

NORTH LINE CREEK PROJECT AREA

1987 EXPLORATION PROGRAM

S.E. British Columbia
Part of Coal Lease #4
Kootenay Land District

NTS 82G/15

Latitude: 49° 57 North

Longitude: 114° 45 West

Held by: Shell Canada Limited

Operated by: Crows Nest Resources Limited

Report by: Janet Bannick,
Geologist
Barry Ryan,
Manager, Geology
Brian McKinstry,
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February, 1988

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STATEMENT OF QUALIFICATIONS

Name; Janet Bannick, BSc (Hon.)
Barry Ryan, PhD, P. Geol. Alberta
Brian McKinstry BSc. MSc
Concerning: Report entitled North Line Creek Project Area
Date: February, 1988

The work outlined in this report was jointly undertaken by Janet Bannick, BSc (Hon), and Barry Ryan, PhD, P. Geol., and Brian McKinstry BSc. MSc.

Janet Bannick graduated BSc (Hon) Geological Sciences from Queen's University at Kingston, Ontario in 1982. She has worked as an Exploration Geologist for Crows Nest Resources Ltd. intermittently from 1981 to present.

Barry Ryan graduated BSc (Hon.) Geology U.B.C. in 1967 and PhD in 1973 also from U.B.C. From 1973 to 1975 he worked on a National Research Council supported Research Fellowship at the University of Witwatersrand, South Africa. In 1976 to 1980 he worked as Research Associate and lecturer at U.B.C. For the past seven years he has worked for CNRL and currently holds the position of Manager, Geology. He has extensive experience in structural geology, coal geology and coal quality.

Brian McKinstry graduated BSc (Hon) Geology from Carleton University in 1971 and MSc in 1980 also from Carleton University. From 1971 - 1973, he worked for INCO in Thompson, Manitoba. From 1973 - 1980 he worked as a Researcher for Carleton University. In 1980 - 1981 he worked for a consulting firm. From 1981 to present he has been a Staff Geologist with Crows Nest Resources.

1.0 INTRODUCTION

1.1 Crows Nest Resources Limited is a wholly owned subsidiary of Shell Canada Limited (Head Office, Calgary, Alberta). Shell acquired Crows Nest Industries in 1978 and with it coal holdings of the original Crows Nest Pass Coal Company which dates back to the late 1800s.

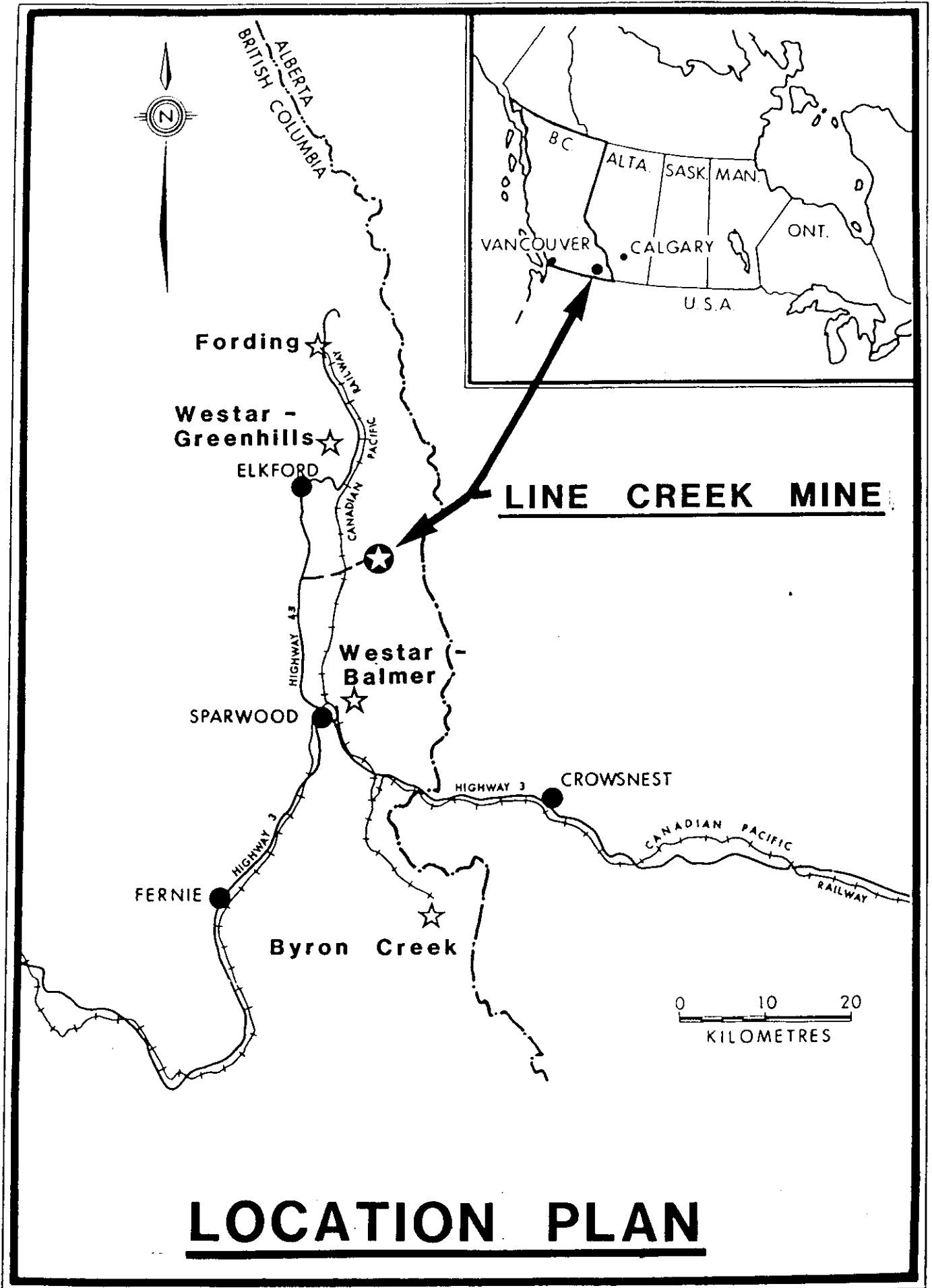
The new company, Crows Nest Resources Limited developed and started production at the Line Creek coal mine in 1981. Mining was initiated at a height of 2074m and the first coal shipments were made in 1982. In 1987 approximately 1.7 million tonnes of clean metallurgical and thermal coal were produced. The mine is a conventional multi-benched truck and shovel open pit operation mining up to six seams synchronously.

1.2 Location and Access:

The North Line Creek Project Area is located within B.C. Mine Lease 4 north of CNRL's Line Creek Mine. Access to the project area is via Highway 3 to Sparwood, then north on Highway 43 for 18 km to the mine access road (Figure 1). The security gate and preparation plant are 5 km east of the turn off and active mining area is a further 15 km northeast through the Line Creek Canyon. Access to the North Line Creek Project Area is directly through the main pit of the mine (Figure 2).

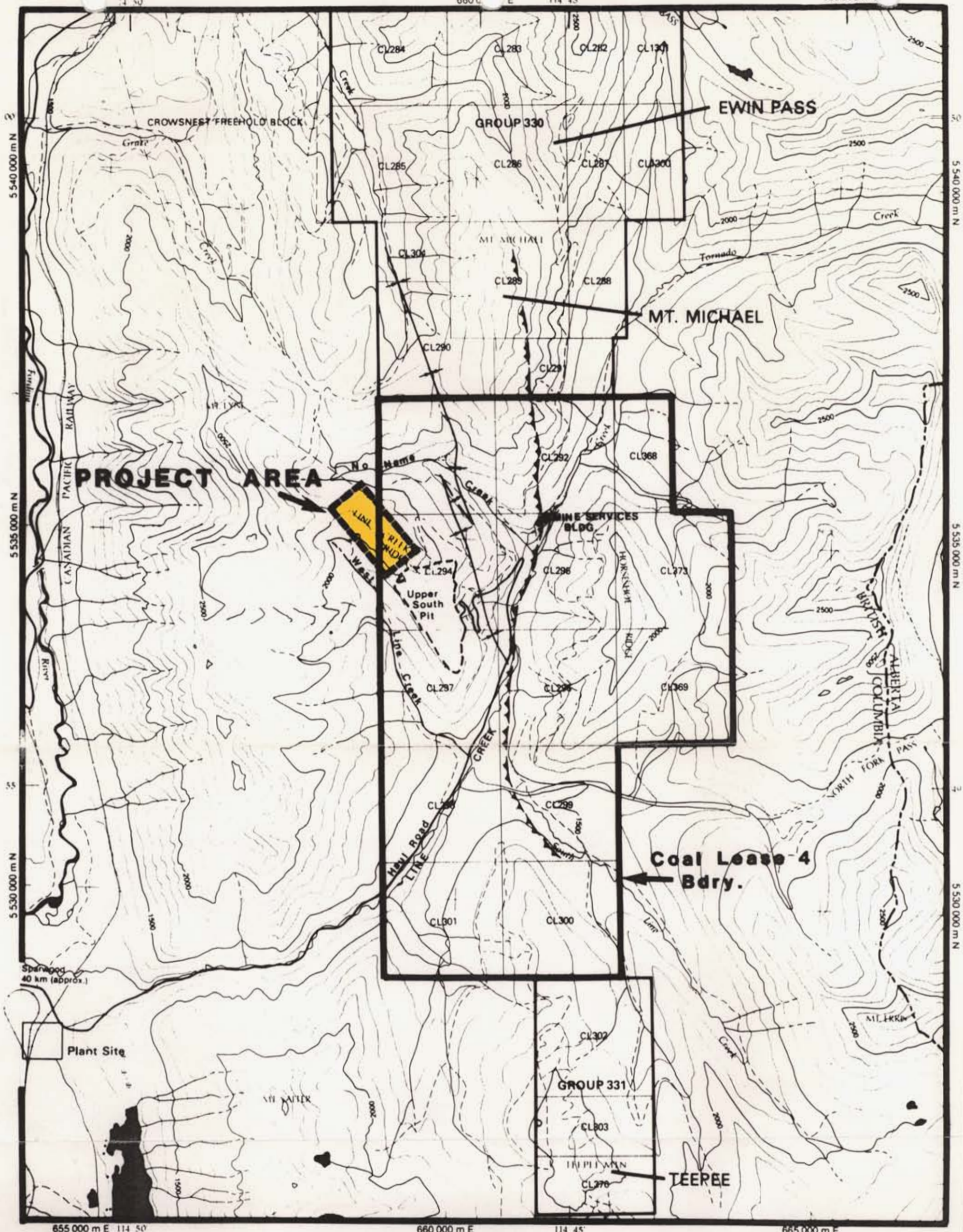
1.3 Summary of Previous Work:

- 1968 - 1972
- Aerial photography and map construction
 - Geologic mapping
 - 17 reverse circulation rotary holes with a total meterage of 4729 meters - DH series
 - all holes were geophysically logged
 - 3 test pits

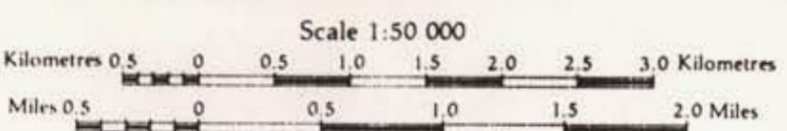


LOCATION PLAN

FIGURE 1



Reference map produced by the Survey and Mapping Branch, Department of Energy, Mines and Resources in 1975 and updated from 1976 Patrons of British Columbia 1:100,000 mapping. Most contours were manually interpolated.



Contour Interval 100m
 Transverse Mercator Projection
 Universal Transverse Mercator Grid Zone II

- Legend**
- Road: Highway, Main road
 - Road: Loose surface, Dry weather
 - Track or trail
 - Railway
 - River
 - Stream
 - Contours
 - Licence boundary
 - Licence group boundary
 - Alexander Creek Syncline
 - Ewin Pass Thrust



Crows Nest Resources Limited

Site Access & Project Location
NORTH LINE CREEK

AUTHOR: JH	SCALE: 1:50,000	ENCLOSURE NO.
DATE: FEB 88	REVISED	FIG. 2
To accompany		

- 1978 - 5 diamond drill holes totalling 1309.5 meters, all geophysically logged (LC-100 series specifically LC-101, LC-106, LC-110, LC-221, LC-114)

- 1979 - geologic mapping

- 1980 - 2 diamond drill holes totally 444 meters and 13 reverse circulation holes totalling 2673 meters.(300 series), all holes were geophysically logged
 - 14 backhoe trenches totally 5256 meters
 - geologic mapping

- 1981 - 1982 - 27 diamond drill holes totalling 12,403.4 meters, (400 series up to 453) all geophysically logged
 - 30 reverse circulation rotary holes totally 10,536.9 meters all geophysically logged (400 series up to 444)
 - One single wall rotary hole, 125.4 meters (Hole 412B)
 - 13 adits totally 472.7 meters
 - 8 auger holes totally 306.3 meters
 - 1,500 meters road construction
 - 16 days geodetic surveys
 - Geophysical surveys including refraction seismic, electromagnetic induction and transient EM
 - Petrographic analysis
 - Palynological studies

- 1983 - 4 diamond drill holes totally 850 meters (400 series specifically 454 - 457), all holes were geophysically logged
 - 8 reverse circulation rotary drill holes totally 2071 meters - (400 series specifically 462 - 471), all holes were geophysically logged

Up to this point, the previous work covered the whole North Line Creek property. From 1984 on, the work was concentrated in the North Line Creek project area.

- 1984
 - road construction and site preparation
 - 33 reverse circulation rotary drill holes totally 3087 meters, (Holes 472 - 504), all holes were geophysically logged

- 1985
 - 2 km road construction and drill site preparation
 - 31 reverse circulation rotary drill holes totally 3638 meters, (Holes 505 - 535), all holes were geophysically logged

1.4 Summary of Work Done in 1987 Program

- Road construction and drill site preparation
- 22 reverse circulation rotary drill holes totally 3032 meters
 - Holes 536 - 572
 - all holes were geophysically logged
- 13 HQ diamond drill holes totally 1120. meters
 - Holes 536 - 572
 - all holes were geophysically logged
- Drill Hole Particulars for 1987 program are listed in Table 3.
- Coal analysis rotary holes - one meter increments, ash and FSI on raw samples.
- Coal analysis diamond holes
 - ash and FSI on coal intersection on raw samples
 - full prox on 1.6 wash plus additional analyses
- Geologic interpretation - 12 geologic cross sections were constructed for projecting drill hole data into the sections.
- An updated geology base map was produced from drill hole and mapping information.

TABLE 1

NORTH LINE CREEK PROJECT AREA

DRILL HOLE PARTICULARS

<u>HOLE</u>	<u>TYPE</u>	<u>LENGTH</u>	<u>N.</u>	<u>E</u>	<u>EL.</u>	<u>ORIENTATION</u>	<u>LOGS</u>
536	rotary	127.0	5534898.5	659077.0	2170.3	vert.	gamma,den,dev.
537	rotary	146.0	5534965.0	659051.0	2177.6	vert	gamma,den,dev.
538	diamond	91.4	5535012.5	659024.2	2188.3	245/50	gamma,den,neut, incli
539	diamond	67.9	5535012.5	659024.2	2188.3	vert.	gamma,neut.
540	rotary	234.0	5535124.7	659021.8	2195.8	253/64	gamma, incli
541	diamond	181.4	5535191.7	658982.5	2178.3	245/50	gamma,den,neut, caliper,res,dev
42	rotary	115.0	5534939.6	658892.6	2144.7	250/60	gamma, incli
543	rotary	193.0	5535033.6	658904.2	2171.7	252/50	gamma, dev.
544	rotary	79.0	5535066.3	658840.9	2183.3	250/50	gamma, incli
545	rotary	121.5	5535064.6	658843.7	2183.1	069/50	gamma, dev.
547	rotary	182.0	5535217.7	658933.3	2176.9	250/50	gamma, dev.
548	rotary	177.0	5535247.6	658889.5	2171.0	250/85	gamma
549	rotary	163.0	5535285.7	658894.3	2149.9	250/50	gamma, dev.
550	rotary	152.0	5535364.9	658878.3	2143.5	250/50	gamma, dev.
551	rotary	127.0	5535332.3	658788.4	2178.1	250/50	gamma, incli
553	rotary	60.5	5535357.5	658726.8	2204.7	250/50	gamma, dev.
554	diamond	61.0	5535435.5	658768.7	2133.5	245/50	gamma, neut, den caliper, res, dev
555	rotary	91.0	5535444.7	658806.6	2132.7	250/50	gamma, dev.
556	rotary	121.5	5534454.4	658878.1	2139.9	250/50	gamma, dev.
557	rotary	140.0	5535377.1	658960.4	2104.1	250/50	gamma, dev.
558	rotary	152.0	5535321.6	658980.1	2109.9	256/58	gamma, dev.
559	rotary	139.0	5535559.0	658899.7	2067.8	252/48	gamma, dev,
50	rotary	60.6	5535539.3	658822.5	2068.3	250/50	gamma, dev.

TABLE 1 con't

NORTH LINE CREEK PROJECT AREA

DRILL HOLE PARTICULARS

<u>HOLE</u>	<u>TYPE</u>	<u>LENGTH</u>	<u>N</u>	<u>E</u>	<u>EL.</u>	<u>ORIENTATION</u>	<u>LOGS</u>
561	rotary	147.0	5535037.7	658907.1	2171.6	vert.	gamma, dev.
562	rotary	190.0	5535434.3	658958.5	2108.0	250/75	gamma, dev.
563	diamond	110.3	5535357.4	658849.6	2154.1	280/52	gamma, neut, den caliper, res, dev
564	diamond	53.3	5535362.3	658716.2	2204.4	250/50	gamma, neut, den
565	diamond	73.2	5535309.2	658756.2	2194.8	250/50	gamma, neut, den caliper, res, dev
566	diamond	62.5	5535303.6	648722.4	2207.7	250/50	gamma, neut, den caliper, res, dev
567	diamond	68.6	5535261.7	658734.4	2208.2	250/50	gamma, neut, den caliper, res, dev
568	diamond	61.0	5535190.9	658783.6	2206.9	250/50	gamma, neut
569	rotary	115.0	5535420.4	658829.8	2150.1	vert.	gamma, neut, den caliper, dev.
570	diamond	149.4	5535263.4	658934.2	2151.3	245/50	gamma, neut, den caliper, res, dev
571	diamond	53.0	5534964.5	659046.3	2177.3	249/80	gamma, neut, den caliper, res, dev
572	diamond	85.3	5535178.8	648900.7	2207.2	250/50	gamma neut, den caliper, res, dev

2.0 THE PROJECT

2.1 Objective of the Present Program

The North Line Creek area is a potential expansion area for mining. The extensive drilling program during 1987 had several objectives. The rotary drilling in the spring was for delineation of coal seam quality, structure and verification of reserves. The summer program of rotary drilling continued this aim. The diamond drilling enhanced existing information as well as providing additional geotechnical data in key areas.

2.2 Project Definition

The area of study is the northern part of Line Creek Ridge directly north of the Line Creek pit (also referred to as Upper South Pit) (Figure 2). The North Line Creek property has all been explored with two areas of concentration: the NLC 8 seam pit on the steep dipping west limb of the Alexander Creek Syncline; and the 2 seam pit in the core of the syncline.

The work done during 1987 was performed on the NLC 8 seam pit area and thus is the area referred to as the North Line Creek Project Area (Figure 3).

3.0 GEOLOGICAL OVERVIEW

3.1 Regional Geology:

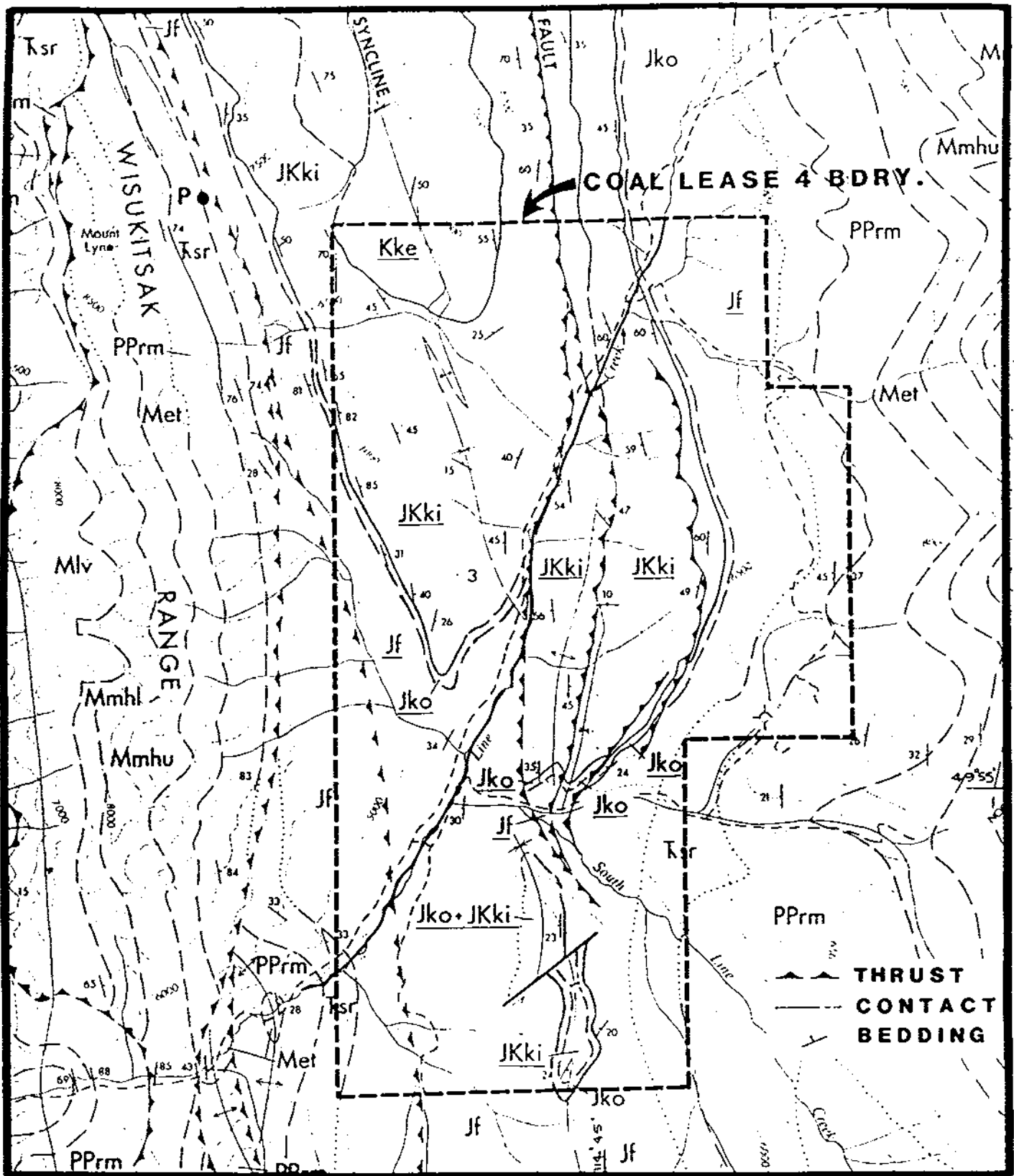
The Line Creek Mine is in the Rocky Mountains, Front Ranges physiographic province of the Eastern Cordillera fold belt. This province is characterized by open shallow plunging north or south trending folds and major thrusts which dip westward and strike north south.

Coal in southeast B.C. occurs in the Jura Cretaceous Kootenay Group which is an eastward thinning wedge of non-marine coal bearing clastic sediments derived from mountains to the south and west. The Kootenay Group is preserved in a number of structurally controlled thrust slices and basins. The Line Creek mine occupies part of the Elk Valley Coal Field which is preserved as the core and east and west limbs of the north trending shallow plunging Alexander Creek Syncline (Figure 4).

3.2 Regional Stratigraphy:

The stratigraphic nomenclature used in this report follows that proposed by Gibson (1979) (Table 2). The Kootenay Group represents a regressive cycle of sediments deposited on the marine shales of the Fernie Formation. As the sea withdrew to the northeast the basal formation of the Kootenay group was deposited; this is a coarse beach derived sandstone (Morrissey Formation). The Morrissey Formation is overlain by the coal bearing deltaic sediments of the Mist Mountain Formation which in turn is overlain by the coarse clastics of the continental Elk Formation.

The Fernie Formation is composed of brown recessive weathering marine mudstones and minor amounts of siltstones and limestones. Phosphate deposits occur within the Fernie Formation but not within Lease 4.



LEGEND

JURASSIC AND CRETACEOUS

KOOTENAY GROUP

- Kke ELK FORMATION: grey lithic sandstone, siltstone and silty mudstone, humic and sapropelic coal; rare conglomerate
- JKki MIST MOUNTAIN FORMATION: dark grey siltstone and mudstone, humic coal; grey lithic sandstone; black carbonaceous shale; rare conglomerate
- JKki - Jki MIST MOUNTAIN FORMATION/MORRISSEY FORMATION: undivided
- Jko MORRISSEY FORMATION: light grey sandstone, locally conglomerate, carbonaceous shale and coal

REGIONAL GEOLOGY
Coal Lease 4

SCALE 1:50 000

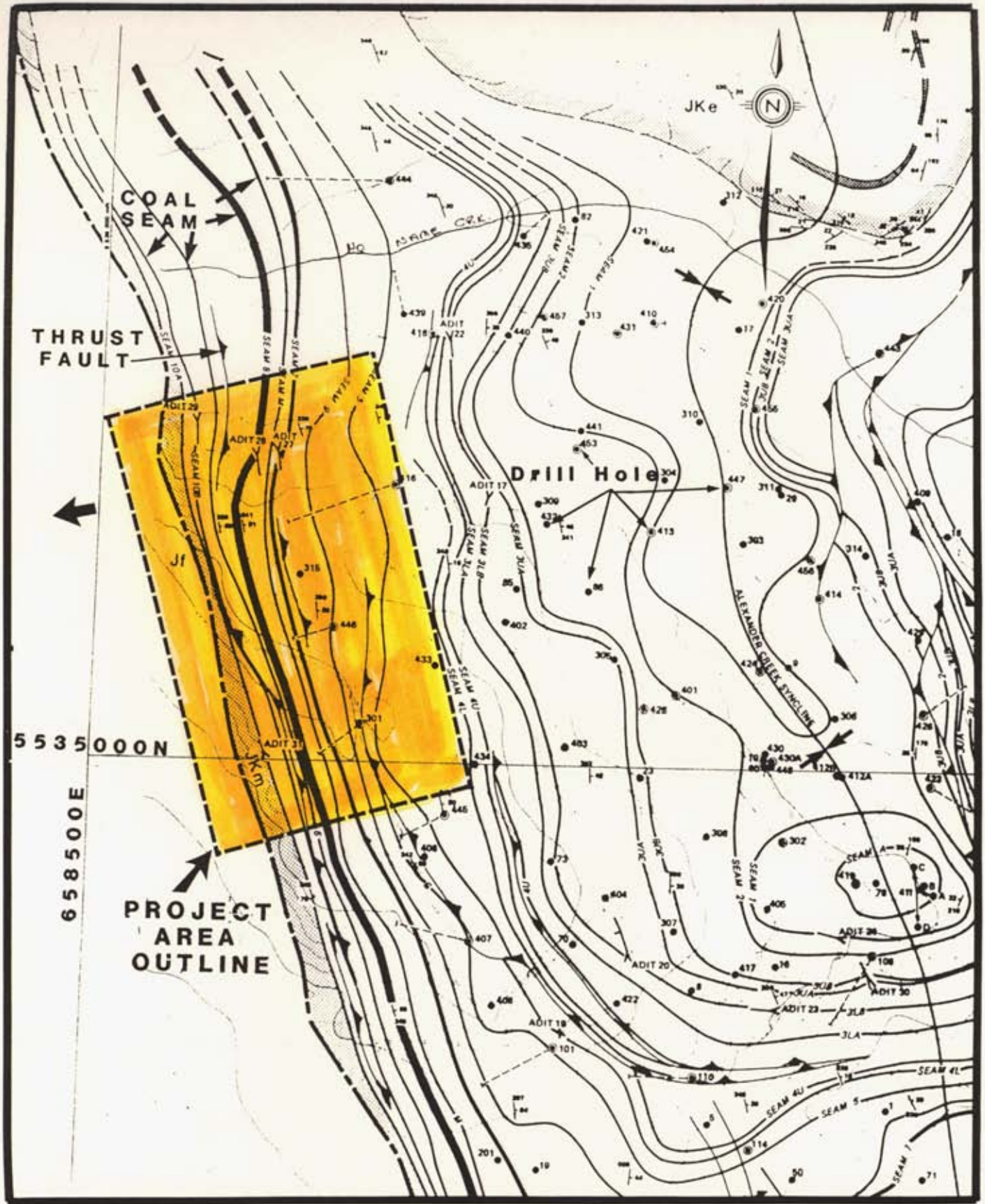


PART OF

Ministry of Energy, Mines and Petroleum Resources

PRELIMINARY MAP 63

FIGURE 4



**PROJECT AREA
NORTH LINE CREEK**

Scale 1:10000

FIGURE 3

TABLE OF FORMATIONS

Nomenclature of the Kootenay Group (after Gibson, 1979)

ALBERTA NORRIS-1959	BRITISH COLUMBIA NEWMARCH-1953	ALBERTA BRITISH COLUMBIA GIBSON-1979	ALBERTA B.C. JANSA-1972	CENTRAL FOOTHILLS ALBERTA STOTT-1975		
Cadomin Fm.	Cadomin Fm.	Cadomin Fm. Pocaterro Creek Mbr.	Cadomin Fm.	Cadomin Fm.		
	ELK FORMATION	ELK FORMATION	ELK FORMATION			
	KOOTENAY FORMATION	KOOTENAY GROUP	KOOTENAY FORMATION	NIKANASSIN FORMATION		
MUTZ MBR.					MIST MOUNTAIN FORMATION	COAL BEARING MEMBER
HILLCREST MBR.						
ADANAC MBR.						
MOOSE MTN. MBR.	BASAL KOOTENAY SD.	Morrissey Formation	MOOSE MTN. MBR.			
FERNIE FM.	FERNIE FM.	WEARY RIDGE MBR. FERNIE FM.	FERNIE FM.	FERNIE FM.		

CROWS NEST RESOURCES

TABLE 2

The Morrissey Formation is an upward coarsening marine or beach sandstone which is subdivided into two members. The lower Weary Ridge Member is composed of fine to medium grained planar thin bedded argillaceous sandstone. The member weathers an orange colour and averages 30m thick. The upper Moose Mountain Member is a grey weathering medium to coarse grained thick-bedded to massive sandstone approximately 20 meters thick. It is cliff forming and makes a good mappable unit for the base of the coal bearing sequence.

The Mist Mountain formation is the economically important coal bearing formation in the Kootenay Group. It is composed of siltstone, sandstone, mudstone, shale and coal. The Mist Mountain strata were deposited within sub-aerial portions of deltas and coastal alluvial plains. The sediments are mostly fine grain flood plain derived, though in places they are cut by lenticular coarse grained sandstone bodies representing river channel deposits. Coal seams occur throughout the Formation; seams near the bottom of the Formation are laterally persistent and thick, where as seams in the upper part of the Formation are thinner and discontinuous. At Line Creek the Mist Mountain Formation is 445 m thick and contains an average of 60m of coal.

The rank of the coal grades from medium volatile bituminous at the base of the section (Ro max values about 1.37 for 10 seam) to high volatile bituminous at the top of the section Ro max values about 1.05 for 2 seam.

The Elk Formation consists of a cliff forming succession of buff weathering sandstones, siltstones, and mudstones. Thick conglomerates and thin seams of needle coal are characteristic of the Elk Formation. The Elk Formation is eroded from the stratigraphic section within Lease 4 but outcrops to the north.

4.0 LINE CREEK (MINE LEASE 4)

4.1 Geology:

The regional geology on Lease 4 is defined by a north trending syncline of coal bearing Mist Mountain Formation sediments on the west half of the lease, thrust up against another syncline of Mist Mountain on the east half of the lease (Figure 4). The north south trending break between the two synclines is the Ewin Pass Thrust and a number of steep dipping trailing splay thrusts developed off the top surface of the Ewin Pass Thrust. The most prominent and most westerly is the Mt. Michael Thrust. Reserves are defined, and mining is taking place, on the west limb of the western syncline (Alexander Creek Syncline). Activity is now extending eastward across the axis of the Alexander Creek Syncline into an area in which the rocks are influenced by the Ewin Pass Thrust and its splays (Mt. Michael Ewin Pass Thrust Slice).

The geometry of the Alexander Creek Syncline is that of an asymmetric north plunging syncline in the sedimentary pile overlying the west dipping Ewin Pass thrust. The syncline has a west limb which dips at 90° or is overturned at higher elevations. At lower elevations and closer to the hinge of the syncline, dips in the Moose Mountain member flatten out. The east limb is partially truncated by the Ewin Pass Thrust but where preserved has west dips ranging up to 65°. The plunge of the fold axis is north or northwest and within the mine lease plunges vary from 5° to 15° northwest.

The over steepening of the west limb of the Alexander syncline in the mine lease may be caused by a thrust in the Fernie Formation to the west, which prior to erosion would have overlain the higher elevations of the west limb. Such a thrust is outlined on preliminary map 63 (BCEMPR 1987). The less competent mudstones and coal measures may have been cut by leading splay thrusts rather than have been over-steepened.

Local west directed thrusts are visible in the highwall. These thrusts could represent movement out of the core of the syncline during folding or be blind thrusts associated with underlying east directed thrusts. The combination of the two thrusts forms a triangle zone.

East of the Ewin Pass thrust and across the Line Creek valley is the Horseshoe Ridge syncline. The Moose Mountain member on the east limb of the syncline forms the back of the north trending Horseshoe Ridge. Approximately the lower half of the Mist Mountain Formation is preserved on Horseshoe Ridge as the east limb of the syncline. On the lower slopes to the west some of the west limb is preserved but in this area the geology is complicated by a number of thrusts. The structure on Horseshoe Ridge is in many respects the mirror image of the structure on the Line Creek extending down to the Mt. Michael thrust.

The Alexander Creek syncline and Mt. Michael Ewin Pass Thrust Slice both extend north across No Name Creek. There is less data available in this area and the structural interpretation is less detailed.

5.0 NORTH LINE CREEK PROJECT AREA

5.1 Stratigraphy

The project area covers mainly the lower third of the Mist Mountain Formation and the underlying Moose Mountain Member. Coal seams in the Mist Mountain Formation are numbered in sequence from No 10A at the base of the Formation to No 1 in the top third of the Formation. In the North Line Creek Project Area seams 10A, 10 Rider, 10B, 9, 8, and 7 are present, representing a stratigraphic thickness of up to 250 meters. Interseam stratigraphy is mainly mudstone and siltstones with a prominent laterally persistent 9 sandstone which also in places replaces 9 seam.

In the west 10 seam occurs in three parts; 10A, 10 Rider and 10B. 10A seam rests on the Moose Mountain Member and has an average true thickness of 4 meters. 10 Rider has an average true thickness of 1.5 meters but it does not have lateral continuity over the whole project area. 10B has an average true thickness of 5 meters.

Nine seam has an average true thickness of 4 meters. In some locations especially at depth it is replaced by the laterally persistent sandstone previously mentioned. Eight seam which contributes the bulk of the coal in the project area has an average true thickness of 15 meters. The Marker seam, a thin but consistent seam below the seven seam zone, has an average true thickness of 2 meters. Seven seam is really a zone of coal bands named 7R, 7, 7L, 7S and 7T with an accumulated true thickness of 12 meters. This zone of coal bands is complicated by faulting.

5.2 Structure

The project area covers part of the steep dipping west limb of the Alexander Creek Syncline. The synclinal structure is further complicated by secondary folds of 100 meters or less wave length. These secondary folds are open to closed with steep west dipping axial

surfaces and near zero north-south plunges. This flat plunge is less than the regional plunge for the Alexander Creek Syncline. The folds have the effect of steepening to the point of overturning the beds, or shallowing the beds almost to the point of reversing the regional east dip.

Two distinct types of faults are present in the project area. Examples of the first are shallow dipping and break the steep dipping beds thrusting the upper plate eastwards. The other type of faults present tend to follow the beds and thrust the upper plate to the west.

5.3 Coal Quality:

Rotary Holes:

Coal samples from the rotary holes were collected in one meter increments and analyzed for raw ash and FSI at the Line Creek lab. Results were composited back to average values for seam intersections and are provided in Enclosure 14. Obviously mathematically composited FSI values are only approximate. Table 3 provides by seam average data generated from Enclosure 14.

Diamond Drill Data:

Coal samples from the diamond drilling were analyzed raw for ash and moisture and at a 1.6 wash for full proximate plus FSI. Some samples (1.6 wash) were also analyzed for S% and CV. This data is reported in Enclosure 15. The far right column indicates 60 representing a 1.6 SG wash, the next left column (RC/YD) provides core recovery on the raw data line (R under column TP) and yield data on the wash line (W under column TP). By seam average quality is presented in Table 4.

Additional tests were performed on some samples. Oxide analysis on H.T. ash for seams 7 and 10A are reported in Table 5, which also includes an attempt at reconstituting the oxides back into a mineral

TABLE 3

NORTH LINE CREEK PROJECT AREA

AVERAGE QUALITY 1987 ROTARY DRILL PROGRAM

	<u>SEAM</u>				
	<u>6</u>	<u>7</u>	<u>8</u>	<u>9</u>	<u>10</u>
Drill Intersection Thickness (SD)	2.0 (0.4)	7.78 (0.7)	14.73 (1.4)	3.16 (0.2)	3.85 (0.9)
Average Raw Ash (SD)	20.1 (3.6)	23.0 (1.1)	16.3 (0.6)	27.8 (3.8)	23.8 (2.0)
Average FSI*(SD)	5.5 (1.7)	5.3 (0.3)	2.8 (0.2)	3.8 (0.4)	4.0 (0.9)

* Limited significance

TABLE 4

NORTH LINE CREEK PROJECT AREA

AVERAGE QUALITY 1987 DIAMOND DRILL PROGRAM

	<u>6</u>	<u>7</u>	<u>8</u>	<u>10</u>
Drill Intersection Thickness (SD)	1.37 (2.5)	8.67 (2.0)	13.0 (2.5)	4.16 (0.7)
Raw Ash (SD)	20.9 (8.7)	28.1 (2.2)	15.4 (0.8)	20.7 (4.3)

* Limited significance

(-) SD not calculated due to one piece of data

TABLE 5
OXIDE ANALYSIS

NORTH LINE CREEK 22/2/88

PRJ	SM	No	HL	SRT	ASH	SiO	AlO	TiO	FeO	CaO	MnO	NaO	KO	PO	SO	S%
nlc	7	1	541	109.4	11.7	62.9	25.5	1.72	2.29	2.21	.33	.44	.63	1.71	.45	.35
nlc	10a	2	568	31.7	13.4	62.7	28.1	1.68	.34	2.1	.14	.53	.42	1.38	.34	.47

PRJ SM No HL SRT B/A ratio

nlc 7 1 541 109.4 0.065
nlc 10a 2 568 31.7 0.038

CALCULATED POSSIBLE MINERAL COMPOSITION

PRJ nlc SM 7 No 1 HL 541 SRT 109.4

total sulphur in coal is 0.39

composed of Pyritic, Organic and Sulfate as follows 0.01 0.36 0.02

mineral composition of ash and relative %

1 Quartz	19.12% (0.00)	2 Kaolinite	59.38% (62.18)
3 Illite	1.64% (1.91)	4 Feldspar	1.19% (0.00)
5 Montmorillonite	0.00% (0.00)	6 Chlorite	1.79% (2.20)
7 Calcite	0.00% (0.00)	8 Pyrite	0.10% (0.68)
9 Gypsum	0.00% (0.00)	10 Organic S	2.00% (24.31)
11 Apatite	2.71% (3.96)	12 Spinel	0.00% (0.00)
13 Dolomite	0.00% (0.00)	14 Siderite	0.98% (4.77)
15 Ankerite	0.00% (0.00)	16 Magnesite	0.00% (0.00)
17 Rutile	1.06% (0.00)	18 Monazite	0.03% (0.00)

numbers in brackets are % wt loss attributed to mineral as % of total wt loss

weight loss on ashing as % of weight of ash = 12.86

CALCULATED POSSIBLE MINERAL COMPOSITION

PRJ nlc SM 10a No 2 HL 568 SRT 31.7

total sulphur in coal is 0.47

composed of Pyritic, Organic and Sulfate as follows 0.01 0.44 0.02

mineral composition of ash and relative %

1 Quartz	15.80% (0.00)	2 Kaolinite	75.67% (68.88)
3 Illite	1.03% (1.22)	4 Feldspar	1.35% (0.00)
5 Montmorillonite	0.00% (0.00)	6 Chlorite	0.56% (0.69)
7 Calcite	0.00% (0.00)	8 Pyrite	0.08% (0.57)
9 Gypsum	0.00% (0.00)	10 Organic S	2.00% (25.01)
11 Apatite	2.10% (3.12)	12 Spinel	0.57% (0.00)
13 Dolomite	0.00% (0.00)	14 Siderite	0.10% (0.52)
15 Ankerite	0.00% (0.00)	16 Magnesite	0.00% (0.00)
17 Rutile	0.74% (0.00)	18 Monazite	0.00% (0.00)

numbers in brackets are % wt loss attributed to mineral as % of total wt loss

weight loss on ashing as % of weight of ash = 13.49

assemblage. This work is the subject of an on-going study and the results should be considered provisional at best. The computer program in calculating a possible mineral assemblage also calculates the weight loss on ashing.

Giesler fluidity measurements were performed on four samples as well as petrography on the 7 and 8 seam from hole 563. These results are reported in Table 6.

6.0 SUMMARY

The North Line Creek Project Area is on the west limb of the Alexander Creek Syncline. It is further complicated by secondary folds and two distinct types of faults. Within the project area seams 7 - 10A occur. With the information gathered from the 1987 program, the North Line Creek Project Area has been advanced from an exploration project to an active mining area.

The cost of the study is outlined in Table 7. Costs include contractor costs, Line Creek equipment costs where applicable and Line Creek personnel salary costs where applicable.

7.0 ACKNOWLEDGEMENTS

The authors would like to thank Jeff Schlender for his field assistance, and Ted Hannah for his knowledge and expertise during report preparation. Also John Kinnear, for his drafting, and Marie Ruzek for typing and report preparation.

8.0 REFERENCES

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MAP INDEX

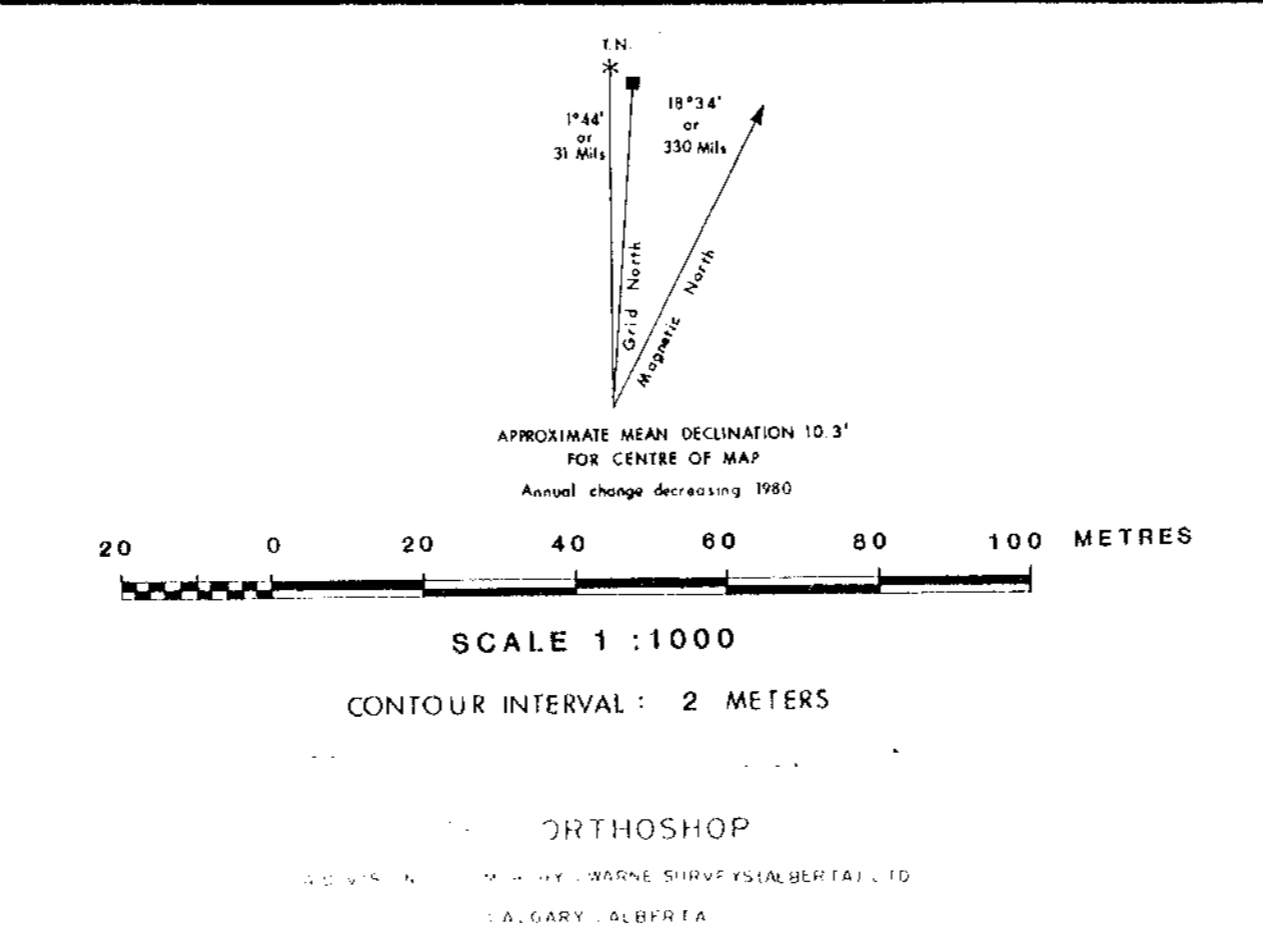
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N23C	N23D	023C
49°57'30"		
N24A	N24B	024A
49°57'00"		
N24C	N24D	024C
49°56'30"		

1:14 47'15" 1:14 46'30" 1:14 45'45" 1:14 45'00"

MAP REFERENCE

MAIN ROAD	DITCH, CREEK WITH FLOW DIRECTION	TREES
SECONDARY ROAD	DEPRESSION	SPOT ELEVATION
TRAIL OR TRACK	RAILWAY	BUILDING
BRIDGE, CULVERT	RIVER, LAKE	SURVEY STATION

MAP PROJECTION: U.T.M. CENTRAL MERIDIAN 117° W



LEGEND:

- DIAMOND DRILL HOLE -1987
- ROTARY DRILL HOLE -1987
- DIAMOND-PRE 1987
- ROTARY-PRE 1987
- ▲ COAL OUTCROP
- ▬ THRUST FAULT
- - - SEAM TRACE - INFERRED

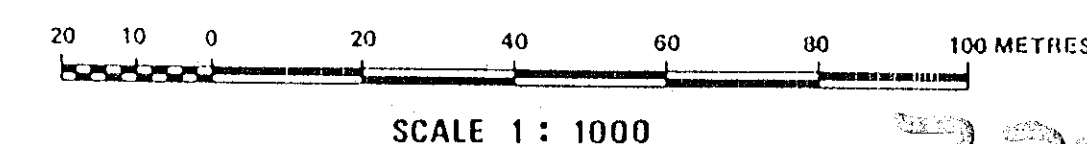
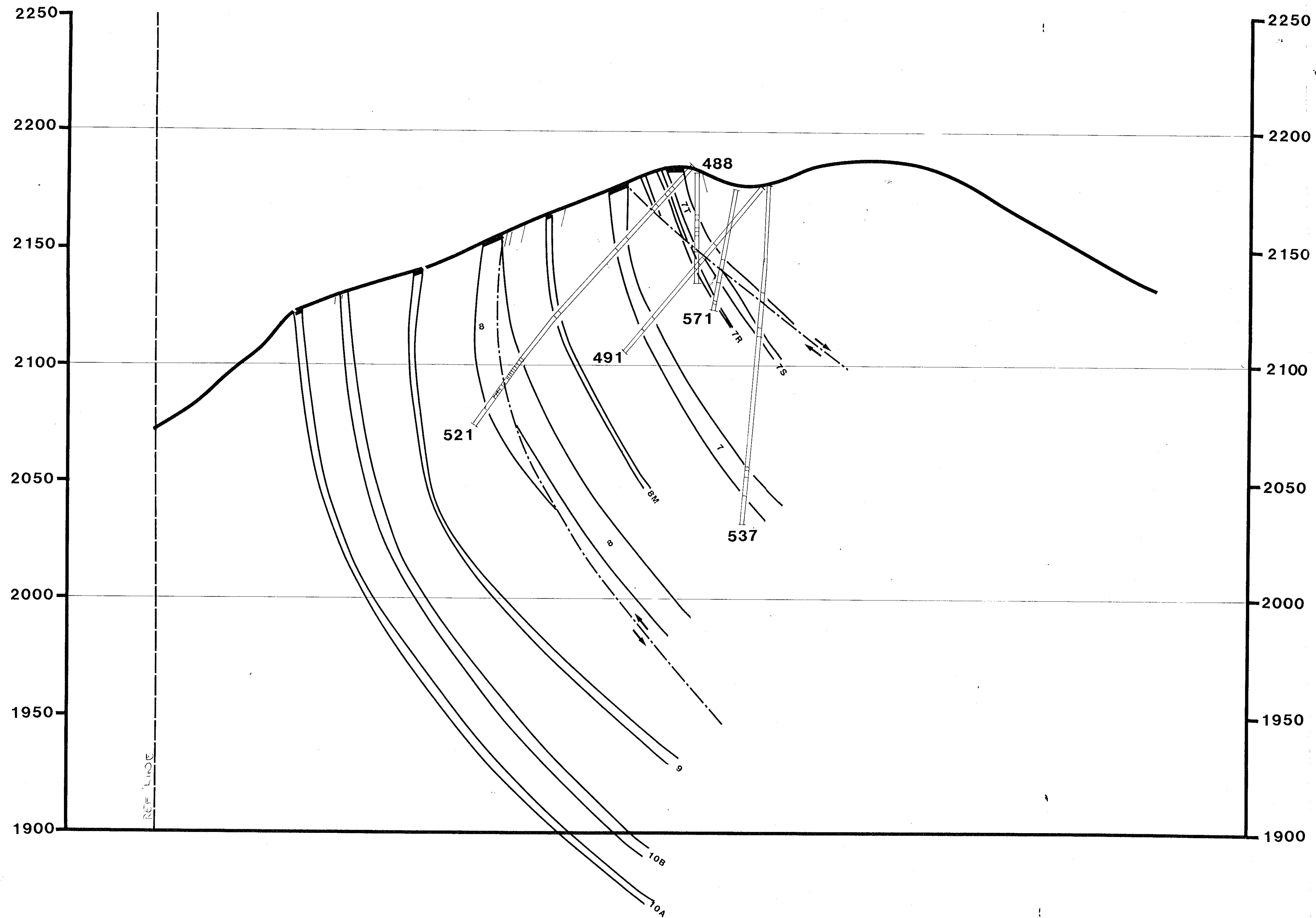
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NORTH LINE CREEK
GEOLOGY

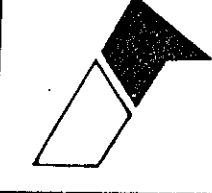
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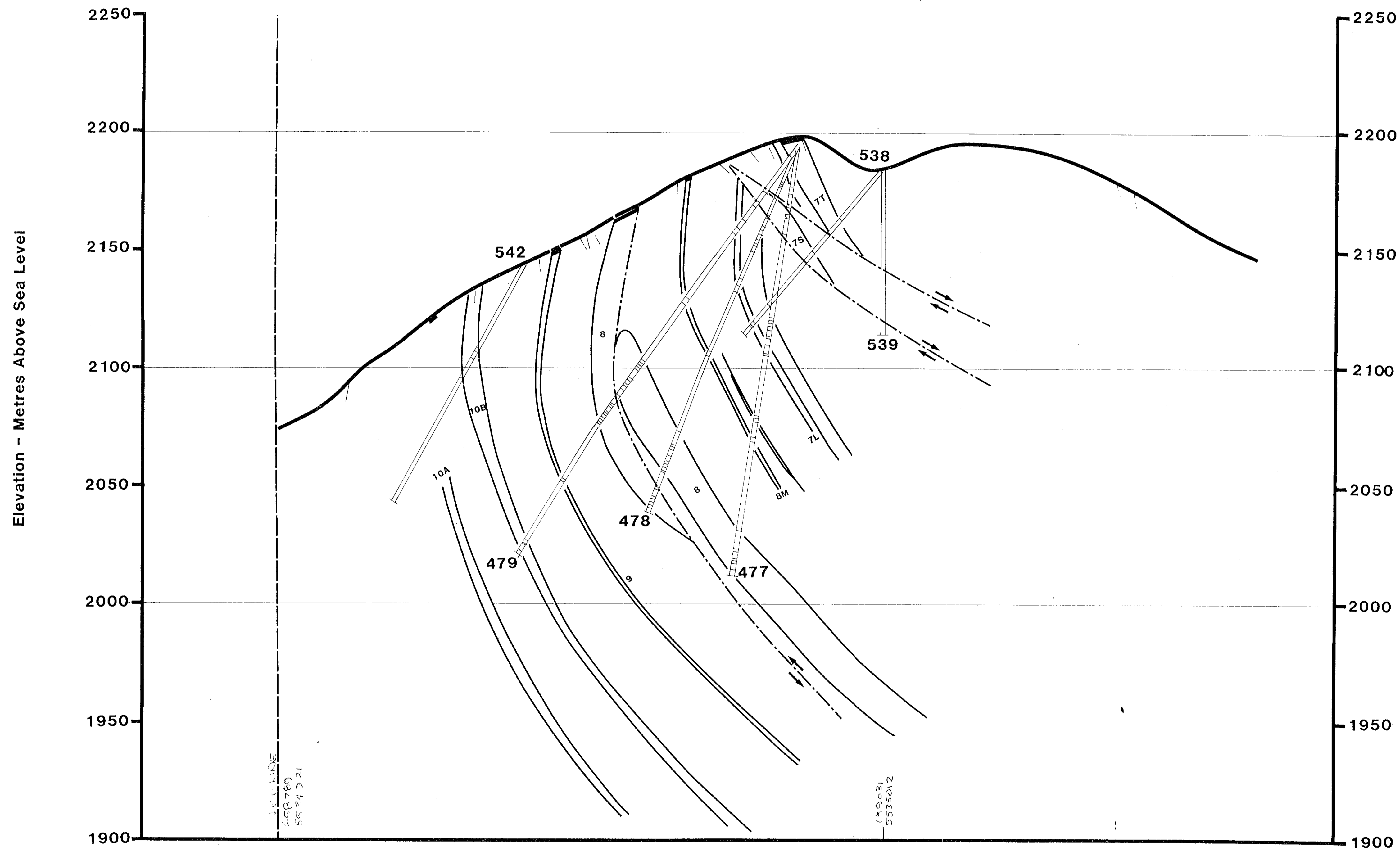
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AUTHOR JB	SCALE 1:1000	MAP No ENCL. 1

Elevation - Metres Above Sea Level



737

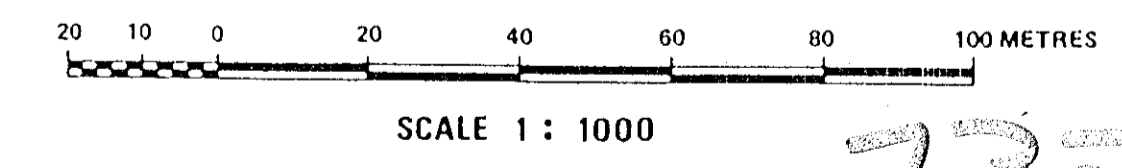
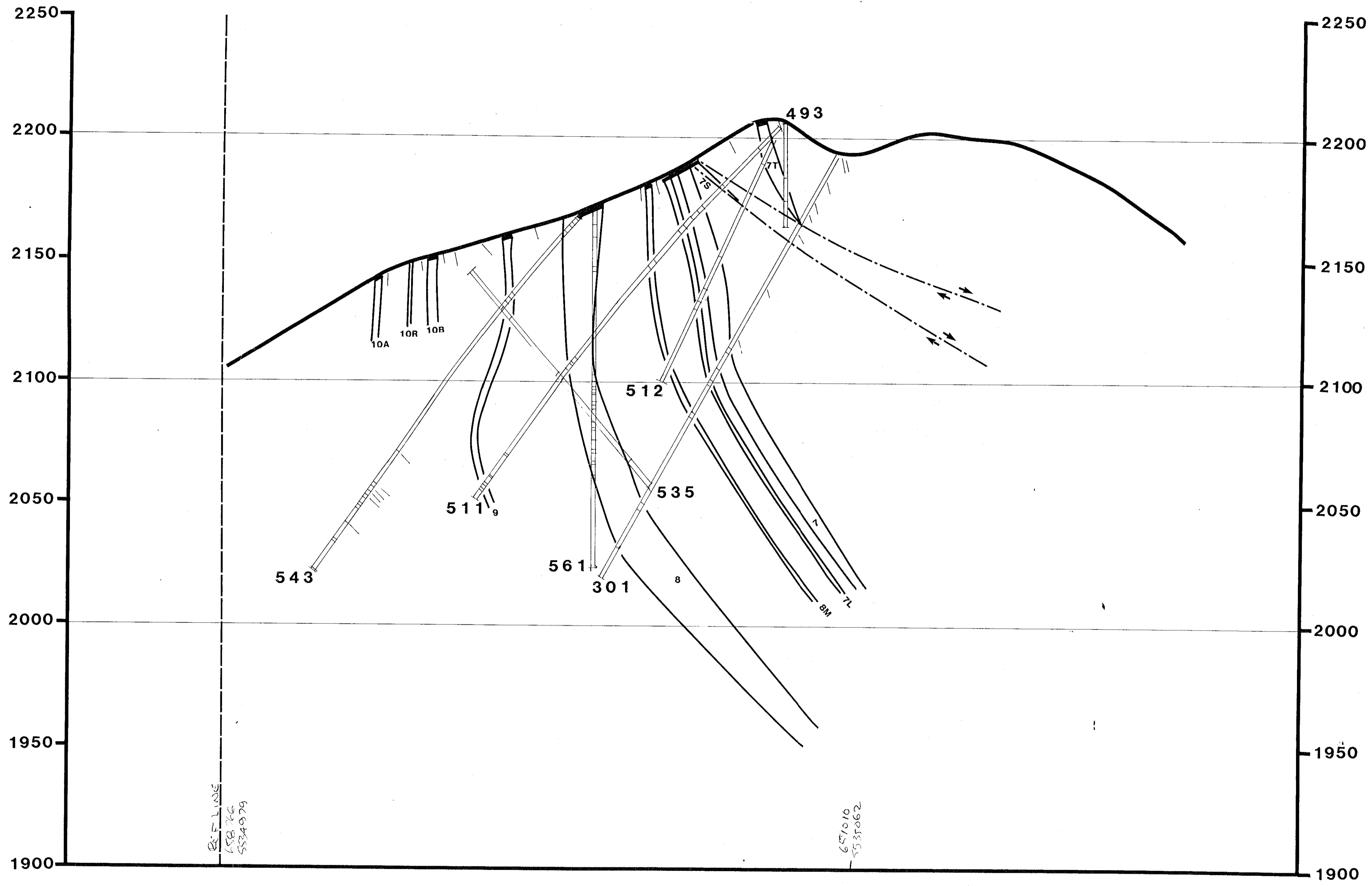
	
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MAP No	ENCL 2



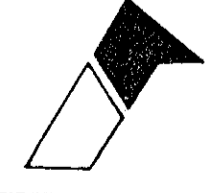
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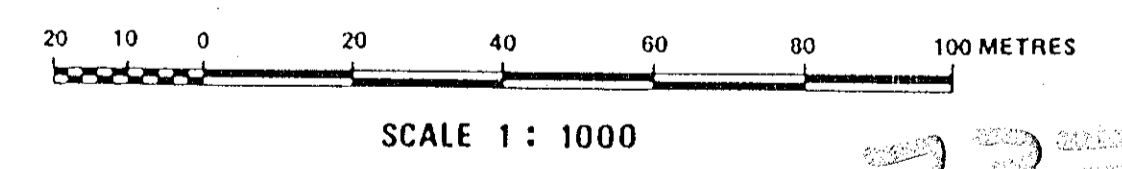
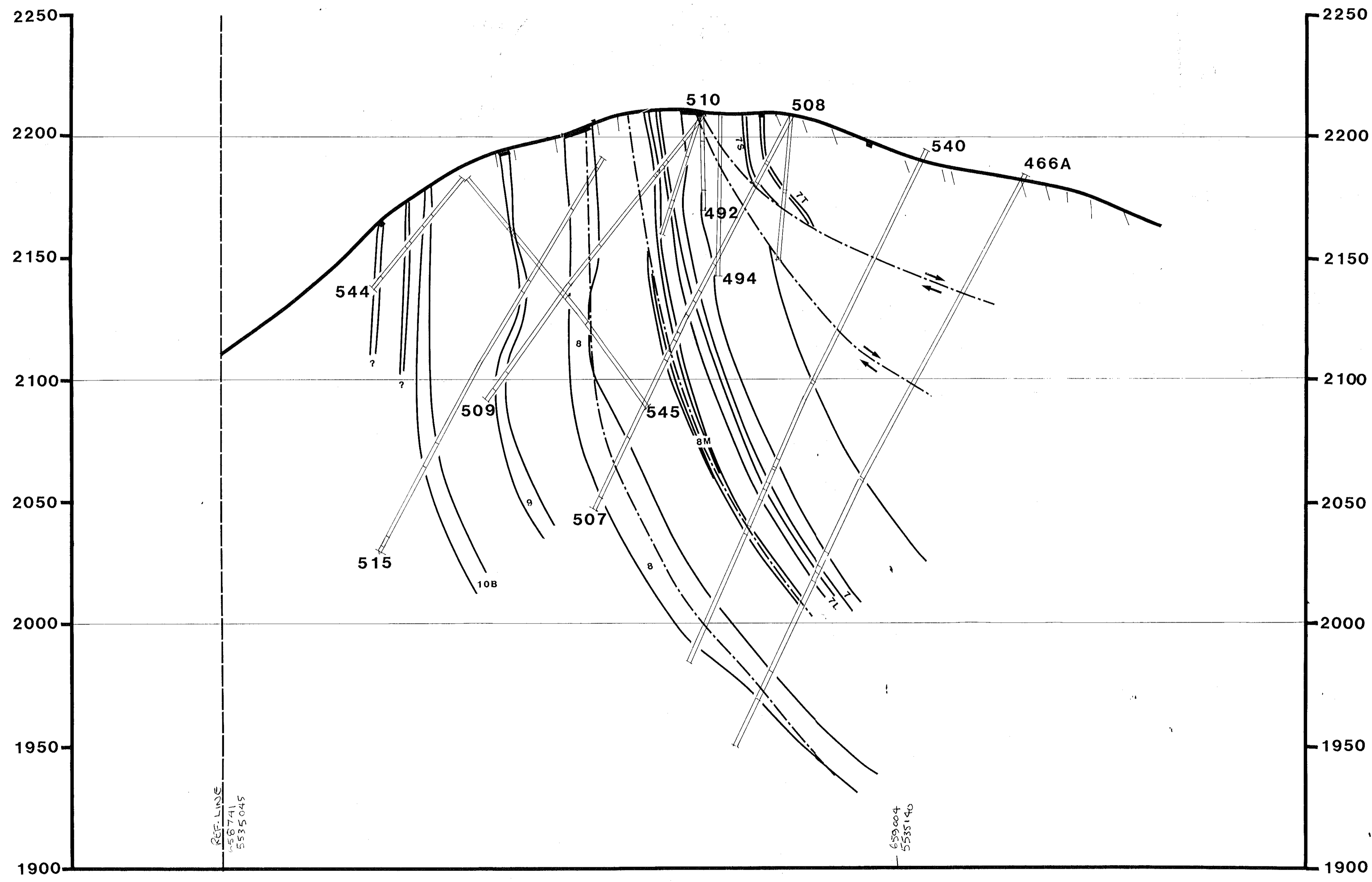
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NORTH LINE CREEK		
CROSS SECTION - 2400		
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<small>AUTHOR</small> BM	<small>SCALE</small> 1:1000	<small>MAP No</small> ENCL 4

Elevation - Metres Above Sea Level



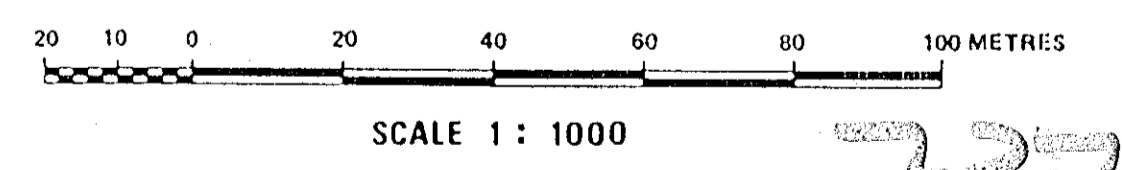
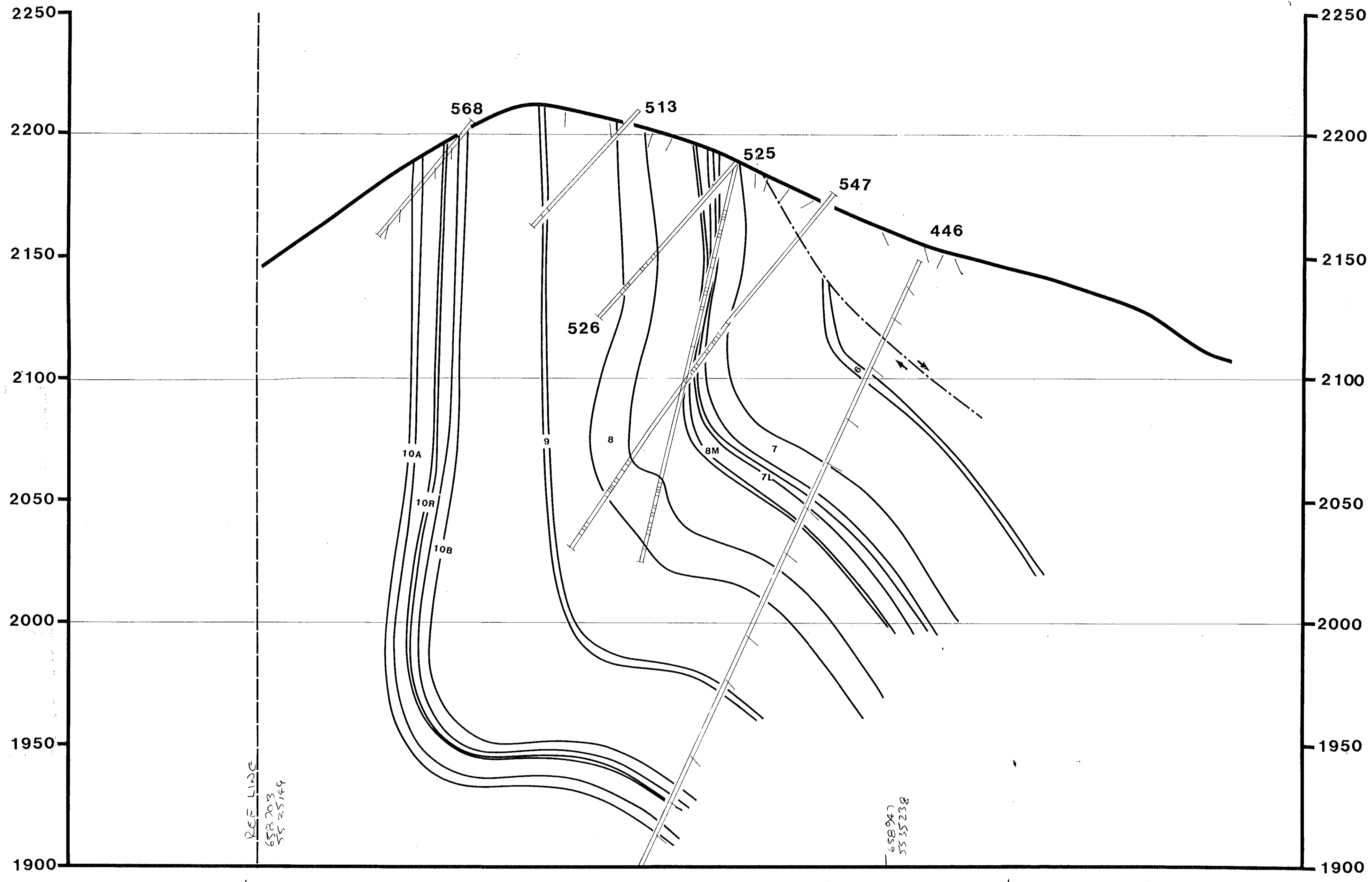
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LINE CREEK MINE

NORTH LINE CREEK
CROSS SECTION - 2470


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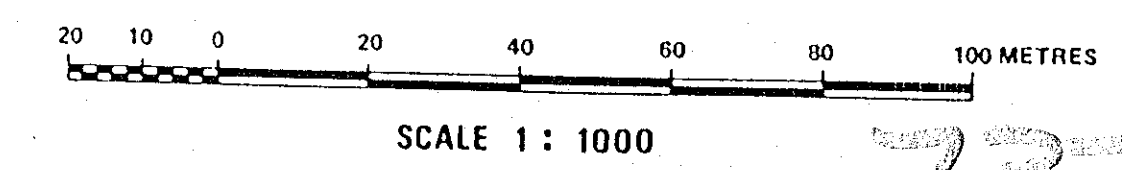
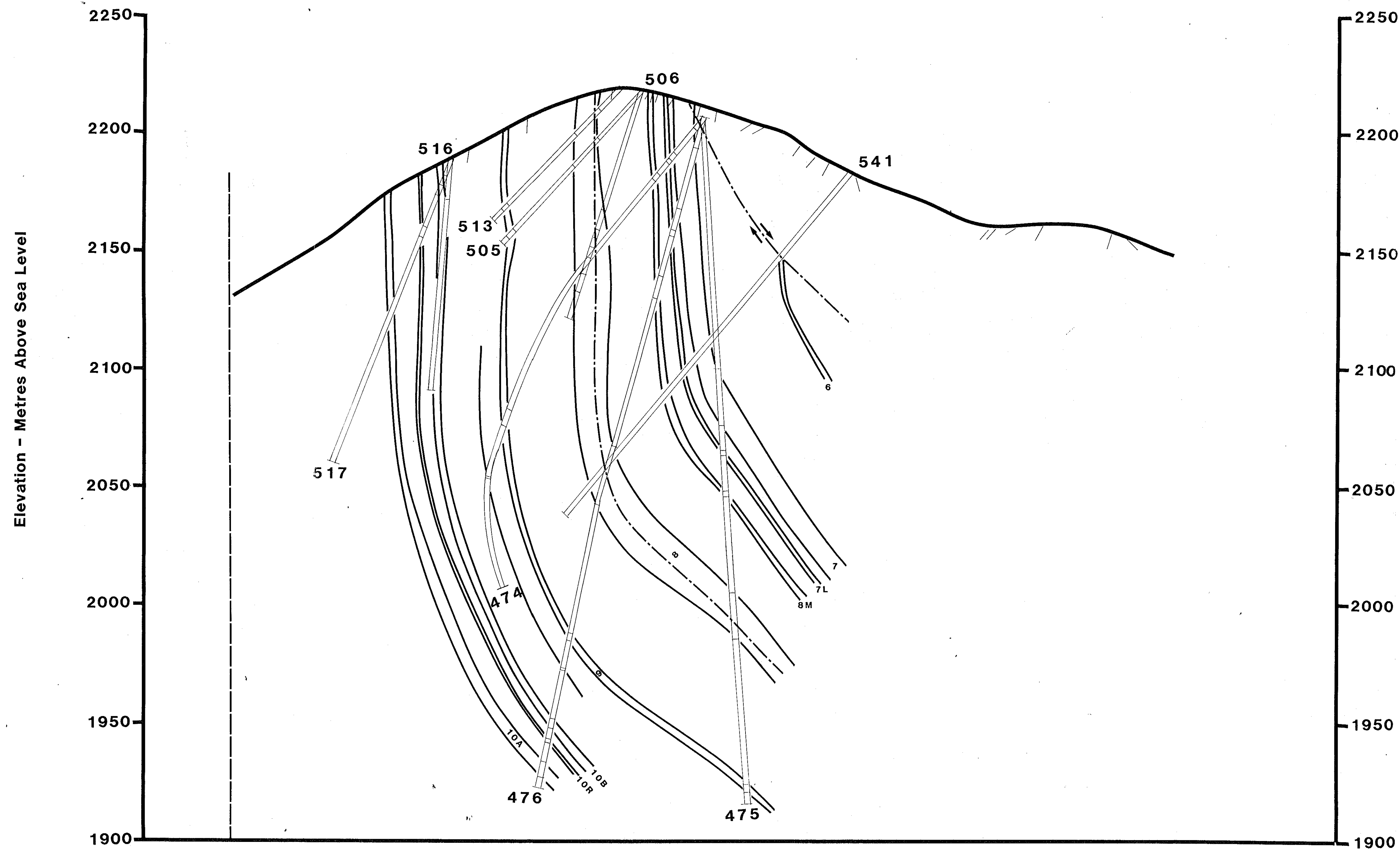
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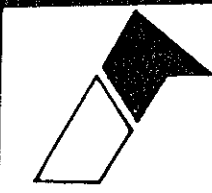
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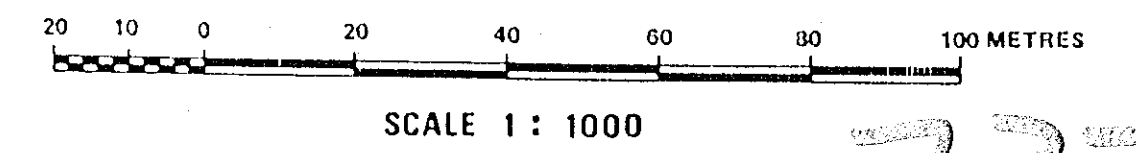
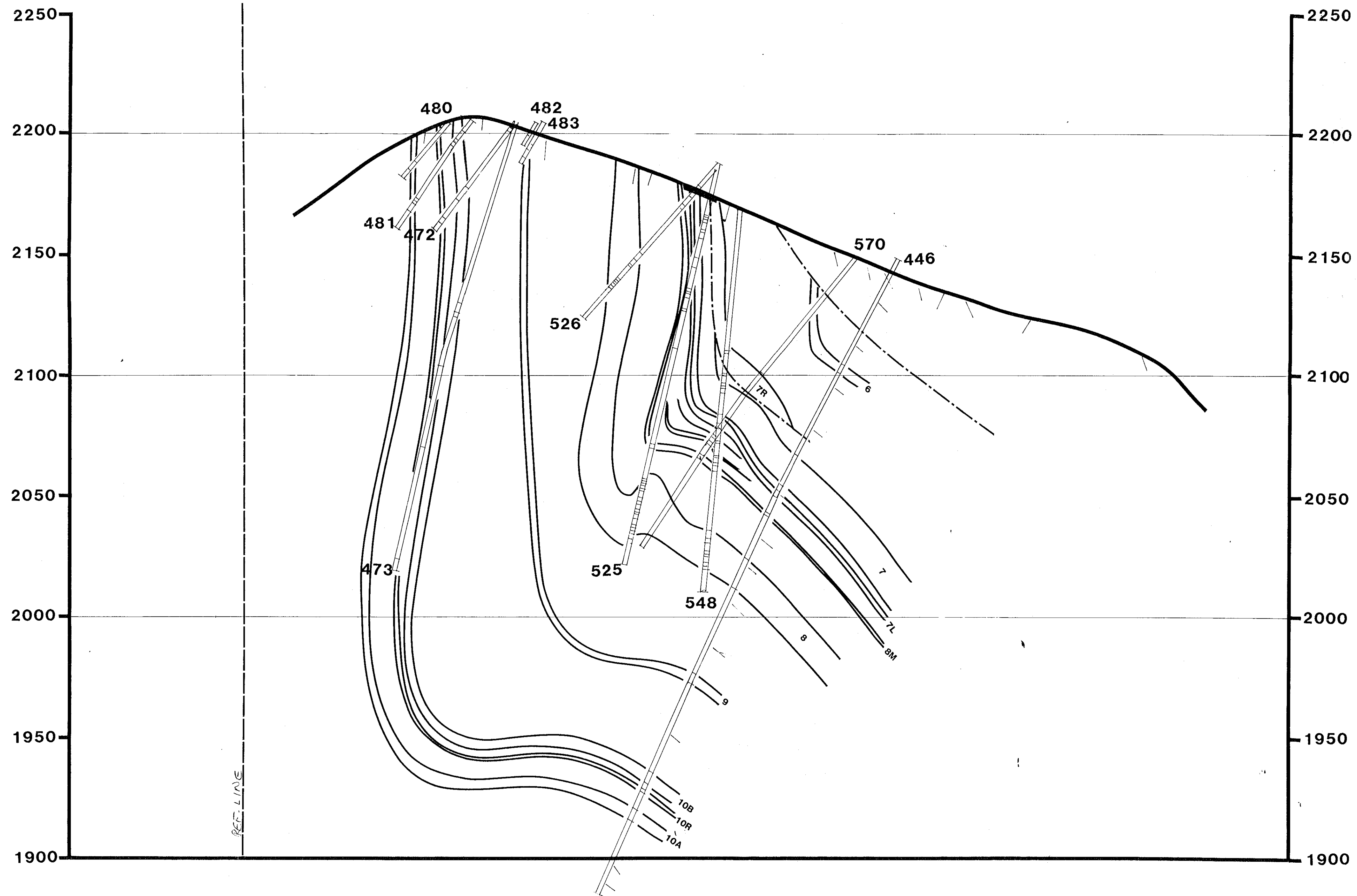
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AUTHOR	BM	SCALE	1:1000
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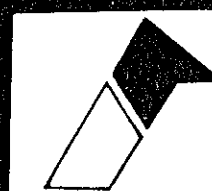


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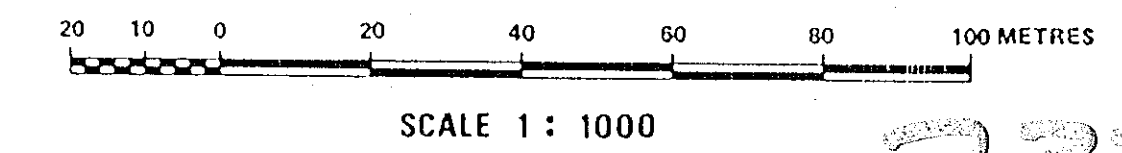
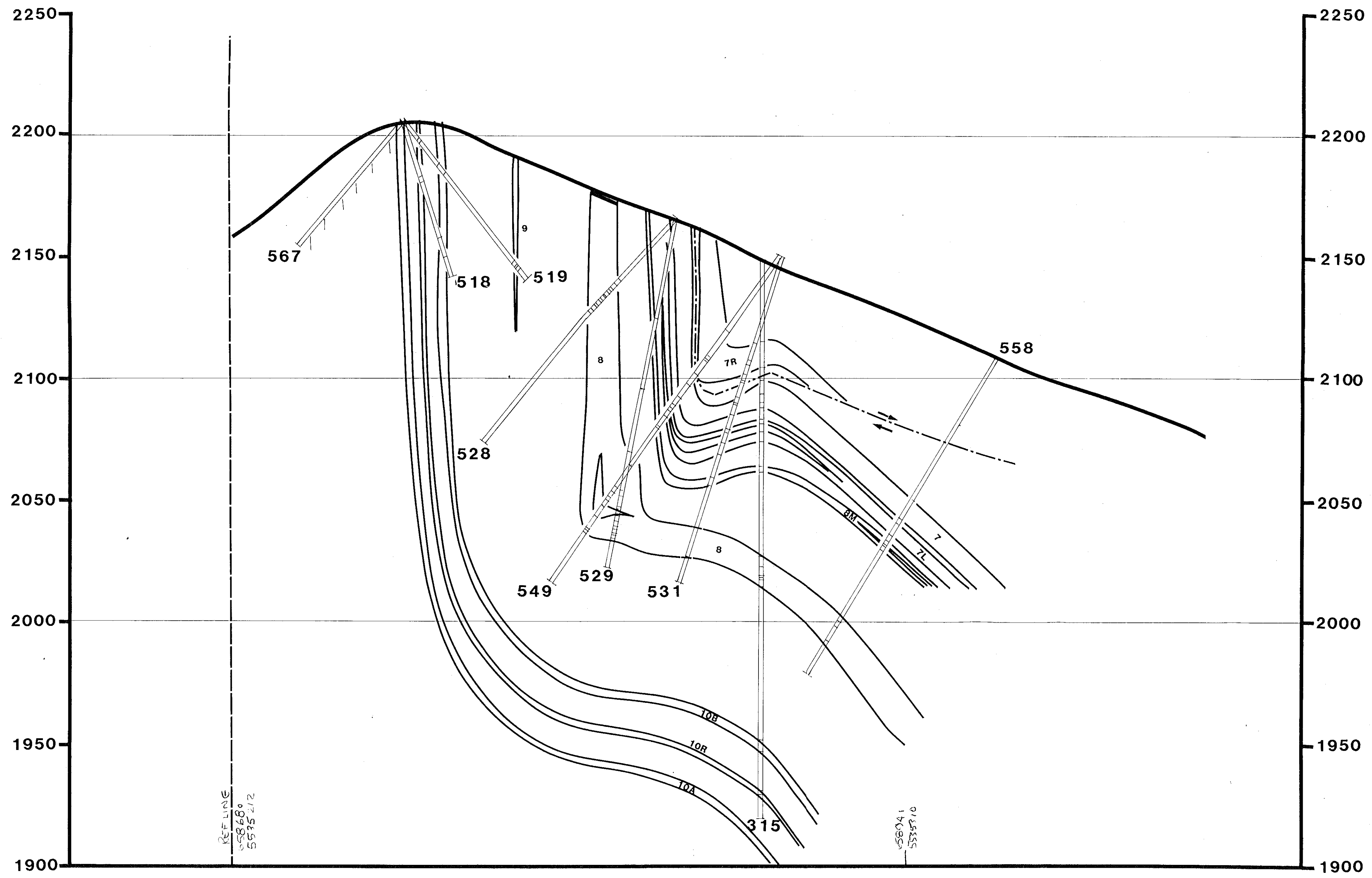
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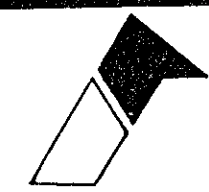
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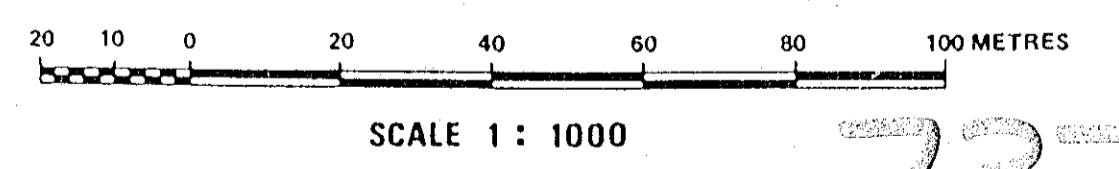
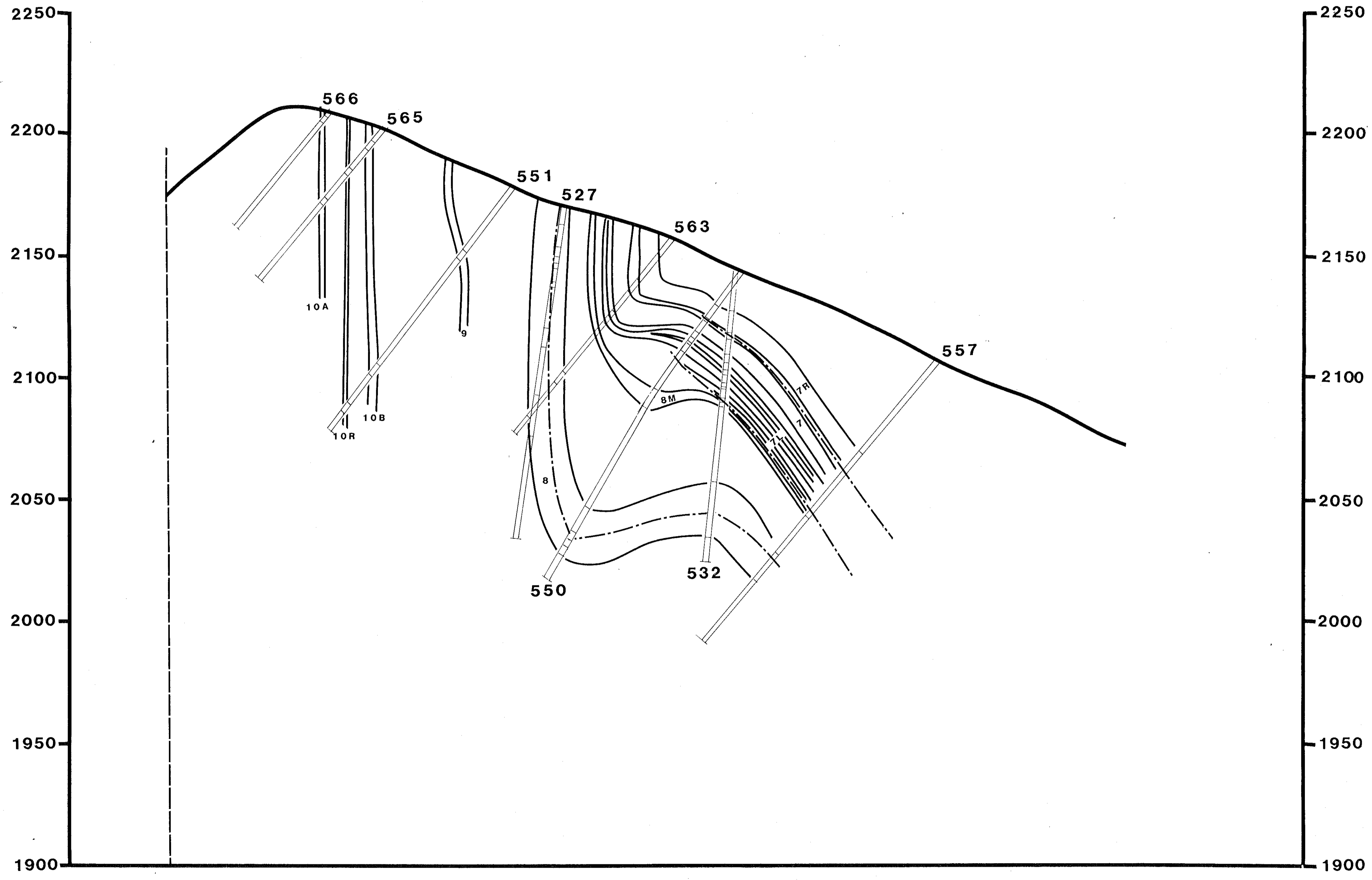
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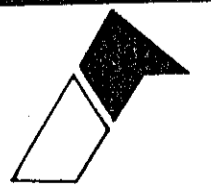
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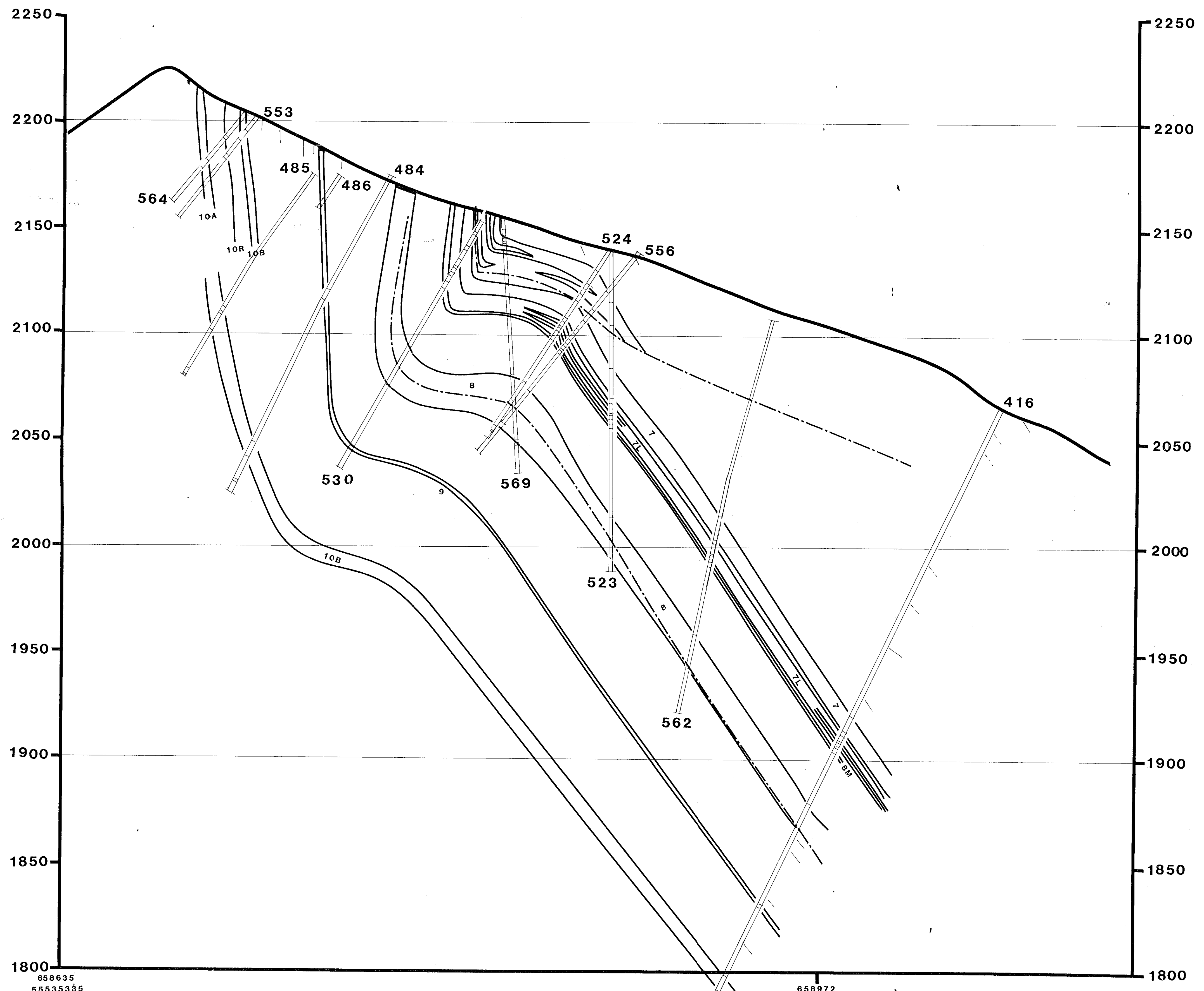
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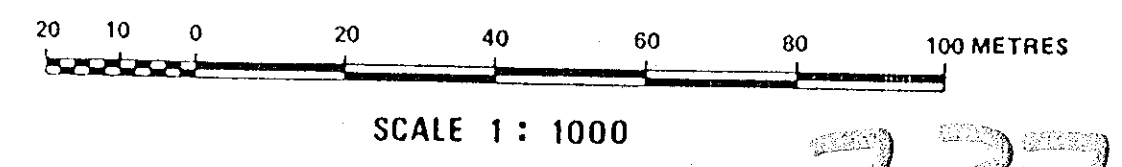
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NORTH LINE CREEK		
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Elevation - Metres Above Sea Level



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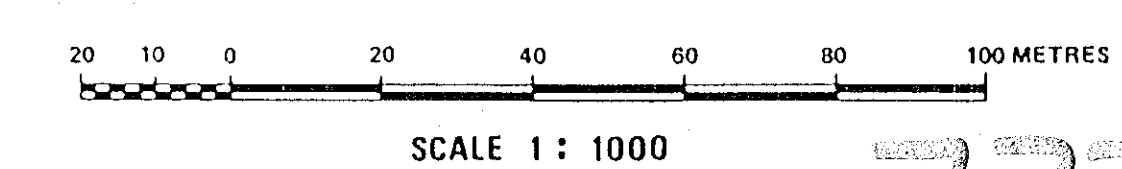
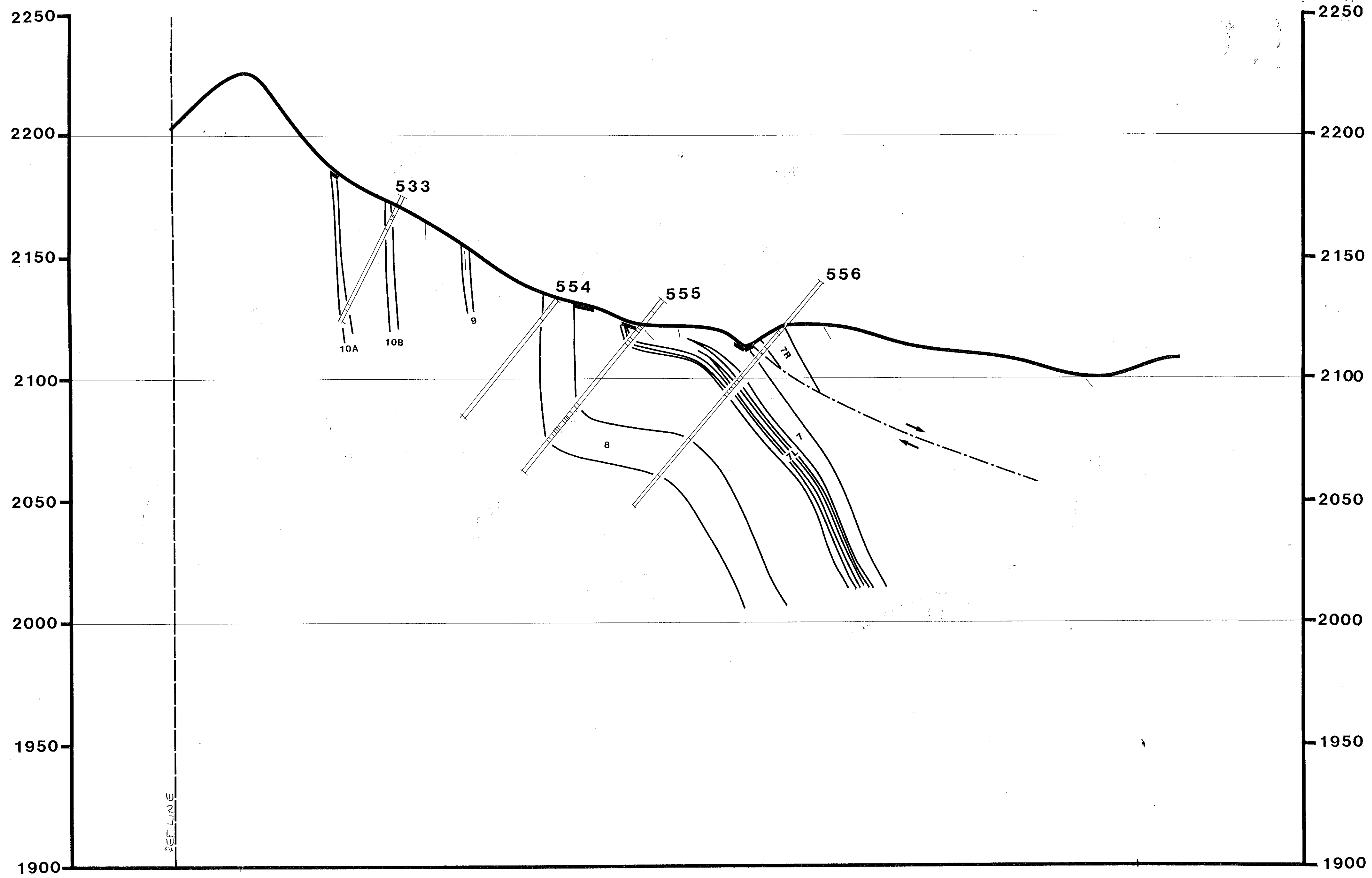
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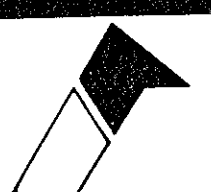
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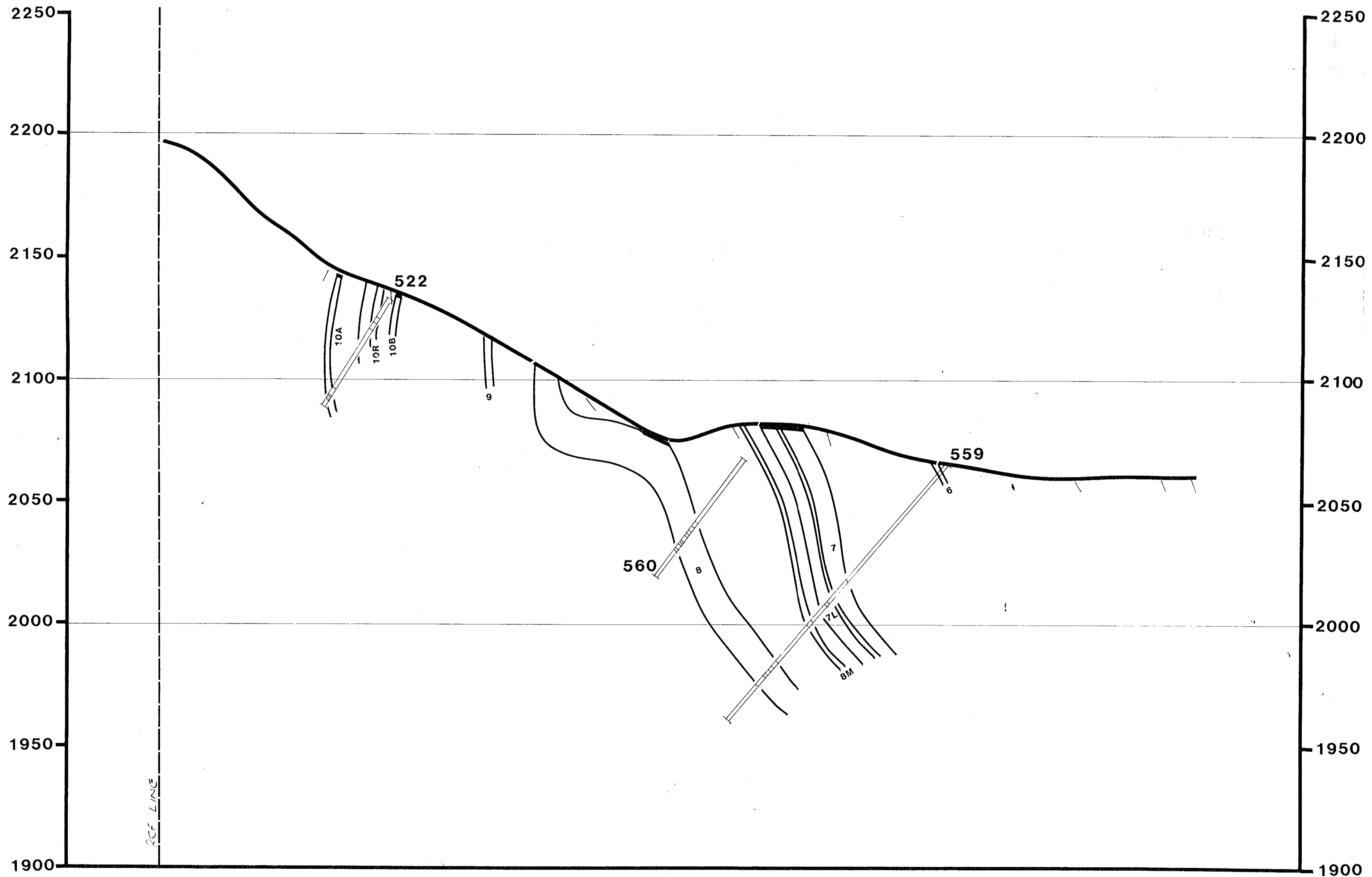
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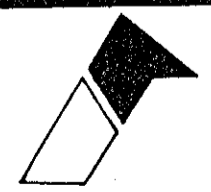
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Elevation - Metres Above Sea Level



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SCALE 1:1000

 Crows Nest Resources Limited			
LINE CREEK MINE			
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CROSS SECTION - 2900			
DRAWN BY	JWK	DATE	NOV'87
AUTHOR	BM	SCALE	1:1000
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