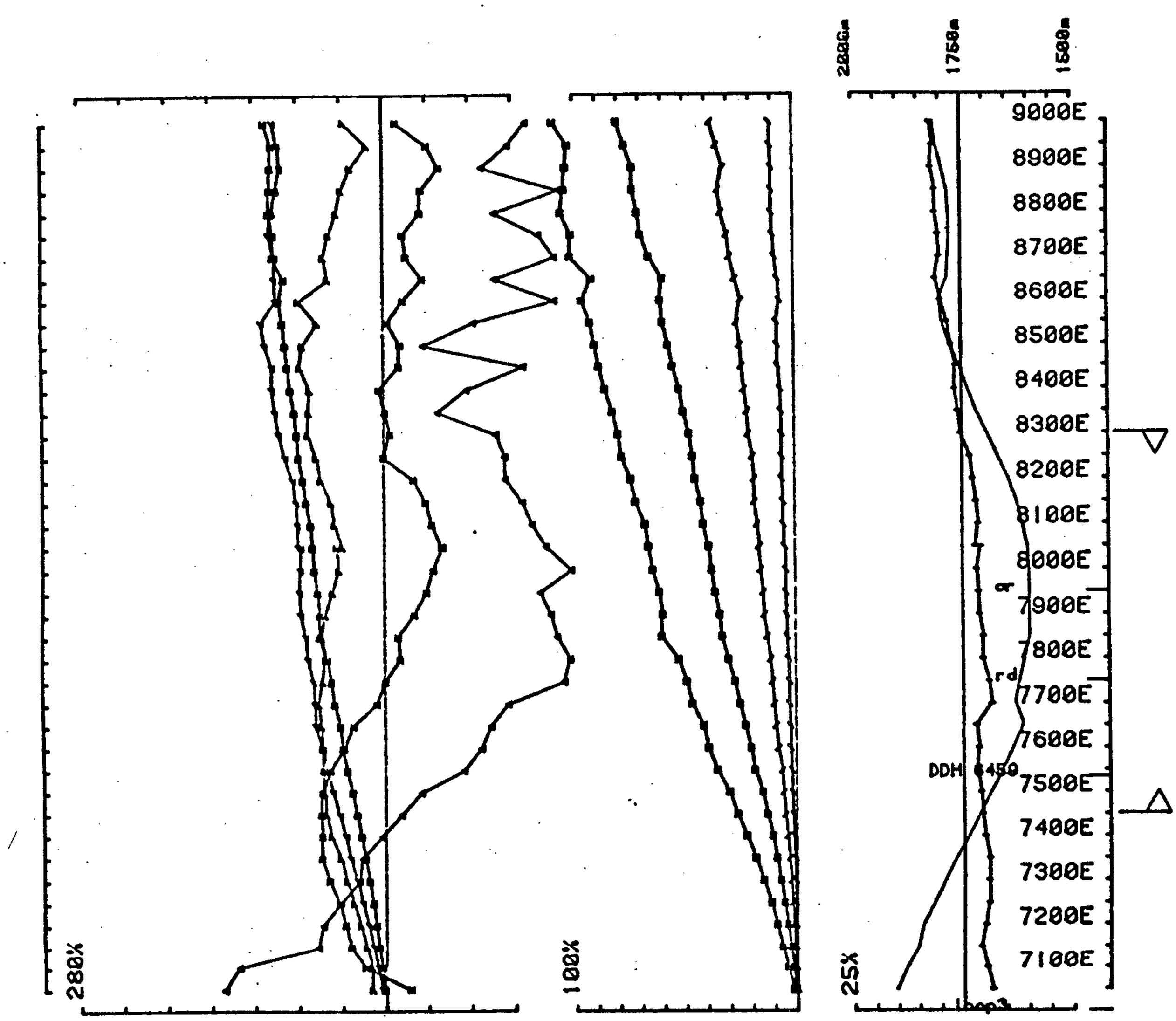


Area MATTHEW CREEK 1986 Cominco operator SJV & JV freq(hz) 30.974
Loopno 2 Line 5500N component Hz secondary Ch 1 normalized Ch 1 reduced

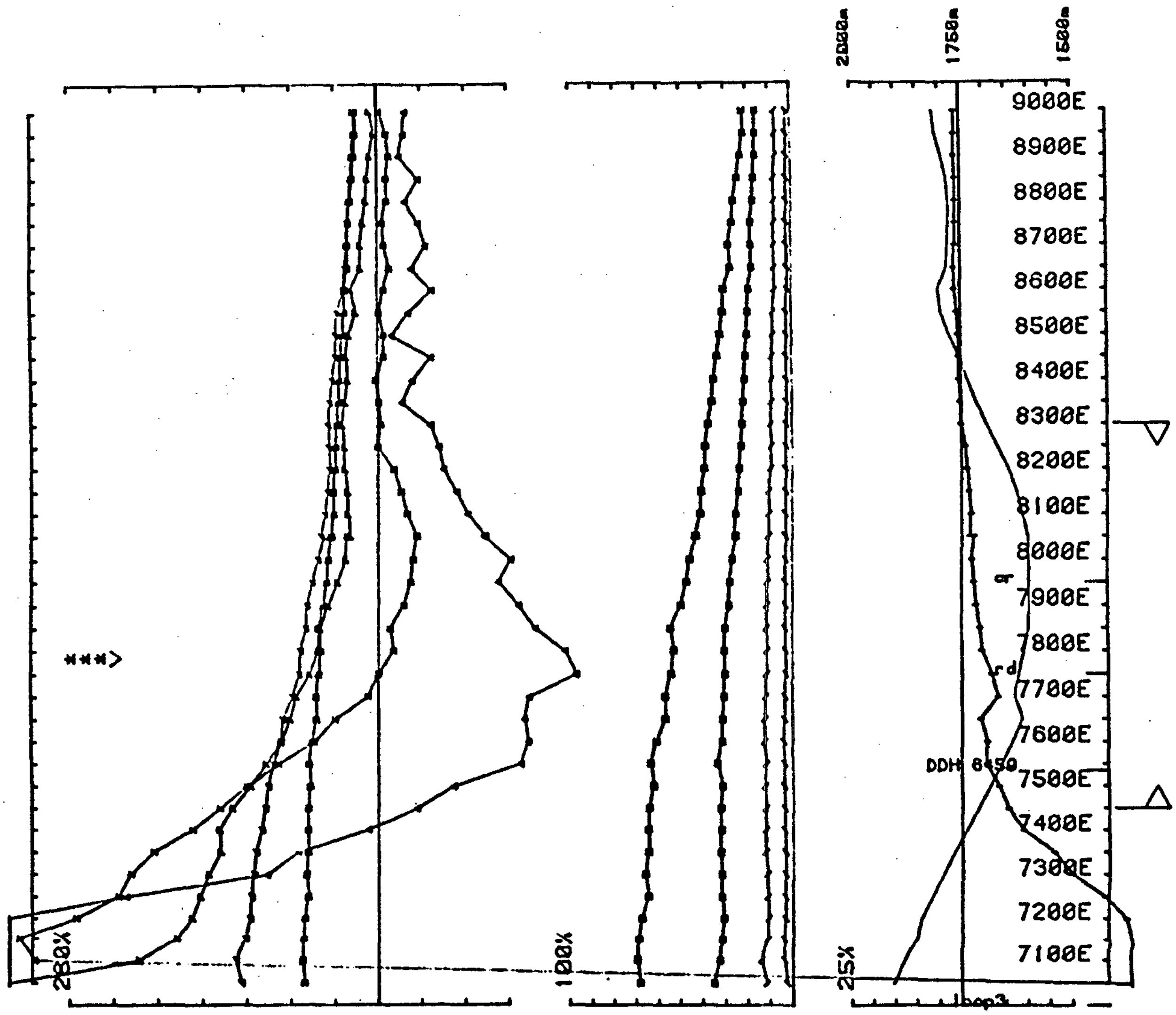


Area MATTHEW CREEK 1986 Cominco operator SJV & JV freq(hz) 30.974

Loopno 2 Line 5500N component Hz secondary Ch I normalized Ch I reduced

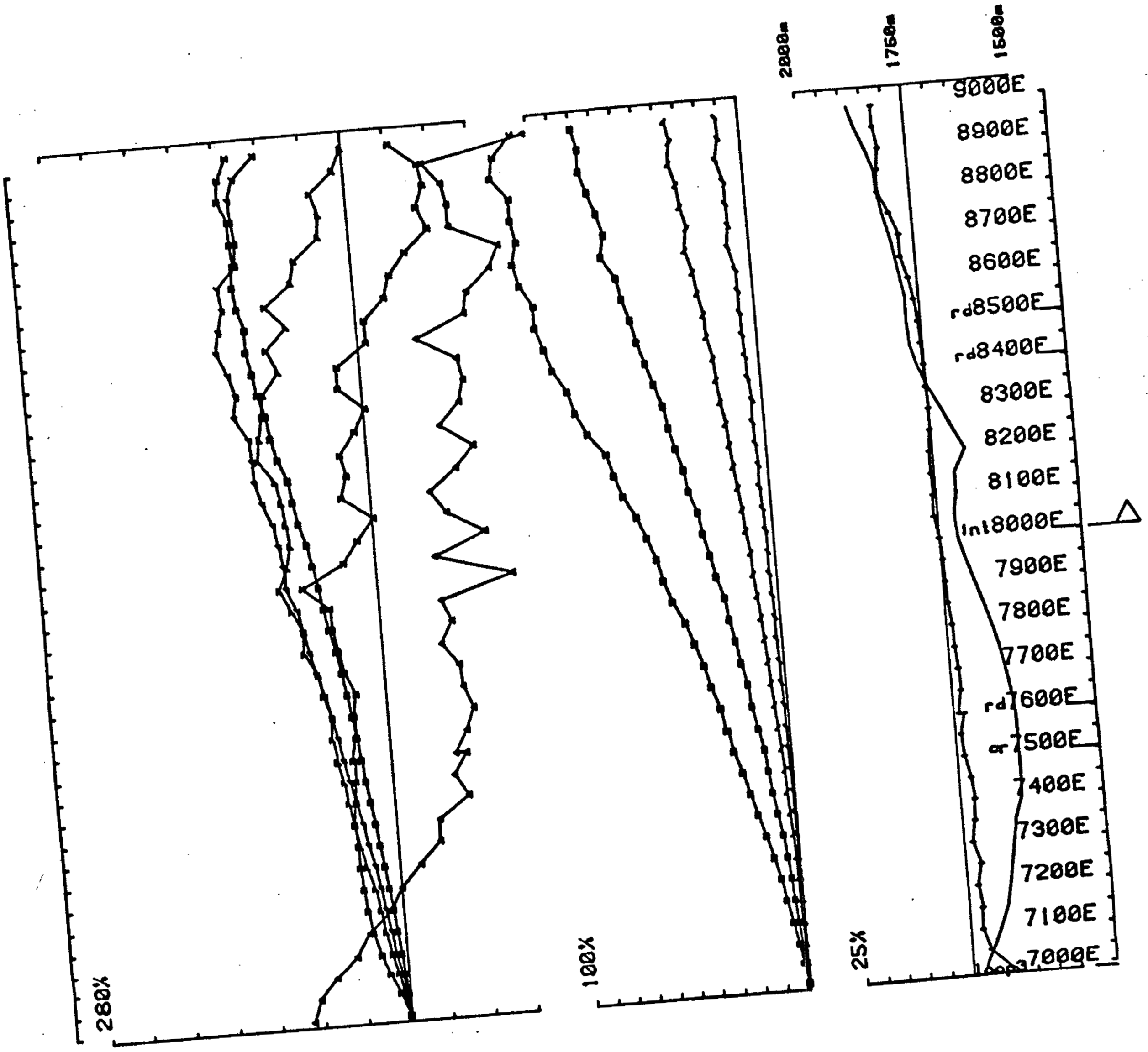


Area MATTHEW CREEK 1986 Cominco operator SJV & JV freq(hz) 30.974
Loopno 3 Line 4000N component Hz secondary Ch 1 normalized Ch 1 reduced



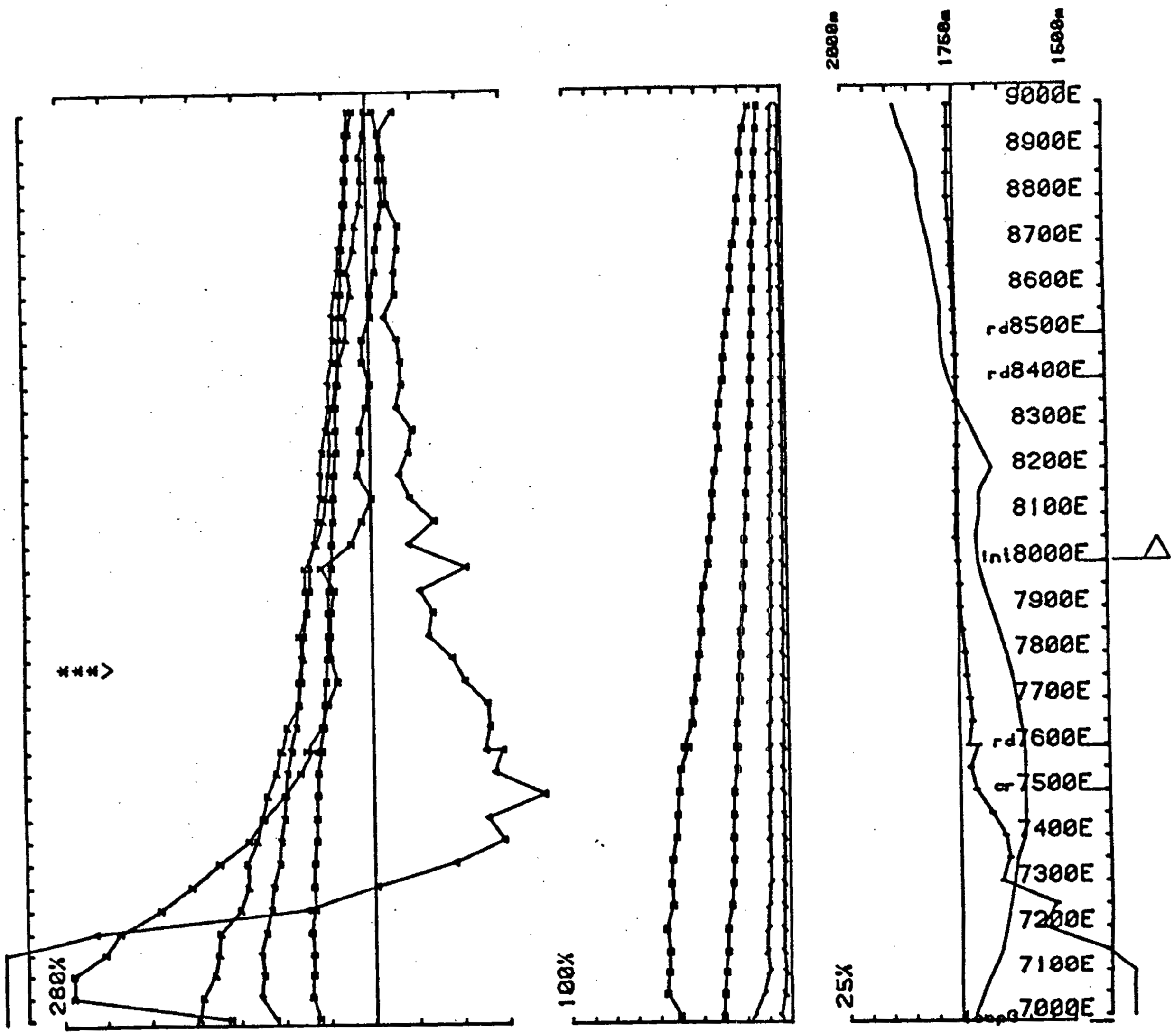
Area MATTHEW CREEK 1986 Cominco operator SJV & JV freq(hz) 30.974
Loopno 3 Line 4000N component Hz secondary Ch I normalized Ch I reduced

DS 9a



Area MATTHEW CREEK 1986 Cominco operator SJV & JV freq(hz) 30.974
Loopno 3 Line 4500N component Hz secondary Ch 1 normalized Ch 1 reduced

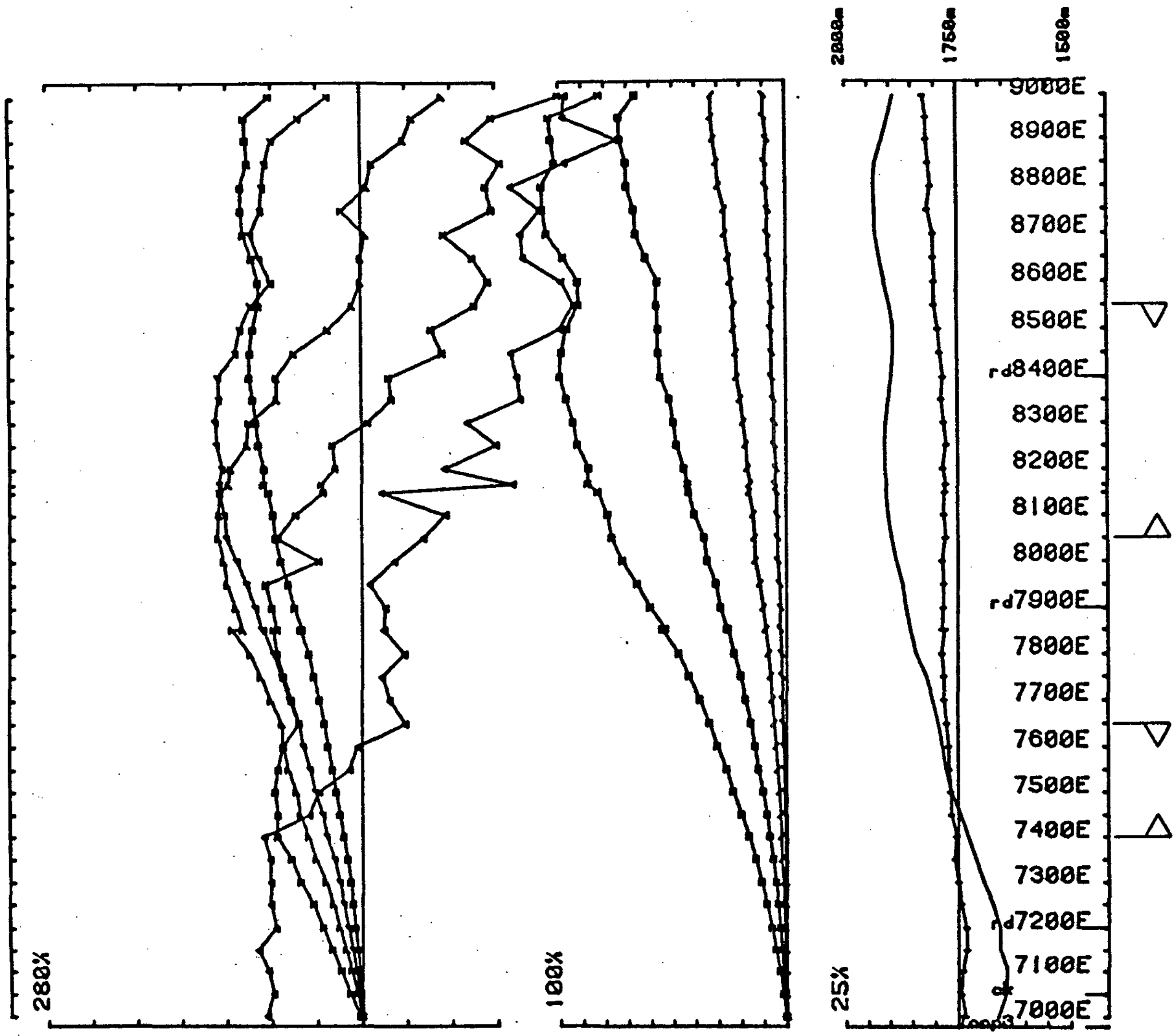
DS 10



Area MATTHEW CREEK 1986 Cominco operator SJV & JV freq(hz) 30.974

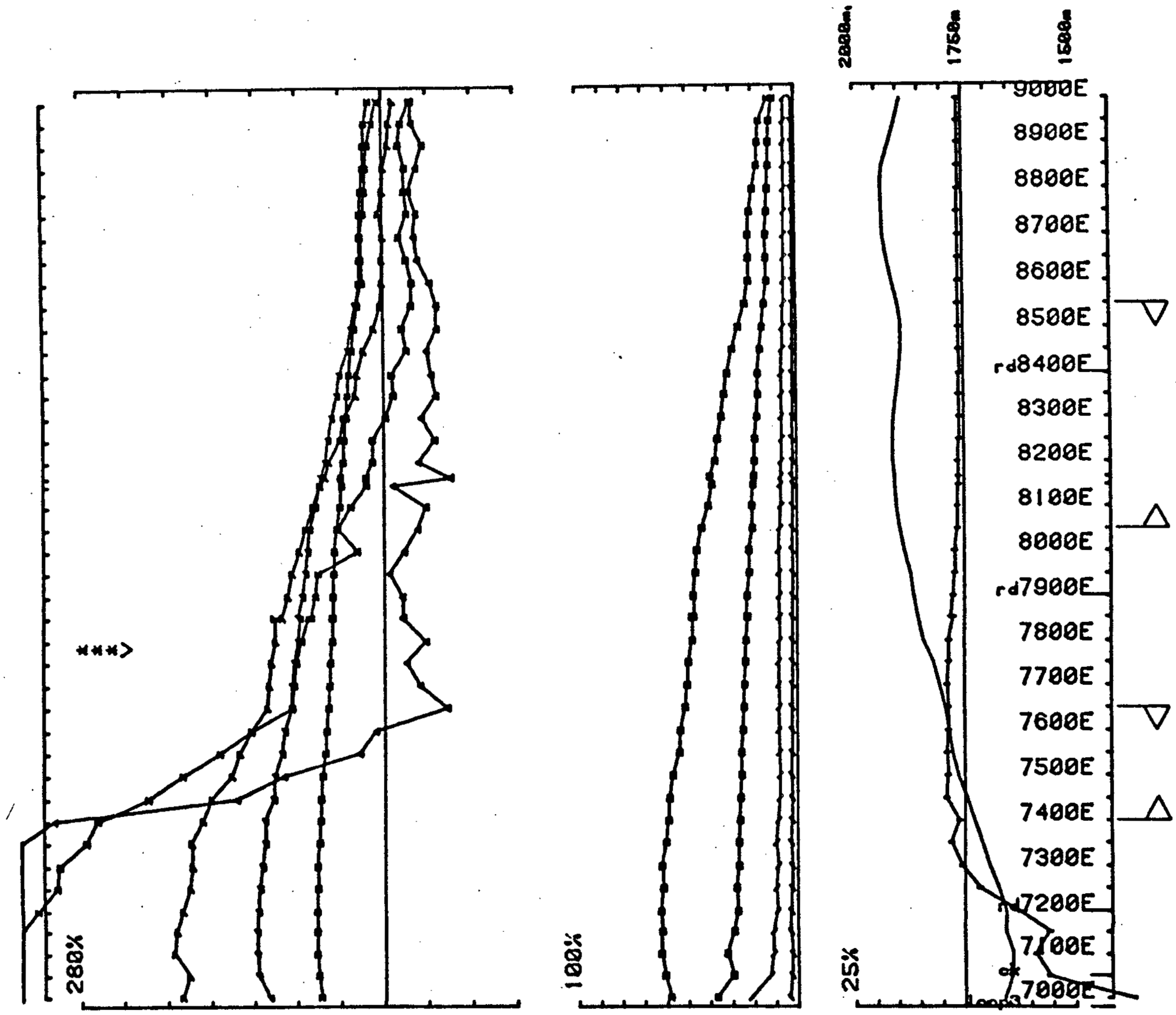
Loopno 3 Line 4500N component Hz secondary Ch I normalized Ch I reduced

DS 10a



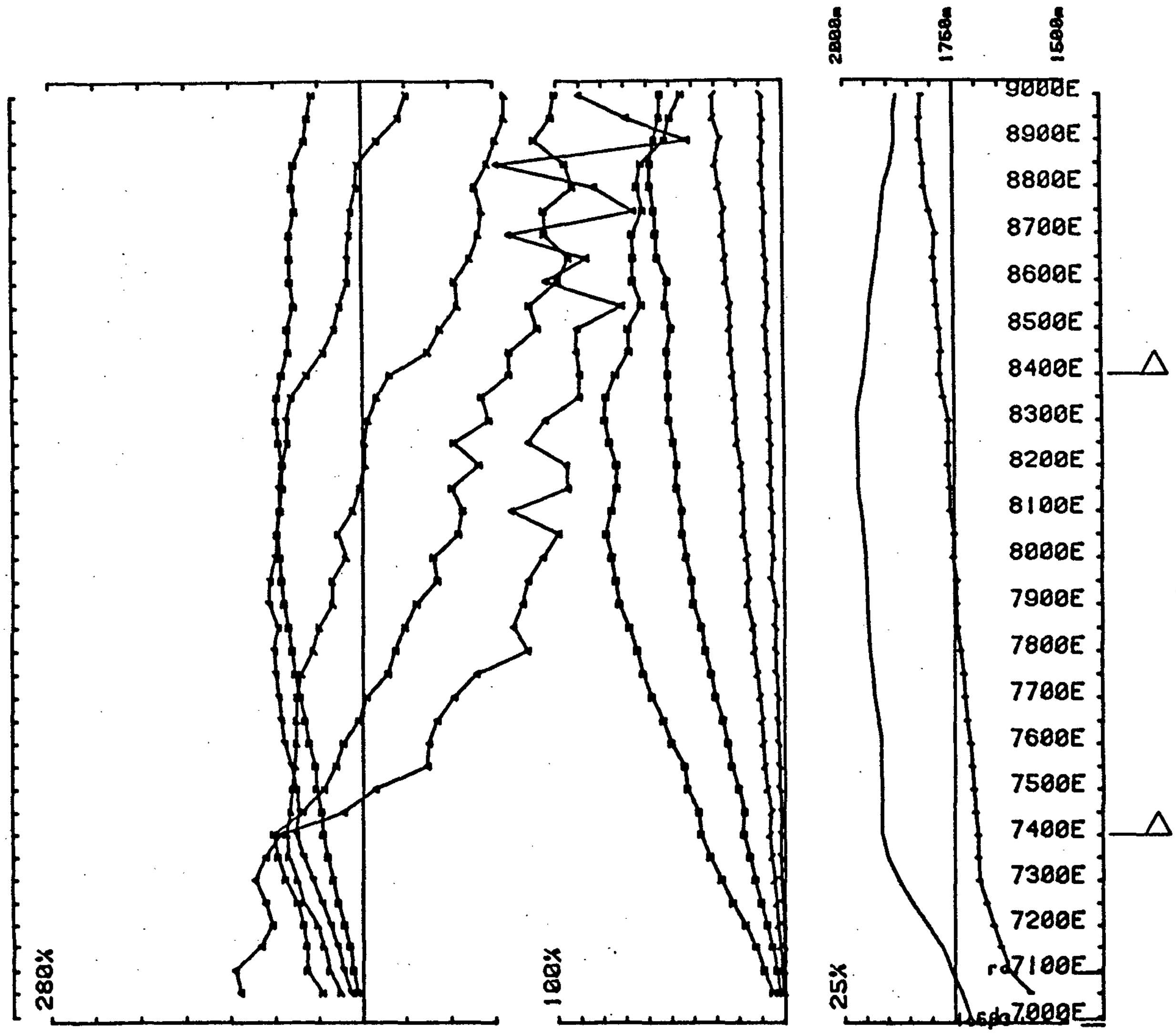
Area MATTHEW CREEK 1986 Cominco operator SJV & JV freq(hz) 30.974
Loopno 3 Line 5000N component Hz secondary Ch I normalized Ch I reduced

DS 11



Area MATTHEW CREEK 1986 Cominco operator SJV & JV freq(hz) 30.974
Loopno 3 Line 5000N component Hz secondary Ch 1 normalized Ch 1 reduced

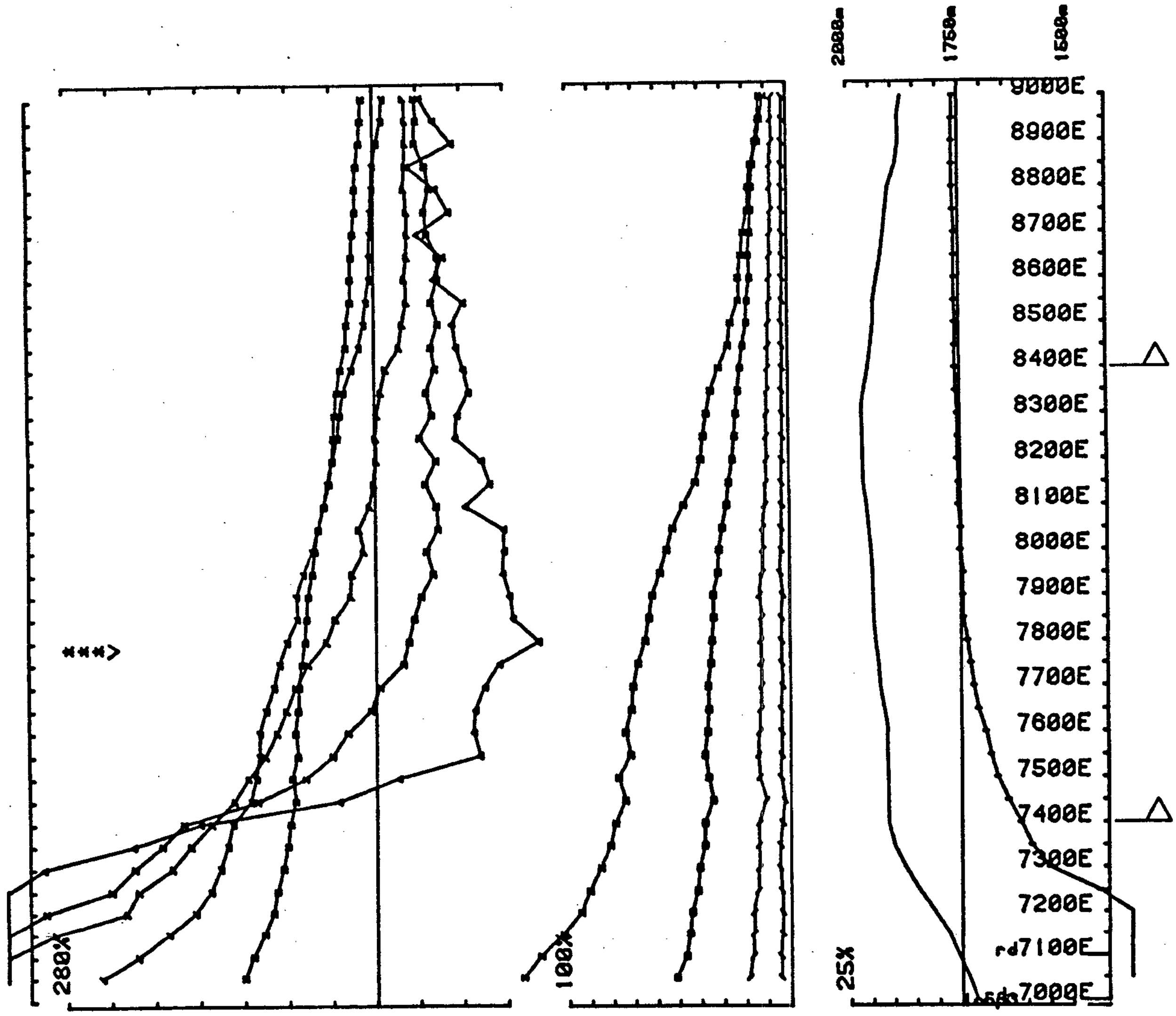
DS 11a



Area MATTHEW CREEK 1986 Cominco operator SJV & JV freq(hz) 30.974

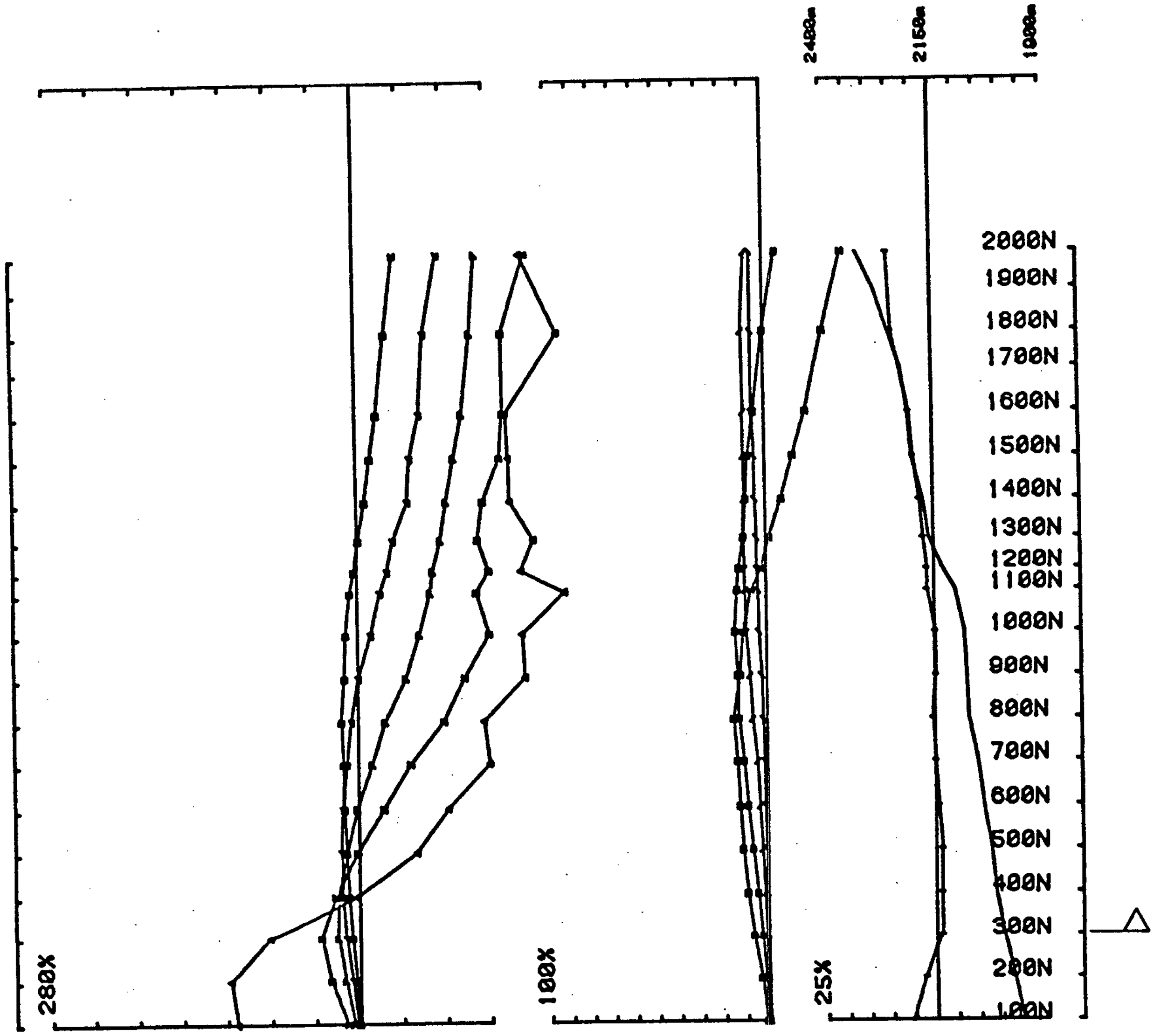
Loopno 3 Line 5500N component Hz secondary Ch I normalized Ch I reduced

DS 12



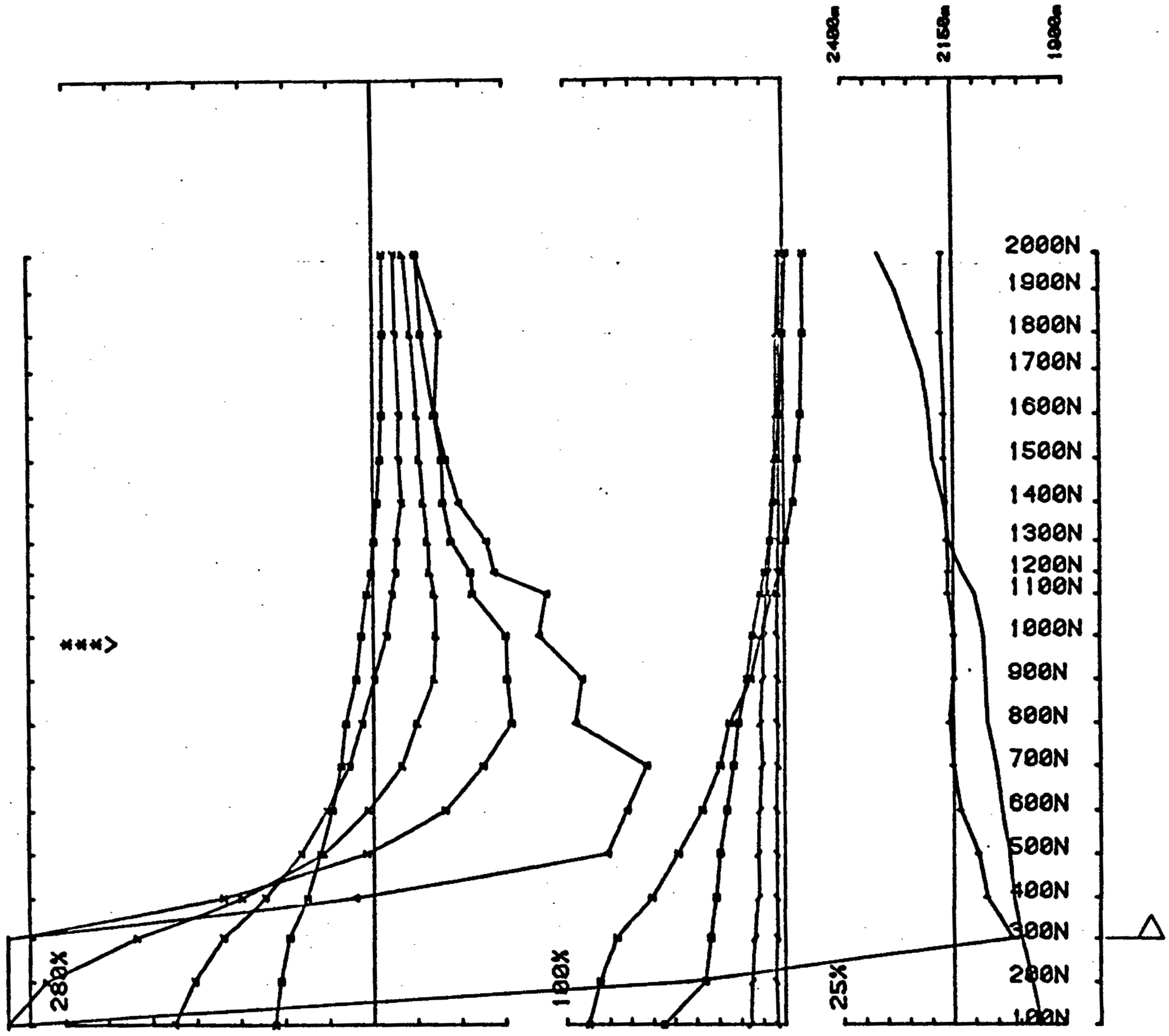
Area MATTHEW CREEK 1986 Cominco operator SJV & JV freq(hz) 30.974
Loopno 3 Line 5500N component Hz secondary Ch 1 normalized Ch 1 reduced

DS 12a



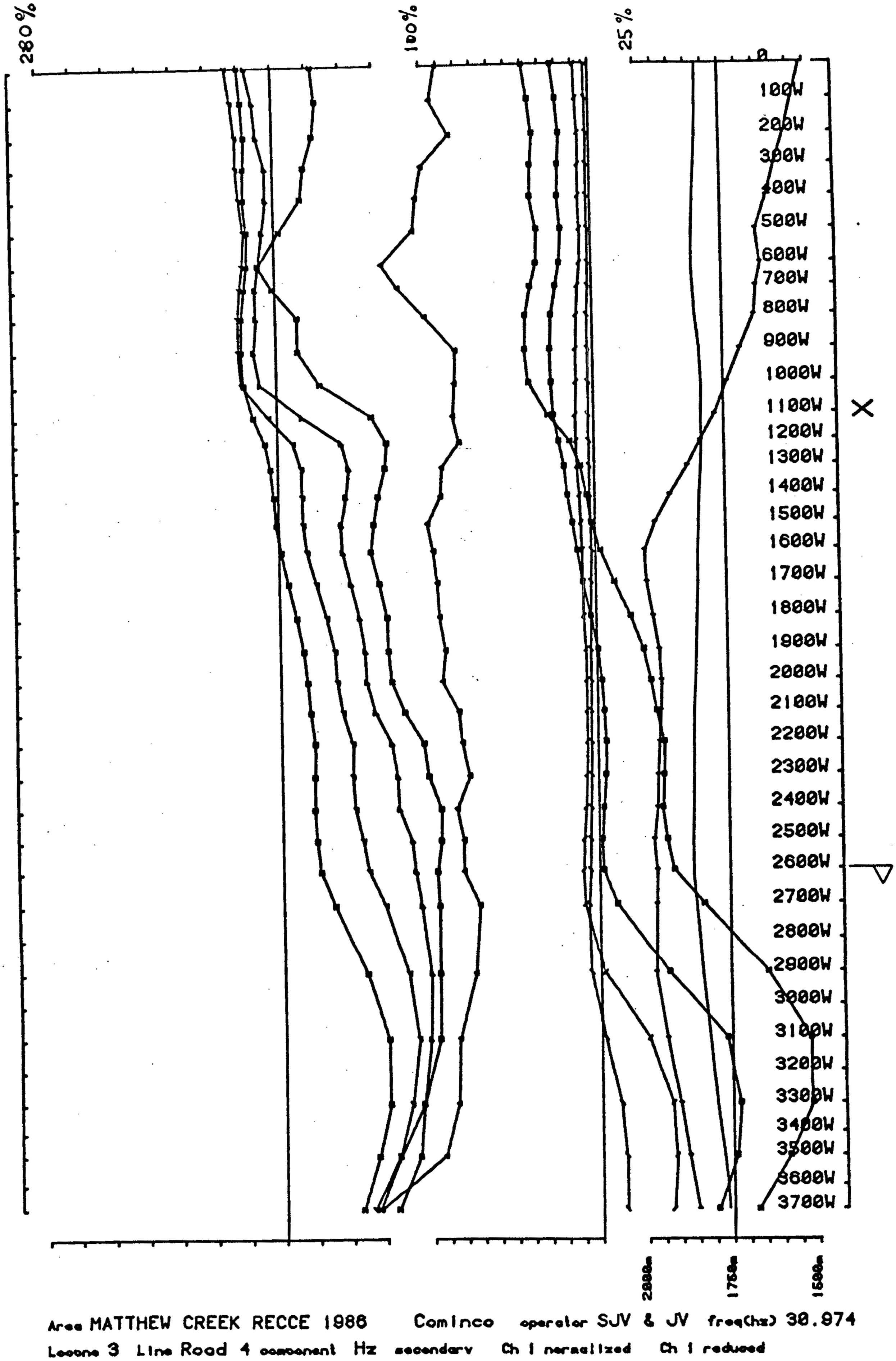
Area MATTHEW CREEK RECCE 1986 Cominco operator SJV &JV freq(hz) 30.974
Loopno 2 Line Fire Break R1 component Hz secondary Ch I normalized Ch I reduced

DS 13



Area MATTHEW CREEK RECCE 1986 Cominco operator SJV &JV freq(hz) 30.974
Loopno 2 Line Fire Break R1 component Hz secondary Ch 1 normalized Ch 1 reduced

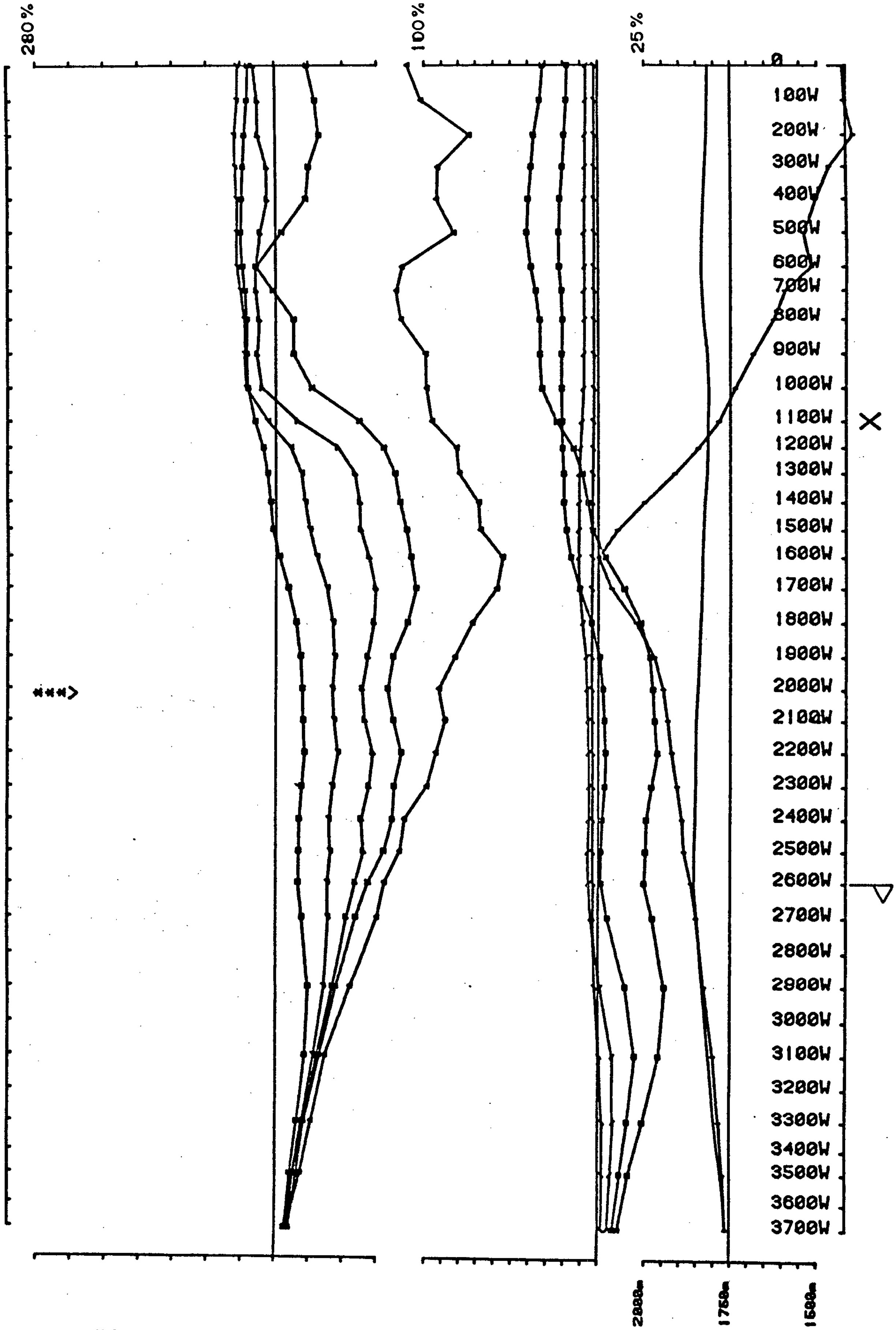
DS 13a



Area MATTHEW CREEK RECCE 1986 Cominco operator SJV & JV freq(hz) 30.974

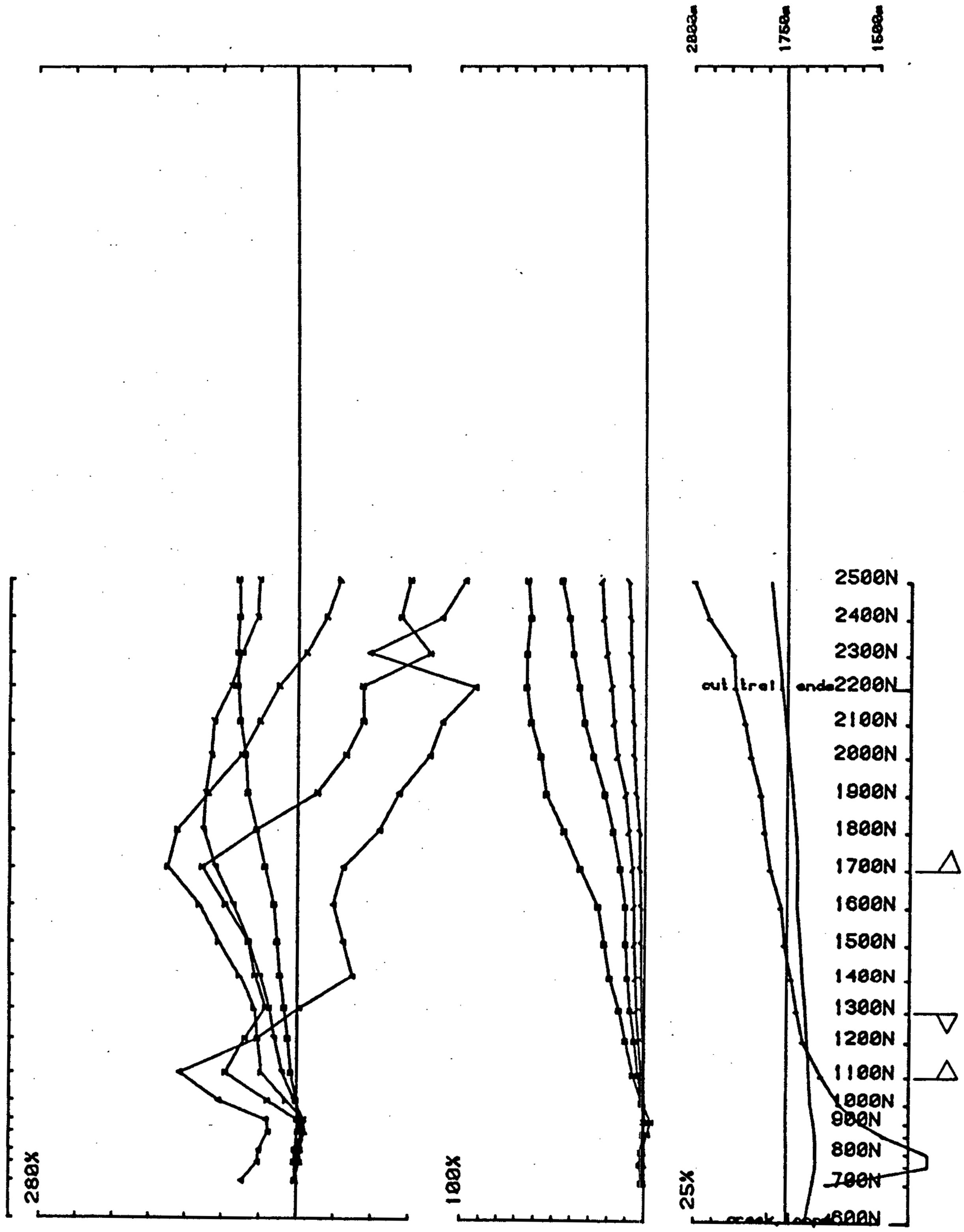
Loocns 3 Line Road 4 component Hz secondary Ch I normalized Ch I reduced

DS 14



Area MATTHEW CREEK RECCE 1986 Cominco operator SJV & JV freq(hz) 30.974
Loeone 3 Line Road 4 component Hz secondary Ch 1 normalized Ch 1 reduced

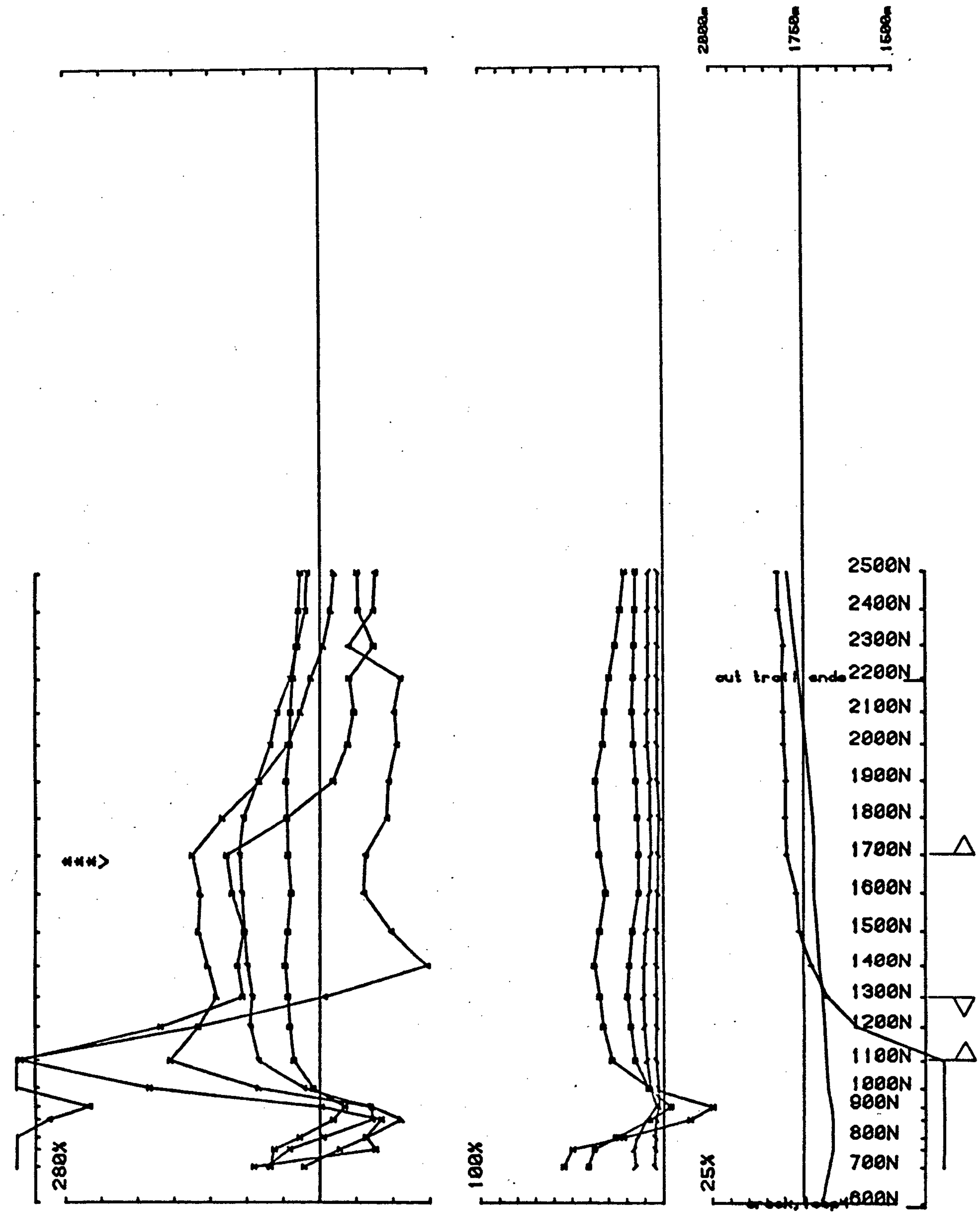
DS 14a



Area MATTHEW CREEK RECCE 1986 Cominco operator SJV & JV freq(hz) 30.974

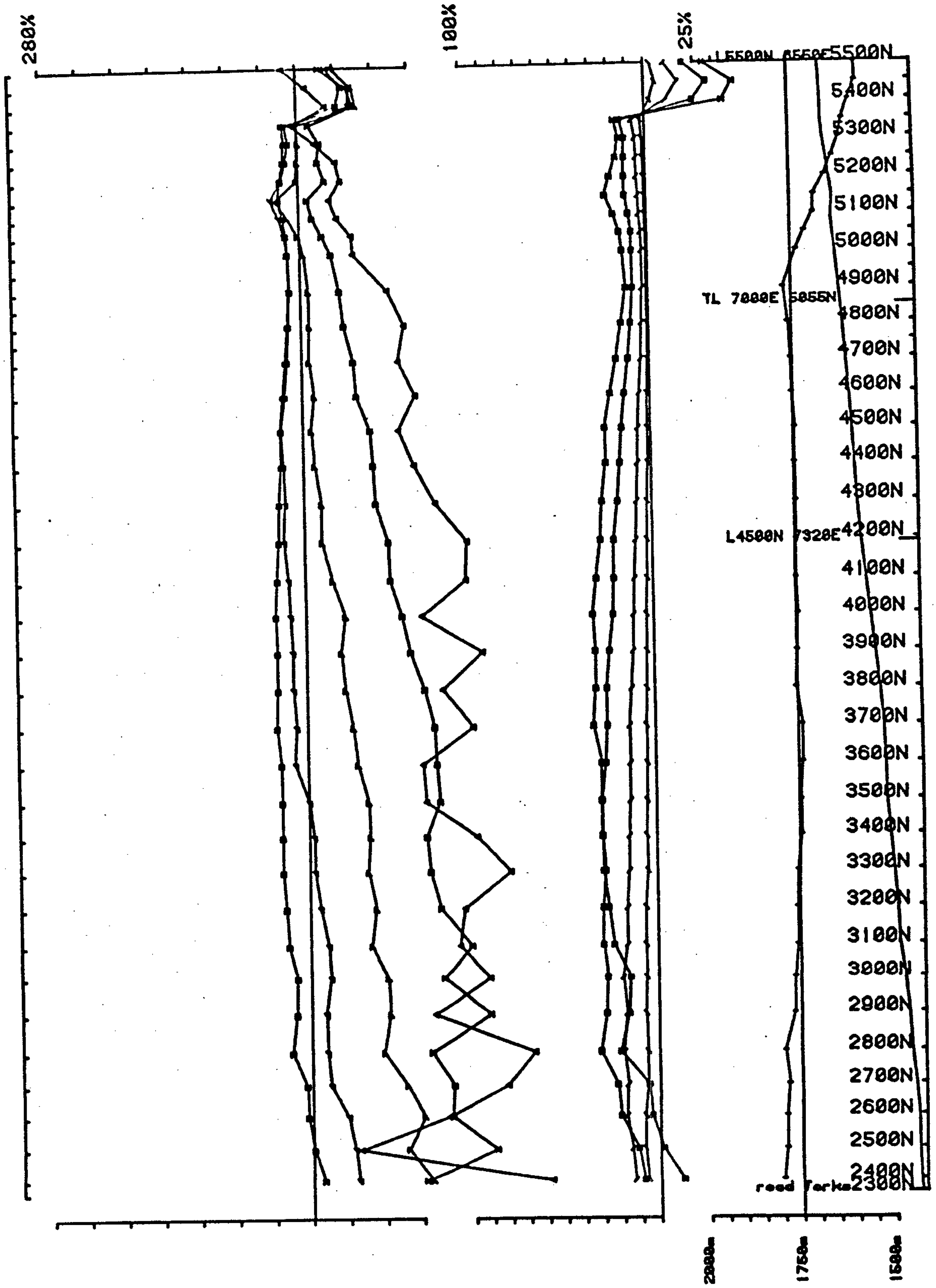
Loopno 4 Line Trail R2 component Hz secondary Ch I normalized Ch I reduced

DS 15

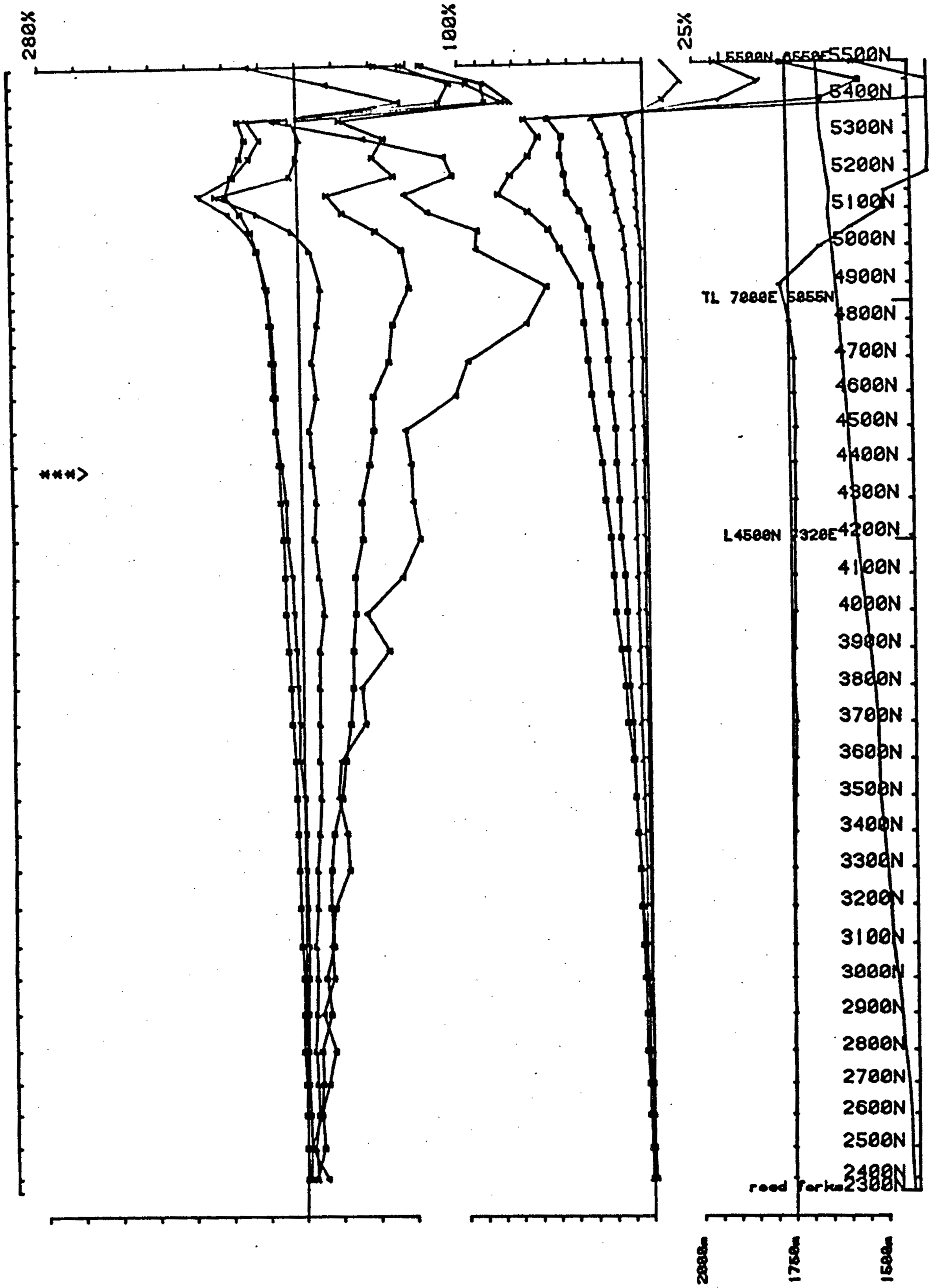


Area MATTHEW CREEK RECCE 1986 Cominco operator SJV & JV freq(hz) 30.974
Loopne 4 Line Trail R2 component Hz secondary Ch I normalized Ch I reduced

DS 15a



Area MATTHEW CREEK RECCE 1986 Cominco operator SJV & JV freq(hz) 30.974
Loopno 4 Line Road 65 component Hz secondary Ch I normalized Ch I reduced



Area MATTHEW CREEK RECCE 1986 Cominco operator SJV & JV freq(hz) 30.974

Loopno 4 Line Road 65 component Hz secondary Ch I normalized Ch I reduced

DS 16a

APPENDIX III

APPENDIX III

IN THE MATTER OF THE B.C. MINERAL ACT

AND IN THE MATTER OF A GEOPHYSICAL PROGRAMME

CARRIED OUT ON MAT 71 GROUP OF CLAIMS

LOCATED 7 KM WEST OF KIMBERLEY, B.C.

IN THE FORT STEELE MINING DIVISION OF

PROVINCE OF BRITISH COLUMBIA, MORE PARTICULARLY

N.T.S.: 82F/9

S T A T E M E N T

I, SYD J. VISSER, OF THE MUNICIPALITY OF DELTA, IN THE PROVINCE OF BRITISH COLUMBIA, MAKE OATH AND SAY:-

1) THAT I am employed as a geophysicist by S.J.V. Consultants Ltd., on contract with Cominco Ltd. and as such have a personal knowledge of the facts to which I hereinafter depose;

2) THAT annexed hereto and marked as "EXHIBIT "A" to this statement is a true copy of expenditures incurred on a geophysical survey on the MAT 71 group of mineral claims;

3) THAT the said expenditures were incurred for the purpose of mineral exploration of the above-noted claims in the period between the 24th day of July and 6th day of September, 1986.

Signed: [signature]

S.J. Visser, B.Sc.
Geophysicist
S.J.V. Consultants Ltd.

DECEMBER 1986

EXHIBIT "A"

STATEMENT OF GEOPHYSICAL EXPENDITURES - 1986

ON THE MAT 71 GROUP OF CLAIMS

UTEM SURVEY (SURFACE)

(1) SALARIES

a)	S.J. Visser, geophysicist 10 days @ $240/day	$ 2,400.00	
b)	J. Vyselaar, geophysicist 15 days @ $240/day	3,600.00	
c)	M.J. Davies, technician 10 days @ $115/day	1,150.00	
d)	N. Murphy, assistant 4 days @ $70/day	280.00	
e)	S. Kemp, assistant 9 days @ $80/day	720.00	
f)	D. Askey, assistant 2 days @ $75/day	150.00	$ 8,300.00

(2) OPERATING DAY CHARGES Note: This charge is applied for those days on which useful data are acquired, to cover cost of data compilation, drafting, interpretation and report

10 days @ $250/day	2,500.00

(3) EQUIPMENT RENTAL

UTEM 10 operating days @ $150/day	1,500.00

(4) EXPENSE ACCOUNTS

S.J. Visser	560.00	
J. Vyselaar	450.00	
M.J. Davies	310.00	1,320.00

Carried Forward 13,620.00

	Carried Forward	$ 13,620.00

(5) MISCELLANEOUS

Accommodation 12 days @ $50/day	600.00	
Truck Rental 2 x $40/day x 12 days	960.00	
Demobilization Cost	240.00	
Wire Usage	100.00	1,900.00
	Total	15,520.00
Less: Reduction for Work Done on 3 C.G. claims		355.00
	Total of UTEM Survey (Surface)	$ 15,165.00

DOWNHOLE BOREHOLE SURVEY

(1) SALARIES

a)	J.J. Lajoie, geophysicist 4 days @ $280/day	$ 1,120.00	
b)	S.J. Visser, geophysicist 7 days @ $240/day	1,680.00	
c)	M.J. Davies, technician 5 days @ $115/day	575.00	
d)	N. Murphy, assistant 4 days @ $70/day	280.00	
e)	S. Kemp, assistant 9 days @ $80/day	720.00	
f)	G. Allen, assistant 4 days @ $75/day	280.00	$ 4,655.00

(2) OPERATING DAY CHARGES Note: This charge is applied for those days on which useful data are acquired, to cover cost of data compilation, drafting, interpretation and report

4 days @ $250/day		1,000.00
	Carried Forward	$ 5,655.00

	Carried Forward		5,655.00

(3) EQUIPMENT RENTAL

Downhole UTEM	4 operating days @ $150/day		900.00

(4) EXPENSE ACCOUNTS

J.J. Lajoie	255.00	
S.J. Visser	260.00	
M.J. Davies	200.00	715.00

(5) MISCELLANEOUS

Accommodation	6 days @ $50/day	$ 300.00	
Truck Rental	6 days @ $40/day	240.00	
Shipping Downhole Equipment		370.00	
Wire Usage		75.00	985.00
	Total of Downhole UTEM Survey		$ 8,255.00

TOTAL OF UTEM SURVEY (SURFACE) & DOWNHOLE UTEM SURVEY		$ 23,420.00
LINECUTTING CHARGES	$ 4,950.00	
Less: Work Done on 3 C.G. Claims	350.00	
Total Linecutting Charges		$ 4,600.00
TOTAL EXPENDITURES		$ 28,020.00

I certify this to be a true Statement of Expenditures for the geophysical surveys on the Mat 71 Group of Claims in 1986.

S.J. Visser, B.Sc.
Geophysicist
S.J.V. Consultants Ltd.

DECEMBER 1986

APPENDIX IV

APPENDIX IV

CERTIFICATION

I, SYD J. VISSER, of 8081 - 112th Street, in the Municipality of Delta, in the Province of British Columbia, do hereby certify:-

1) THAT I graduated from Haileybury School of Mines in 1971 as a Mining Technician and from the University of British Columbia in 1981 with Honours B.Sc. in Geophysics and Geology.

2) THAT I have worked in mineral exploration since 1968.

S.J. Visser, B.Sc.
Geophysicist
S.J.V. Consultants Ltd.

DECEMBER 1986

Distribution:

Kootenay Exploration
Western District
Exploration Administration
Victoria

ADMIN

COMINCO LTD

EXPLORATION WESTERN DISTRICT

NTS: 82F/9

1986 NORTH STAR HILL DETAIL

UTEM SURVEY

Latitude: 49° 40'N

Longitude: 116° 00'W

Work Performed by: SYD VISSER and JIM VYSELAAR

Claim Owner and Operator: COMINCO LTD.

JANUARY 1987

JULES J. LAJOIE

TABLE OF CONTENTS

COMINCO LTD.

EXPLORATION WESTERN DISTRICT

INTRODUCTION

The 1986 North Star Hill Utem detail survey grid is located immediately southwest of Kimberley, B.C., as shown in the Location map (Plate 316-86-1). The grid on a topographic base map is shown in Plate 316-86-2. Access to the grid is via a road from the Kimberley ski hill which is north of the survey area.

The detail grid is underlain by rocks of the Lower Aldridge Formation. The North Star deposit occurs 500 metres directly north of the northern boundary of the detail grid. The latter is along the North Star corridor mineralized trend.

The objective of the detail Utem survey described herein is to outline a Utem anomaly discovered in the 1985 Sullivan Ski Hill Utem survey (Lajoie, 1986), called conductor J.

6.25 line kilometres of inside loop Utem surveying were completed, mostly at a station interval of 25 metres and line spacing of 50 metres.

FIELD WORK

The field work was performed by geophysicists Syd Visser and Jim Vyselaar during the period Oct 14 to 18, 1986. As shown in the Compilation Map (Plate 316-86-2), eight lines were surveyed inside the loop.

Unfortunately, chainage on each of the detail lines was not started from tie line 1500E, and so station 1500E does not correspond always to tie line 1500E.

DESCRIPTION OF THE UTEM SYSTEM

UTEM is an acronym for "University of Toronto ElectroMagnetometer". The system was developped by Dr.

Y. Lamontagne (1975) while he was a graduate student of that university.

The field procedure consists of first laying out a large loop of single strand insulated wire and energizing it with current from a transmitter which is powered by a motor generator. Survey lines are generally oriented perpendicular to one side of the loop and surveying can be performed both inside and outside the loop.

The transmitter loop is energized with a precise triangular waveform at a carefully controlled frequency (30.974Hz for this survey). The receiver system includes a sensor coil and backpack portable receiver module which has a digital recording facility on cassette magnetic tape. The time synchronization between transmitter and receiver is achieved through quartz crystal clocks in both units which must be accurate to about one second in fifty years.

The receiver sensor coil measures the vertical component of the electromagnetic field and responds to its time derivative. Since the transmitter current waveform is rectangular, the receiver coil will sense a perfect square wave in the absence of geologic conductors. Deviations from a perfect square wave are caused by electrical conductors which may be geologic or cultural in origin. The receiver stacks any pre-set number of cycles in order to increase the signal to noise ratio.

The UTEM receiver gathers and records 9 channels of information at each station. The higher number channels (7-8-9) correspond to short time or high frequency while the lower number channels (1-2-3) correspond to long time or low frequency. Therefore, poor or weak conductors will respond on channels 9, 8, 7, and 6. Progressively better conductors will give responses on progressively lower number channels as well. For example, massive, highly conducting sulphides or graphite will produce a response on all nine channels.

It was mentioned above that the UTEM receiver records data digitally on a cassette. This tape is played back into a computer at the base camp. The computer processes the data and controls the plotting on an 11" x 15" graphics plotter. Data are portrayed on Data Sections as profiles of each of the nine channels, one section for each survey line.

DATA PRESENTATION

The results of this survey are presented in one compilation map (Plate 316-86-2) and 8 Data Sections which all face N, plus two Data Sections from the previous survey (Lajoie, 1986).

The maps are listed as follows:

Plate 316-86-1 (in text)	Location Map Scale 1:50,000
Plate 316-86-2 (in envelope)	Compilations Map Scale 1"=400'

A legend for the compilation map and data sections is included. The data sections are arranged in order of line number from 1000S to 1400S.

The magnetic field amplitudes from both the transmitter loop (primary field) and from the electric currents induced in the ground (secondary field) vary considerably from the beginning of a line near the transmitter loop wire, to the middle of the transmitter loop. To present such data, a normalizing scheme must be used. In this survey, the primary field from the loop is used for normalizing and presenting the data according to the following schemes:

1. Continuously normalized plots.

   This is the standard normalization scheme.

   a) For channel 1:

   $$\% \text{ Ch.1 anomaly} = \frac{\text{Ch.1} - P}{P} \times 100\%$$

   where P is the primary field from the loop at the station and Ch.1 is the observed amplitude for channel 1.

   b) The remaining channels (n=2 to 9) are channel 1 reduced and channel 1 normalized:

   $$\% \text{ Ch.n anomaly} = \frac{\text{Ch.n} - \text{Ch.1}}{\text{Ch.1}} \times 100\%$$

   where Ch.n is the observed amplitude of Channel n (n=2 to 9).

2. Point normalized plots.

These plots display an arrow at the top of the section indicating the station to which all data on the line are normalized. The purpose of point normalized plots is to display only the relative amplitude variation of the secondary field along the line, that is, only that magnetic field from the currents induced in the ground.

a) For Channel 1:

$$\% \text{ Ch.1 anomaly} = \frac{\text{Ch.1} - \text{Ppn}}{\text{Ppn}} \times 100\%$$

where Ppn is the primary field from the loop at the point norm station and Ch.1 is the observed amplitude for Channel 1.

b) The remaining channels (n=2 to 9) are channel 1 reduced and channel 1 normalized:

$$\% \text{ Ch.n anomaly} = \frac{\text{Ch.n} - \text{Ch.1pn}}{\text{Ch.1pn}} \times 100\%$$

where Ch.n is the observed amplitude of Channel n and Ch.1pn is the observed channel 1 amplitude at the point norm station.

Point normalized plots are usually produced on data sections containing anomalies to help interpretation by providing a different perspective to the data.

The above normalizing procedures result in chaining errors displayed in Channel 1 only.

INTERPRETATION

The data from this detail survey are shown in Data Sections 1 to 8 at the back of this report. Data Sections 9 and 11 are the respective Data Sections from the 1985 work and are included for discussion. The location of the transmitter loop and detail survey grid are shown in Plate 316-86-2. In Data Sections 1 to 8, the tie-line 1500E intersection with the grid line is shown on each Section; clearly, it does not occur at "station" 1500E on every line. Therefore, in the data compilations of Plate 316-86-2 and Figures 1 and 2, the anomaly locations are plotted with respect to TIE-LINE 1500E, assuming the latter is straight.

Conductor J which was discovered in the 1985 field work (Lajoie, 1986), shows up as a clear positive inside loop anomaly on all detail lines except for line 1400S. The extent of the anomaly is shown by a bar at the bottom of each Data Section, with channel 2 being the latest anomalous channel on most Sections. Figure 1 shows a computer contour plot of the residual channel 4 anomaly amplitude after removal of an estimated regional component. It clearly outlines the anomalous zone.

Line 1200S was chosen for model fitting using the Plate program. The results are shown in Figure 2, with an overlay containing the residual channel 2 to 5 field data. The model is a 325 by 162 metre plate with a conductance of 100 mhos, dip of 33 deg. E, and a depth to top at its shallowest of 78 metres. It is shown in section in Figure 2 under the Plate model results. The overlay to Figure 2 shows the residual field data which is seen to fit the model data very well. The overlay to Figure 1 shows the horizontal projection of the model, and the dashed oval shows the interpreted outline of the geologic source causing this anomaly. Looking at the contour plot of Figure 1 again, the sharpness of the southern edge of the anomaly compared to the broader northern tail suggests a plunge to the north.

A vertical drill hole is recommended to intersect the conductor near its center. It should be collared on line 1200S, 40 metres WEST of tie line 1500E, at picket 1525E. The estimated depth of intersection is 100 metres, but the hole should be planned for 160 metres, since the plate model may not be an accurate representation of the geologic source.

The results of the 1985 work on line 1000S are re-interpreted in light of this detail survey. In Data Section 9, the anomalous feature at 1500E was previously interpreted as a contact-type anomaly with less resistive rocks to the west. It is now recognized that a sloping background can be put through this feature (as shown in channel 5) producing a negative response similar to the response observed on line 1250S, thus agreeing with the detail results. Note that a flat body produces a negative anomaly outside the loop and a positive anomaly inside the loop with our present plotting convention.

The eastern edge of an anomaly is now recognized at the western end of lines 1150S to 1300S, in Data Sections 3 to 6. It is clearest in the point normalized sections (3a to 6a). It appears to be anomalous to channel 4. Returning to the 1985 work on this line, shown in Data Section 11, we can see in the vicinity of stations 1000E to 1100E a negative response in the early time channels on the top graph, and a lower than normal amplitude in the channel 1 to 5 data. This response explains the anomalous results observed in the detail data. Unfortunately, this was not picked up as an anomaly in the 1985 work, probably because it was not clearly defined and attention was focussed on conductor J further east. It nevertheless should be followed up.

Interpretation of the 1985 outside loop data (Lajoie,1986) had given a 150X150 metre plate at a depth to top of 55 metres. This differs from the present interpretation because only one line of data was available, and so strike length could not be determined. A greater strike length results in a larger anomaly on surface and so the body must be deeper to produce the same amplitude, hence the present depth interpretation of 78 metres.

CONCLUSIONS AND RECOMMENDATIONS

Conductor J of the 1985 Sullivan Ski Hill Survey was detailed with 6.25 km of inside loop surveying. A conductor with dimensions of about 300 by 150 metres was outlined, with a conductance of 100 mhos, dip 33 deg. E, and depth to top of 78 metres. A 160 metre vertical drill hole is recommended at picket 1525E on line 1200S, 40 metres west of tie line 1500E, to intersect the center of the conductor at an estimated depth of 100 metres.

The edge of a second anomaly was recognized at the western edge of the detail survey area, and it is recommended to extend the detail survey further west to outline this new zone.

cc: Victoria
Cominco Exploration:
Cranbrook
Western District
Administration

Report by:

Jules J. Lajoie, Ph.D., P.Eng.
Cominco Ltd.

REFERENCES

Lajoie, J. J., 1986, 1985 Sullivan Ski Hill Utem Survey: Cominco internal report.

Lamontagne, Y., 1975, Applications of wideband, time-domain EM measurements in mineral exploration: Ph.D. thesis, U. of Toronto.

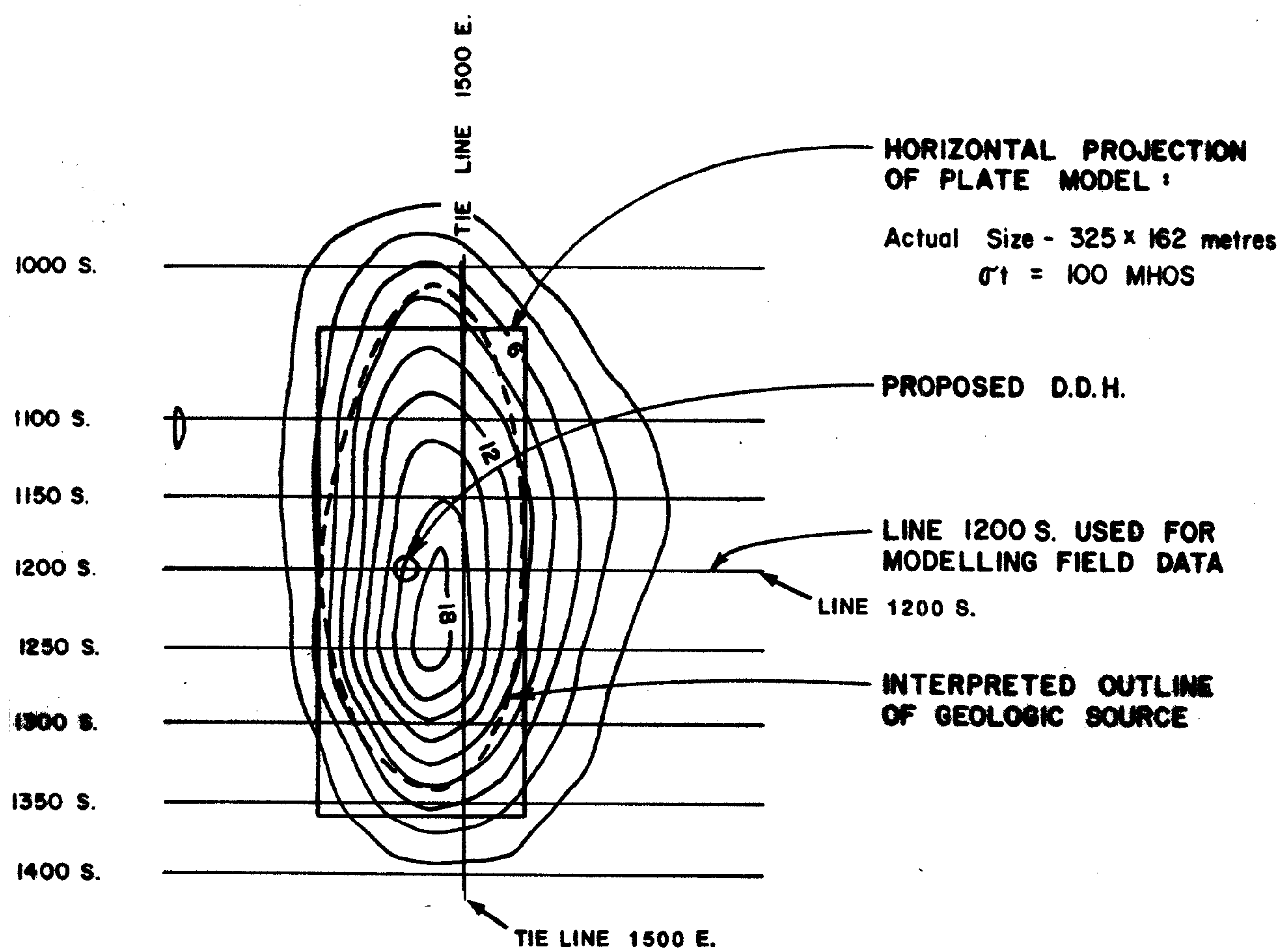
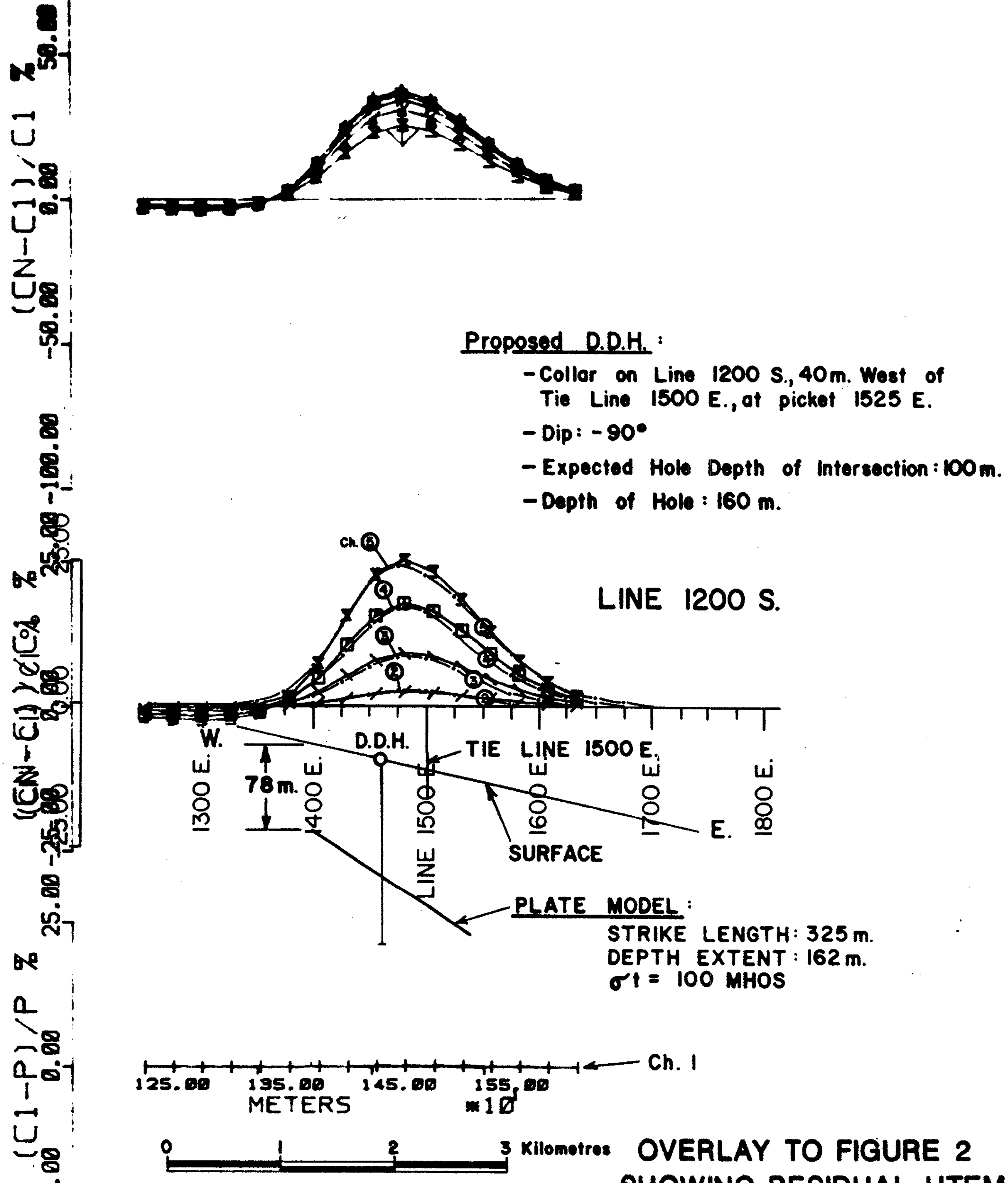


FIGURE 1
CONTOUR PLOT OF RESIDUAL CHANNEL
4 UTEM AMPLITUDE – CONDUCTOR J

Drawn by: J. J. L.		Traced by: a. m. b.		1986 NORTH STAR HILL DETAIL UTEM SURVEY
Revised by	Date	Revised by	Date	OVERLAY TO FIGURE 1 SHOWING BEST FIT PLATE MODEL AND INTERPRETED GEOLOGIC SOURCE

Scale: 1" = 400'	Date: Jan., 1987	Figure 1 Overlay



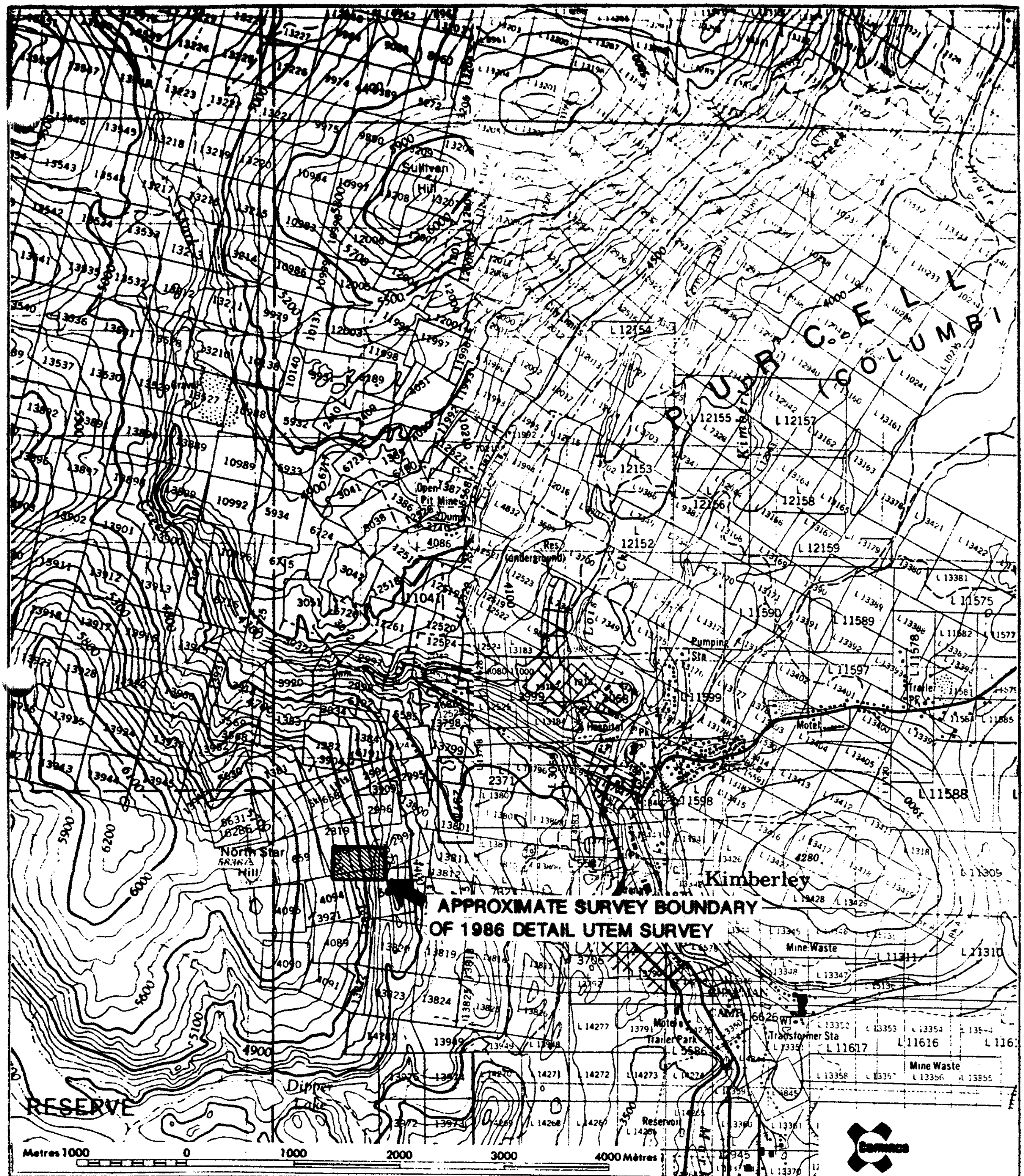
OVERLAY TO FIGURE 2
SHOWING RESIDUAL UTEM
CHANNELS 2 to 5 ON LINE 1200 S.

Drawn by: J. J. L.	Traced by: a. m. b.	1986 NORTH STAR HILL DETAIL UTEM SURVEY
Revised by / Date	Revised by / Date	SECTION: UTEM PLATE MODEL RESULTS OF CONDUCTOR J ON LINE 1200 S.

Scale: 1 : 5,000	Date: Jan., 1987	Figure 2

NCI 112A CL

210-0610



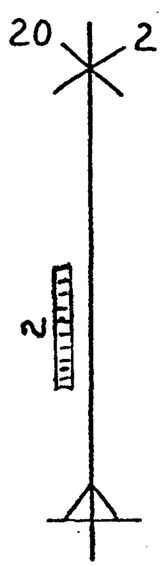
Drawn by:	Traced by:	
Revised by Date	Revised by Date	**1986 NORTH STAR HILL DETAIL UTEM SURVEY**
		GENERAL LOCATION MAP
		Scale: **1:50000** Date: **JAN., 1987** Plate **316-86-1**

LEGEND

UTEM COMPILATION MAP AND DATA SECTIONS

SYMBOL	CHANNEL	MEAN DELAY TIME
		30 Hz
|	1	12.8 ms
/	2	6.4
\	3	3.2
□	4	1.6
Σ	5	0.8
∆̸	6	0.4
7	7	0.2
⧖	8	0.1
△	9	0.05
◇	10	0.025

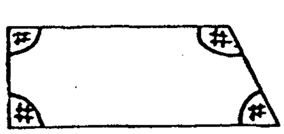
In the data sections, the upper graph contains Channels 9 to 5, the centre graph contains Channels 5 to 2, and the lower graph contains Channel 1. Station numbers are indicated along the abscissa. Elevations along the survey line are shown by the solid profile in the lower graph, the scale for which is the ordinate on the right hand side of the graph.



Axis of a crossover anomaly. The right superscript indicates the latest anomalous channel. The left superscript indicates depth to current axis in metres, or S = shallow depth, M = moderate depth and D = deep.

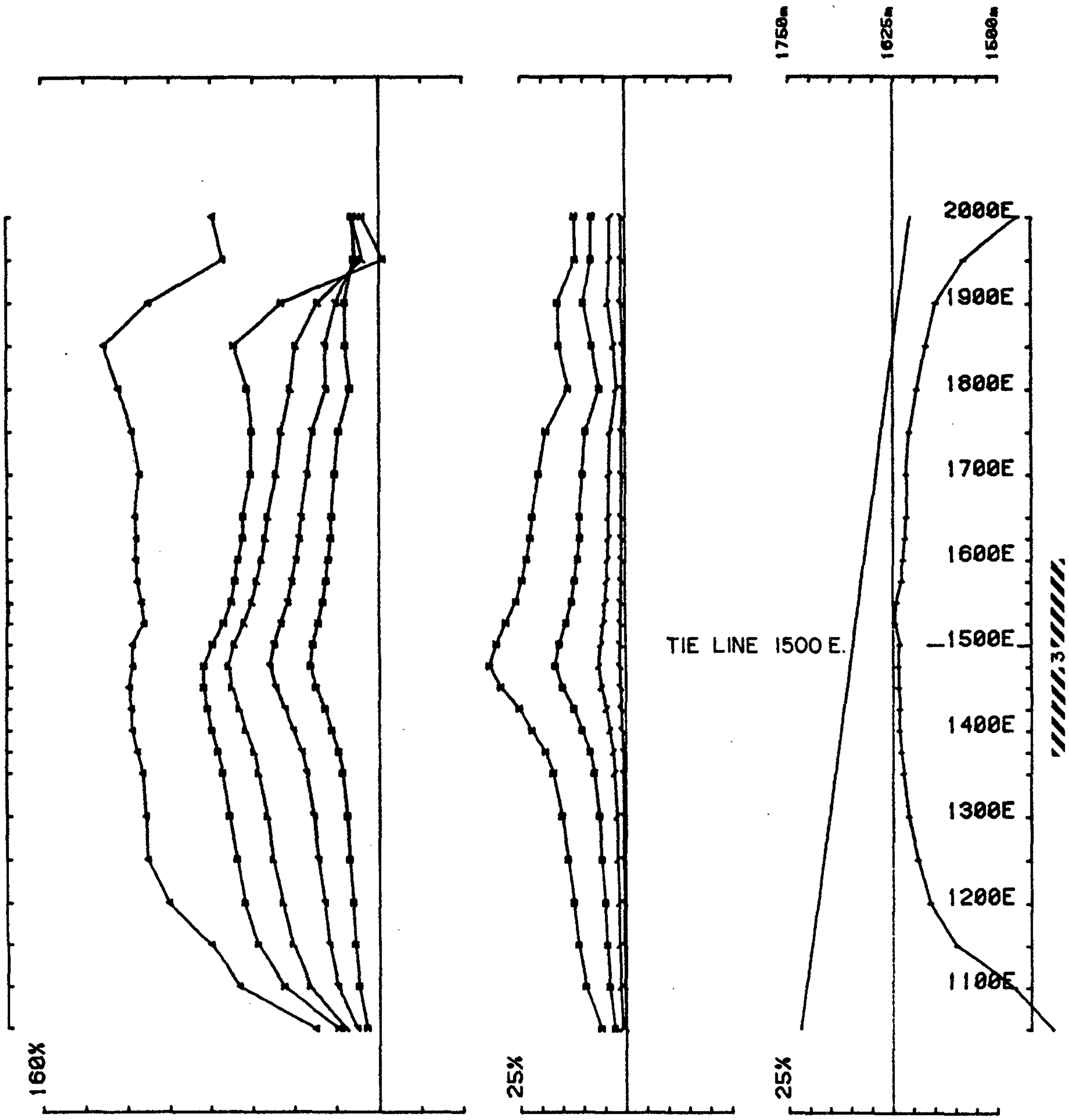
Indicates a negative anomaly of width shown by the dash. The latest anomalous channel is shown. Can sometimes be confused with the negative part of a crossover anomaly.

Indicates contact between two regions of differing resistivity. Arrow points to low resistivity zone.



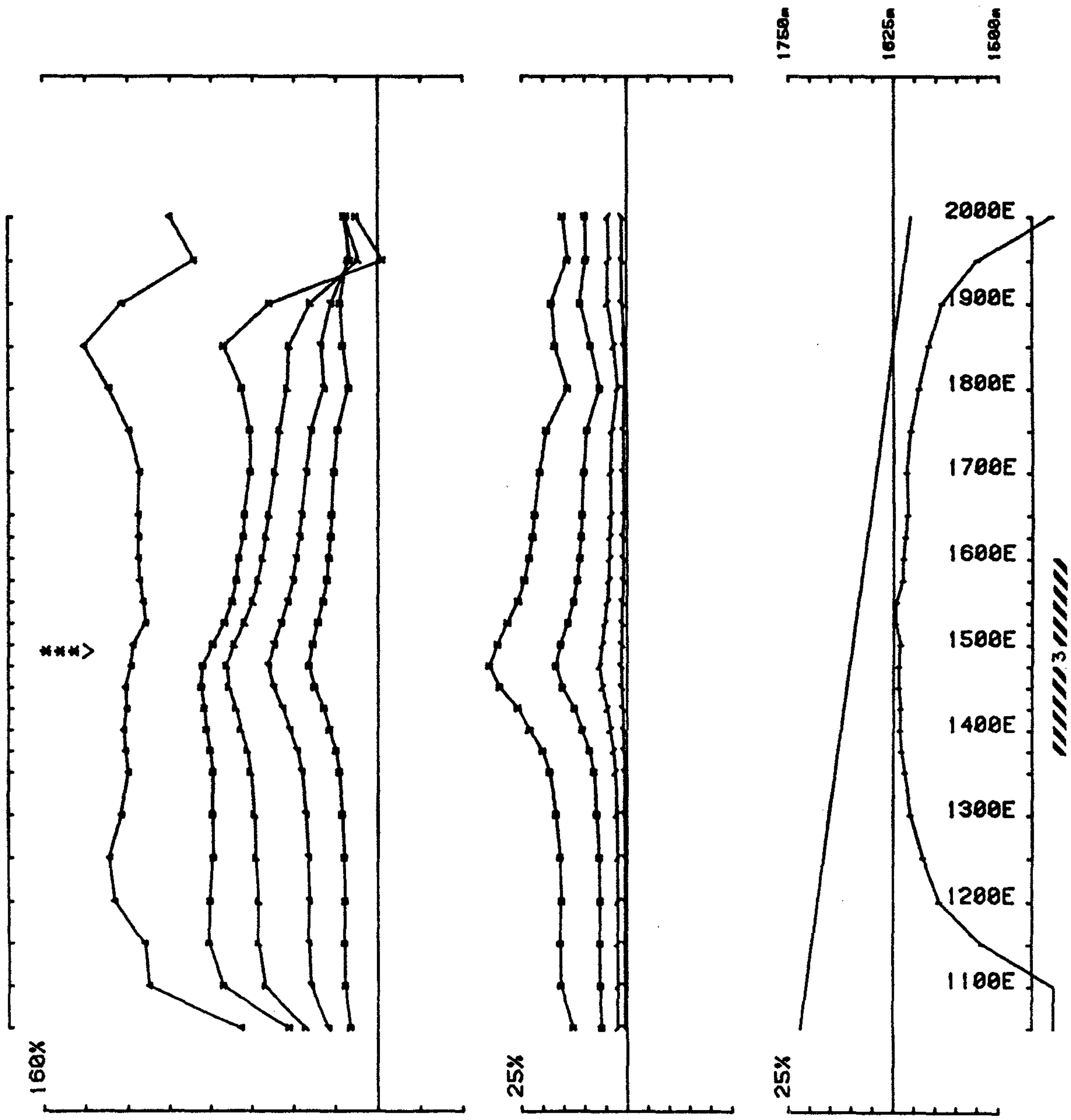
Outline of a transmitter loop

DATA SECTIONS



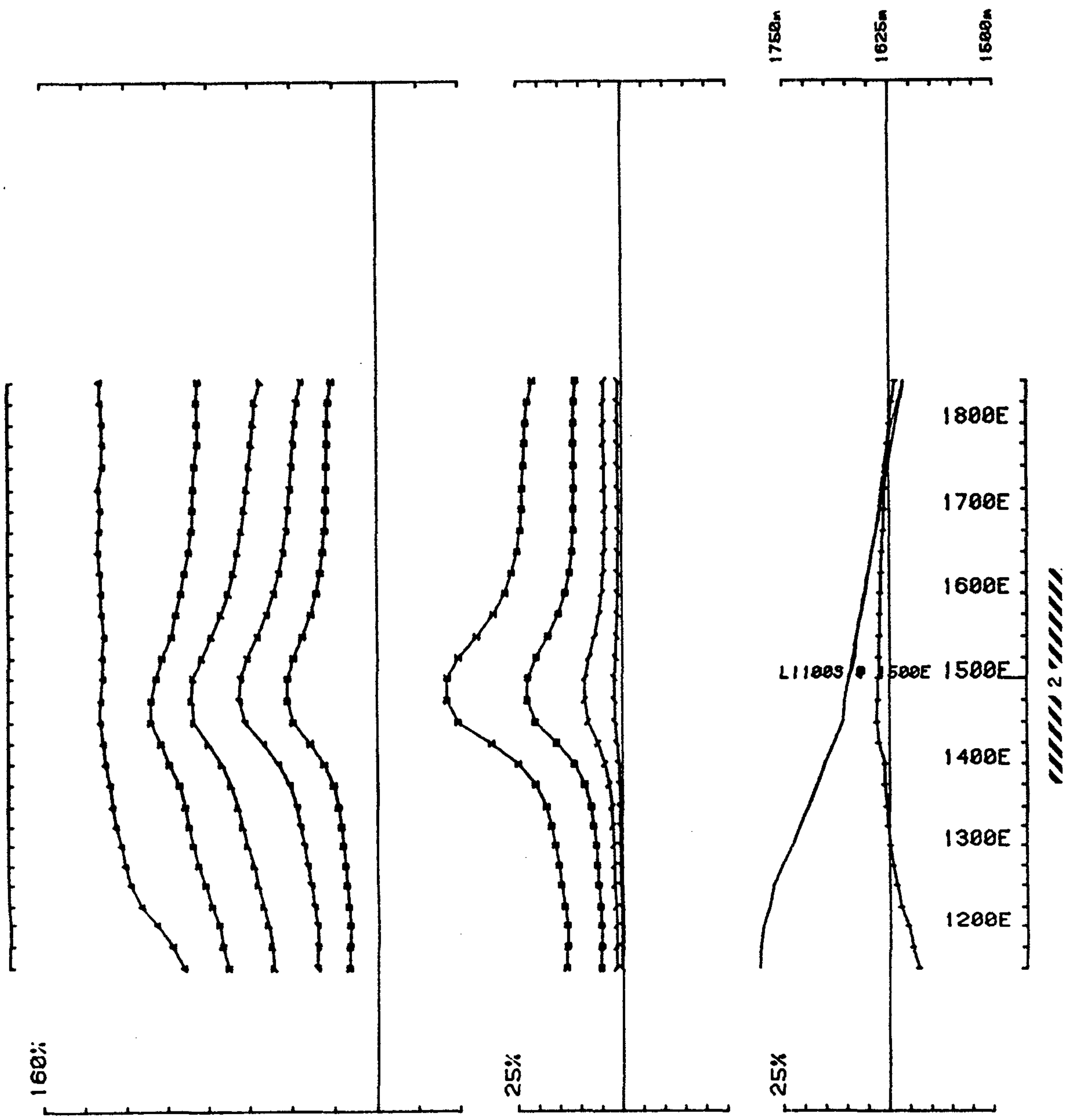
Area NORTH STAR HILL DETAIL 1986 Cominco operator SJV & JV freq(hz) 30.97
Loopno 1 Line 1000S component Hz secondary primary field normalized Ch 1 reduced

DS1



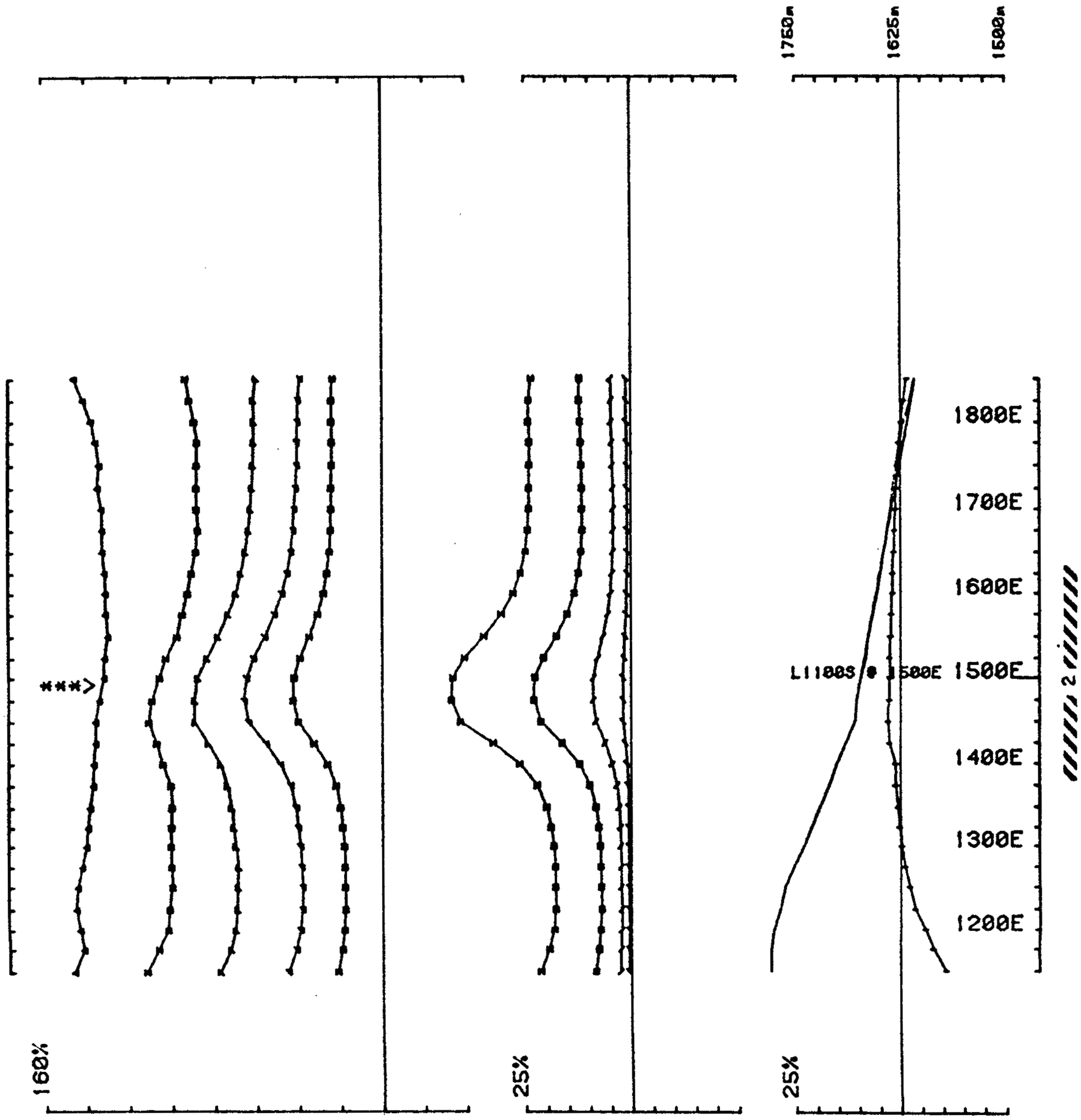
Area NORTH STAR HILL DETAIL 1986 Cominco operator SJV & JV freq(hz) 30.97
Loopno 1 Line 1000S component Hz secondary primary field normalized Ch 1 reduced

DS Ia



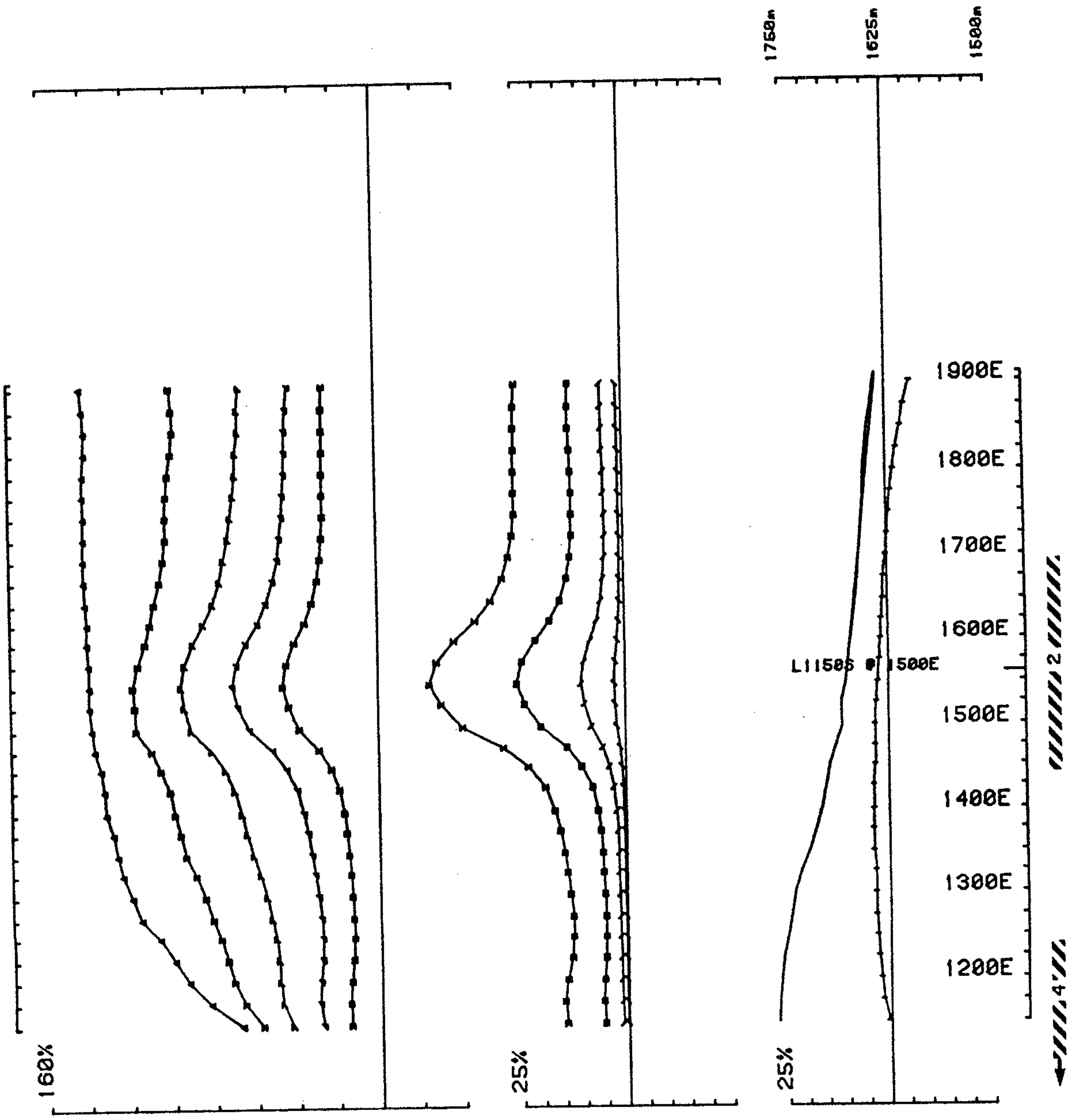
Area NORTH STAR HILL DETAIL 1986 Cominco operator SJV & JV freq(hz) 30.97
Loopno 1 Line 1100S component Hz secondary primary field normalized Ch 1 reduced

DS 2

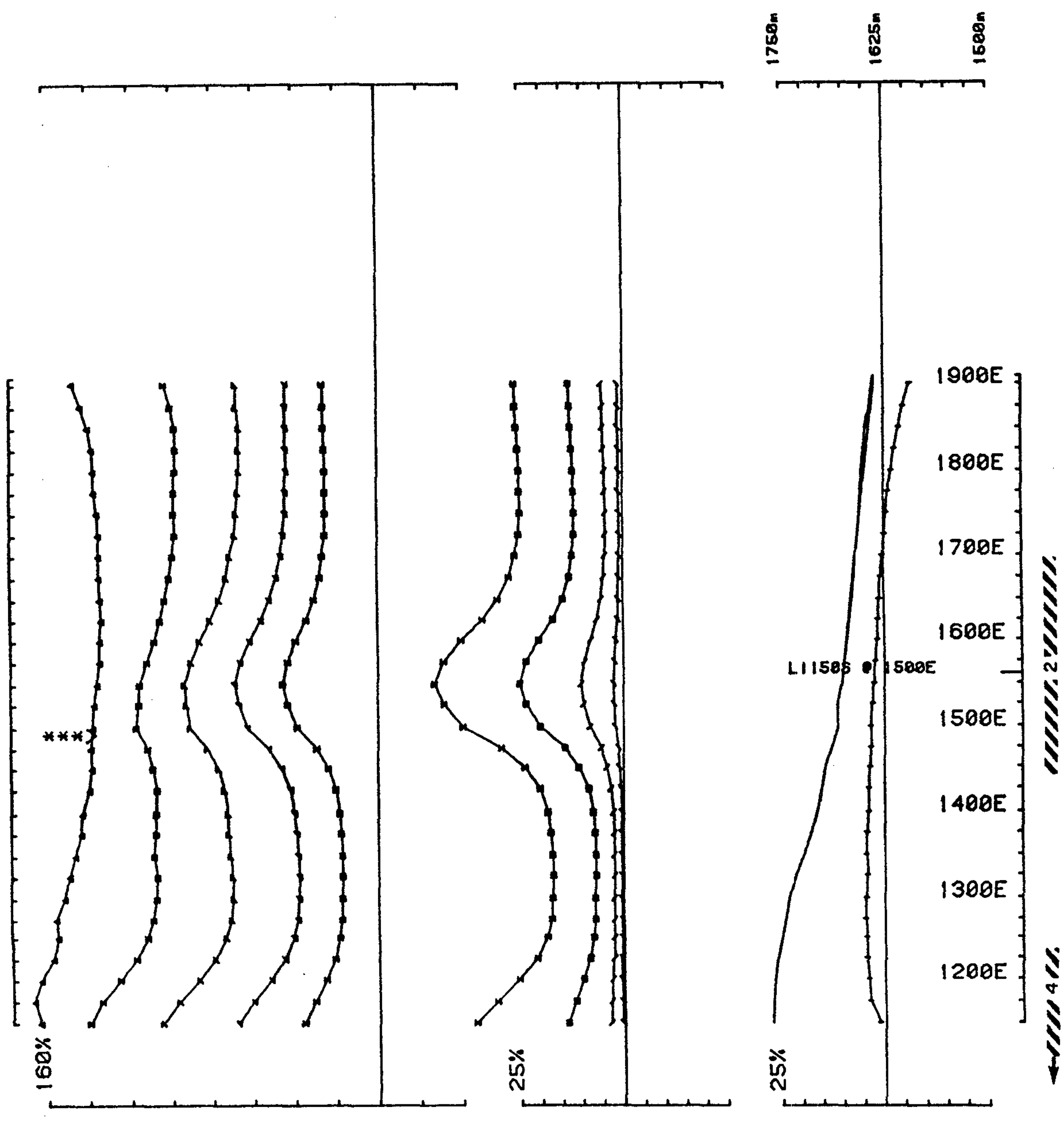


Area NORTH STAR HILL DETAIL 1986 Cominco operator SJV & JV freq(hz) 30.97
Loopno 1 Line 1100S component Hz secondary primary field normalized Ch 1 reduced

DS 2a

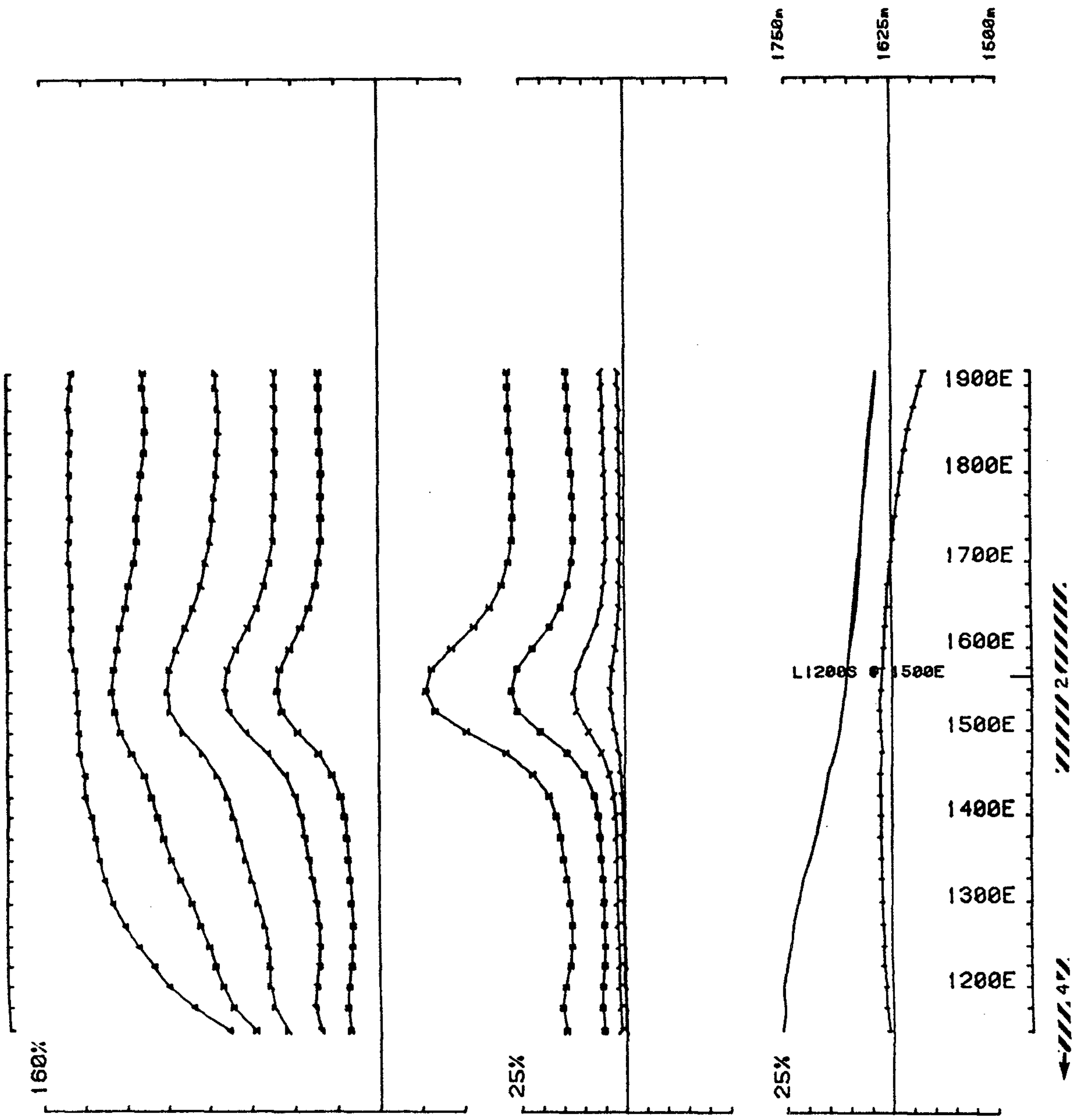


Area NORTH STAR HILL DETAIL 1986 Cominco operator SJV & JV freq(hz) 30.97
Loopno 1 Line 1150S component Hz secondary primary field normalized Ch 1 reduced

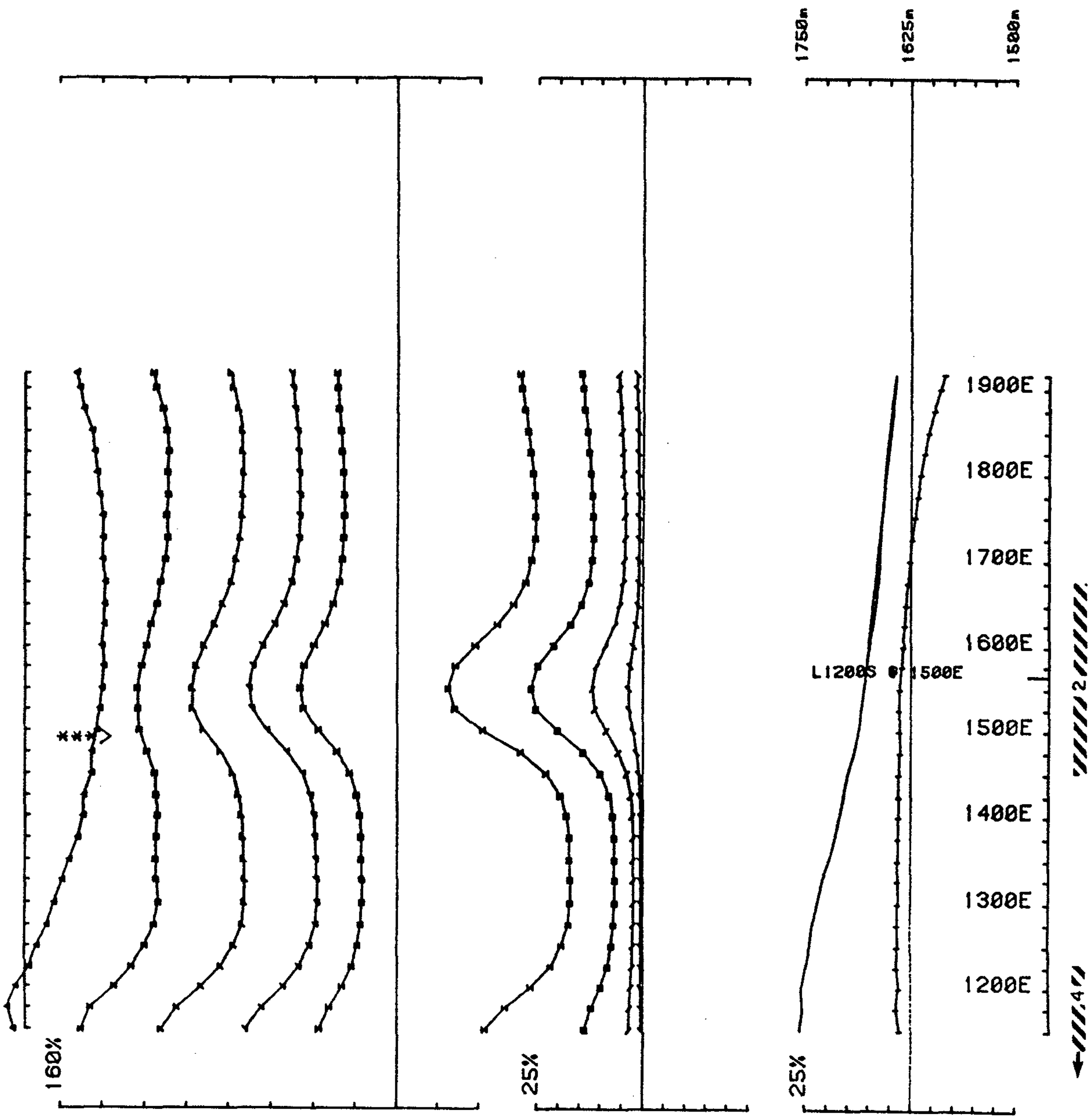


Area NORTH STAR HILL DETAIL 1986 Cominco operator SJV & JV freq(hz) 30.97
Loopno 1 Line 1150S component Hz secondary primary field normalized Ch 1 reduced

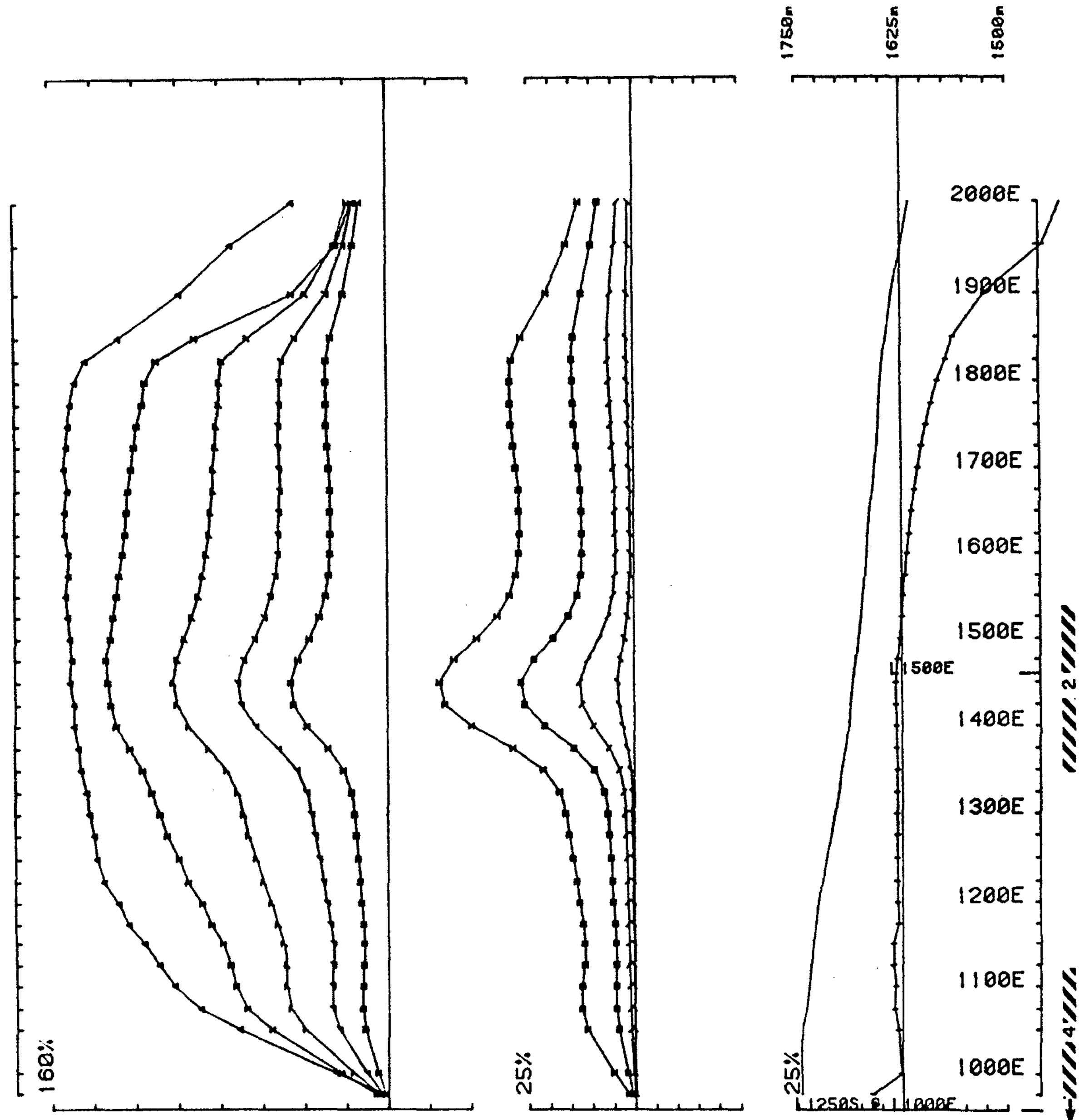
DS3a



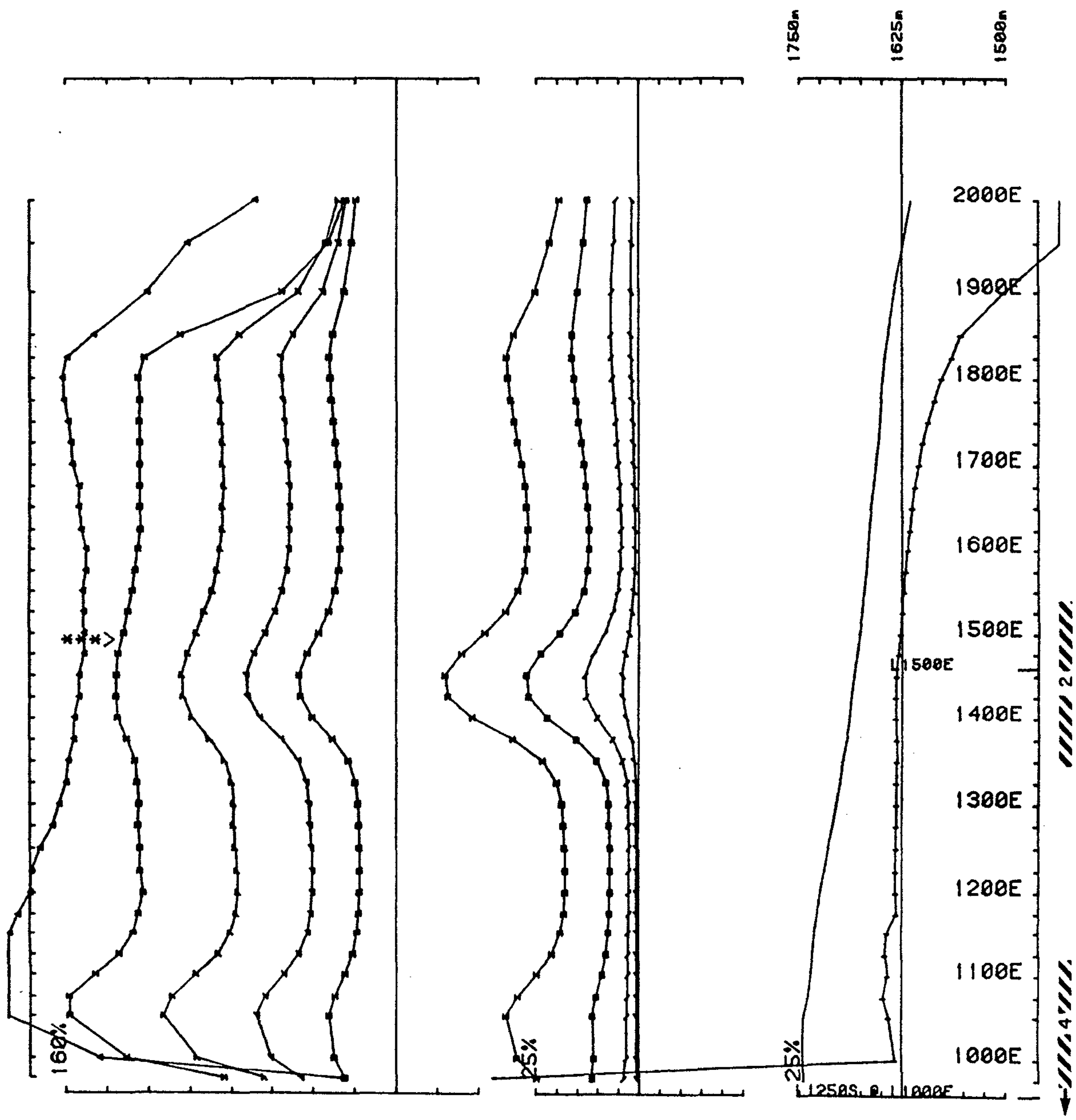
Area NORTH STAR HILL DETAIL 1986 Cominco operator SJV & JV freq(hz) 30.97
Loopno 1 Line 1200S component Hz secondary primary field normalized Ch 1 reduced



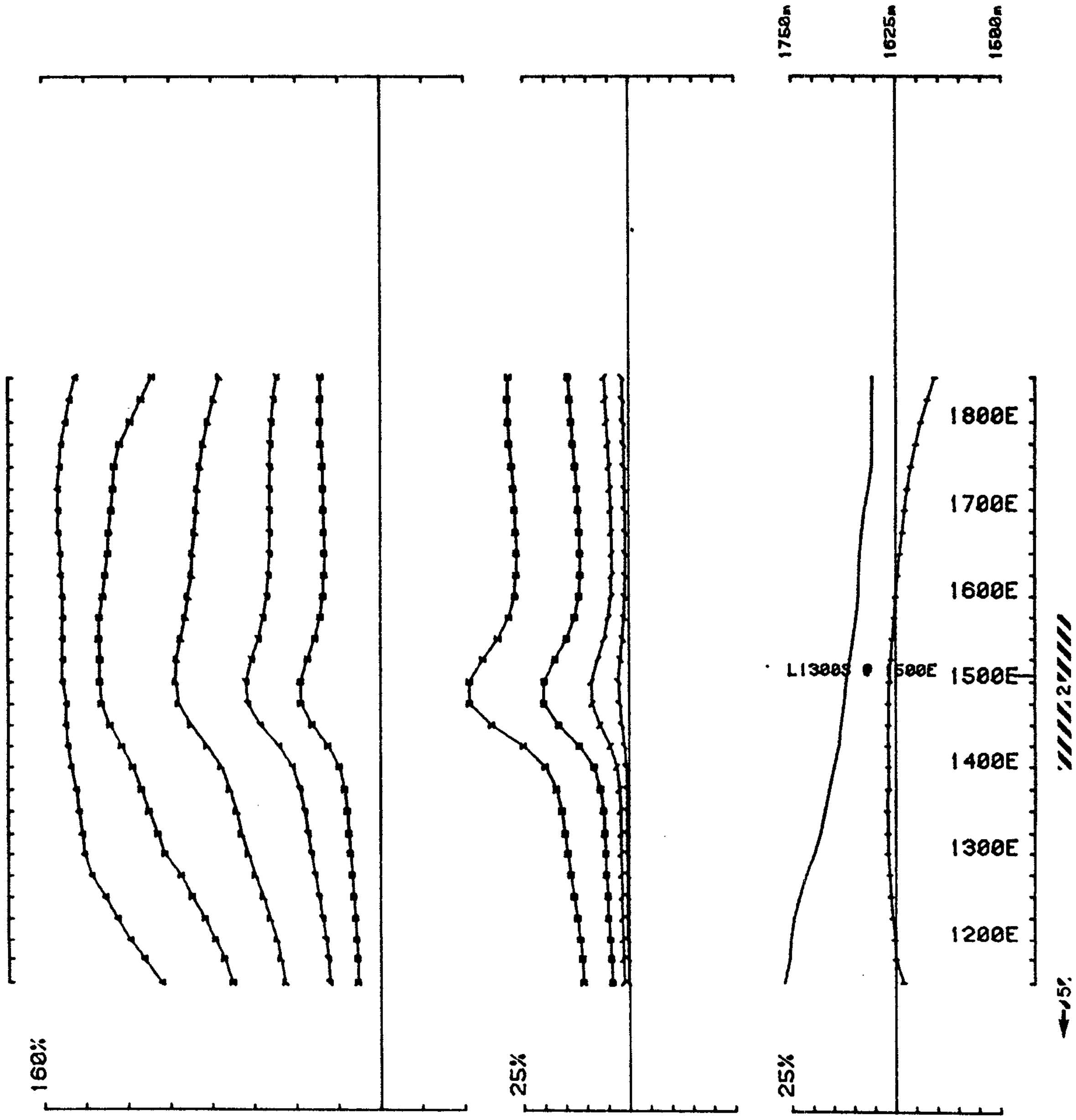
Area NORTH STAR HILL DETAIL 1986 Cominco operator SJV & JV freq(hz) 30.97
Loopno 1 Line 1200S component Hz secondary primary field normalized Ch 1 reduced



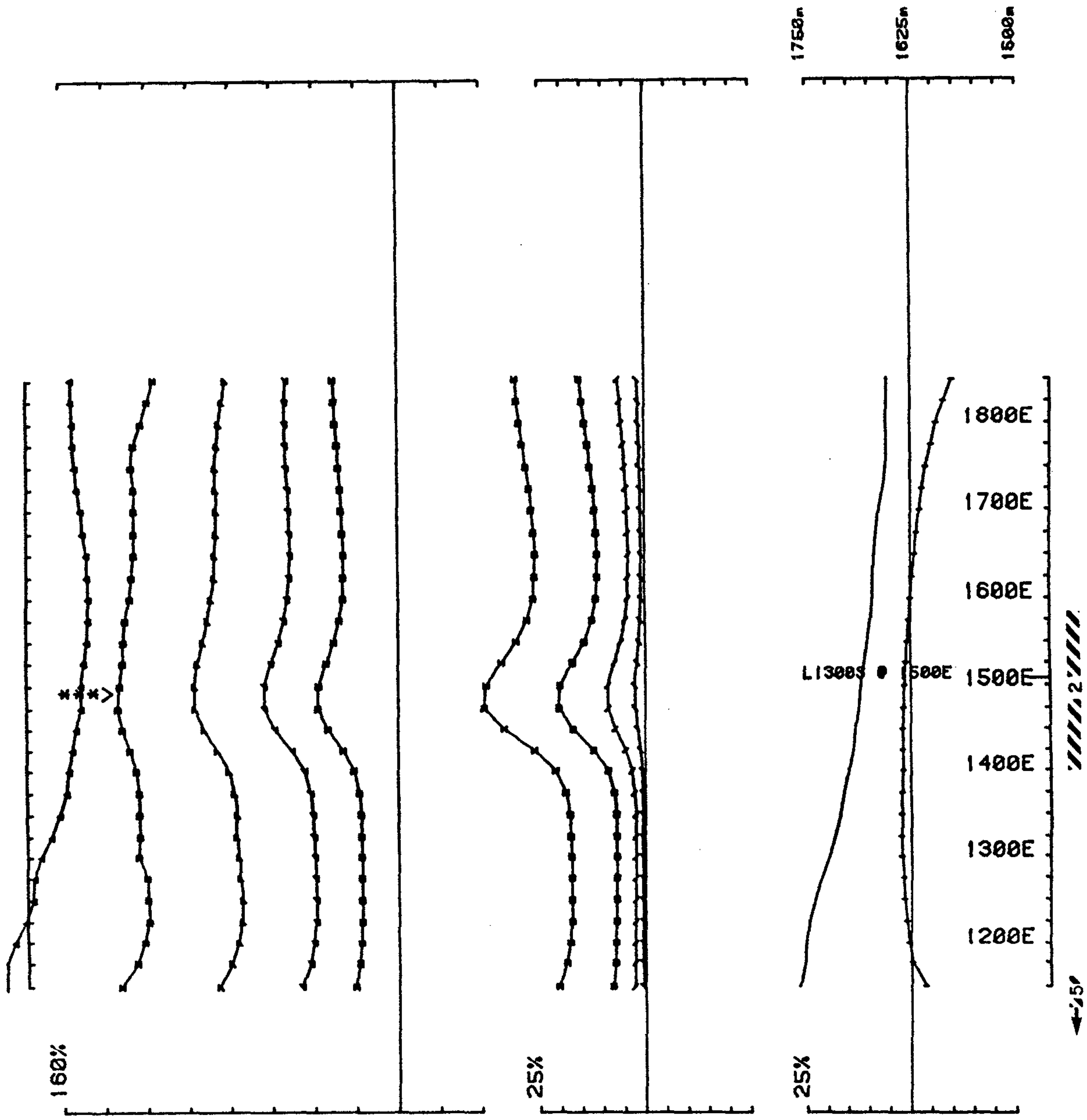
Area NORTH STAR HILL DETAIL 1986 Cominco operator SJV & JV freq(hz) 30.97
Loopno 1 Line 1250S component Hz secondary primary field normalized Ch 1 reduced



Area NORTH STAR HILL DETAIL 1986 Cominco operator SJV & JV freq(hz) 30.97
Loopno 1 Line 1250S component Hz secondary primary field normalized Ch 1 reduced



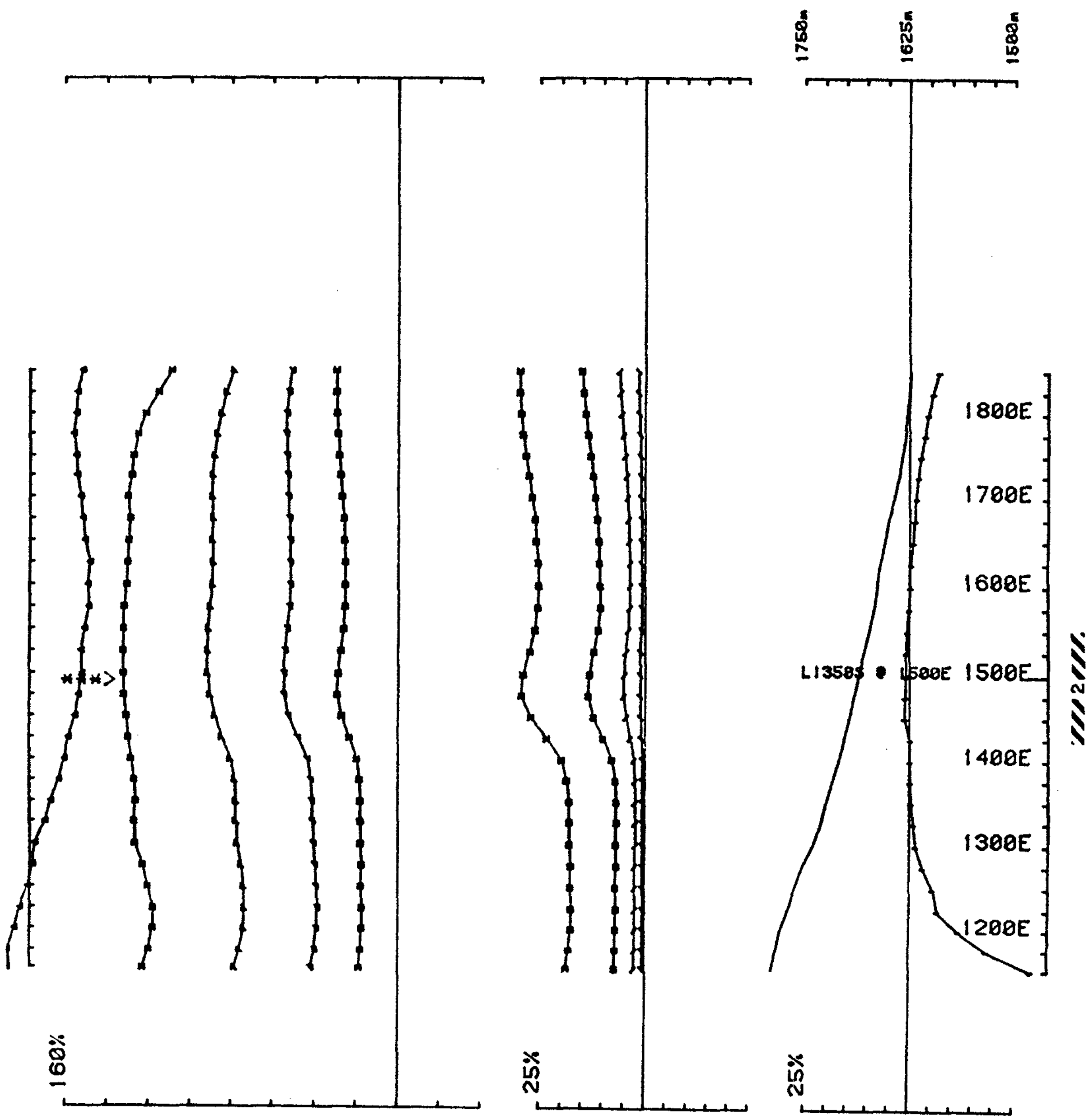
Area NORTH STAR HILL DETAIL 1986 Cominco operator SJV & JV freq(hz) 30.97
Loopno 1 Line 1300S component Hz secondary primary field normalized Ch 1 reduced



Area NORTH STAR HILL DETAIL 1986   Cominco   operator SJV & JV   freq(hz) 30.97

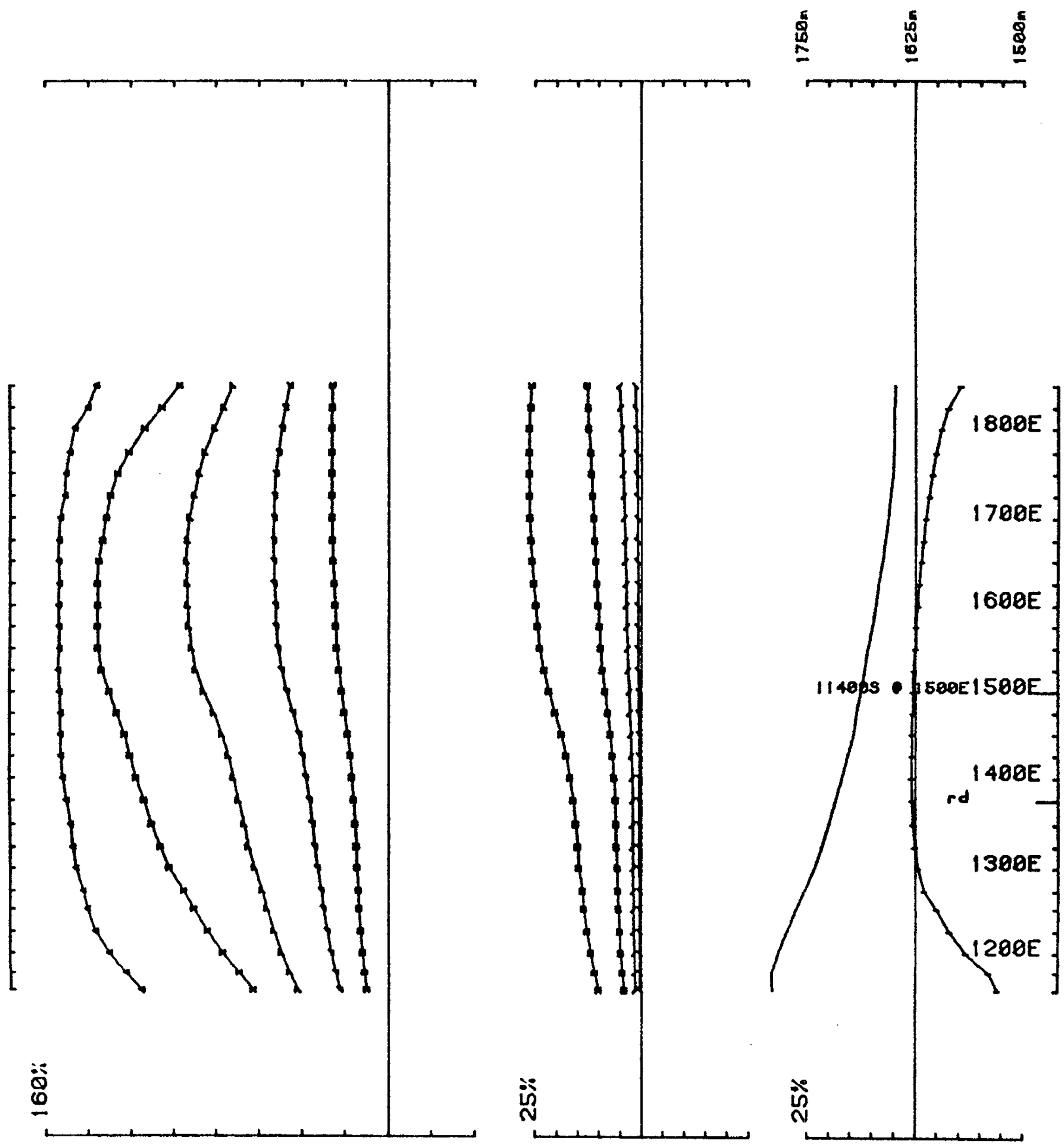
Loopno 1   Line 1300S component Hz secondary   primary field normalized   Ch 1 reduced

DS 6a

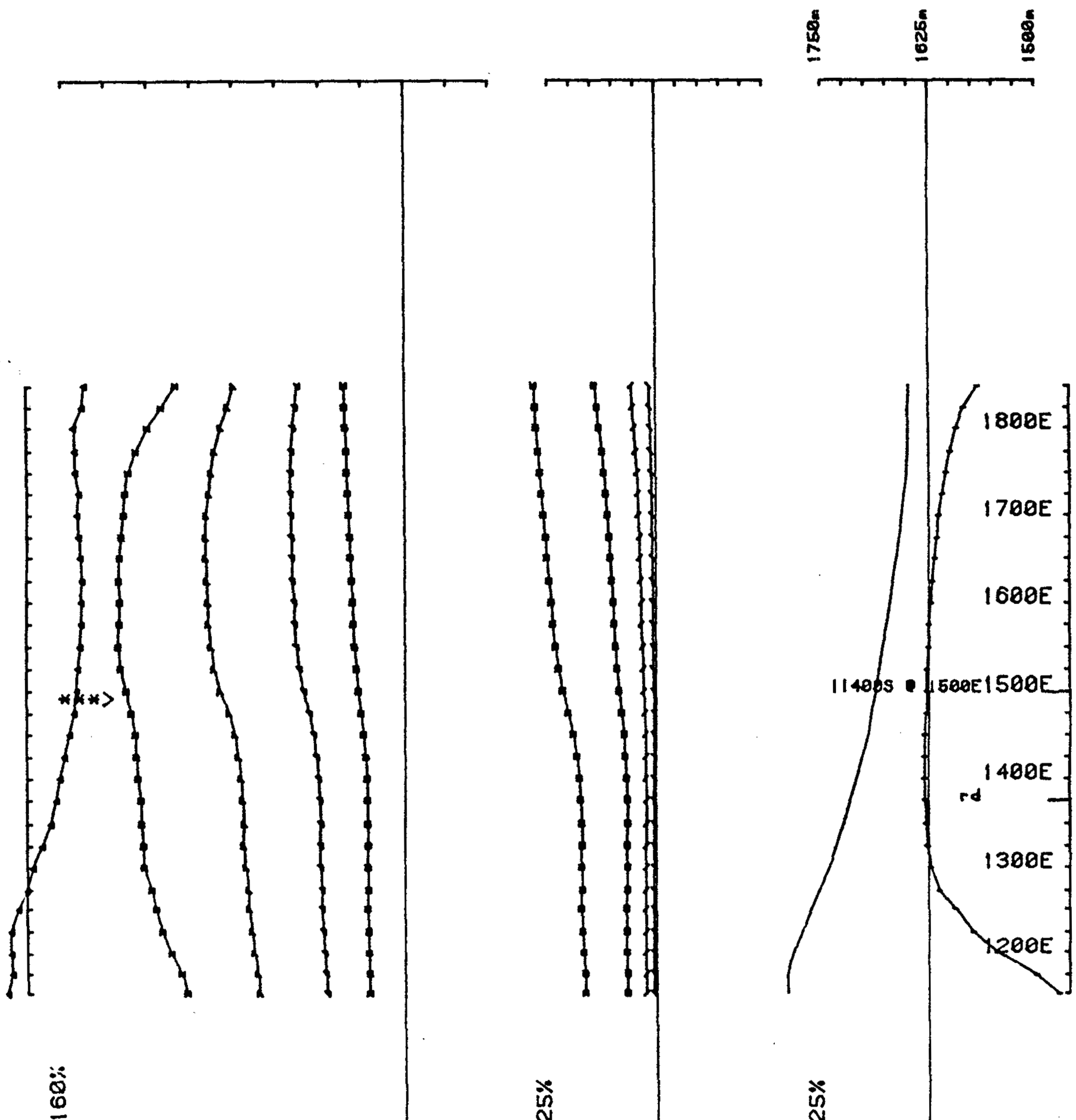


Area NORTH STAR HILL DETAIL 1986 Cominco operator SJV & JV freq(hz) 30.97
Loopno 1 Line 1350S component Hz secondary primary field normalized Ch 1 reduced

DS 7a

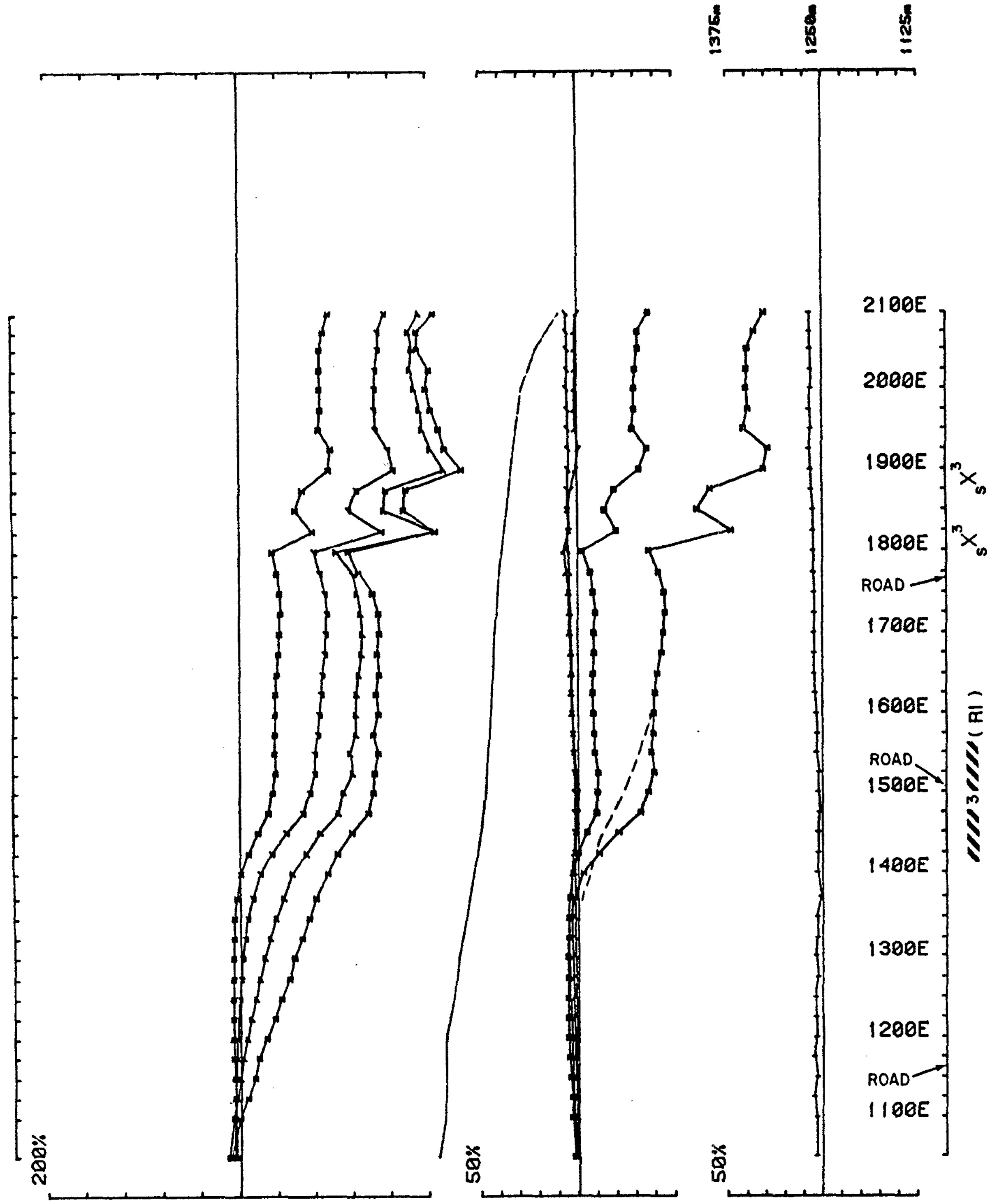


Area NORTH STAR HILL DETAIL 1986 Cominco operator SJV & JV freq(hz) 30.97
Loopno 1 Line 1400S component Hz secondary primary field normalized Ch I reduced



Area NORTH STAR HILL DETAIL 1986 Cominco operator SJV & JV freq(hz) 30.97
Loopno 1 Line 1400S component Hz secondary primary field normalized Ch 1 reduced

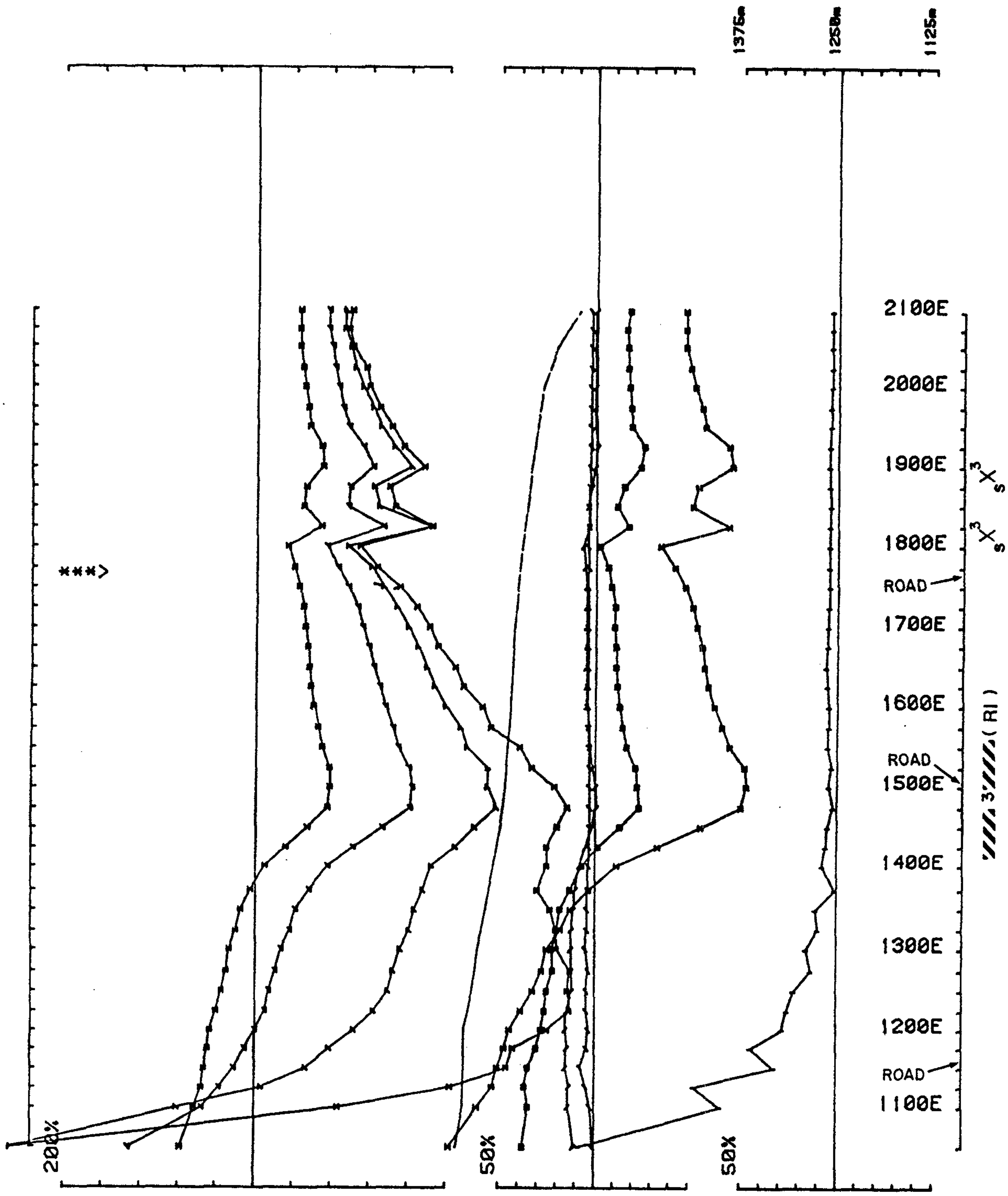
DS8a



Area SULLIVAN: SKI HILL 85 Cominco operator JJL&AOH freq(hz) 30.974
Loopno 2 Line 1000S component Hz secondary Ch 1 normalized Ch 1 reduced

REINTERPRETATION OF 1985 OUTSIDE LOOP SURVEY DATA DS 9

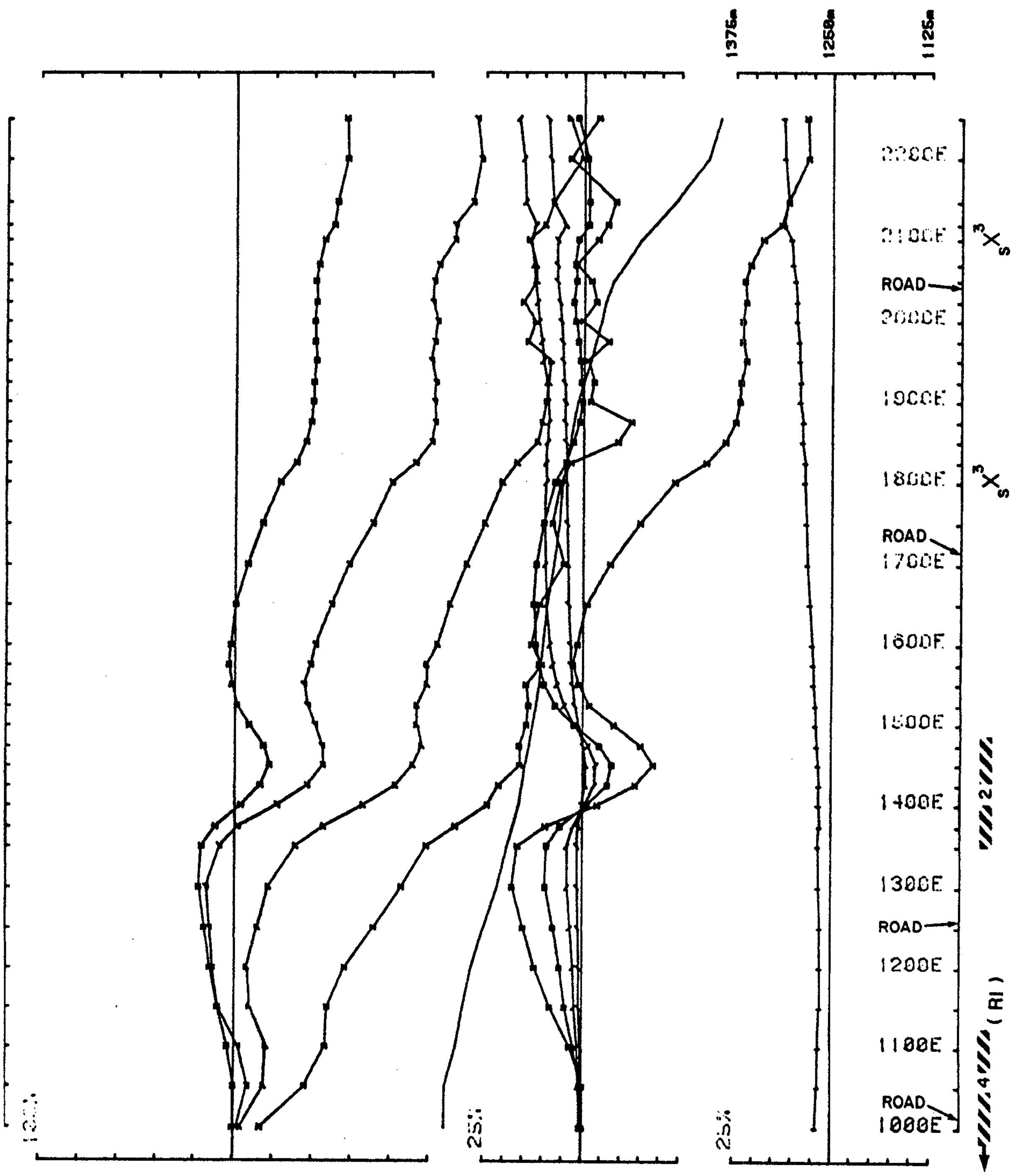
[FROM DS9 in LAJOIE,1985] [RI -REINTERPRETATION]



Area SULLIVAN:SKI HILL 85 Cominco operator JJL&AOH freq(hz) 30.974
Loopno 2 Line 1000S component Hz secondary Ch 1 normalized Ch 1 reduced

REINTERPRETATION OF 1985 OUTSIDE LOOP SURVEY DATA DS9a

[FROM DS9a in LAJOIE,1985] [RI -REINTERPRETATION]

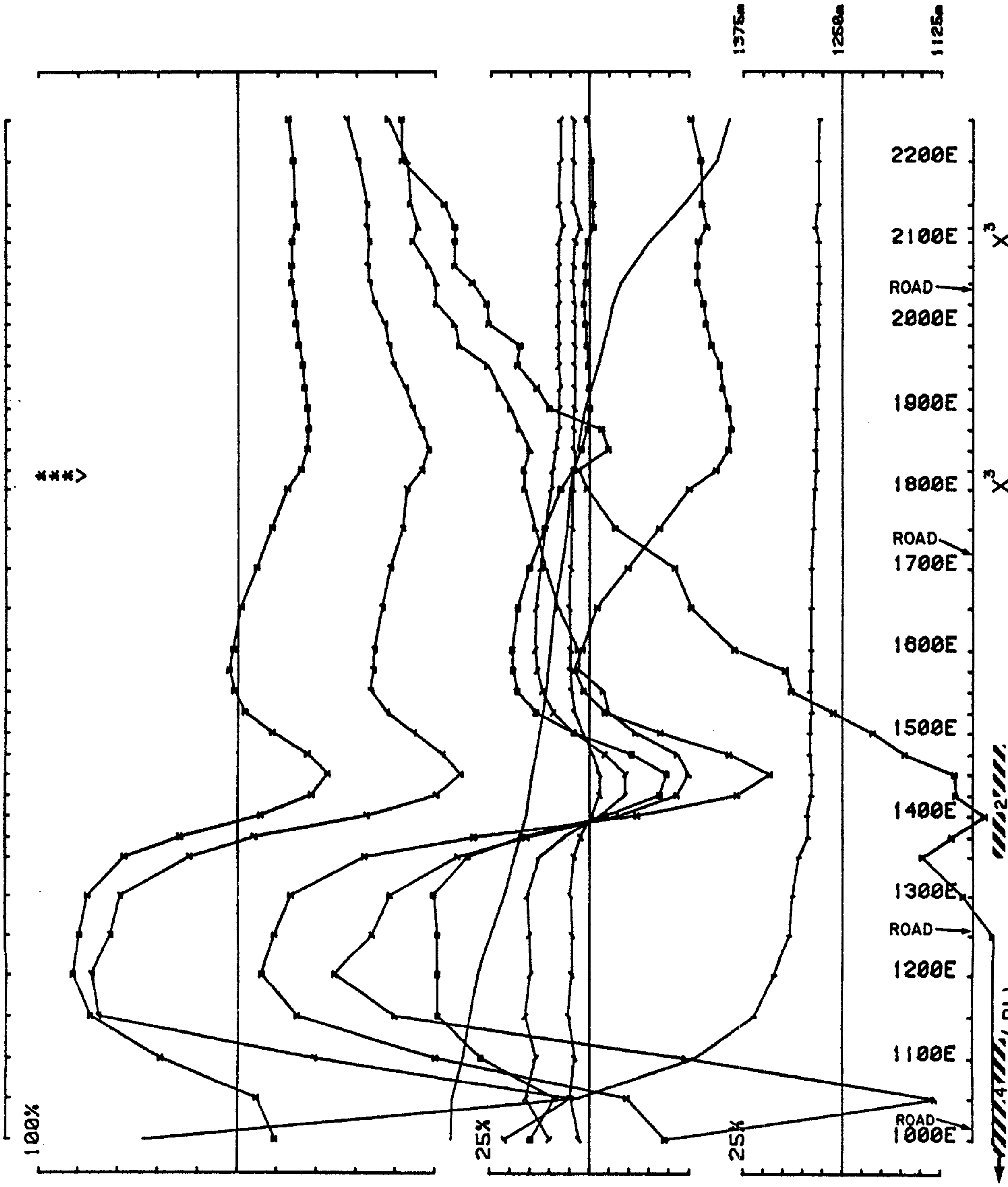


Area [illegible] SKI HILL 85 [illegible] operator [illegible] freq(hz) [illegible]
[illegible] 3 Line [illegible] component [illegible] [illegible] Ch 1 [illegible] Ch 1 reduced

REINTERPRETATION OF 1985 OUTSIDE LOOP SURVEY DATA

DS II

[FROM DS II In LAJOIE,1985] [RI =REINTERPRETATION]



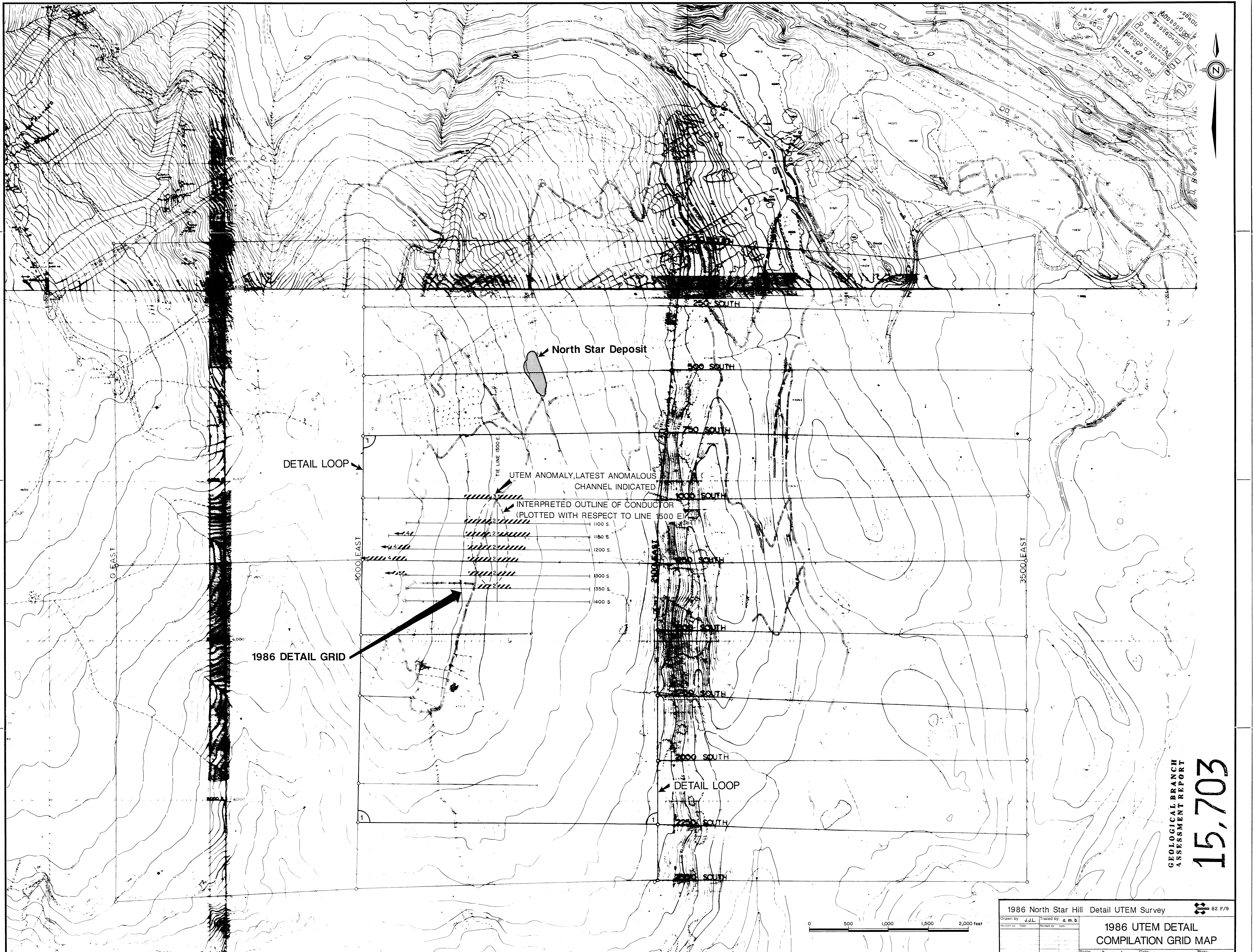
Area SULLIVAN: SKI HILL 85 Cominco operator JJL&AOH freq(hz) 30.974

Loopno 3 Line component Hz secondary Ch 1 normalized Ch 1 reduced

REINTERPRETATION OF 1985 OUTSIDE LOOP SURVEY DATA

DSIIa

[FROM DS IIa in LAJOIE,1985] [RI -REINTERPRETATION]



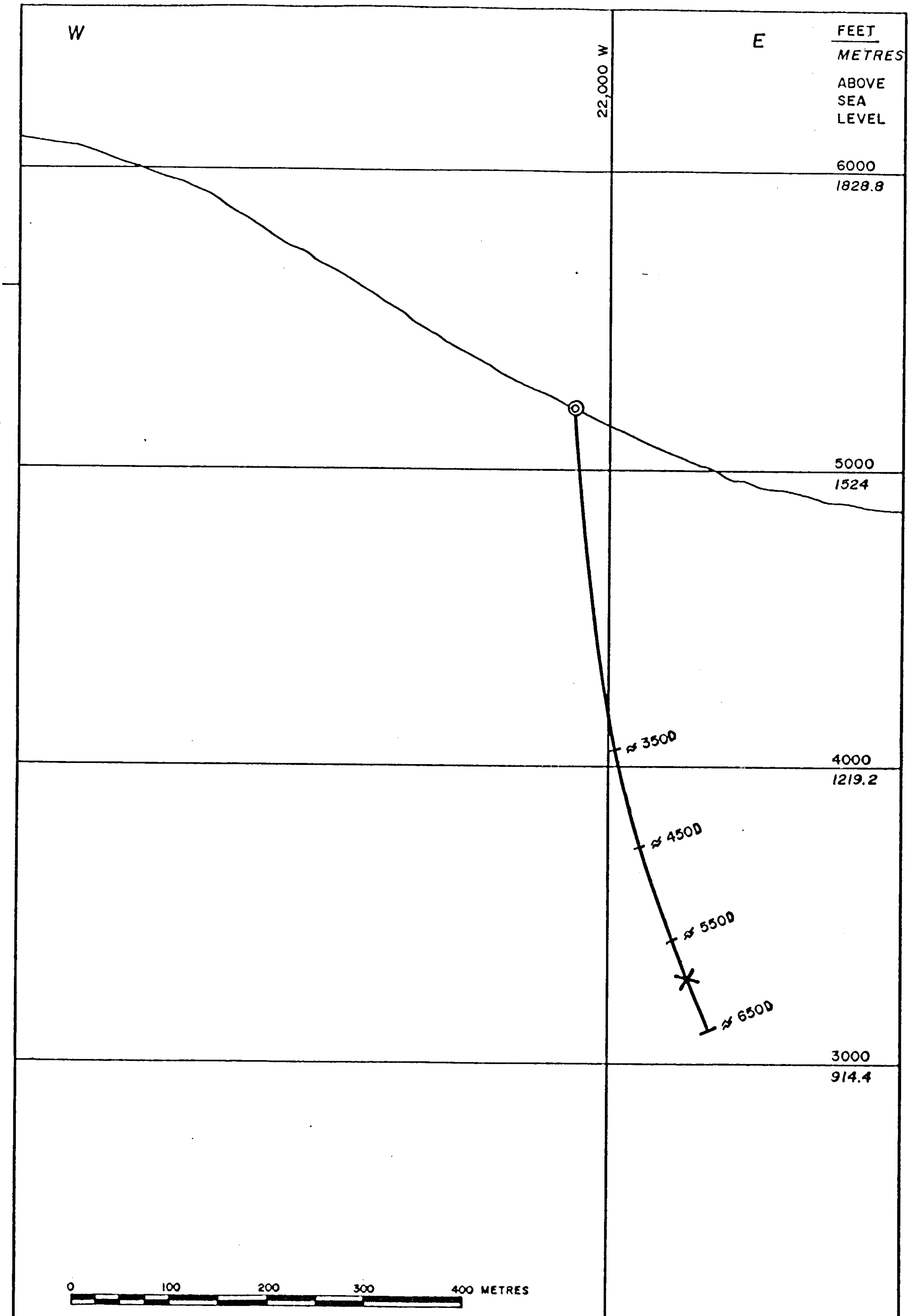
1986 North Star Hill Detail UTEM Survey

Cominco 82 F/9

Drawn by: J.J.L.	Traced by: a. m. b.	1986 UTEM DETAIL COMPILATION GRID MAP	
Revised by / Date	Revised by / Date		
Scale: 1" = 400'	Date: Jan., 1987	Plate: 316-86-2	

Form 210-0680

18,000 W
18,000 N
DDH
6459
KIMBERLEY FAULT
NORTHEAST FORK MATTHEW CREEK
LEGEND
FAULT ROCK (SCHIST, BRECCIA)
GABBRO (MOYIE INTRUSION)
QUARTZITIC WACKE WACKE, SUBWACKE AND ARGILLITE (ALDRIDGE FM) - NOT ORNAMENTED
BEDDING
CLEAVAGE
BEDDING/CLEAVAGE INTERSECTION
OUTCROP, OUTCROP AREA, SCATTERED OUTCROP
CONTACTS - APPROXIMATE
ROAD
CONTOUR INTERVAL - 100 FEET
SULLIVAN MINE GRID - FEET
SCALE
0
500 METRES
0
1500 FEET
GEOLOGICAL BRANCH
ASSESSMENT REPORT
15,703
10,000 N
28,000 W
SULLIVAN MINE
Drawn by: PWR
Traced by:
GEOLOGY NORTHEAST FORK
MATTHEW CREEK
Scale:
Date: JAN. 1987
Plate: FIG 21-1



MATTHEW CREEK CLAIMS FORT STEELE M.D., B.C.

NTS 82-G

Drawn by:		Traced by:	
Revised by	Date	Revised by	Date

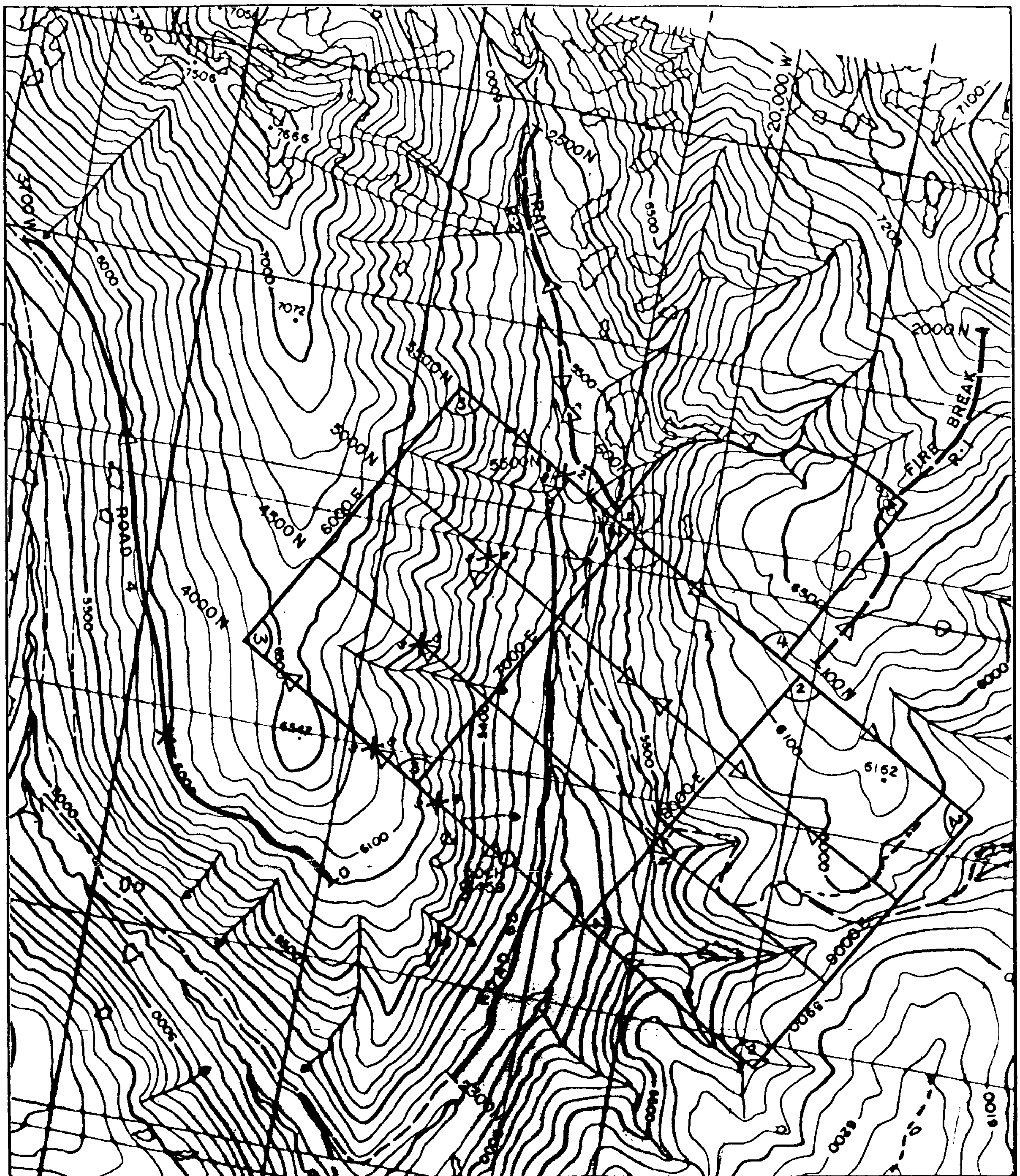
DDCH 6459
VERTICAL SECTION on AZIMUTH 292

Scale: 1 : 4800 | Date: DECEMBER 1986 | Plate: 313-86-4

BCIL-2187-C

210-0610

FORM 210 - 0670



$_{S}X^{4}$ Axis of a crossover anomaly.
The number indicates the latest anomalous channel.
Depth indicated by: S - shallow (<100 m.)
M - moderate (100 - 200 m.)
D - deep (>200 m.)

Area where conductivity is higher than average background.

Outline of a UTEM transmitter loop and loop number.

0 500 1000 1500 2000
METRES

MATTHEW CREEK CLAIMS FORT STEELE M.D, B.C.

Cominco

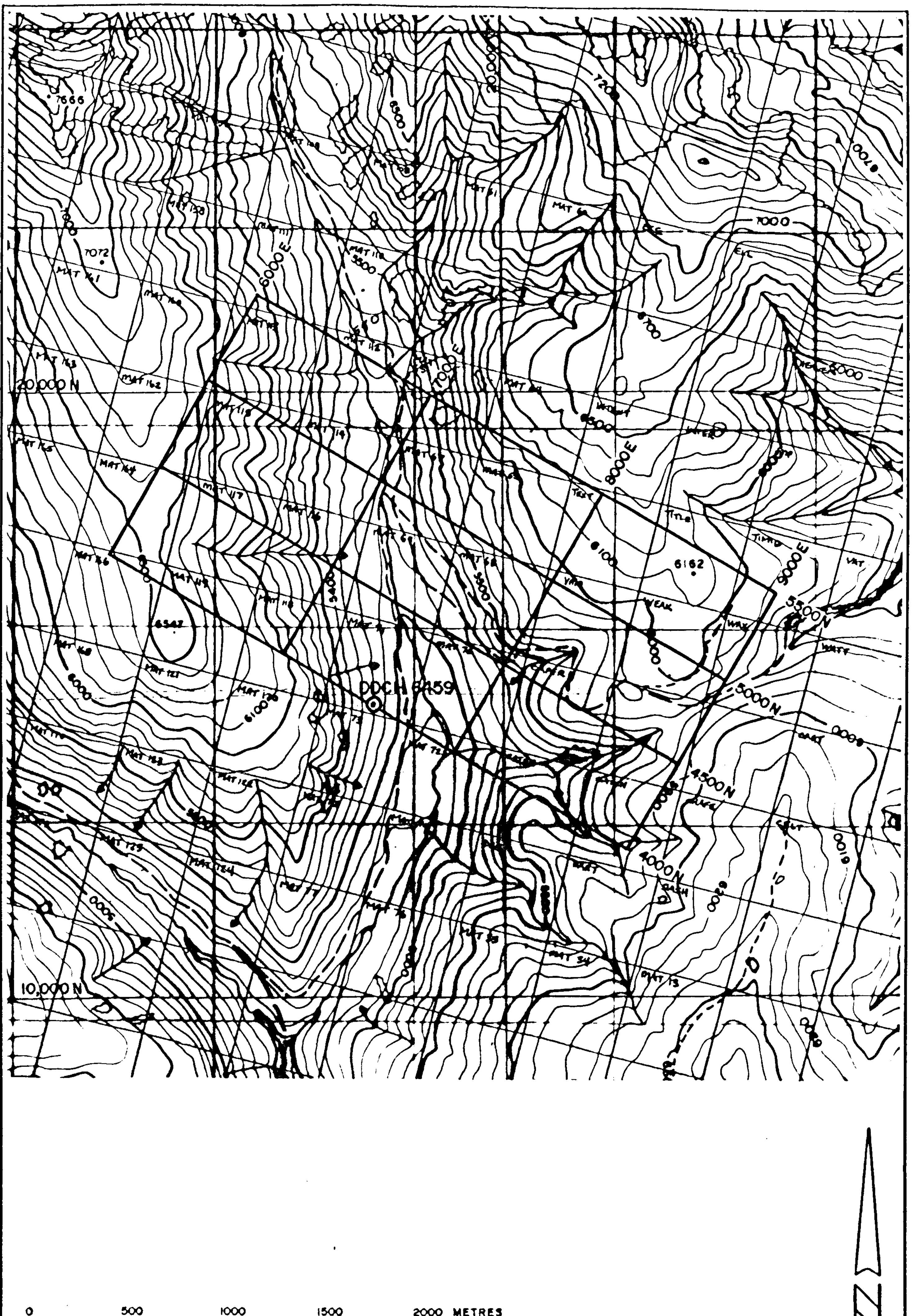
NTS 82-G

Drawn by:		Traced by:	
Revised by	Date	Revised by	Date

UTEM SURVEY GRID and COMPILATION MAP

Scale: 1 : 24,000	Date: DECEMBER 1986	Plate: 313-86-5

BCIL-2187-C 210-0610



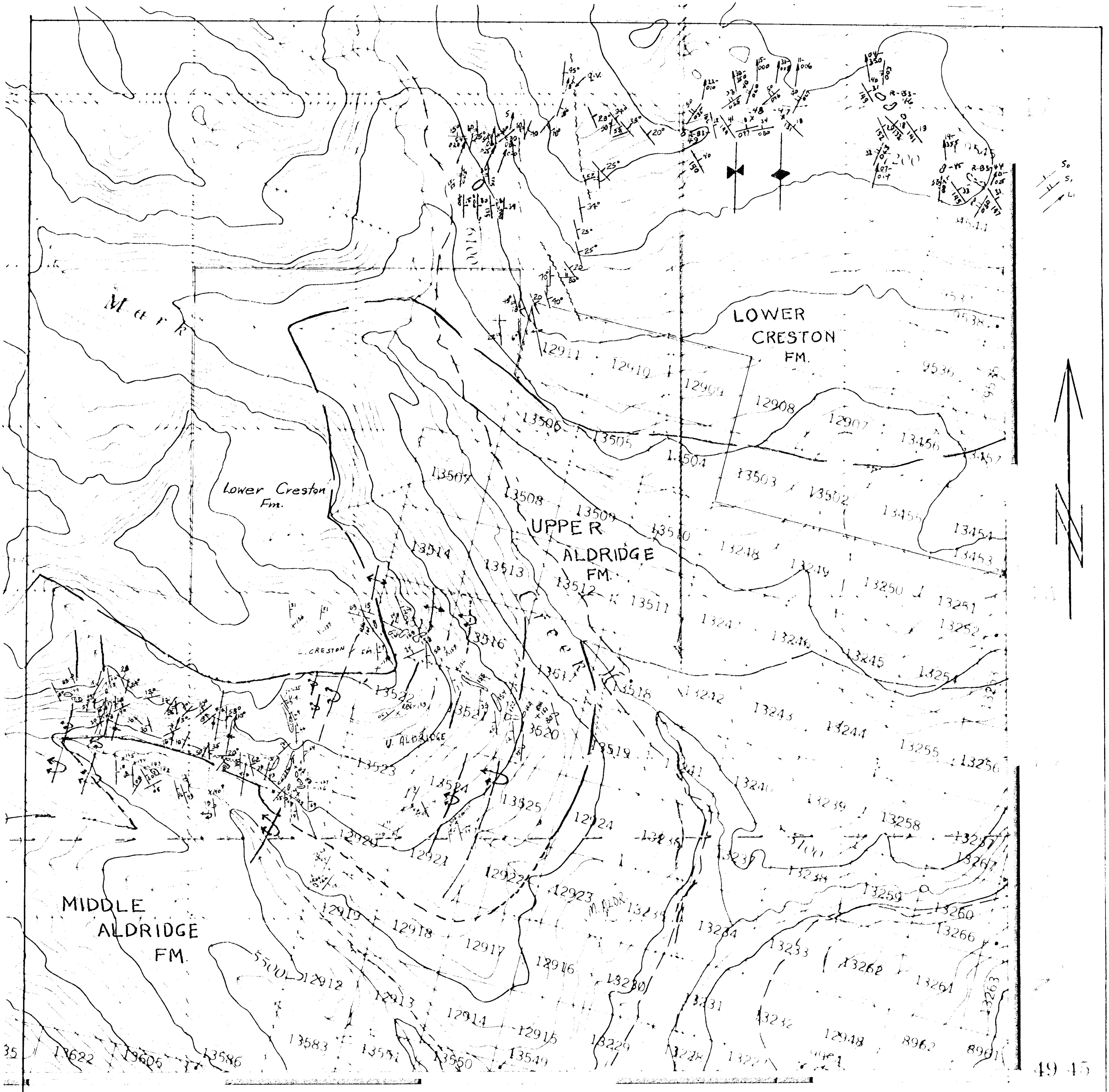
MATTHEW CREEK CLAIMS FORT STEELE M.D., B.C.

NTS 82-G

Drawn by:		Traced by:		MAT 71 GROUP (Claims)
Revised by	Date	Revised by	Date	DDCH 6459 and UTEM GRID
				LOCATION MAP

Scale: 1 : 24,000 | Date: DECEMBER 1986 | Plate: 313-86-2

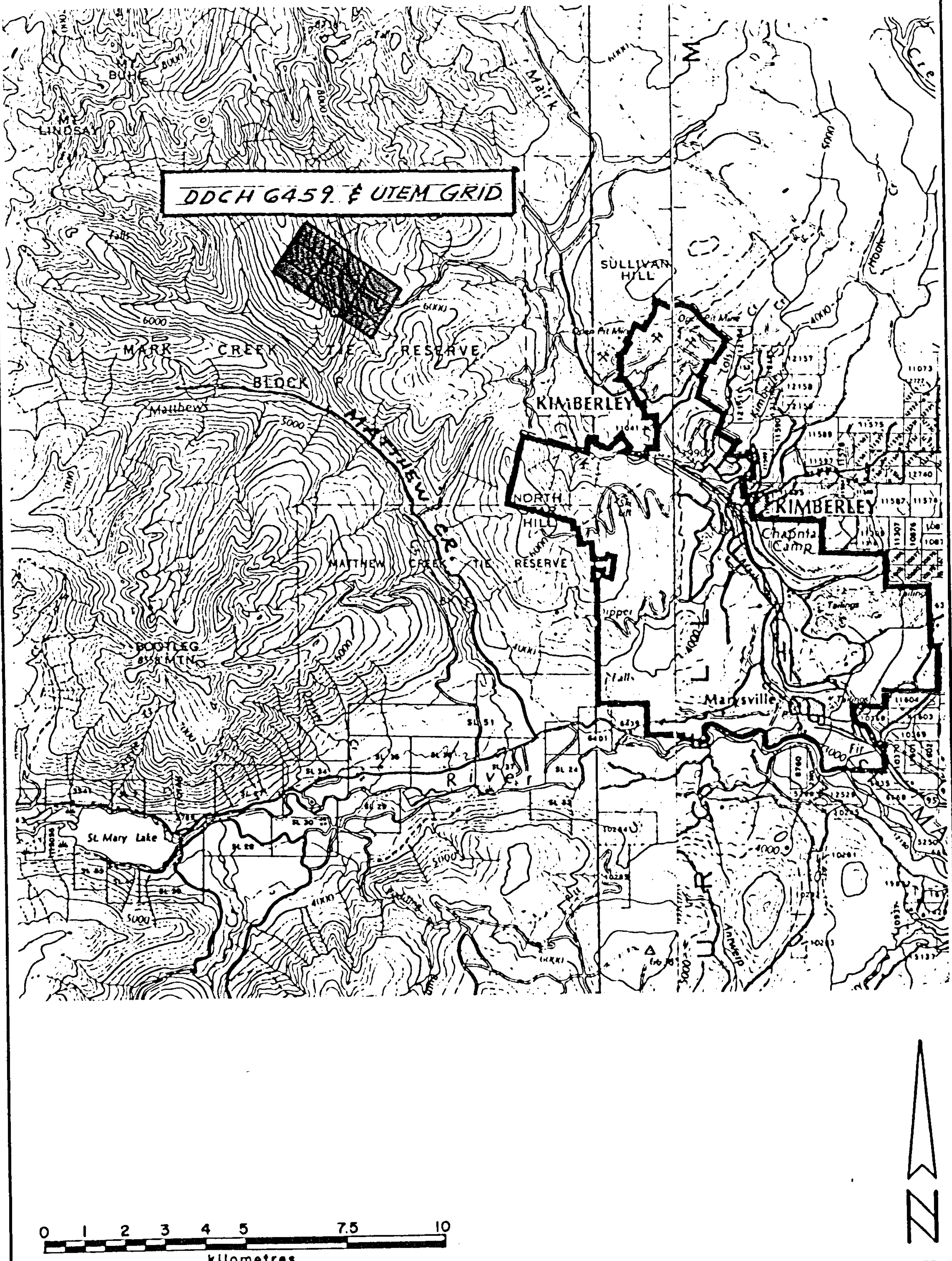
BCIL-2187-C 210-0610



GEOLOGY - Northwest Mark Creek

15703

Fig. 21-8



MATTHEW CREEK CLAIMS

FORT STEELE M.D, B.C.

Cominco

NTS 82-G (NW) 82-F (NE)

Drawn by:		Traced by:		
Revised by	Date	Revised by	Date	DDCH 6459 and UTEM GRID LOCATION MAP

Scale: 1 : 125,000

Date: DECEMBER 1986

Plate: 313-86-1

BCIL 2187-C

210.0610