Mt. Michael Pass
8 Section Report
1987 Exploration Program
Confidential Analyses -
Petrographic, Fluidity, Wash.

738

TABLE 8

MT MICHEAL EWIN PASS THRUST SLICE

1987 GIESELER FLUIDITY AND PETROGRAPHY

HOLE	START LENGTH	SEAM	WASH ASH	FSI	START TEMP	FINAL TEMP.	MAX. DDPM	RO MAX.	TOTAL REACTIVES	TOTAL INERTS
5145	53	8	9.1	3.5	453	493	2	1.31	59.3	40.7
5149	56.45	10	9.7	6.0	423	497	5			

TABLE 6

MT. MICHEAL EWIN PASS THRUST SLICE

AVERAGE QUALITY 1987 DIAMOND DRILL PROGRAM

	SEAM	
	8	10
Intersection Thickness (SD)	4.45 (1.13)	9.88 (5.4)
Raw Ash (SD)	20.9 (2.2)	26.5 (8.4)
Wash Ash (SD)	8.7 (1.1)	9.5 (.7)
Wash Vols. (SD)	20.8 (.3)	21.1 (.8)
Wash FSI* (SD)	4.5	6.0

* Limited significance

TABLE 5

MT. MICHAEL EWIN PASS THRUST SLICE

COAL QUALITY DIAMOND DATA

LOWER SOUTH PIT HL5145 15/12/87

HL	SEAM	TOP	TO	TP	ADM	ASH	VOLS	FC	FSI	C.V	S%	RC/YD	SG
5145	8	42.4	48.9	R	2	18.35	-1	-1	0	-1	-1	80	60
5145	8	42.4	48.9	W	1.78	7.36	21.6	69.26	0	-1	.3	93.28	60
5145	8	53	65.3	R	.45	20.95	-1	-1	4	-1	-1	93	60
5145	8	53	65.3	W	.57	9.06	21.47	68.9	3.5	-1	.37	77.67	60
5145	Q	67	68.9	R	.37	30.57	-1	-1	4	-1	-1	82	60
5145	Q	67	68.9	W	.81	11.22	20.68	67.29	7.5	-1	.49	64.15	60
5145	Q	169.4	170.7	R	.47	10.2	-1	-1	8.5	-1	-1	60	60
5145	Q	169.4	170.7	W	.55	4.92	24.74	69.79	8.5	-1	.66	95.91	60

LOWER SOUTH PIT H5146 15/12/87

HL	SEAM	TOP	TO	TP	ADM	ASH	VOLS	FC	FSI	C.V	S%	RC/YD	SG
5146	Q	15.7	19.15	R	1.76	29.84	-1	-1	0	-1	-1	36	60
5146	Q	15.7	19.15	W	1.49	12.53	20.95	65.03	0	-1	-1	65.8	60
5146	8	70.3	72.83	R	.55	24.36	-1	-1	4	-1	-1	23	60
5146	8	70.3	72.83	W	.53	11.23	20.57	67.67	7.5	-1	-1	73.73	60
5146	8	74.85	78.35	R	.59	13.56	-1	-1	2.5	-1	-1	38	60
5146	8	74.85	78.35	W	.63	8.42	20.12	70.83	2.5	-1	-1	90.53	60
5146	8	80.5	81.1	R	.47	14.76	-1	-1	2.5	-1	-1	30	60
5146	8	80.5	81.1	W	.65	6.18	20.5	72.67	4.5	-1	-1	82.05	60
5146	10B	129.95	136.45	R	.48	28.68	-1	-1	5.5	-1	-1	40	60
5146	10B	129.95	136.45	W	.53	8.31	21.58	69.58	5	-1	-1	68.55	60
5146	10A	141.75	145.25	R	.76	91.24	-1	-1	7	7806	.39	6	60
5146	10A	141.75	145.25	W	.57	8.14	21.27	70.02	0	-1	-1	.19	60
5146	10A	145.4	148.15	R	.42	49.77	-1	-1	6	-1	.4	5	60
5146	10A	145.4	148.15	W	.8	10.73	23.41	65.06	9	-1	-1	23.26	60

LOWER SOUTH PIT H5147 15/12/87

HL	SEAM	TOP	TO	TP	ADM	ASH	VOLS	FC	FSI	C.V	S%	RC/YD	SG
5147	8	55.6	59.2	R	.48	26.55	-1	-1	7.5	-1	-1	69	60
5147	8	55.6	59.2	W	.75	5.94	22.13	71.18	8	-1	.62	71.82	60
5147	8	60.6	62.5	R	.34	34.55	-1	-1	4	-1	-1	79	60
5147	8	60.6	62.5	W	.88	8.06	21.61	69.45	7	-1	-1	57.9	60

LOWER SOUTH PIT H5148 15/12/87

HL	SEAM	TOP	TO	TP	ADM	ASH	VOLS	FC	FSI	C.V	S%	RC/YD	SG
5148	8	23.2	31.45	R	1.23	11.1	-1	-1	0	-1	-1	72	60
5148	8	23.2	31.45	W	1.17	7.21	19.04	72.58	0	-1	.29	93.00	60
5148	8	33.5	41.1	R	.64	26.88	-1	-1	2.5	-1	-1	81	60
5148	8	33.5	41.1	W	.74	9.95	20.79	68.52	3.5	-1	.47	72.78	60
5148	8	42.55	43.6	R	.48	21.62	-1	-1	3.5	-1	-1	87	60
5148	8	42.55	43.6	W	.46	10.26	21.12	68.16	6	-1	.59	72.92	60
5148	8	46.1	47.2	R	.48	29.5	-1	-1	1	-1	-1	56	60
5148	8	46.1	47.2	W	.45	18.92	19.37	61.26	1.5	-1	-1	50.65	60

LOWER SOUTH PIT H5149 15/12/87

HL	SEAM	TOP	TO	TP	ADM	ASH	VOLS	FC	FSI	C.V	S%	RC/YD	SG
5149	10B	56.45	76.85	R	.54	22.04	-1	-1	5	-1	-1	27	60
5149	10B	56.45	76.85	W	.62	9.7	20.63	69.05	6	-1	-1	79.74	60

8 SEAM REPEAT PROJECT
(Mt. Michael Ewin Pass Thrust Slice)

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

738

Report by: Barry Ryan
Manager, Geology
February, 1988

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LIST OF ENCLOSURES

(Filed sequentially at back of report)

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2 to 20	Vertical Geological Cross Sections 070° trend 60 m spacing	1:1000
21	Geophysical Logs Rotary Holes	
22	Geophysical Logs Diamond Holes	
23	Core Descriptions Diamond Holes	
24	Coal Intersection Data Rotary Holes	
25	Coal Intersection Data Diamond Holes	

STATEMENT OF QUALIFICATIONS

Name: Barry Ryan, PhD, P. Geol. Alberta
Concerning: Report entitled 8 Seam Repeat Project
Date: February, 1988

The work outlined in this report was undertaken or supervised by Barry Ryan, PhD, P. Geol.

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.

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 2074 meters 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.

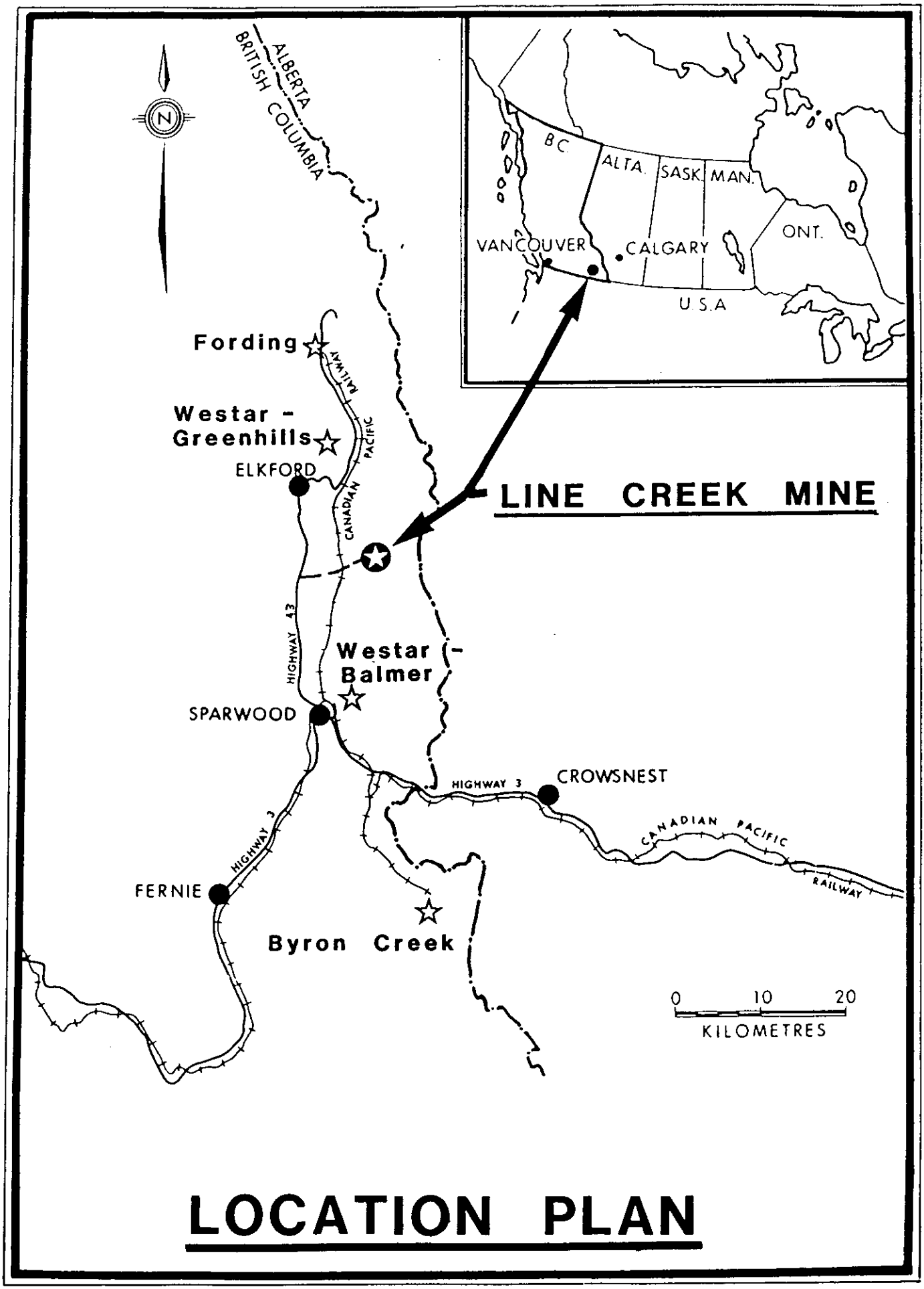
1.2 Location and Access:

The Line Creek Mine (B.C. Mine Lease 4) is located approximately 25 km north of Sparwood in southeastern B.C. Access to the mine 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 wash plant are five km east of the turn off and the active mining area is a further 15 km northeast through the Line Creek canyon (Figure 2).

1.3 Summary of Previous Work:

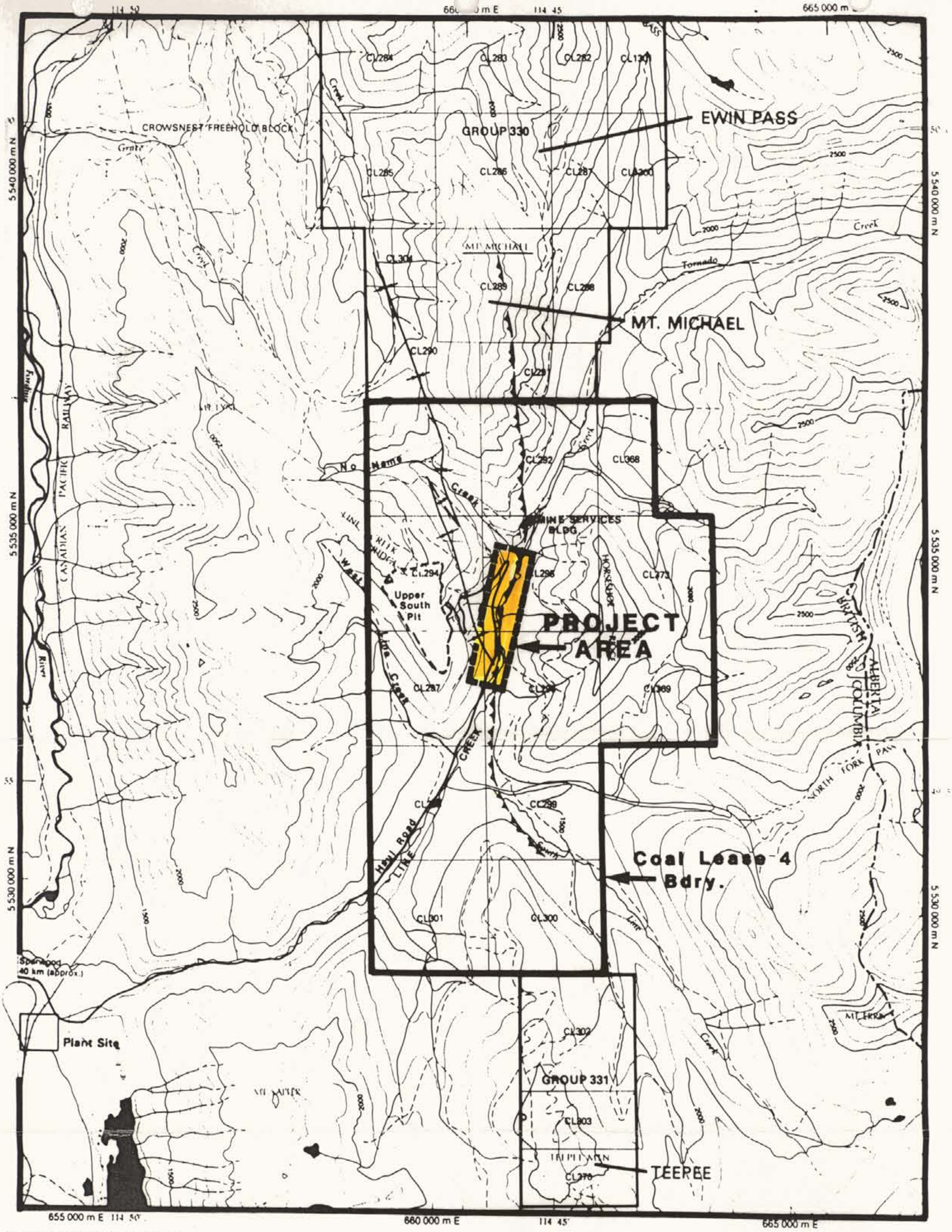
1969 - 1971 Crows Nest Industries constructed access roads onto Line Creek Ridge. The ridge was geologically mapped and 17 reserve circulation rotary holes drilled for a total meterage of 3145 meters. (series numbered up to 99).

1978 Crows Nest Resources Limited (CNRL) drilled three diamond core holes (737 meters total) (series numbered 100 to 199).



LOCATION PLAN

FIGURE 1



Scale 1:50 000

Kilometres 0.5 0 0.5 1.0 1.5 2.0 2.5 3.0 Kilometres

Miles 0.5 0 0.5 1.0 1.5 2.0 Miles

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 2000 1500
- Licence boundary
- Licence group boundary
- **Alexander Creek Syncline**
- **Ewin Pass Thrust**

TN

Grid North

Crows Nest Resources Limited

Site Access & Project Location

MT. MICHAEL-EWIN PASS THRUST SLICE

FIG. 2

1979	CNRL drilled four rotary drill holes (370 meters total) and constructed one adit in 8 seam.
1980	Two rotary holes (200 series)
1981 - 1982	A number of diamond holes were drilled in North Line Creek, six of these are plotted in the northern part of the present area. (400 series)
1983	CNRL drilled two rotary holes (610 and 906)
1985	CNRL drilled three rotary holes (1799, 1800, 1812)
1986 to spring 1987	CNRL conducted a major FAME supported exploration program consisting of the following elements: - 1800 meter road construction - drill site preparation - rotary drilling 112 holes for a total meterage of 8877 meters (holes numbered 5000 to 5112) - lab analysis (ash and FSI raw) on one meter increment coal samples - geological interpretation utilizing CNRL Mincom MINER2 software.

1.4 Summary of Work Done in 1987 Program:

- 14 reverse circulation rotary holes for 1822 meters (series 5113 to 5144).
- 6 HQ cored diamond holes for 744.6 meters (5145 to 5150)
- Coal analysis: Rotary Holes; 1 meter increments ash and FSI on raw samples. Diamond holes; ash and FSI on coal intersection
  raw samples; full prox on 1.6 wash plus additional analyses.
- Geological interpretation; 20 sections were constructed with the help of a PC program for projecting drill hole data down the

structural plunge into the sections. The geological structure is too complicated to be modeled by the main frame Mincom MINER2 software.

2.0 THE PROJECT

2.1 Objective of the Present Program:

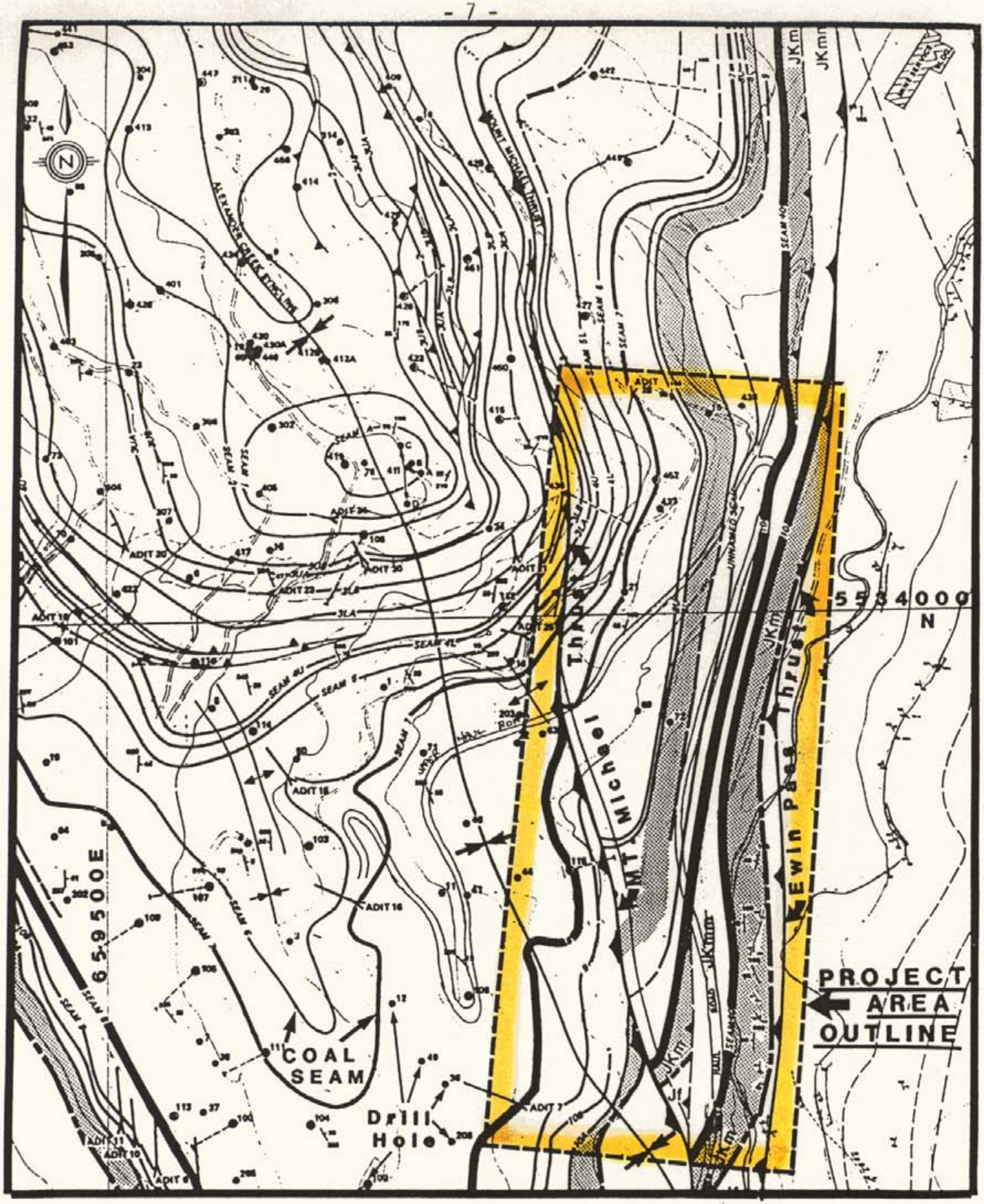
Mining is at present taking place in the Lower South Pit (Figure 2) which occupies the flat dipping core of the Alexander Creek Syncline. East of this area is a structural domain influenced by trailing thrusts developed on the back of the Ewin Pass thrust where it cuts up section through the Moose Mountain Member. There is considerable economic advantage to extending the present mining activities to the east into this area if the strip ratio is favourable.

The present "8 Seam Repeat" program was initiated in order to provide data to help describe the geology in this structurally complex area.

2.2 Project Definition:

The main Line Creek pit also referred to as the Upper South Pit occupies the west limb of the Alexander Creek Syncline on the southern part of the Line Creek Ridge (Figure 2). The Lower South Pit occupies the core of the Alexander Creek Syncline at the southern end of the Line Creek Ridge. The northern part of Line Creek Ridge is divided into the N.L.C. 8 seam pit (the steep dipping west limb) and the 2 seam pit (core of the syncline).

The area of the study is structurally the thrust slice between the Mt. Michael thrust (eastern edge of Lower South Pit) and Ewin Pass thrust (Line Creek valley) (Figure 3). The area extends the length of Line Creek Ridge from West Line Creek to No Name Creek. In the rest of this report the study area will be referred to as the Mt. Michael Ewin Pass thrust slice.



PROJECT AREA

MT. MICHAEL-EWIN PASS THRUST SLICE

Scale 1:10000

FIGURE 3

3.0 GEOLOGICAL OVERVIEW

3.1 Regional Geology:

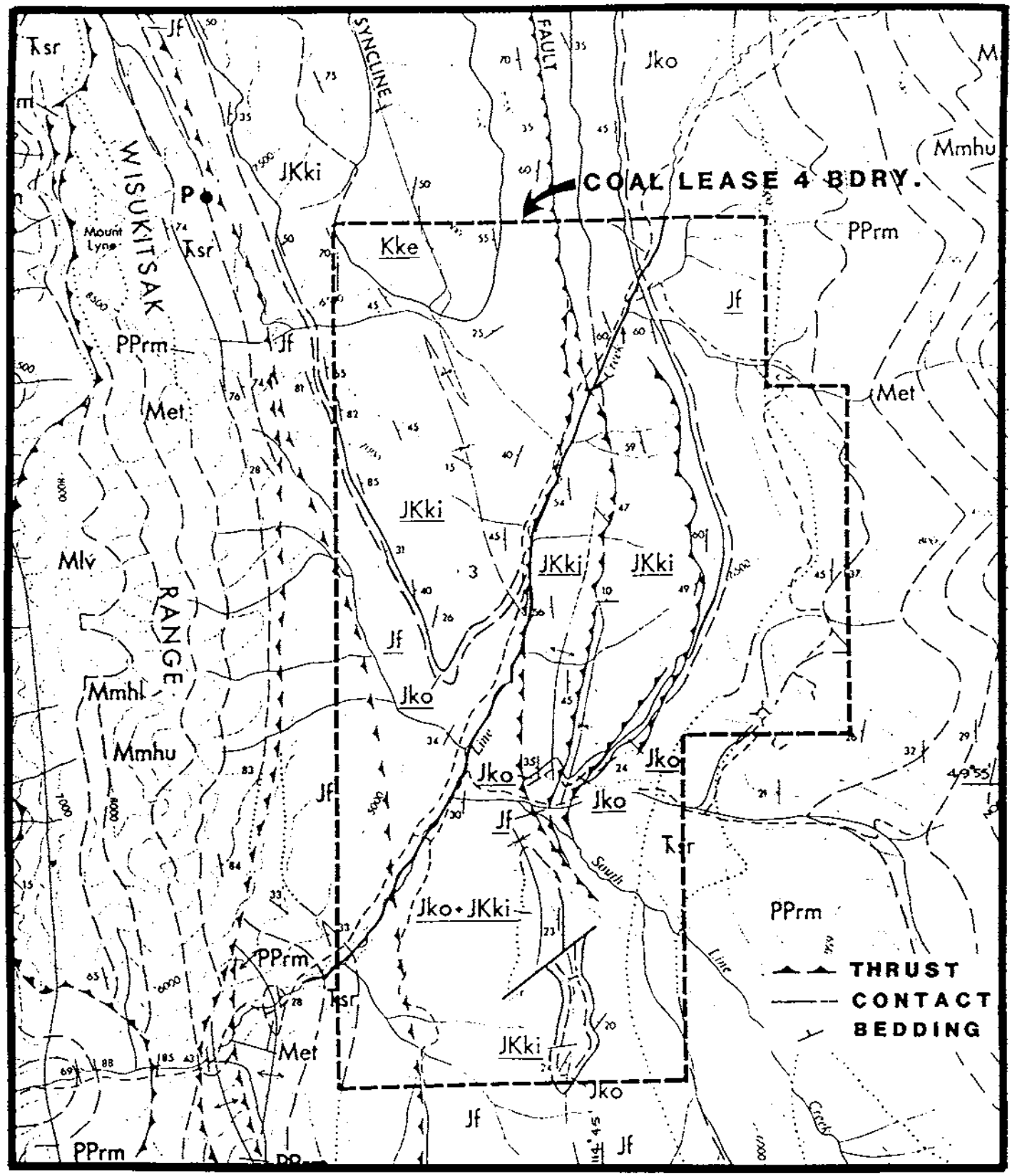
The Line Creek Mine is in the Rocky Mountains, Front Ranges physiographic province of the Eastern Cordillera fold belt. This province is characterized by open shallow plunging north or south trending folds and major thrusts which dip westward and strike north south.

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 1). 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 conglomeratic; carbonaceous shale and coal*

REGIONAL GEOLOGY

Coal Lease 4

SCALE 1:50 000

0 1 2 3 4 5 KILOMETRES

PART OF

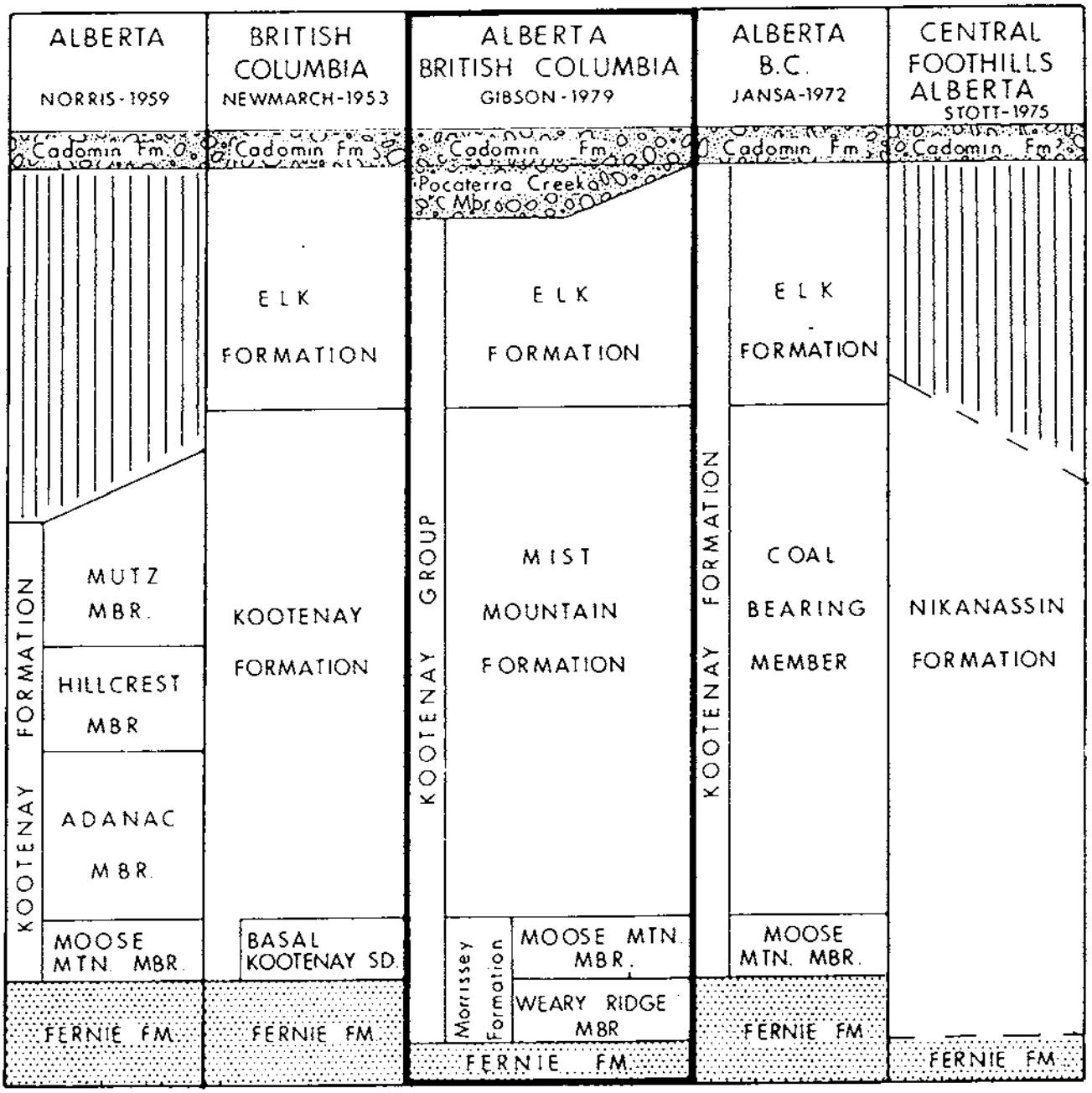
Ministry of Energy, Mines and Petroleum Resources

PRELIMINARY MAP 63

FIGURE 4

TABLE OF FORMATIONS

Nomenclature of the Kootenay Group (after Gibson, 1979)



CROWS NEST RESOURCES

TABLE 1

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 30 meters 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 was 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 meters 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 developing off the top surface of the Ewin Pass Thrust. The most prominent and most most westerly being 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 assymetric 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 forming 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 MT. MICHAEL EWIN PASS THRUST SLICE

5.1 Stratigraphy:

Coal seams in the Mist Mountain Formation are numbered in sequence from No. 10 at the base of the Formation to No. 1 in the top third of the Formation. In the Mt. Michael Ewin Pass Thrust Slice seams 10, 9, 8 and possibly 7 are present representing a stratigraphic thickness up to 200m resting on the Moose Mountain formation. Lithologies other than coal include sandstone, siltstone, and mudstone. Uncertainties in the structural interpretation make it very difficult to define the proportions of the various lithologics.

In the west of the area 10 seam occurs as two major bands (10A and 10B). Tracing the seam to the east towards the Ewin Pass thrust multiply intersections of the 10 seam are encountered. The author prefers a structural interpretation for the confusion as indicated by the sections which depict a number of thrusts that stack 10 seam.

Nine seam thins eastward in the Lower South Pit. In the Mt. Michael Ewin Pass Thrust Slice it is discontinuous and when identified often consists of a number of splits. The 9 sand is prominent and probably responsible for the absence of 9 seam. Eight Seam is thick in the western edge of the area but thins eastward to less than three meters of coal in a number of splits.

5.2 Structure:

The project area is cut by a number of steep dipping thrust faults and is underlain by the Ewin Pass Thrust which subcrops to the east of the area. Coal seams in the area are shallow to steep dipping overlapped and down dropped to the east under successive thrusts. Exploration to date has consisted of numerous rotary drill holes; some diamond holes; one adit and geological mapping on a 1:5000 scale. Drill particulars for the 1987 program are listed in Table 2.

TABLE 2

MT. MICHAEL EWIN PASS THRUST SLICE

DRILL HOLE PARTICULARS

HOLE	TYPE	LENGTH	N	E	EL.	ORIENTATION	LOGS
5113	Rotary	101	5533966.0	660409.0	1620.1	074/63	no logs
5114	"	146	5533965.8	660403.3	1620.1	069/30	gamma, dev.
5115	"	205.6	5534029.0	660378.0	1620.5	250/80	gamma, dev.
5131	"	72	5534166.1	660428.3	1598.5	090/90	gamma, dev.
5132	"	128	5534156.2	660397.8	1601.9	090/90	gamma
5133	"	91	5534154.6	660365.4	1605.6	090/90	gamma, dev.
5134	"	120	5534165.0	660371.9	1605.8	250/51	gamma, dev.
5135	"	115	5534091.7	660373.8	1607.5	250/61	gamma, dev.
5136	"	130	5534091.7	660373.8	1607.5	250.85	gamma, dev.
5137	"	140	5534091.3	660375.9	1607.4	070/49	gamma, dev.
5138	"	146	5534179.8	660477.7	1591.8	090/90	no logs
5139	"	170	5534206.1	660342.0	1630.3	090/90	gamma, dev.
5140	"	146	5534277.0	660385.8	1633.4	090/90	gamma, dev.
5145	HQ Core	228.9	5534171.9	660431.3	1597.8	245/65	gamma, neut, den, dev.
5146	"	156.2	5534076.3	660462.7	1582.8	250/55	gamma, neut, den, dev.
5147	"	130.9	5534029.2	660378.7	1620.6	075/75	gamma, neut, den. dev.
5148	"	79.7	5534074.9	660460.6	1582.8	090/90	gamma, neut, den, caliper, res. dev.
5149	"	81.9	5533948.6	660498.3	1572.4	260/55	gamma, neut, den, caliper res. dev.
5150	"	70.1	5533945.8	660495.3	1572.0	069/54	no logs

There is no outcrop in the area so that the structural interpretation is based on drill hole data projected into vertical sections. Regional structural data and dip strike information to the north indicate a trend of 340°/15 for the folds. This orientation of one close to it was used as a control for projecting drill hole data into sections and for projecting structural patterns from section to section.

Two simplified constraints borrowed from Dahlstrom (1970) Boyers and Elliott (1982) were used to ensure internal consistency of the interpretation. The length of the particular seam measured between two fixed control points on a section was kept approximately constant from section to section. Folding could give way to fault overlap or vise versa but major folds or faults could not be introduced in one section and left off adjacent sections because this would cause a drastic change in the seam length. The same principle of conservation of seam length was applied to different seams within a single section. If 8 seam length over a horizontal width of 200m was 300 m then the 10 seam profile must have approximately the same length. Obviously these are first order constraints that are not totally valid but they do help to constrain interpretations towards the more plausable.

In the southern and northern parts of the area data is sparce and the sections are very simplified and stylized. As more data is obtained the sections will be completely re-worked. At this stage though they are useful as rough indicator of exploration potential.

The general structural style represented by the sections is one of thrust repetition. In some places though it was impossible to meet the constraint of seam length and thrust offset. Any thrust based explanation of seam locations or absences in drill holes implied an inordinate length of seam hiding in the section. the author was forced into an interpretation of forward moving wedges. In this model underlying wedges of rock are squeezed eastward under west dipping fault surfaces which collapse to fill the void left behind. The end result is the appearance of a west dipping normal fault. The model

explains the information to date but is probably rooted more in desperation than reality.

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 Table 3. Obviously mathematically composited FSI values are only approximate. Table 4 provides by seam average data generated from Table 3.

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 Table 5. 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 6.

Additional tests were performed on some samples. Oxide analysis on H.T. ash for seams 8 and 10B are reported in Table 6, which also includes an attempt at reconstituting the oxides back into a mineral 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 the two above samples as well as petrography on the 8 seam sample. These results are reported in Table 7. The data for 8 seam is typical; 8 seam in this area is partially oxidized and combined with its unreactive nature

often of poor metallurgical quality. The core recovery for the 10 seam sample was poor consequently the data is not very reliable.

TABLE 3

MT. MICHAEL EWIN PASS THRUST SLICE

COAL QUALITY ROTARY DATA

NO	HOLE	TYPE	seam	from	to	ash	FSI
1	5140	R	8.00	68.50	74.50	17.60	4.00
2	5140	R	8.00	75.50	88.50	26.90	4.00
3	5140	R	9.00	108.00	111.00	28.90	3.00
4	5140	R	9.00	120.00	121.00	33.90	5.50
5	5137	R	8.00	85.50	87.50	38.30	3.00
6	5137	R	8.00	89.50	91.00	15.10	7.50
7	5137	R	8.00	91.00	98.00	19.80	1.50
8	5137	R	8.00	98.00	100.00	18.00	7.50
9	5139	R	8.00	86.00	91.00	37.20	4.00
10	5139	R	8.00	95.00	104.00	35.30	3.50
11	5138	R	8.00	100.00	103.00	29.80	4.00
12	5138	R	8.00	105.00	106.00	23.90	7.00
13	5138	R	8.00	121.00	124.00	26.10	4.50
14	5138	R	8.00	126.50	127.50	31.80	3.50
15	5077	R	8.00	27.00	32.50	17.80	5.00
16	5077	R	8.00	34.00	42.00	23.70	3.00
17	5077	R	9.00	85.50	91.50	24.60	5.00
18	5077	R	9.00	93.00	97.00	20.50	5.00
19	5077	R	10.00	153.50	155.50	40.50	2.00
20	5077	R	10.00	162.00	163.00	26.40	3.00
21	5107	R	8.00	11.00	17.00	19.70	3.50
22	5107	R	8.00	19.00	30.00	24.60	1.50
23	5107	R	9.00	77.50	79.50	29.20	3.50
24	5107	R	10.00	129.50	131.00	22.60	4.50
25	5107	R	10.00	136.00	144.00	23.60	4.50
26	5107	R	10.00	150.00	155.00	20.90	3.00
27	5114	R	9.00	96.00	105.00	12.80	3.50
28	5114	R	9.00	105.00	107.00	17.80	5.50
29	5114	R	9.00	116.00	120.00	16.40	7.00
30	5114	R	9.00	120.00	123.00	7.70	7.50
31	5114	R	9.00	123.00	131.00	13.80	6.50
32	5042	R	8.00	52.00	58.00	20.30	4.50
33	5042	R	8.00	59.00	65.50	20.30	4.00
34	5042	R	9.00	114.00	119.50	45.30	2.50
35	5042	R	10.00	169.00	181.00	0.00	4.00
36	5042	R	10.00	169.00	181.00	23.90	4.00
37	5087	R	8.00	70.50	74.50	53.80	3.00
38	5087	R	8.00	76.50	78.50	39.00	4.50
39	5087	R	8.00	80.00	86.60	16.10	5.00
40	5087	R	8.00	107.50	110.50	24.70	0.00
41	5087	R	8.00	116.50	124.50	24.90	0.00
42	5106	R	8.00	17.00	21.00	26.40	4.00
43	5106	R	8.00	21.00	23.00	43.20	2.50
44	5106	R	8.00	23.00	29.00	21.20	1.50
45	5106	R	9.00	81.50	83.00	46.70	1.00
46	5106	R	9.00	92.80	95.00	64.90	1.50

TABLE 3 con't

NO.	HOLE	TYPE	SEAM	FROM	TO	ASH	FSI
47	5106	R	9.00	136.50	156.50	29.40	2.50
48	5076	R	8.00	38.00	44.00	18.30	3.50
49	5076	R	8.00	45.00	55.00	21.10	3.50
50	5076	R	9.00	99.00	105.00	29.60	3.50
51	5076	R	9.00	110.50	114.00	43.70	3.50
52	5115	R	9.00	61.00	62.00	41.00	3.00
53	5115	R	10.00	132.00	144.00	23.50	4.00
54	5115	R	10.00	145.00	156.00	25.20	3.50
55	5137	R	8.00	35.50	42.00	27.20	5.00
56	5137	R	8.00	44.00	46.00	29.30	4.00
57	5137	R	8.00	47.50	49.50	30.90	5.00
58	5105	R	8.00	39.00	43.00	23.90	1.50
59	5105	R	8.00	43.00	45.00	45.60	1.00
60	5105	R	8.00	45.00	54.00	20.80	3.00
61	5105	R	9.00	100.00	104.00	36.20	3.50
62	5105	R	9.00	110.00	113.00	49.80	1.00
63	5105	R	10.00	161.50	165.00	32.00	2.50
64	5105	R	10.00	170.00	172.50	33.60	4.00
65	5105	R	10.00	181.00	187.50	27.30	3.00
66	5081	R	9.00	40.40	50.00	39.10	3.50
67	5112	R	10.00	120.50	131.00	15.00	0.00
68	5112	R	10.00	138.50	145.00	29.90	6.50
69	5037	R	8.00	6.00	9.00	18.50	3.00
70	5037	R	8.00	30.00	34.00	32.50	0.50
71	5037	R	8.00	37.00	44.00	21.40	1.00
72	5037	R	8.00	46.00	52.00	15.70	2.50
73	5037	R	8.00	52.00	62.00	31.30	3.00
74	5037	R	10.00	176.00	186.00	37.60	4.00
75	5037	R	10.00	194.00	198.00	38.60	3.50
76	5037	R	10.00	215.00	216.50	43.90	4.50
77	5037	R	10.00	220.00	224.00	29.50	1.50
78	5037	R	10.00	234.00	238.00	27.90	3.50
79	5113	R	9.00	51.00	52.00	28.00	2.50
80	5098	R	9.00	123.00	128.00	28.50	1.00
81	5098	R	9.00	128.00	131.00	42.60	2.00
82	5098	R	9.00	131.00	137.00	30.40	0.00
83	5098	R	10.00	166.50	172.50	50.60	7.00
84	5098	R	10.00	190.00	215.00	20.50	1.50
85	5136	R	8.00	45.00	47.00	15.80	5.00
86	5136	R	8.00	50.50	52.50	19.00	4.00
87	5136	R	8.00	53.50	56.00	20.40	5.50
88	5135	R	9.00	55.00	57.00	27.60	6.00
89	5091	R	8.00	38.50	45.50	44.90	6.00
90	5091	R	8.00	47.50	55.50	47.50	2.50
91	5091	R	8.00	55.50	62.50	45.60	2.00
92	5091	R	8.00	63.30	66.50	32.50	2.00
93	5131	R	8.00	43.00	44.00	43.90	3.00
94	5131	R	8.00	44.00	47.00	20.70	0.00
95	5131	R	8.00	47.00	51.00	28.20	0.00
96	5131	R	8.00	51.00	54.00	16.60	4.50
97	5131	R	8.00	54.00	57.00	18.30	1.00
98	5133	R	8.00	53.00	59.00	25.00	6.50
99	5133	R	8.00	59.00	64.00	28.90	4.00
100	5133	R	8.00	67.00	71.00	36.30	7.00
101	5133	R	8.00	72.00	76.00	43.00	4.50
102	5134	R	9.00	68.00	71.00	25.80	3.50
103	5134	R	9.00	72.00	74.00	25.60	5.00
104	5090	R	8.00	43.50	53.50	28.90	5.50
105	5090	R	8.00	54.50	64.50	33.60	1.50

TABLE 4

MT. MICHEAL EWIN PASS THRUST SLICE

AVERAGE QUALITY 1987 ROTARY DRILLING

	SEAM 8	SEAM 9	SEAM 10
Drill intersection Thickness (SD)	5.06 (.4)	3.86 (.5)	6.18 (.9)
Average Raw ASh (SD)	28.1 (1.3)	30.3 (2.6)	28.3 (1.9)
Average FSI*	3.5	3.8	4.0

* Limited significance

TABLE 5

MT. MICHAEL EWIN PASS THRUST SLICE

COAL QUALITY DIAMOND DATA

LOWER SOUTH PIT HLS145 15/12/87

HL	SEAM	TOP	TO	TP	ADM	ASH	VOLS	FC	FSI	C.V	S%	RC/YD	SG
S145	8	42.4	48.9	R	2	18.35	-1	-1	0	-1	-1	80	60
S145	8	53	65.3	R	.45	20.95	-1	-1	4	-1	-1	93	60
S145	Q	67	68.9	R	.37	30.57	-1	-1	4	-1	-1	82	60
S145	Q	169.4	170.7	R	.47	10.2	-1	-1	8.5	-1	-1	60	60

LOWER SOUTH PIT HS146 15/12/87

HL	SEAM	TOP	TO	TP	ADM	ASH	VOLS	FC	FSI	C.V	S%	RC/YD	SG
S146	Q	15.7	19.15	R	1.76	29.84	-1	-1	0	-1	-1	36	60
S146	8	70.3	72.83	R	.55	24.36	-1	-1	4	-1	-1	23	60
S146	8	74.85	78.35	R	.59	13.56	-1	-1	2.5	-1	-1	38	60
S146	8	80.5	81.1	R	.47	14.76	-1	-1	2.5	-1	-1	30	60
S146	10B	129.95	136.45	R	.48	28.68	-1	-1	5.5	-1	-1	40	60
S146	10A	141.75	145.25	R	.76	91.24	-1	-1	7	7806	.39	6	60
S146	10A	145.4	148.15	R	.42	49.77	-1	-1	6	-1	.4	5	60

LOWER SOUTH PIT HS147 15/12/87

HL	SEAM	TOP	TO	TP	ADM	ASH	VOLS	FC	FSI	C.V	S%	RC/YD	SG
S147	8	55.6	59.2	R	.48	26.55	-1	-1	7.5	-1	-1	69	60
S147	8	60.6	62.5	R	.34	34.55	-1	-1	4	-1	-1	79	60

LOWER SOUTH PIT HS148 15/12/87

HL	SEAM	TOP	TO	TP	ADM	ASH	VOLS	FC	FSI	C.V	S%	RC/YD	SG
S148	8	23.2	31.45	R	1.23	11.1	-1	-1	0	-1	-1	72	60
S148	8	33.5	41.1	R	.64	26.88	-1	-1	2.5	-1	-1	81	60
S148	8	42.55	43.6	R	.48	21.62	-1	-1	3.5	-1	-1	87	60
S148	8	46.1	47.2	R	.48	29.5	-1	-1	1	-1	-1	56	60

)WER SOUTH PIT HS149 15/12/87

HL	SEAM	TOP	TO	TP	ADM	ASH	VOLS	FC	FSI	C.V	S%	RC/YD	SG
S149	10B	56.45	76.85	R	.54	22.04	-1	-1	5	-1	-1	27	60

TABLE 6

MT. MICHEAL EWIN PASS THRUST SLICE

AVERAGE QUALITY 1987 DIAMOND DRILL PROGRAM

	SEAM	
	8	10
Intersection Thickness (SD)	4.45 (1.13)	9.88 (5.4)
Raw Ash (SD)	20.9 (2.2)	26.5 (8.4)

TABLE 7

MT MICHEAL EWIN PASS THRUST SLICE ASH OXIDE ANALYSES

PRJ	SM	No	HL	SRT	ASH	SiO	AlO	TiO	FeO	CaO	MgO	NaO	KO	PO	SO	S%
line= 1																
SP	8	1	5145	53.0	9.06	56.0	32.1	2.24	1.27	2.30	.85	.68	.34	1.41	.52	.37
line= 2																
LSP	10B	2	5149	56.5	9.7	58.4	26.7	1.84	4.98	1.93	.43	.71	.43	1.05	.6	-1

PRJ	SM	No	HL	SRT	B/A ratio
LSP	8	1	5145	53.0	0.054
LSP	10B	2	5149	56.5	0.097

PRJ LSP SM 8 No 1 HL 5145 SRT 53.0
total sulphur in coal is 0.37
composed of Pyritic,Organic and Sulfate as follows 0.05 0.30 0.02
mineral composition of ash and relative %

1 Quartz	8.18%	(0.00)	2 Kaolinite	81.70%	(58.45)
3 Illite	0.79%	(0.85)	4 Feldspar	1.63%	(0.00)
5 Montmorillonite	-0.00%	(-0.00)	6 Chlorite	1.23%	(1.41)
7 Calcite	0.00%	(0.00)	8 Pyrite	0.57%	(3.63)
9 Gypsum	0.00%	(0.00)	10 Organic S	1.93%	(21.84)
11 Apatite	2.02%	(2.76)	12 Sphene	0.85%	(0.00)
13 Dolomite	0.00%	(0.00)	14 Siderite	0.23%	(1.06)
15 Ankerite	0.00%	(0.00)	16 Magnesite	0.00%	(0.00)
17 Rutile	0.88%	(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 = 15.67

PRJ LSP SM 10B No 2 HL 5149 SRT 56.5
total sulphur in coal is 0.40
composed of Pyritic,Organic and Sulfate as follows 0.05 0.33 0.02
mineral composition of ash and relative %

1 Quartz	14.25%	(0.00)	2 Kaolinite	72.32%	(58.39)
3 Illite	1.11%	(1.16)	4 Feldspar	1.89%	(0.00)
5 Montmorillonite	0.00%	(0.00)	6 Chlorite	2.25%	(2.49)
7 Calcite	0.00%	(0.00)	8 Pyrite	0.59%	(3.63)
9 Gypsum	0.00%	(0.00)	10 Organic S	2.20%	(23.71)
11 Apatite	1.67%	(2.20)	12 Sphene	1.16%	(0.00)
13 Dolomite	0.00%	(0.00)	14 Siderite	1.92%	(8.42)
15 Ankerite	0.00%	(0.00)	16 Magnesite	0.00%	(0.00)
17 Rutile	0.65%	(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 = 14.63

6.0 SUMMARY

The Mt. Michael Ewin Pass Thrust Slice represents an imbricated zone above and adjacent to the Ewin Pass Thrust. It is cut by numerous trailing thrusts generated off the back of the Ewin Pass Thrust. In the area studied it encompasses seams 8 to 10. Seam 10 is a simple split seam in the west but a thrust repeated zone in the east. Seams 8 and 9 thin markedly to the east and the stratigraphic section becomes more sandy.

The cost of the study is outlined in Table 9. Costs include contractor costs, Line Creek equipment cost where applicable and Line Creek personnel salary costs where applicable.

7.0 ACKNOWLEDGEMENTS

The author would like to acknowledge the field assistance of Jan Bannick and Jeff Schlender, the drafting of John Kinnear and typing and report preparation efforts of Marie Ruzek.

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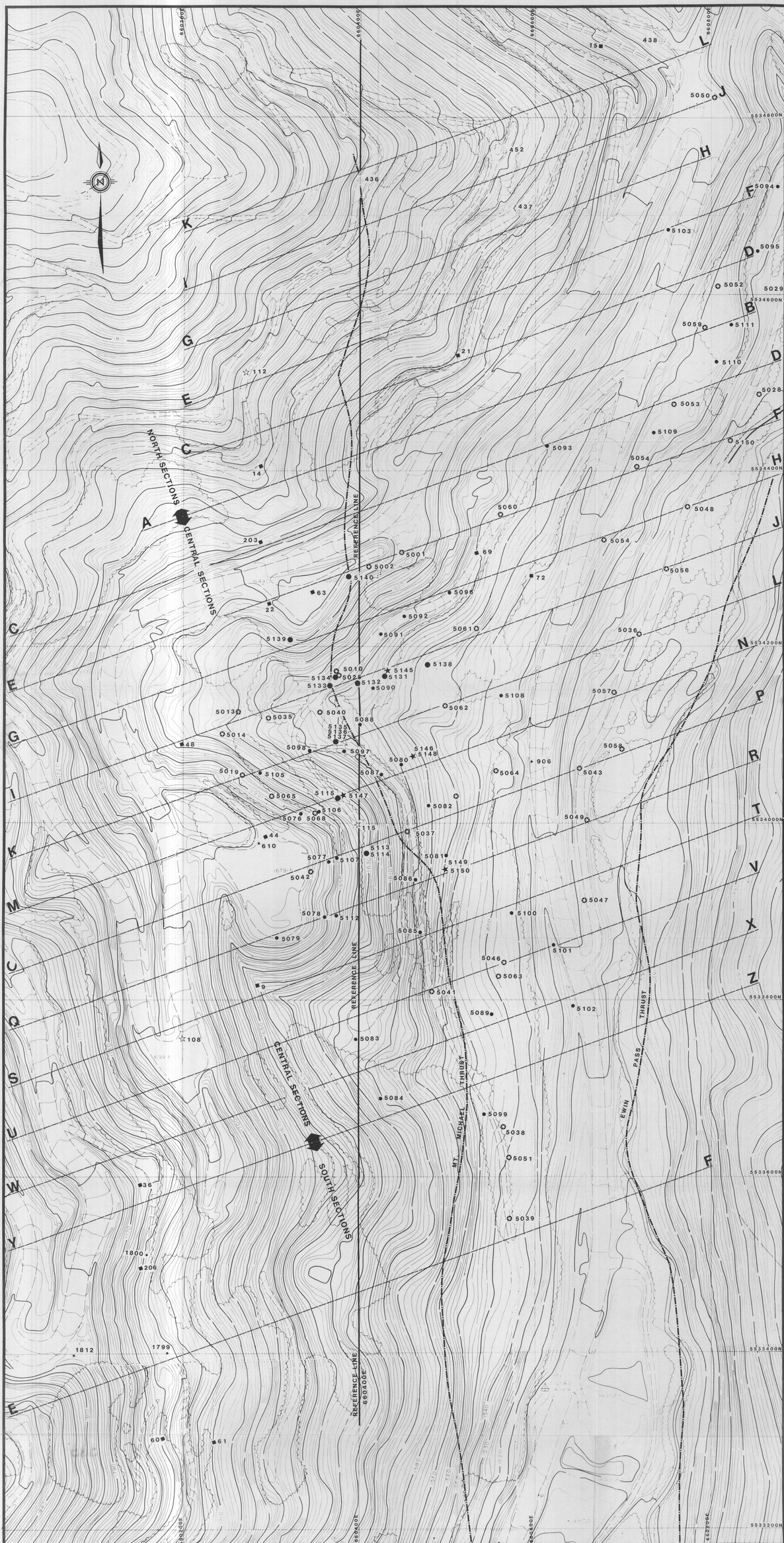

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MAP INDEX

MAP REFERENCE

MAP PROJECTION UTM CENTRAL MERIDIAN 117° W

SCALE 1:1000

FAME 1987 DIAMOND
FAME 1987 ROTARY
SPRING 1987 ROTARY
1986 ROTARY
1980-1985 ROTARY
1981-1982 DIAMOND
PRE 1981 DIAMOND
PRE 1980 ROTARY

Crows Nest Resources Limited
LINE CREEK MINE

Mt. Michael - Ewin Pass Thrust Slice

GEOLOGY

DRAWN BY	JWK	DATE	FEB 1988
AUTHOR	BR	SCALE	1:1000
UTM ZONE	11	MAP No.	ENCL 1

5533325N,660000E

5533613N,660800E

1800

1700

1600

1500

1400

1300

1812

1799

5039

8 SEAM

9 SEAM

10A&B SEAM

10

10

TILL

ROAD

660400E

REF LINE

20 10 0 20 40 60 80 100 METRES

SCALE 1 : 1000

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Crows Nest Resources Limited

LINE CREEK MINE

Mt. Michael - Ewin Pass Thrust Slice

STRUCTURAL CROSS SECTION E-F

SOUTH

DRAWN BY	JWK	DATE	FEB 1,1988
AUTHOR	BR	SCALE	1:1000
		MAP No	ENCL 2

5533516 660001

5533801,660797

1800

1700

1600

1500

1400

1300

8 SEAM

9 SEAM

10A&B SEAM

5084

5039

5099

5038

5051

10

10

10

TILL

ROAD

MT MICHAEL THRUST

EWIN PASS THRUST

660400E

REF LINE

20 10 0 20 40 60 80 100 METRES

SCALE 1 : 1000

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Crows Nest Resources Limited

LINE CREEK MINE

Mt. Michael - Ewin Pass Thrust Slice

STRUCTURAL CROSS SECTION Y-Z

CENTRAL

DRAWN	JWK	DATE	FEB 1,1988
AUTHOR	BR	SCALE	1:1000
		MAP No	ENCL 3

5533578,660000

5533863,660797

1800

1700

1600

1500

1400

1300

8 SEAM

9 SEAM

10A&B SEAM

5089

5102

TILL

C

C

10

10

660400E

REF LINE

20 10 0 20 40 60 80 100 METRES

SCALE 1 : 1000

7,38

Crows Nest Resources Limited

LINE CREEK MINE

Mt. Michael - Ewin Pass Thrust Slice

STRUCTURAL CROSS SECTION W-X

CENTRAL

DRAWN BY	JWK	DATE	FEB 1,1988
AUTHOR	BR	SCALE	1:1000
		MAP No	ENCL 4

5533640,660000

5533926,660796

1800

1700

1600

1500

1400

1300

8 SEAM

9 SEAM

10A&B SEAM

5083

5041

5046

5101

5063

ROAD

LINE CREEK

TILL

MT MICHAEL THRUST

EWIN PASS THRUST

10

C

660400E

REF LINE

20 10 0 20 40 60 80 100 METRES

SCALE 1 : 1000

738

Crows Nest Resources Limited

LINE CREEK MINE

Mt. Michael - Ewin Pass Thrust Slice

STRUCTURAL CROSS SECTION U-V

CENTRAL

DRAWN BY	JWK	DATE	FEB 1,1988
AUTHOR	BR	SCALE	1:1000
		MAP No	ENCL 5

5533703,660000

5533991,660796

1800

1700

1600

1500

1400

1300

8 SEAM

9 SEAM

10A&B SEAM

5085

5100

5047

TILL

9

C

10

660400E

REF LINE

20 10 0 20 40 60 80 100 METRES

SCALE 1 : 1000

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Crows Nest Resources Limited

LINE CREEK MINE

Mt. Michael - Ewin Pass Thrust Slice

STRUCTURAL CROSS SECTION S-T

CENTRAL

DRAWN BY	JWK	DATE	FEB 1,1988
AUTHOR	BR	SCALE	1:1000
MAP No	ENCL 6		

553376, 6660000

5534055, 660796

1800

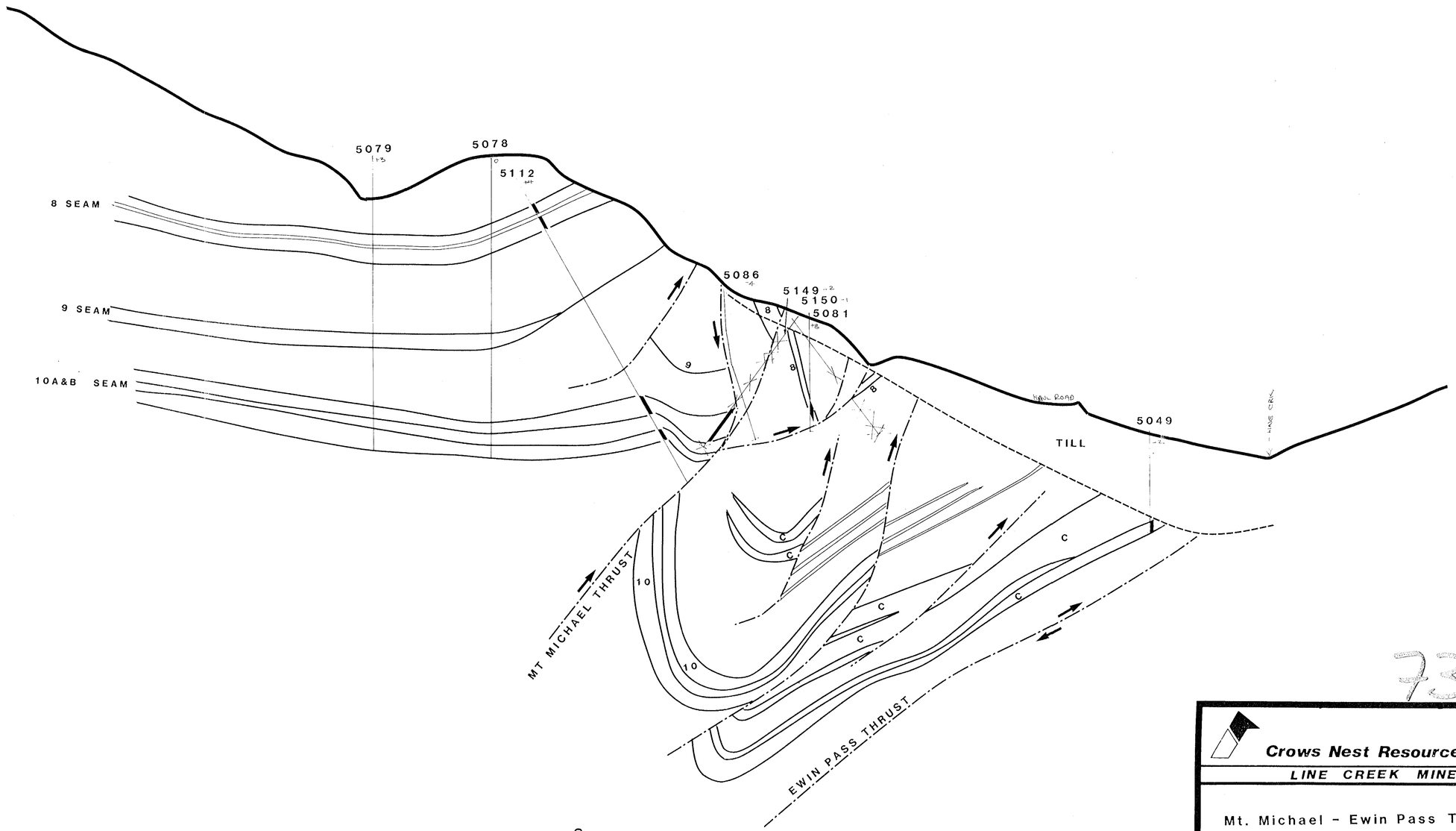
1700

1600

1500

1400

1300



660400

REF LINE

20 10 0 20 40 60 80 100 METRES

SCALE 1 : 1000

738

Crows Nest Resources Limited

LINE CREEK MINE

Mt. Michael - Ewin Pass Thrust Slice

STRUCTURAL CROSS SECTION Q-R

CENTRAL

DRAWN BY	JWK	DATE	FEB 1,1988
AUTHOR	BR	SCALE	1:1000
		MAP No	ENCL 7

5533830,660000

5534119,660796

1800

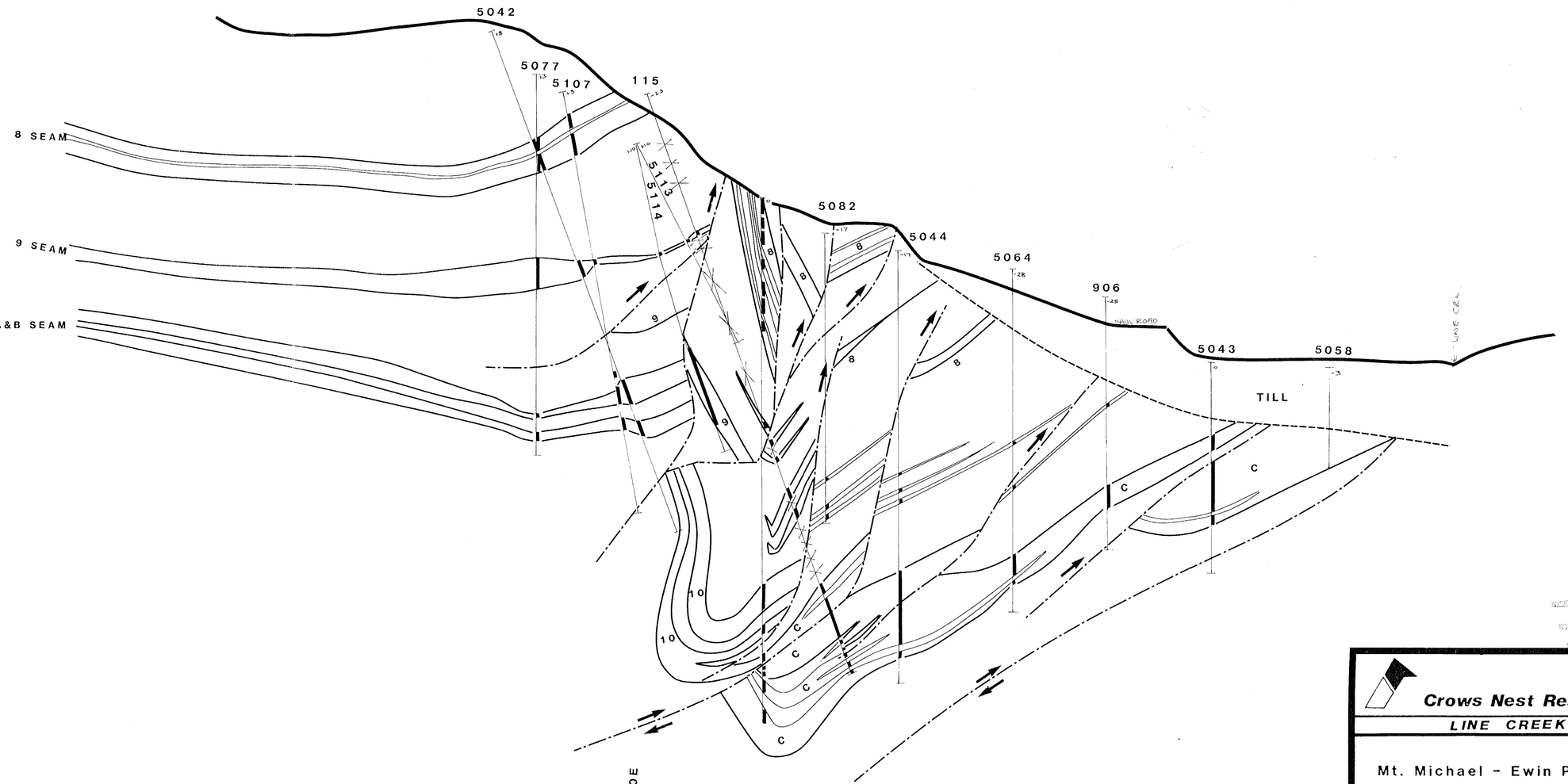
1700

1600

1500

1400

1300



20 10 0 20 40 60 80 100 METRES

SCALE 1 : 1000

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Crows Nest Resources Limited

LINE CREEK MINE

Mt. Michael - Ewin Pass Thrust Slice

STRUCTURAL CROSS SECTION O-P

CENTRAL

DRAWN BY	JWK	DATE	FEB 1,1988
AUTHOR	BR	SCALE	1:1000
		MAP No	ENCL 8

5533894,660000

5534185,660795

1800

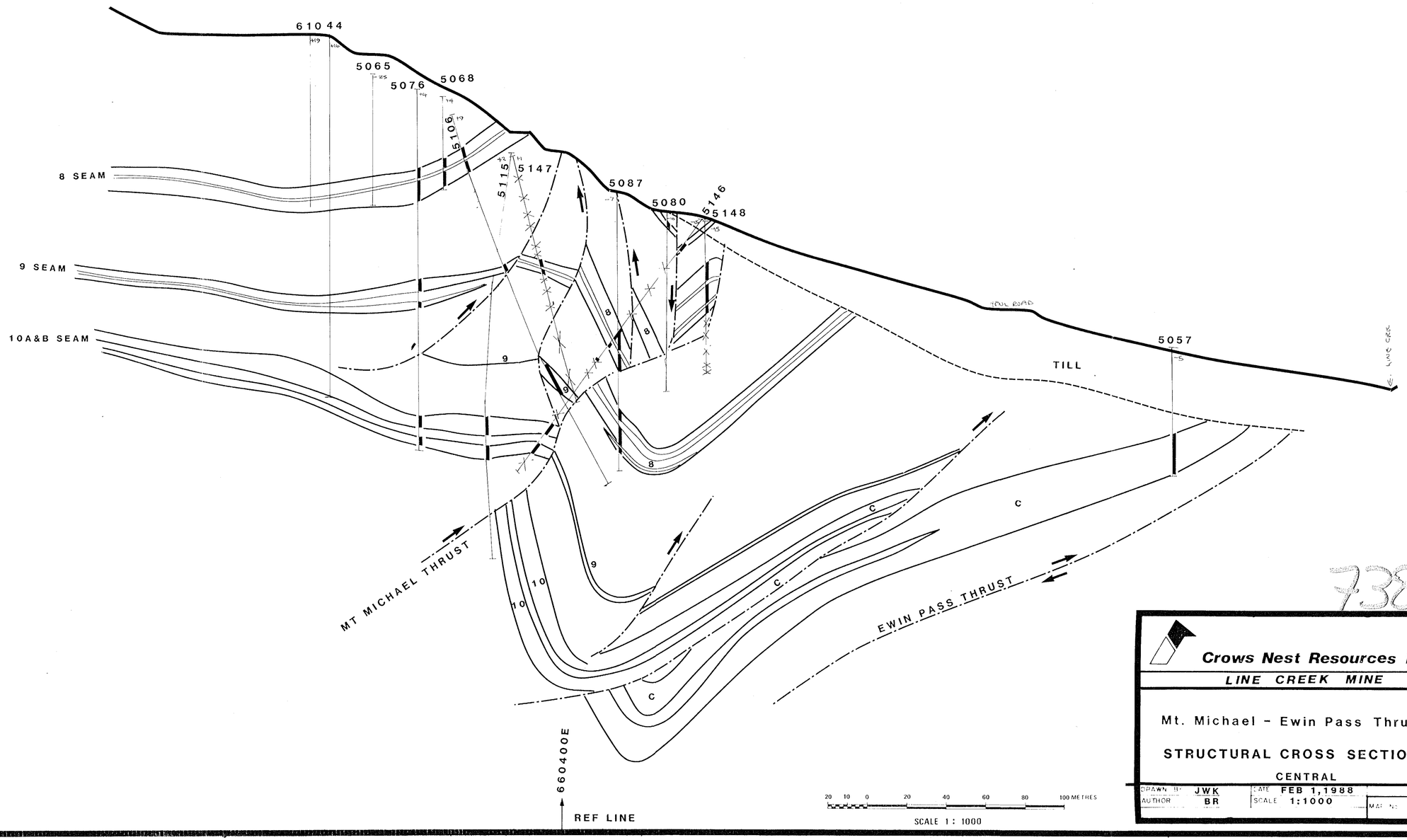
1700

1600

1500

1400

1300



20 10 0 20 40 60 80 100 METRES

SCALE 1 : 1000

738

Crows Nest Resources Limited

LINE CREEK MINE

Mt. Michael - Ewin Pass Thrust Slice

STRUCTURAL CROSS SECTION M-N

CENTRAL

DRAWN BY	JWK	DATE	FEB 1,1988
AUTHOR	BR	SCALE	1:1000
		MAP NO.	ENCL 9

5533957,660000

5534274,660879

1800

1700

1600

1500

1400

1300

5019

5105

5098

5088

5062

5018

5148

5036

5135

5136

5097

5137

8 SEAM

9 SEAM

10A&B SEAM

TILL

100L ROAD

LINE 4

660400E

REF LINE

20 10 0 20 40 60 80 100 METRES

SCALE 1 : 1000

738

Crows Nest Resources Limited

LINE CREEK MINE

Mt. Michael - Ewin Pass Thrust Slice

STRUCTURAL CROSS SECTION K-L

CENTRAL

DRAWN BY JWK	DATE FEB 1,1988		
AUTHOR BR	SCALE 1:1000	MAP No.	ENCL 10

5534021,660000

5534339,660879

1800

1700

1600

1500

1400

1300

48

5014

5013

5035

5040

5133

5134

5010

5132

5131

5145

5025

5090

5138

5061

5056

8U

8L

9 SEAM

10B SEAM

10A SEAM

9

8

10

C

MT MICHAEL THRUST

EWIN PASS THRUST

HAUL ROAD

LINE CREEK

738

REF LINE

20 10 0 20 40 60 80 100 METRES

SCALE 1 : 1000

Crows Nest Resources Limited

LINE CREEK MINE

Mt. Michael - Ewin Pass Thrust Slice

STRUCTURAL CROSS SECTION I-J

CENTRAL

DRAWN BY	JWK	DATE	FEB 1,1988
AUTHOR	BR	SCALE	1:1000
		MAP No	ENCL 11

5534085,660000

5534401,660879

1800

1700

1600

1500

1400

1300

5139
-6

5092

5091
+21)

+10

5096
+3

69
-29

72
+17

HAUL ROAD

5045
+5

5048
0

5138
+73

TILL

8 SEAM

9 SEAM

10B SEAM

10A SEAM

8

C

9

REF LINE (660400E)

20 10 0 20 40 60 80 100 METRES

SCALE 1 : 1000

738

Crows Nest Resources Limited

LINE CREEK MINE

Mt. Michael - Ewin Pass Thrust Slice

STRUCTURAL CROSS SECTION G-H

CENTRAL

DRAWN BY	JWK	DATE	FEB 1,1988
AUTHOR	BR	SCALE	1:1000
		MAP No	ENCL 12

5534147,660000

5534461,660879

1800

1700

1600

1500

1400

1300

22

63

5140

5002

5001

5060

5054

5055

TILL

8U

8L

7

8

9

10

C

MT. MICHAEL THRUST

EWIN PASS THRUST

660400E

REF LINE

20 10 0 20 40 60 80 100 METRES

SCALE 1 : 1000

738

Crows Nest Resources Limited

LINE CREEK MINE

Mt. Michael - Ewin Pass Thrust Slice

STRUCTURAL CROSS SECTION E-F

CENTRAL

DRAWN BY	JWK	DATE	FEB 1,1988
AUTHOR	BR	SCALE	1:1000

MAP No ENCL 13

5342 11,660000

5534527,660878

1800

1700

1600

1500

1400

1300

203

+65

7 SEAM

8U

8L

9

8

8

9

9

10B

10A

10 SEAM

5093

+2

5109

+2

5053

+13

5110

+22

5028

+28

TILL

C

C

C

660400E

REF LINE

20 10 0 20 40 60 80 100 METRES

SCALE 1 : 1000

738

Crows Nest Resources Limited

LINE CREEK MINE

Mt. Michael - Ewin Pass Thrust Slice

STRUCTURAL CROSS SECTION C-D

CENTRAL

DRAWN BY	JWK	DATE	FEB 1,1988
AUTHOR	BR	SCALE	1:1000
		MAP No	ENCL 14

5534331,660152

5534581,660850

1800

1700

1600

1500

1400

1300

14

21

5059 5111 5052

5029

HAUL ROAD

TILL

8 SEAM

9 SEAM

10B

10A

7 SEAM

7

C

MT. MICHAEL THRUST

EWIN PASS THRUST

660400E

REF LINE

20 10 0 20 40 60 80 100 METRES

SCALE 1: 1000

738

Crows Nest Resources Limited

LINE CREEK MINE

Mt. Michael - Ewin Pass Thrust Slice

STRUCTURAL CROSS SECTION A-B

CENTRAL

DRAWN BY	JWK	DATE	FEB 1,1988
AUTHOR	BR	SCALE	1:1000
		MAP No	ENCL 15

5534413,660200

5534645,660849

1800

1700

1600

1500

1400

1300

6

7

8

8

9

10B

10A

10 SEAM

9 SEAM

6 SEAM

7 SEAM

8U SEAM

8L SEAM

10

21 +7

HAUL ROAD

5052

+20

TILL

5095

-2

C

C

10

10

10

738

660400E

REF LINE

20 10 0 20 40 60 80 100 METRES

SCALE 1 : 1000

Crows Nest Resources Limited

LINE CREEK MINE

Mt. Michael - Ewin Pass Thrust Slice

STRUCTURAL CROSS SECTION C-D

NORTH

DRAWN BY	JWK	DATE	FEB 1,1988
AUTHOR	BR	SCALE	1:1000
		MAP No	ENCL 16

5534471,660200

5534712,660850

1800

1700

1600

1500

1400

1300

112
+13

437
-75

5103
+3
HAUL ROAD

TILL

5094

4

5

6

7

8U

8L

9

10B

10A

10

5 SEAM

6 SEAM

7 SEAM

8U SEAM

8L SEAM

9 SEAM

10 SEAM

MT MICHAEL THRUST

EWIN PASS THRUST

738

660400E

REF LINE

20 10 0 20 40 60 80 100 METRES

SCALE 1 : 1000

Crows Nest Resources Limited

LINE CREEK MINE

Mt. Michael - Ewin Pass Thrust Slice

STRUCTURAL CROSS SECTION E-F

NORTH

DRAWN BY	JWK	DATE	FEB 1,1988
AUTHOR	BR	SCALE	1:1000
		MAP No.	ENCL 17

5534537,660200

5534758,660800

1800

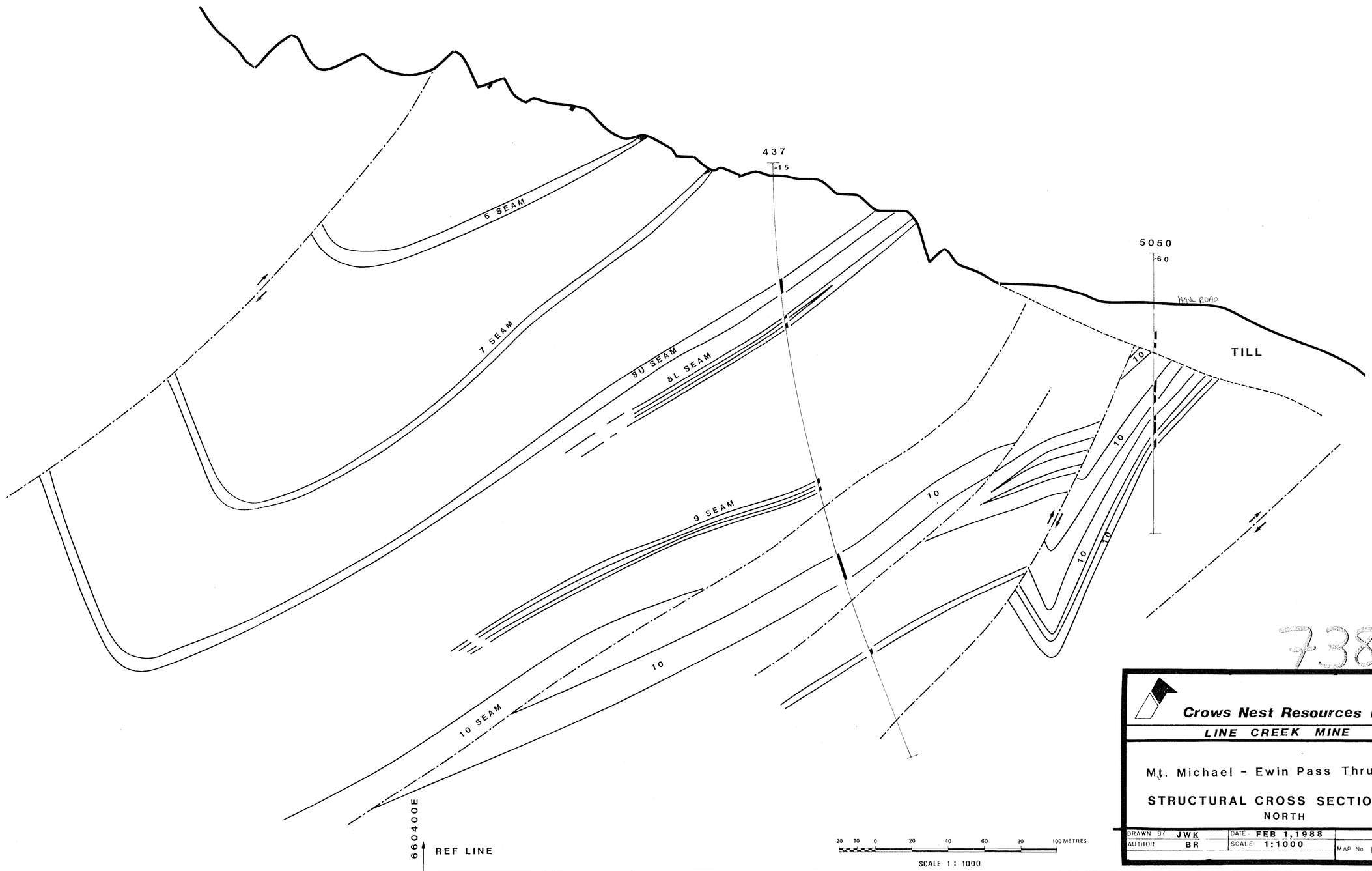
1700

1600

1500

1400

1300



6604000E

REF LINE

20 10 0 20 40 60 80 100 METRES

SCALE 1 : 1000

738

Crows Nest Resources Limited

LINE CREEK MINE

Mt. Michael - Ewin Pass Thrust Slice

STRUCTURAL CROSS SECTION G-H

NORTH

DRAWN BY	JWK	DATE	FEB 1,1988
AUTHOR	BR	SCALE	1:1000
		MAP No	ENCL 18

5534603,6602005

534822,,660800

1800

1700

1600

1500

1400

1300

436
-49
3
3
4

452
-24

15
-98

438
-85

5050
0

TILL

M.T. MICHAEL THRUST

6 SEAM

7 SEAM

8U SEAM

8L SEAM

9 SEAM

10 SEAM

C

C

C

C

C

10

REF LINE (660400)

20 10 0 20 40 60 80 100 METRES

SCALE 1 : 1000

738

Crows Nest Resources Limited

LINE CREEK MINE

Mt. Michael - Ewin Pass Thrust Slice

STRUCTURAL CROSS SECTION I-J

NORTH

DRAWN BY	JWK	DATE	FEB 1,1988
AUTHOR	BR	SCALE	1:1000
		MAP No.	ENCL 19

5534668N,660200E

5534894N,660800E

1800

1700

1600

1500

1400

1300

436
+11

3

4 SEAM

452
+33

6 SEAM

7 SEAM

8L SEAM

8U SEAM

9 SEAM

10 SEAM

15
-39

438
-22

5050
+65

TILL

C W

C W

C W

C W

C W

660400E

REF LINE

20 10 0 20 40 60 80 100 METRES

SCALE 1 : 1000

738

Crows Nest Resources Limited

LINE CREEK MINE

Mt. Michael - Ewin Pass Thrust Slice

STRUCTURAL CROSS SECTION K-L

NORTH

DRAWN BY	JWK	DATE	FEB 1,1988
AUTHOR	BR	SCALE	1:1000
		MAP No	ENCL 20

ENCLOSURE 23 - 1

MT. MICHEAL EWIN PASS THRUST SLICE

CORE DESCRIPTIONS DIAMOND HOLES

Hole: 5145 Date Start: 87/08/14

Northing = 5534171.9

Easting = 660431.3

Elevation = 1597.8

Orientation = 245°/65°

Length = 228.9 m

738

Crows Nest Resources
LIMITED

CORE DESCRIPTION

PROJECT	LOWER SOUTH PIT
AREA	LINE CREEK

DATE	BEGIN	22/09/87
	END	

HOLE NO. LSD1 5/95

PAGE 1 OF 11

HOLE PARTICULARS

LOCATION	NORTHING: 5534717-9 (a)		
	EASTING: 660431-3 (a)		
ELEVATION	1597-8	HOLE BEARING (AZ°)	205
TOTAL DEPTH	228.90 m	HOLE ANGLE (°)*	65

LOGGING

LOGS RUN	FULL SUITE
LOGGED BY	CENTURY
OTHER TESTS	

PRE-CORE INFORMATION

CASING LENGTH	24.4	(a)
OVERBURDEN DEPTH		(a)
OVERBURDEN TYPE		
WATER LEVEL		(a)

EXAMINATION

LOG USED	GAMMA/DEN
NO. OF SEAMS SAMPLED	
EXAMINER (S)	JB
DATE	22/09/87

BOX NO.	DEPTH AT TOP OF BOX	MARKER BLOCKS FROM	MARKER BLOCKS TO	MARKER BLOCKS RECOVERY (a)	GEOPHYS DEPTH FROM	GEOPHYS DEPTH TO	BEDDING ANGLE▲ DEPTH	BEDDING ANGLE▲ ANGLE	SAMPLE NO.	SEAM NAME	SEAM RECOVERY	LITHO DESCRIPTION MAIN	LITHO DESCRIPTION MINOR	LITHO DESCRIPTION AMPLIFIED
1	24.4	24.4	29.65	1.55							30%	OVERBURDEN		- THOUGHT TO BE BOULDER DRILLING
														- ALL RUBBLE TO BROWN
														- LITHOLOGY CHANGES ARE IMMEDIATE AND UNRELATED BETWEEN CHUNKS
														- LOTS OF PEBBLE LIKE PIECES = BOULDER AND REDRILLED
														- MINOR MUD LAYERS AT 25.6, 25.9, 26.1
		29.65	32.05	1.92							80%	MUD	ROCK	- DOMINANTLY MUD LAYER WITH VARYING LITHOLOGY CHUNKS OF ROCK + SOME SST MOST LIMESTONE
														- ~ 80% MUD
2	32.05	32.05	39.9	2.7							34%	OVERBURDEN		- SAME AS ABOVE WITH SOME SLIGHTLY BIGGER PIECES
														- MUD LAYERS AT 36.6-36.8 AND 39.0-39.6
		39.9	43.0	1.51							99%	MUD		- SAME AS ABOVE WITHOUT ROCK CHUNKS + V. SMALL (<1 cm) PIECES OF ROCK OF UNDISTINGUISHABLE LITHOLOGY
3	41.5													- 41.5-43.0 MUD IS SLIGHTLY COALY
		43.0	48.0	4.0	42.9	48.9			1	Q	80%	COAL		- CORE VARIES FROM COMPACTED POWDER TO SEMI STICK CORE; PREDOMINANTLY POWDER TO PEBBLE
4	47.5													- COAL IS HARD AND BRIGHT WHERE NOT POWDER
														- IRON STAINING PRESENT
														- POWDER AT 43.0 - 44.5 AND 46.5 - 48.0
		48.0	52.0	2.69							66%	MOST		- STICK CORE TO RUBBLE + DOMINANTLY BROKEN
														- V.V. MINOR AMTS OF COAL + WHERE POWDERY RUBBLE
														- IRON STAINING
														- SEVERAL POLISHED SURFACES
														- POWDER-RUBBLE AT 48.0 - 48.9, 50.0 - 50.35, 51.55-51.75
		52.0	52.2	0.2					P		100	COAL		- 52.0 - 52.1 IS COMPACTED POWDER
									2					- 52.1 - 52.2 IS STICK CORE
									1					- COAL IS BRIGHT, HARD AS STICK

* MEASURED FROM THE HORIZONTAL PLANE

▲ ANGLE MEASURED FROM CORE OF AXIS

HOLE NO.

BA-341

Crows Nest Resources LIMITED

CORE DESCRIPTION

PROJECT: LODGE SOUTH PIT

HOLE NO. CONTINUED: LSP 1

BOX NO.	DEPTH AT TOP OF BOX	MARKER BLOCKS FROM	MARKER BLOCKS TO	MARKER BLOCKS RECOVERY (%)	GEOPHYS DEPTH FROM	GEOPHYS DEPTH TO	BEDDING ANGLE▲ DEPTH	BEDDING ANGLE▲ ANGLE	SAMPLE NO.	SEAM NAME	SEAM RECOVERY	LITHO DESCRIPTION MAIN	LITHO DESCRIPTION MINOR	LITHO DESCRIPTION AMPLIFIED
		52.2	52.55	0.3					2			MDST	COAL	- SEMI STICK CORE - CORE IS ~ 70% MDST WITH COAL - POLISHED SURFACES
		52.55	69.9	11.44	53.0	65.3			4	Q	93%	COAL		- CORE VARIES FROM STICK TO COMPACTED POWDER + DOMINANTLY BROKEN
5	53.1													- POWDER AT 56.8 - 58.2, 58.5 - 59.7, 60.95 - 61.3, 63.4 - 63.5
6	57.6								3					- MDST SPLIT AT 58.2 - 58.5
7	61.75													- COAL IS OVERALL BRIGHT AND FAIRLY HARD
		64.9	66.75	1.8	65.3	67.0	65.9	44°			97%	MDST		- STICK CORE TO RUBBLE - DOMINANTLY SEMI STICK
8	65.6						66.7	42°						- V MINOR COAL STRINGERS (< 1cm THICK) ALSO
														- LENGTH OF RUN AT 65.0 - 69.1 COALY RICH ZONE AND CORE IS A RUBBLE
														- FAINT BEDDING OUTLINED BY COAL STRINGERS
														- SOME POLISHED SURFACES
		66.75	69.1	1.93	67.0	68.9			4	Q	82.7%	COAL		- SEMI STICK TO RUBBLE - DOMINANTLY BROKEN
														- COAL IS HARD AND BRIGHT
														- 65.6 - 68.8 MDST SPLIT
														- 68.4 - 68.6 RUBBLE RICH POWDER
		69.1	76.8	7.3			70.0	24°			95	MDST		- DOMINANTLY STICK CORE WITH SOME RUBBLE AND BROKEN AREAS
9	70.4						74.7	36°						- RUBBLE 69.4 - 69.7 & VERY COALY
10	74.35													- SOME POLISHED SURFACES
														- SOMEWHAT SILTY AT INTERMITTENT AREAS
														- MINOR ISOLATED BANDING VISIBLE
		76.8	80.95	4.12			76.2	41°			99	SLST		- DOMINANTLY STICK CORE WITH SOME BROKEN
11	78.45						79.3	40°						- MINOR POLISHED SURFACES AND CaCO3 INFILLINGS
							80.3	43°						- SOME ISOLATED SST INTERBEDDING PRESENT
		80.95	81.95	1.03			81.2	37°			103	SST		- DOMINANTLY STICK CORE WITH SOME BROKEN
							81.8	41°						- FINE GRAINED SST WITH MODERATELY WELL DEVELOPED BEDDING + LOTS OF CROSS BEDDING VISIBLE
														- CaCO3 INFILLINGS PRESENT
		81.95	82.55	0.58			82.2	48°			97	SLST	SST	- STICK AND SEMI STICK CORE
														- SLST WITH INTERMITTENT SST BEDDING
														- POLISHED SURFACES

* MEASURED FROM THE HORIZONTAL PLANE

▲ ANGLE MEASURED FROM CORE OF AXIS

HOLE NO.

Crows Nest Resources LIMITED

CORE DESCRIPTION

PROJECT	LOWER SOUTH PIT

HOLE NO.	64
CONTINUED	

BOX NO.	DEPTH AT TOP OF BOX	MARKER BLOCKS FROM	MARKER BLOCKS TO	MARKER BLOCKS RECOVERY (m)	GEOPHYS DEPTH FROM	GEOPHYS DEPTH TO	BEDDING ANGLE▲ DEPTH	BEDDING ANGLE▲ ANGLE	SAMPLE NO.	SEAM NAME	SEAM RECOVERY	LITHO DESCRIPTION MAIN	LITHO DESCRIPTION MINOR	LITHO DESCRIPTION AMPLIFIED
		82.55	87.1	4.16			83.65	51°			91	MDST		- STICK CORE WITH BROKEN
12	82.105						86.5	52°						- A LOT OF BEDDING VISIBLE 82.7-89.1
														- POLISHED SURFACE VISIBLE
														- SOME MINOR $CaCO_3$ INFILLINGS
														- ISOLATED MINOR BANDING VISIBLE
														- AT 86.3 2cm MUD ZONE SURROUNDED BY RUBBLE
		87.1	87.6	0.5							100	SLST		- SEMI STICK CORE
13	87.2													- MINOR $CaCO_3$ INFIL. WAS ALL POLISHED SURFACE
														- NO BANDING OR BEDDING VISIBLE
		87.60	90.05	2.46			87.7	51°			100+	SST		- STICK WITH BROKEN INTO RUBBLE
							88.3	52°						- FINE GRAINED SST
							89.3	49°						- BEDDING VISIBLE BUT EXCESSIVE CROSS BEDDING
														AND BEDDING IRREGULARITIES 87.7 - 89.2
														- NUMEROUS $CaCO_3$ INF. IN FRACTURES
		90.05	91.1	1.05							100	SLST		- STICK CORE AND BROKEN AT 90.05-90.2
														- NO BANDING
														- $CaCO_3$ INFILLINGS 90.25-90.2 AND AT 90.9m
		91.1	99.95	3.78			91.9	68°			98	SLST	SST	- STICK CORE
14	91.25						93.05	65°						- SLST WITH VARYING AMTS OF FINE GRAINED
														SST + SOME BEDDING VISIBLE
														- NUMEROUS SMALL $CaCO_3$ INFILLED FRACTURES
														* DOMINANTLY CLOSED
														- CROSS BEDDING ALSO PRESENT
		99.95	99.05	3.0			95.2	68°			97	SST		- STICK CORE
15	95.9						96.1	56°						- FINE GRAINED, WELL DEVELOPED BEDDING
							97.0	62°						- NUMEROUS V. SMALL $CaCO_3$ INFILLED FRACTURES
							97.7	75°						- MINOR CROSS BEDDING
														- MINOR POLISHED SURFACES
		99.05	100.15	2.02							96	SST		- STICK CORE WITH MINOR RUBBLE
16	99.95													- NUMEROUS SMALL (2-4mm) COAL STRINGERS
														- SST IS MEDIUM TO COARSE GRAINED
														- BEDDING IS NOT WELL DEVELOPED + VERY HARD
														TO SEE IN MOST PLACES
														- AT 99.2m A 3-4cm MUDDY/COALY RUBBLE ZONE

* MEASURED FROM THE HORIZONTAL PLANE

▲ ANGLE MEASURED FROM CORE OF AXIS

HOLE NO.	

Crows Nest Resources LIMITED

CORE DESCRIPTION

PROJECT	LOWER SOUTH PIT

HOLE NO.	LSP #1
CONTINUED	

BOX NO.	DEPTH AT TOP OF BOX	MARKER BLOCKS FROM	MARKER BLOCKS TO	MARKER BLOCKS RECOVERY (m)	GEOPHYS DEPTH FROM	GEOPHYS DEPTH TO	BEDDING ANGLE▲ DEPTH	BEDDING ANGLE▲ ANGLE	SAMPLE NO.	SEAM NAME	SEAM RECOVERY	LITHO DESCRIPTION MAIN	LITHO DESCRIPTION MINOR	LITHO DESCRIPTION AMPLIFIED
		100.15	100.6	0.45							100	SLST	SST	- STICK CORE - SLST WITH MINOR FINE GRAINED SST - SET IS WIDLY AND IRREGULAR
		100.6	101.05	0.45			101.0	70°			100	SST		- STICK CORE - BEDDING IS WELL DEVELOPED BUT LOTS OF CROSS BEDDING - LOTS OF $CaCO_3$ INFILL. F. FRACTURES - POLISHED SURFACES V. FINE
		101.05	102.95	1.4			102.6	65°			100	SLST		- STICK CORE - SLST W/ V.V. MINOR SST INTERBEDS + ISOLATED - SOME POLISHED SURFACES
		102.45	104.35	1.9			103.15	72°			100	SST		- DOMINANTLY STICK CORE - FINE TO COARSE GRAINED → BEDDING IS PRESENT WHERE FINE GRAINED ABSENT WHERE COARSE OR - $CaCO_3$ INFILLED FRACTURES - SOME POLISHED SURFACES - LOTS OF CROSS BEDDING
17	104.15						104.0	71°						
		104.35	104.6	0.25							100	SLST		- BROKEN CORE - NO BANDING VISIBLE - SOME POLISHED SURFACES
		104.6	104.9	0.3							100	SST		- BROKEN AND RUBBLE - MEDIUM GRAINED SST MASSIVE - V. MINOR COALY STRINGERS AND $CaCO_3$ INFILLINGS
		104.9	105.5	0.3							50	BOULDERS		- ALL ROUNDED RUBBLE - MARKER BLOCK INDICATES A CAVE IN & APPEARS AS IF RUBBLE HAS FALLEN IN AS LITHOLOGY IS VERY VARIABLE → SST TO SLST
		105.5	105.85	0.35			105.6	64°			100	SST		- STICK CORE - MEDIUM TO COARSE GRAINED SST - FAINT BEDDING TRACES - MINOR $CaCO_3$ INFILLED FRACTURES
		105.85	106.5	0.65			106.25	50°			100	SLST		- DOMINANTLY STICK CORE - V. FAINT V. MINOR SST BEDDING - POLISHED SURFACES
		106.5	113.95	7.39			108.15	68°			99	SST		- FINE TO MEDIUM GRAINED - STICK CORE TO RUBBLE → DOMINANTLY SEMI STICK - BEDDING VARIES FROM WELL DEVELOPED TO INVISIBLE - THE WHOLE ZONE HAS NUMEROUS COAL THIN STRINGERS ESPECIALLY 112-113 m
18	106.5						109.0	63°						
							109.85	68°						
19	112.65						111.9	66°						

* MEASURED FROM THE HORIZONTAL PLANE

▲ ANGLE MEASURED FROM CORE OF AXIS

HOLE NO.	

Crows Nest Resources LIMITED

CORE DESCRIPTION

PROJECT	

HOLE NO.	LSP #1
CONTINUED	

BOX NO.	DEPTH AT TOP OF BOX	MARKER BLOCKS FROM	MARKER BLOCKS TO	MARKER BLOCKS RECOVERY (m)	GEOPHYS DEPTH FROM	GEOPHYS DEPTH TO	BEDDING ANGLE▲ DEPTH	BEDDING ANGLE▲ ANGLE	SAMPLE NO.	SEAM NAME	SEAM RECOVERY	LITHO DESCRIPTION MAIN	LITHO DESCRIPTION MINOR	LITHO DESCRIPTION AMPLIFIED
														- POLISHED SURFACES
														- $CaCO_3$ INFILLED FRACTURES
														- AT 107.7 A 2cm SHATTERED SLST ZONE
							114.0	18°						
		113.95	116.35	2.38			114.3	17°			99	SLST		- DOMINANTLY STICK CORE
							115.2	12°						- V. MINOR AMTS OF SST INTERBEDDING → VERY
							115.7	29°						CLEAR BEDDING - WELL DEFINED
							116.0	47°						- NUMEROUS $CaCO_3$ IN-FILLED FRACTURES OBTEN
							116.2	42°						DISRUPTING BEDDING
														- SOME POLISHED SURFACES
		116.35	120.9	4.48			116.6	54°			96	SST		- STICK AND BROKEN CORE → ~ 80% STICK
20	116.65						117.45	57°						- FINE TO COARSE GRAINED SST
							118.7	62°						- BEDDING POORLY TO WELL DEVELOPED
							119.2	63°						- MINOR $CaCO_3$ INFILLINGS (FRACTURES)
							119.75	46						- MINOR COALY INFILLING (BEDDING)
							120.5	53°						- SOME CROSS BEDDING
21	120.9	120.9	121.1	0.2							100	SLST		- STICK CORE
														- NO BANDING VISIBLE
														- V. MINOR $CaCO_3$ INFILLED FRACTURES
		121.1	124.5	3.28			121.4	44°			96	SST		- STICK AND BROKEN CORE → ~ 35% STICK
							121.9	48°						- FINE GRAINED SST W/ MODERATELY DEVELOPED BDG
							122.7	54°						- NUMEROUS COAL STRINGERS THROUGH OUT CORE
							124.5	40°						- $CaCO_3$ INFILLED FRACTURES
														- SOME POLISHED SURFACES
														- CROSS BEDDING, FURRY-MORE
		124.5	124.9	0.2							67	COAL		- ALL BUBBLE AND POWDER
														- COAL IS BRIGHT BUT FAIRLY SOFT
		124.9	129.15	4.29			125.2	47°			99	SST		- STICK TO BUBBLE → MOSTLY BROKEN
22	125.1						126.85	42°						- MED TO COARSE GRAINED
														- BEDDING VERY POORLY DEVELOPED → MOSTLY MASSIVE
23	129.7													- NUMEROUS V. SMALL $CaCO_3$ INFILLINGS
														- NUMEROUS SMALL COAL STRINGERS
														- POLISHED SURFACES
		129.15	130.7	1.55			129.90	39°			100	SLST	SST	- STICK CORE
							130.2	37°						- SLST WITH INTERMITTENT FINE GRAINED SST
														- BEDDING VISIBLE BUT SOME CROSS BEDDING
														ALSO PRESENT
														- MINOR POLISHED SURFACES

* MEASURED FROM THE HORIZONTAL PLANE

▲ ANGLE MEASURED FROM CORE OF AXIS

HOLE NO.	

Crows Nest Resources
LIMITED

CORE DESCRIPTION

PROJECT

HOLE NO. LSP #1
CONTINUED

BOX NO.	DEPTH AT TOP OF BOX	MARKER BLOCKS FROM	MARKER BLOCKS TO	MARKER BLOCKS RECOVERY (m)	GEOPHYS DEPTH FROM	GEOPHYS DEPTH TO	BEDDING ANGLE* DEPTH	BEDDING ANGLE* ANGLE	SAMPLE NO.	SEAM NAME	SEAM RECOVERY	LITHO DESCRIPTION MAIN	LITHO DESCRIPTION MINOR	LITHO DESCRIPTION AMPLIFIED
		130.7	131.3	0.5							83	SST		- STICK CORE - MEDIUM GRAINED SST → MASSIVE
		131.3	140.0	9.01							104	SLST	SST	- DOMINANTLY STICK CORE - SLST WITH INTERMITTENT AMTS OF FINE GRAINED SST + V. IRREGULAR BEDDING - MINOR $CaCO_3$ INFILLINGS - MINOR POLISHED SURFACES
24	132.9													
25	137.0													
		140.0	143.45	3.32							96	SLST		- STICK CORE WITH SMALL RUBBLE POCKETS - SOME $CaCO_3$ INFILLINGS - NO BEDDING APPARENT
26	141.5													
		143.45	151.5	7.92			145.1 149.4	29° 21°			98	SST		- DOMINANTLY STICK CORE - VERY FINE GRAINED SST - BEDDING IS POORLY DEVELOPED EXCEPT IN ISOLATED SPOTS - ALSO QUITE IRREGULAR - LOTS OF $CaCO_3$ INFILLINGS - SOME IRON STAINING
27	145.7													
28	150.0													
		151.5	156.6	4.73							93			
29	154.1											SLST	SST	- STICK CORE - SLST WITH VARYING AMTS OF FINE GRAINED SST → SST HAS NONE OF BEDDING - IT IS VERY DISORIENTED AND IRREGULAR - MINOR $CaCO_3$ INFILLINGS - SOME POLISHED SURFACES
		156.6	157.95	1.51							112	SLST		- STICK CORE WITH MINOR BROKEN → RUBBLE INDICED (9) - NO VISIBLE BANDING - MINOR POLISHED SURFACES
		157.95	161.8	3.6							94	MDST		- DOMINANTLY STICK CORE → RUBBLE AT 158.2-158.3 - NO BANDING - NO POLISHED SURFACES
30	158.5													
		161.8	162.1	0.2							67	MDST	COAL	- STICK MDST WITH COALY RUBBLE → ~ 95% MDST - COAL IS BRIGHT AND SOFT → DIRTY - COAL IS STRINGERS IN MDST
		162.1	162.55	0.45							100	MDST		- STICK CORE - DULL → NO FEATURES
		162.55	164.4	1.5							81	MDST		- RUBBLE AND BROKEN TO 163.4, STICK CORE 163.4-164.4 - MDST WITH U MINOR COAL TO 163.4, THEN CLEAN - LOTS OF POLISHED SURFACES - MINOR $CaCO_3$ INFILLINGS
31	163.4													

* MEASURED FROM THE HORIZONTAL PLANE

▲ ANGLE MEASURED FROM CORE OF AXIS

HOLE NO.

Crows Nest Resources LIMITED

CORE DESCRIPTION

PROJECT: LOWER SOUTH PIT

HOLE NO. 4-SP #1 CONTINUED

BOX NO.	DEPTH AT TOP OF BOX	MARKER BLOCKS FROM	MARKER BLOCKS TO	MARKER BLOCKS RECOVERY (m)	GEOPHYS DEPTH FROM	GEOPHYS DEPTH TO	BEDDING ANGLE▲ DEPTH	BEDDING ANGLE▲ ANGLE	SAMPLE NO.	SEAM NAME	SEAM RECOVERY	LITHO DESCRIPTION MAIN	LITHO DESCRIPTION MINOR	LITHO DESCRIPTION AMPLIFIED
		164.4	164.75	0.35							100	SST		· STICK CORE
														· MINOR $CaCO_3$ INFILLINGS
														· POLISHED SURFACES
		164.75	168.75	4.05			166.8	34°			99	MDST		- STICK CORE
32	167.60						167.4	31°						- MINOR POLISHED SURFACES
							168.1	33°						- MINOR ISOLATED BANDING
		168.75	170.2	0.44					S	Q	60	COAL		· POWDER AND RUBBLE TO 169.5, THEN CHUNKY RUBBLE
														- 169.5 - 170.2 PIECES ARE VERY SHATTERED & THEY FALL APART AT TOUCH
														- COAL IS BRIGHT AND POLISHED
														· THE ZONE IS DIRTY
		170.2	171.0	0.75							94	MDST	COAL	· BROKEN AND RUBBLE MDST WITH POWDERY COAL ~ 85% MDST
														- TO PICK BOUNDARY BETWEEN THIS ZONE AND ABOVE IS DIFFICULT & POSSIBLY A LOT OF CONTAMINATION BY COAL FROM ABOVE
33	172.7	171.0	176.95	5.37							90	MDST		- 171.0 - 172.2 BROKEN AND RUBBLE
														- 172.2 - 174.4 STICK CORE
														- 174.4 - 174.85 RUBBLE
														174.85 - 176.95 STICK CORE
														- MINOR COALY STRINGERS AND $CaCO_3$ INFILLINGS
														- POLISHED SURFACES
		176.95	178.0	1.03			177.0	35°			98	SST		· STICK CORE
34	177.2						177.8	33°						· V. MINOR $CaCO_3$ INFILLINGS AND POLISHED SURFACES
														- INTERMITTENT MINOR SST INTERBEDS
		178.0	179.15	1.15			178.75	34°			100	SST		· STICK CORE
							179.1	41°						- FINE GRAINED SST → MASSIVE TO MODERATELY WELL DEVELOPED BEDDING
														- MINOR $CaCO_3$ INFILLINGS
		179.15	179.65	0.5							100	MDST	SST	- STICK CORE
														· MDST WITH 2 ISOLATED MASSIVE SST BANDS ~ 5 cm THICK + NOT REGULARILY BEDDED
														- $CaCO_3$ INFILLINGS
		179.65	180.4	0.75							100	MDST		· BROKEN TO RUBBLE
														- MDST WITH NUMEROUS V. SMALL $CaCO_3$ INFILLINGS
														· POLISHED SURFACES

* MEASURED FROM THE HORIZONTAL PLANE ▲ ANGLE MEASURED FROM CORE OF AXIS

HOLE NO.

Crows Nest Resources
LIMITED

CORE DESCRIPTION

PROJECT: LOWER SOUTH PIT

HOLE NO. LSP 1 CONTINUED

BOX NO.	DEPTH AT TOP OF BOX	MARKER BLOCKS FROM	MARKER BLOCKS TO	MARKER BLOCKS RECOVERY (m)	GEOPHYS DEPTH FROM	GEOPHYS DEPTH TO	BEDDING ANGLE▲ DEPTH	BEDDING ANGLE▲ ANGLE	SAMPLE NO.	SEAM NAME	SEAM RECOVERY	LITHO DESCRIPTION MAIN	LITHO DESCRIPTION MINOR	LITHO DESCRIPTION AMPLIFIED
		180.4	181.7	1.29			180.6	33°			99	MDST	SST	- STICK CORE
35	181.05						181.0	19°						- MDST WITH VARYING [illegible] OF FINE
							181.25	43°						GRAINED SST
														- POORLY DEVELOPED B[illegible]DING
														- POLISHED SURFACES
		181.7	182.35	0.65			182.2	41°			100	SST		- STICK CORE
														- FINE TO MEDIUM GRAINED SST
														- [illegible] VISIBLE BUT MARKED BY CROSS [illegible]
		182.35	184.5	1.83			182.9	39°			85	SLST	SST	- STICK CORE
														- SLST WITH VARYING [illegible] OF SST OVER WHOLE
														CORE → NOT JUST ISOLATED BANDS
														- SOME BEDDING VISIBLE → NOT ALWAYS REGULAR
														- $CaCO_3$ INFILLINGS
														- POLISHED SURFACES
		184.5	186.7	2.12			186.1	44°			96	MDST		- DOMINANTLY STICK CORE + SOME DRILL INDUCED FRACTURES
36	185.8													- [illegible] FAINT BANDING AT [illegible]
														- MINOR $CaCO_3$ INFILLING
		186.7	188.05	1.35			187.5	42°			100	SLST	SST	- STICK CORE
							187.9	36°						- SLST WITH VARYING AM[illegible] OF SST AS ABOVE
		188.05	189.0	0.95			188.4	28°			100	SST		- STICK CORE
														- MEDIUM GRAINED
														- LOTS OF CROSS BEDDING
														- MINOR $CaCO_3$
		189.0	190.7	1.7							100	MDST		- DOMINANTLY STICK CORE
37	190.2													- LOTS OF POLISHED SURFACES
														- LOTS OF $CaCO_3$
		190.7	191.5	0.8			190.9	35°			100	SST		- STICK CORE
														- FINE GRAINED SST CUT BY HUNDREDS OF $CaCO_3$
														INFILLED FRACTURES
														- POLISHED SURFACES
		191.5	193.0	1.48			192.0	31°			99	SLST	SST	- STICK CORE
							192.7	34°						- AS ABOVE
		193.0	193.75	0.72							96	SLST		- DOMINANTLY STICK CORE W[illegible] - DRILL INDUCED FRACTURES
														- POLISHED SURFACES
														- $CaCO_3$ INFILLINGS

* MEASURED FROM THE HORIZONTAL PLANE

▲ ANGLE MEASURED FROM CORE OF AXIS

HOLE NO.

Crows Nest Resources LIMITED

CORE DESCRIPTION

PROJECT	LOWER SOUTH PIT

HOLE NO.	LSP
CONTINUED	1

BOX NO.	DEPTH AT TOP OF BOX	MARKER BLOCKS			GEOPHYS DEPTH		BEDDING ANGLE▲		SAMPLE NO.	SEAM NAME	SEAM RECOVERY	LITHO DESCRIPTION		
		FROM	TO	RECOVERY (m)	FROM	TO	DEPTH	ANGLE				MAIN	MINOR	AMPLIFIED
		197.75	197.25	3.97			194.1	23°			99	SST		- STICK CORE
37	194.9						195.8	35°						- MEDIUM GRAINED SST VARYING FROM MASSIVE
							196.9	43°						TO WELL BEDDED & CROSS BEDDING ALSO PRESENT
														- $CaCO_3$ INFILLINGS.
		197.25	198.0	0.75			197.4	30°			100	MDST	SST	- STICK CORE
							197.9	33°						- MDST WITH WELL DEVELOPED SST BEDS + LOTS OF
														CROSS BEDDING
														- POLISHED SURFACES
		198.0	199.0	1.05							95	MDST		- STICK CORE
39	199.7													- NO VISIBLE BANDING
		199.0	202.7	3.7			199.4	35°			100	MDST	SST	- STICK CORE
							200.25	44°						- MDST WITH MINOR BITS OF FINE GRAINED
							201.65	29°						SST → BEDDING IS VISIBLE WITH MINOR
							202.6	20°						IRREGULARITIES
														- SOME POLISHED SURFACES
		202.7	207.9	4.8			203.75	32°			99	MDST		- STICK CORE WITH VARIOUS SILTY ZONES
40	202.9						205.8	28°						- VERY MINOR BANDING
							206.6	36°						- $CaCO_3$ INFILLINGS
41	207.4						207.2	29°						- BROKEN CORE 207.4 - 207.9
														- SOME POLISHED SURFACES
		207.9	207.95	0.05							100	SST		- REDRILLED RUBBLE AND BROKEN CORE
														- MEDIUM TO FINE GRAINED SST
														→ POSSIBLE CAVED AREA - SOMES COMPLETELY
														OUT OF PLACE
		207.95	208.2	0.25							100	MDST		- STICK CORE
														- SAME AS ABOVE WITHOUT BANDING
		208.2	210.8	2.55			209.3	29°			99	SLST	SST	- STICK CORE
							210.1	22°						- SLST WITH VARYING AMTS OF FINE GRAINED SST
														- BANDING WELL DEVELOPED IN ISOLATED PLACES BUT
														CROSS BEDDING VISIBLE
														- IRON STAINING PRESENT
														- MINOR POLISHED SURFACES
		210.8	211.9	1.10			211.1	32°			100	MDST		- DOMINANTLY STICK CORE WITH BROKEN ZONE 211.35-211.45
42	211.7						211.6	34°						- VERY MINOR BANDING
														- SOME POLISHED SURFACES
														- MINOR $CaCO_3$ INFILLINGS

* MEASURED FROM THE HORIZONTAL PLANE ▲ ANGLE MEASURED FROM CORE OF AXIS

HOLE NO.	

Crows Nest Resources LIMITED

CORE DESCRIPTION

PROJECT	LOWER SOUTH PIT

HOLE NO.	LSD
CONTINUED	1

BOX NO.	DEPTH AT TOP OF BOX	HARKER BLOCKS FROM	HARKER BLOCKS TO	HARKER BLOCKS RECOVERY (m)	GEOPHYS DEPTH FROM	GEOPHYS DEPTH TO	BEDDING ANGLE▲ DEPTH	BEDDING ANGLE▲ ANGLE	SAMPLE NO.	SEAM NAME	SEAM RECOVERY	LITHO DESCRIPTION MAIN	LITHO DESCRIPTION MINOR	LITHO DESCRIPTION AMPLIFIED
		211.9	215.7	1.56			212.3	27°			87	SST		· STICK CORE
							213.1	30°						· FINE GRAINED WITH [illegible] BEDDING BUT IT IS
							213.65	29°						IRREGULAR AND CROSS BEDDED
														· POLISHED SURFACES
														- $CaCO_3$ INFILLINGS
		213.7	214.05	0.35							100	mSST		· STICK CORE
														· NO BANDING VISIBLE
		214.05	215.65	1.57			214.4	26°			98	mSST	SST	· STICK CORE
							215.0	31°						· mSST WITH FINE GR[illegible] SST
							215.6	28°						· BEDDING VISIBLE BUT [illegible] CROSS BEDDING
43	216.2	215.65	216.75	1.1							100	SLST		· STICK CORE
														· NO VISIBLE BANDING
														· MINOR $CaCO_3$ INFILLINGS
		216.75	221.8	4.76			217.1	24°			102	SLST	SST	· STICK CORE
44	220.5						218.0	26°						· SLST WITH POCKETS OF ALMOST PURE SST
							218.7	34°						· BEDDING WELL DEVELOPED & NUMEROUS SST PRESENT
							219.2	33°						- $CaCO_3$ INFILLINGS
							220.0	30°						- MINOR POLISHED SURFACES
							220.85	34°						
							221.1	41°						
		221.9	223.2	1.55							86	SLST		· STICK CORE WITH SOME DRILL INDUCED FRACTURES
														· NO VISIBLE BANDING
														· MINOR $CaCO_3$ INFILLINGS
		223.2	225.2	2.12			223.3	41°			106	SLST	SST	· STICK CORE
45	224.95						223.7	37°						· SLST WITH POCKETS OF FINE GRAINED SST &
							224.2	44°						AMT OF SST INCREASES GOING DOWN THE RUN
							224.7	42°						· BEDDING IS CLEARLY VISIBLE
							225.1	34°						· MINOR $CaCO_3$ INFILLINGS
														· SOME POLISHED SURFACES
		225.2	225.75	0.55			225.3	46°			100	SST		· FINE GRAINED
							225.55	43						· STICK CORE
							225.8	45						· BEDDING DEVELOPED BY LOTS OF CRUSHED SHELL
														· AT 225.25m A 2-5cm $CaCO_3$ INFILLING
														· POLISHED SURFACES
		225.75	225.9	0.15			225.8	43°			100	mSST		- SEMI STICK
														- FAINT SST BEDDING IN TOP 5cm
														· POLISHED SURFACES

* MEASURED FROM THE HORIZONTAL PLANE

▲ ANGLE MEASURED FROM CORE OF AXIS

HOLE NO.	

Crows Nest Resources LIMITED

CORE DESCRIPTION

PROJECT	LOWER SOUTH PIT

HOLE NO.	LSP #1
CONTINUED	

BOX NO.	DEPTH AT TOP OF BOX	MARKER BLOCKS FROM	MARKER BLOCKS TO	MARKER BLOCKS RECOVERY (%)	GEOPHYS DEPTH FROM	GEOPHYS DEPTH TO	BEDDING ANGLE▲ DEPTH	BEDDING ANGLE▲ ANGLE	SAMPLE NO.	SEAM NAME	SEAM RECOVERY	LITHO DESCRIPTION MAIN	LITHO DESCRIPTION MINOR	LITHO DESCRIPTION AMPLIFIED
		225.9	227.3	1.39			226.2	46°			99	SST		- FINE TO MEDIUM GRAINED WITH SMALL (<2cm)
							226.65	44°						ISOLATED SLST BANDS
							227.15	44°						- STICK CORE
														- BEDDING PRESENT BUT LOTS OF CROSS
														BEDDING AND BEDDING INTERUPTIONS
														- $CaCO_3$ INFILLINGS WITH MASSIVE PYRITE
														ALSO PRESENT
		227.3	227.95	0.58			227.5	28°			97	SLST		- STICK CORE
							227.85	39°						- V. MINOR SST BEDDING THROUGH WHOLE RUN
		227.95	228.9	0.95			228.3	3/0°			89	SST	SLST	- STICK TO BROKEN CORE
							228.7	3/0°						- POCKETS OF SLST AND MEDIUM GRAINED
														SST ALTERNATING @ ~ 1.5% SST
														- NUMEROUS $CaCO_3$ INFILLINGS @ MOSTLY IN SST
														- POLISHED SURFACES
														- SST IS V. FAINTED BEDDED @ NOT VERY CONSISTENT

* MEASURED FROM THE HORIZONTAL PLANE

▲ ANGLE MEASURED FROM CORE OF AXIS

HOLE NO.	

ENCLOSURE 23 - 2

MT. MICHEAL EWIN PASS THRUST SLICE

CORE DESCRIPTIONS DIAMOND HOLES

Hole: 5146 Date Start: 87/08/22

Northing = 5534076.3

Easting = 660462.7

Elevation = 1582.8

Orientation = 250°/55°

Length = 156.2m

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Crows Nest Resources
LIMITED

CORE DESCRIPTION

PROJECT	LOWER SOUTH PIT
AREA	LINE CREEK

DATE	
BEGIN	
END	

HOLE NO. LSP,2 5/86

PAGE 1 OF ____

HOLE PARTICULARS

LOCATION	NORTHING: 5534076.3 (m)		
	EASTING: 660462.7 (m)		
ELEVATION	1582.8	HOLE BEARING (AZ°)	250
TOTAL DEPTH	156.2	HOLE ANGLE (°)*	55

LOGGING

LOGS RUN	FULL SUITE
LOGGED BY	CENTURY
OTHER TESTS	

PRE-CORE INFORMATION

CASING LENGTH	(m)
OVERBURDEN DEPTH	(m)
OVERBURDEN TYPE	
WATER LEVEL	(m)

EXAMINATION

LOG USED	GAMMA / DENSITY
NO. OF SEAMS SAMPLED	
EXAMINER (S)	JB
DATE	01/10/87

BOX NO.	DEPTH AT TOP OF BOX	MARKER BLOCKS FROM	MARKER BLOCKS TO	MARKER BLOCKS RECOVERY (m)	GEOPHYS DEPTH FROM	GEOPHYS DEPTH TO	BEDDING ANGLE▲ DEPTH	BEDDING ANGLE▲ ANGLE	SAMPLE NO.	SEAM NAME	SEAM RECOVERY	LITHO DESCRIPTION MAIN	LITHO DESCRIPTION MINOR	LITHO DESCRIPTION AMPLIFIED
1	16.3'	16.3	16.5	0.15								SST		- FINE GRAINED
														- SOME LOSS DUE TO REDRILLING (2 PIECES)
														- MINOR COALY INTERVALS
		16.5	16.8	0.3								MDST		- SOME STICK TO RUBBLE → REDRILLING INCIDENT
														- MINOR COALY INFILLINGS
		16.8	17.75	0.34					1	Q	36	COAL		- RUBBLE PIECES
														- COAL IS BRIGHT AND FAIRLY HARD
		17.75	19.7	0.67							34	MDST	COAL	- DOMINANTLY RUBBLE
														- MOSTLY MDST WITH COAL → ~ 75% MDST BUT
														RECOVERY IS SO LOW, THIS COULD BE VERY
														MISLEADING
														- COAL IS FINE RUBBLE OR POWDERY
		19.7	25.05	1.66							87	MDST		- 19.7 - 21.6 BROKEN AND RUBBLE DOMINANTLY WITH
2	21.85													POOR RECOVERY
														- 21.6 - 26.05 DOMINANTLY SEMI STICK TO STICK
														WITH DRILL INDUCED FRACTURES
														- IRON STAINING THROUGHOUT
														- NO VISIBLE BANDING
		25.05	27.0	1.92								SLST		- DOMINANTLY SEMI STICK TO BROKEN
3	26.1													- V. MINOR ISOLATED MASSIVE SST POCKETS
														- IRON STAINING PRESENT
		27.0	28.2	0.99								MDST		- DOMINANTLY SEMI STICK TO BROKEN
														- NO VISIBLE BANDING
		28.2	29.7	1.33			29.7	32°			89	MDST	SST	- DOMINANTLY STICK CORE WITH RUBBLE
							29.6	35°						- MDST WITH INTERMITTENT SST RICH ZONES
														→ SST IS FINE GRAINED SOME FAINT BDG
														- AT 28.6 A 5cm MUD LAYER IS PRESENT
														- IRON STAINING PRESENT

* MEASURED FROM THE HORIZONTAL PLANE

▲ ANGLE MEASURED FROM CORE OF AXIS

HOLE NO.

BA-341

Crows Nest Resources
LIMITED

CORE DESCRIPTION

PROJECT: LOWER SOUTH PIT

HOLE NO. LSP 2 CONTINUED | PAGE 2 OF

BOX NO.	DEPTH AT TOP OF BOX	MARKER BLOCKS FROM	MARKER BLOCKS TO	MARKER BLOCKS RECOVERY (m)	GEOPHYS DEPTH FROM	GEOPHYS DEPTH TO	BEDDING ANGLE ▲ DEPTH	BEDDING ANGLE ▲ ANGLE	SAMPLE NO.	SEAM NAME	SEAM RECOVERY	LITHO DESCRIPTION MAIN	LITHO DESCRIPTION MINOR	LITHO DESCRIPTION AMPLIFIED
		29.7	31.05	1.09							81	MDST		- STICK AND BROKEN CORE
4	30.5													- V MINOR SST AT 30.3
														- AT 30.2 m 3cm MUD LAYER
		31.05	32.0	0.83			31.4	36°			87	SST		- SEMI STICK TO BROKEN
							31.6	33°						- FINE GRAINED
							31.9	37°						- WELL DEVELOPED BEDDING INTERMITTENLY
														- IRON STAINING PRESENT
		32.0	32.3	0.28								MDST		- SEMI STICK TO BROKEN
														- V FAINT IRREGULAR BANDING
		32.3	32.75	0.45			32.4	42°				SST		- STICK TO BROKEN
							32.6	45°						- WELL DEVELOPED BEDDING ALSO CROSS BEDDING
														- IRON STAINING PRESENT
5	34.5	32.75	36.75	3.66			33.0	31°				MDST	SST	- SEMI STICK TO RUBBLE
							33.5	33°						- MDST WITH INTERMITTENT SST - AMT VARIES OVER RUN
							34.2	35°						- IRON STAINING
							35.6	35°						- AT 34.1 AND 36.55 MUD LAYERS
		36.75	39.9	2.19								MDST	MUD	- RUBBLE AND MINOR BROKEN
6	39.55													- LOTS OF IRON STAINING 36.75 - 38.1
														- PROBABLE FAULT ZONE
		39.9	42.0	2.1			40.3	34°				SST		- STICK TO BROKEN
							40.8	36°						- MEDIUM TO FINE GRAINED
							41.7	34°						- BEDDING WELL DEVELOPED WITH CROSS BEDDING
														- IRON STAINING ON OPEN SURFACES
		42.0	44.3	1.95			42.5	41°				MDST		- DOMINANTLY STICK AND SEMI STICK
7	43.7						43.8	42°						- V. ISOLATED SST INTERBEDS
														- IRON STAINING PRESENT
		44.3	45.7				44.7	46°				SST	MDST	- STICK TO SEMI STICK
							45.6	43°						- SST WITH MDST INTERBEDS
														- SST BEDDING MODERATELY DEVELOPED

* MEASURED FROM THE HORIZONTAL PLANE

▲ ANGLE MEASURED FROM CORE OF AXIS

HOLE NO.

Crows Nest Resources
LIMITED

CORE DESCRIPTION

PROJECT: LOWER SOUTH PIT

HOLE NO. CONTINUED: LSP #2

BOX NO.	DEPTH AT TOP OF BOX	MARKER BLOCKS FROM	MARKER BLOCKS TO	MARKER BLOCKS RECOVERY (m)	GEOPHYS DEPTH FROM	GEOPHYS DEPTH TO	BEDDING ANGLE* DEPTH	BEDDING ANGLE* ANGLE▲	SAMPLE NO.	SEAM NAME	SEAM RECOVERY	LITHO DESCRIPTION MAIN	LITHO DESCRIPTION MINOR	LITHO DESCRIPTION AMPLIFIED
		45.7	46.9	1.1			45.8	90°				MDST		- STICK CORE
							46.3	38°						- V. MINOR ISOLATED SST WISPY INTERBDS
		46.9	48.9	1.4			47.3	49°				MDST	SST	- DOMINANTLY STICK CORE WITH RUBBLE AT
8	47.9						48.35	42°						47.7-47.8 m
														- MDST WITH VARYING AMTS OF SST → SOME
														BEDDING DEVELOPMENT
		48.4	49.55	1.05			48.6	45°				SST		- STICK TO SEMI STICK
							49.3	45°						- FINE TO COARSE GRAINED
														- BEDDING IS POORLY TO WELL DEVELOPED
														- IRON STAINING
		49.55	51.9	2.23			49.8	41°				SST	MDST	- STICK TO SEMISTICK WITH V. MINOR RUBBLE
							50.7	47						- AT 49.65 - 49.7 MUD LAYER
							51.5	48°						- SST WITH VARYING AMTS OF MDST
														- BEDDING MODERATELY DEVELOPED
														- IRON STAINING
		51.9	62.4	9.77			52.1	48°				SST		- MEDIUM TO COARSE GRAINED
9	52.2						52.7	43°						- STICK TO BROKEN
							53.5	42°						- LOTS OF IRON STAINING
10	56.35						54.2	44°						- COALY STRINGERS
							55.4	41°						- BEDDING POORLY DEVELOPED TO WELL DEVELOPED
11	61.0						56.4	37°						- AT 52.0 MUD LAYER 3cm THICK
							57.4	35°						- AT 56.1 10 cm V. COALY ZONE
							58.5	45°						- CROSS BEDDING VISIBLE IN INTERMITENT PLACES
							59.6	36°						- $CaCO_3$ INFILLINGS
							60.7	42°						
							61.7	38°						
							62.1	42°						
		62.4	62.75	0.33								MDST		- SEMI STICK WITH DRILL INDUCED FRACTURES
														- MINOR SANDY POCKETS AND INTERBANDING
		62.75	63.15	0.4								SST		- MASSIVE COARSE GRAINED SST
														- SEMI STICK TO RUBBLE
														- COALY INFILLINGS
		63.15	63.75	0.58			63.65	58°				MDST	SST	- SEMI STICK TO RUBBLE
														- MDST WITH INTERMITTENT SST INTERBEDS
														- $CaCO_3$ INFILLINGS
		63.75	65.0	1.16								MDST		- SEMI STICK TO RUBBLE → NUMEROUS DRILL
12	64.7													INDUCED FRACTURES
														- V. MINOR ISOLATED FST POCKETS

* MEASURED FROM THE HORIZONTAL PLANE

▲ ANGLE MEASURED FROM CORE OF AXIS

HOLE NO. ____

Crows Nest Resources
LIMITED

CORE DESCRIPTION

PROJECT

HOLE NO. LOP #2
CONTINUED

PAGE 4 OF

BOX NO.	DEPTH AT TOP OF BOX	MARKER BLOCKS FROM	MARKER BLOCKS TO	MARKER BLOCKS RECOVERY (m)	GEOPHYS DEPTH FROM	GEOPHYS DEPTH TO	BEDDING ANGLE DEPTH	BEDDING ANGLE ANGLE	SAMPLE NO.	SEAM NAME	SEAM RECOVERY	LITHO DESCRIPTION MAIN	LITHO DESCRIPTION MINOR	LITHO DESCRIPTION AMPLIFIED
		65.0	69.3	3.02								SST		- CORE RANGES GREATLY FROM RUBBLE
														TO STICK
														- ALSO VARIES FROM COARSE GRAINED WITH VERY
														LITTLE BEDDING TO V. FINE GRAINED WITH
														WELL DEVELOPED BEDDING
														- COALY INFILLINGS AND STRINGERS DOMINATE
														- SOME POLISHED SURFACES
														- CACO INFILLINGS

* MEASURED FROM THE HORIZONTAL PLANE

▲ ANGLE MEASURED FROM CORE OF AXIS

HOLE NO.

Crows Nest Resources LIMITED

CORE DESCRIPTION

PROJECT: LOWER SOUTH PIT

HOLE NO. CONTINUED: Lop#2

BOX NO.	DEPTH AT TOP OF BOX	MARKER BLOCKS FROM	MARKER BLOCKS TO	MARKER BLOCKS RECOVERY (%)	GEOPHYS DEPTH FROM	GEOPHYS DEPTH TO	BEDDING ANGLE* DEPTH	BEDDING ANGLE* ANGLE	SAMPLE NO.	SEAM NAME	SEAM RECOVERY	LITHO DESCRIPTION MAIN	LITHO DESCRIPTION MINOR	LITHO DESCRIPTION AMPLIFIED
		68.3	70.9	2.12								MDST		· STICK TO RUBBLE WITH NUMEROUS DRILL INDUCED FRACTURES - LOTS OF POLISHED SURFACES
13	68.9													
		70.5	72.85	0.53					2	8	23%	COAL		· RUBBLE TO SEMI STICK · COAL IS DIRTY AND DULL · FAIRLY HARD · 1cm MDST SPLIT N M DXE
		72.85	73.5	0.65								MDST		· STICK CORE WITH MINOR BROKEN · POLISHED SURFACES
		73.5	73.8	0.3					3	8	75%	COAL		· BROKEN AND RUBBLE · COAL IS BRIGHT AND FAIRLY HARD · ANGULAR SHATTERED PIECES
		73.9	74.15	0.25								MDST		· STICK AND SEMI STICK · POLISHED SURFACES · V. MINOR COALY INFILLINGS AND STRINGERS
		74.15	77.65	1.34					4	8	38%	COAL		· DOMINANTLY COMPACTED POWDER WITH V. MINOR CHUNKS AND RUBBLE · COAL IS SOFT AND DULL
14	75.0													
		77.65	79.2	1.24								MDST		· STICK CORE WITH MINOR BROKEN 77.65 - 78.0 · POLISHED SURFACES · MINOR CACO3 INFILLINGS · NO VISIBLE BANDING
		79.2	80.4	0.36					5	8	30%	COAL		· ALL RUBBLE PIECES ROUNDED NOT BROKEN UP FROM SHATTERING · COAL IS FAIRLY BRIGHT AND HARD
		80.4	84.35	3.56								MDST		· 80.4 - 81.6 BROKEN TO RUBBLE · 81.6 - 84.35 STICK WITH DRILL INDUCED FRACTURES · POLISHED SURFACES PRESENT · NO VISIBLE BANDING
15	82.15													

* MEASURED FROM THE HORIZONTAL PLANE

▲ ANGLE MEASURED FROM CORE OF AXIS

HOLE NO. ____

Crows Nest Resources
LIMITED

CORE DESCRIPTION

PROJECT	

HOLE NO.	LCP 52
CONTINUED	

PAGE 6 OF ____

BOX NO.	DEPTH AT TOP OF BOX	MARKER BLOCKS FROM	MARKER BLOCKS TO	MARKER BLOCKS RECOVERY (%)	GEOPHYS DEPTH FROM	GEOPHYS DEPTH TO	BEDDING ANGLE▲ DEPTH	BEDDING ANGLE▲ ANGLE	SAMPLE NO.	SEAM NAME	SEAM RECOVERY	LITHO DESCRIPTION MAIN	LITHO DESCRIPTION MINOR	LITHO DESCRIPTION AMPLIFIED
		84.35	84.8	0.45								SLST		- STICK CORE - POLISHED SURFACE
		84.8	87.25	2.23			85.0	12°				SST		- STICK CORE
16	86.9						86.2	45°						- FINE GRAINED SST
							87.2	41°						- MODERATE TO POOR BEDDING DEVELOPMENT - $CaCO_3$ INFILLINGS
		87.25	87.55	0.3								SLST		- STICK CORE - NO BEDDING VISIBLE
		87.55	88.6	1.05			87.6	48°				SST		- FINE GRAINED
							88.0	15°						- STICK CORE
							88.6	44°						- MODERATE BEDDING DEVELOPMENT - $CaCO_3$ INFILLINGS
		88.6	89.2	0.6								MDST		- STICK CORE - NO VISIBLE BANDING
		89.2	91.65	2.92			89.3	47°				SST	MDST	- DOMINANTLY SST WITH INTERBEDDED MDST IN
17	90.1						90.0	46°						VARYING AMTS - STICK CORE
							91.1	41°						- BEDDING WELL DEVELOPED
		91.65	92.75	1.06								MDST		- STICK CORE WITH DRILL INDUCED FRACTURES - V. MINOR $CaCO_3$ INFILLINGS
		92.75	95.1	2.34			92.9	43°				MDST	SST	- DOMINANTLY STICK CORE - WITH SOME DRILL
							93.9	47°						INDUCED FRACTURES - CORE IS MDST WITH VARYING AMTS OF FINE GRAINED
							99.8	48°						SST & BEDDING IS WELL DEVELOPED
		95.1	96.15	1.03								MDST		- STICK CORE - NO FEATURES
18	95.3													
		96.15	96.9	0.65								SLST		- STICK CORE - NO VISIBLE BEDDING OR BANDING - V. MINOR $CaCO_3$ INFILLINGS
		96.9	97.5	0.7			96.8	46°				SST		- STICK CORE, FINE GRAINED
							97.4	43°						- WELL DEVELOPED BEDDING BUT LOTS OF CROSS BEDDING - INCREASED $CaCO_3$ INFILLINGS

* MEASURED FROM THE HORIZONTAL PLANE

▲ ANGLE MEASURED FROM CORE OF AXIS

HOLE NO.	

Crows Nest Resources LIMITED

CORE DESCRIPTION

PROJECT	LOWER SOUTH PIT

HOLE NO.	LSP #2
CONTINUED	

BOX NO.	DEPTH AT TOP OF BOX	MARKER BLOCKS FROM	MARKER BLOCKS TO	MARKER BLOCKS RECOVERY (m)	GEOPHYS DEPTH FROM	GEOPHYS DEPTH TO	BEDDING ANGLE▲ DEPTH	BEDDING ANGLE▲ ANGLE	SAMPLE NO.	SEAM NAME	SEAM RECOVERY	LITHO DESCRIPTION MAIN	LITHO DESCRIPTION MINOR	LITHO DESCRIPTION AMPLIFIED
		97.5	98.55	0.93								MDST		- DOMINANTLY STICK CORE WITH MINOR RUBBLE - NO VISIBLE BANDING
		98.55	100.25	1.7			98.7	38°				MDST	SST	- STICK CORE - BEDDING IN SST IS MODERATELY DEVELOPED
18	99.6						99.5	42°						- ISOLATED 4mm THICK $CaCO_3$ INFILLINGS
							100.1	44°						- CROSS BEDDING DOMINATES
		100.25	101.6	1.34			100.9	39				SLST		- STICK CORE - V. MINOR SST THROUGHOUT
							101.55	46°						- MINOR $CaCO_3$ INFILLINGS - SOME POLISHED SURFACES
		101.6	105.9	4.26			102.0	39°				SST		- STICK CORE TO RUBBLE + DOMINANTLY STICK - FINE GRAINED SST WITH LOTS OF CROSS BEDDING
20	103.65						103.2	35°						- LOTS OF $CaCO_3$ INFILLINGS ON CROSS FRACTURES
							104.2	44°						- MINOR SLST POCKETS UP TO 10 cm
							105.25	41°						- MINOR COALY INFILLINGS
							105.85	36°						
		105.9	106.65	0.64								MDST		- SEMISTICK TO RUBBLE + DOMINANTLY BROKEN - POLISHED SURFACES - NO VISIBLE BANDING
		106.65	111.2	4.28			106.8	24°				MDST	SST	- STICK CORE TO RUBBLE + DOMINANTLY STICK - MOST WITH V MINOR SST - AMT VARIES OVER
21	107.4						107.75	26°						CORE - SST SHOWS GOOD BEDDING WHERE PRESENT
							108.3	23°						- POLISHED SURFACES
							109.1	21°						- MINOR $CaCO_3$ INFILLINGS
							110.2	21°						
							110.7	19°						
							111.1	8°						
		111.2	111.6	0.4								MDST		- STICK CORE - NO VISIBLE BANDING - $CaCO_3$ INFILLINGS
		111.6	116.1	4.53			111.9	27°				SST	MDST	- STICK TO RUBBLE + DOMINANTLY STICK - CORE VARIES IN AMTS OF SST AND MDST + SOME
22	111.75						112.9	26°						PLACES MDST DOMINATES, THEN SWITCHES
23	115.5						113.8	27°						- BEDDING IS GOOD WITH CROSS BEDDING
							114.85	30°						- MINOR $CaCO_3$ INFILLINGS
							115.4	21°						
							116.0	24°						
		116.1	116.65	0.55								SLST		- STICK CORE - NO VISIBLE FEATURES

* MEASURED FROM THE HORIZONTAL PLANE

▲ ANGLE MEASURED FROM CORE OF AXIS

HOLE NO. ____

Crows Nest Resources LIMITED

CORE DESCRIPTION

PROJECT

HOLE NO. LSP
CONTINUED #2

BOX NO.	DEPTH AT TOP OF BOX	MARKER BLOCKS FROM	MARKER BLOCKS TO	MARKER BLOCKS RECOVERY (m)	GEOPHYS DEPTH FROM	GEOPHYS DEPTH TO	BEDDING ANGLE* DEPTH	BEDDING ANGLE* ANGLE	SAMPLE NO.	SEAM NAME	SEAM RECOVERY	LITHO DESCRIPTION MAIN	LITHO DESCRIPTION MINOR	LITHO DESCRIPTION AMPLIFIED
		116.65	117.15	0.37			117.1	33°				SST	SLST	- DOMINANTLY SEMI STICK - BEDDING IS CLEAR WITH RIPPLE FEATURES
		117.15	118.2	1.05								SLST		- STICK CORE - NO BEDDING VISIBLE - POLISHED SURFACES (MINOR) - MINOR $CaCO_3$ INFILLINGS
		118.2	119.5	1.19			118.35	42°				SST	SLST	- INTER BEDDED SLST & SST IN ZONES 5 12cm
							119.1	39°						OF SLST 17 CM SST - SST IS FINE TO MEDIUM GRAINED, SOME BEDDING - MINOR $CaCO_3$ INFILLINGS - CROSS BEDDING
		119.5	122.6	2.98			119.9	12°						
24	119.95						120.4	44°				SST		- MEDIUM GRAINED
							121.2	41°						- DOMINANTLY STICK CORE
							122.0	43°						- BEDDING POORLY DEVELOPED + LOTS OF CROSS BEDDING - $CaCO_3$ INFILLINGS
		122.6	123.25	0.65			122.8	42°				SST	MDST	- FINE GRAINED SST WITH MDST + V. MINOR
							123.2	44°						- MINOR POLISHED SURFACES - COALY STRINGER AT 123.22

* MEASURED FROM THE HORIZONTAL PLANE

▲ ANGLE MEASURED FROM CORE OF AXIS

HOLE NO.

Crows Nest Resources LIMITED

CORE DESCRIPTION

PROJECT: LOWER SOUTH PIT

HOLE NO. LSP #2 CONTINUED

BOX NO.	DEPTH AT TOP OF BOX	MARKER BLOCKS FROM	MARKER BLOCKS TO	MARKER BLOCKS RECOVERY (m)	GEOPHYS DEPTH FROM	GEOPHYS DEPTH TO	BEDDING ANGLE▲ DEPTH	BEDDING ANGLE▲ ANGLE	SAMPLE NO.	SEAM NAME	SEAM RECOVERY	LITHO DESCRIPTION MAIN	LITHO DESCRIPTION MINOR	LITHO DESCRIPTION AMPLIFIED
		123.25	129.5	6.02			124.8	42°				MDST		DOMINANTLY STICK CORE WITH LOTS OF
							126.1	46°						DRILL INDUCED FRACTURES
25	123.9						126.3	47°						- POLISHED SURFACES
														- V. MINOR ISOLATED BANDING
26	128.6													
		129.5	137.25	3.11					5	NB	40%	COAL		- COAL IS ALL V FINE RUBBLE WITH SOME
														LARGER RUBBLE CHUNKS & COMPACTED POWDER
														- V SOFT WITH SOME FRIABILITY
														- RECOVERY IS V. POOR ESPECIALLY IN TOP 3m
27	137.45	137.25	137.9	0.65								MDST		- STICK CORE WITH NUMEROUS DRILL INDUCED
														FRACTURES
														- POLISHED SURFACES PRESENT
														- MINOR COALY INFILLINGS FIRST 20 cm
		137.9	138.4	0.5			137.95	52°				SST		- V. FINE GRAINED SST
							136.35	49°						- DOMINANTLY STICK CORE - MINOR RUBBLE AT
														138.2 FOR 5cm - COALY ZONE
		138.4	141.1	2.37								MDST		- STICK TO RUBBLE
														- NUMEROUS POLISHED SURFACES
														- DRILL INDUCED FRACTURES BUT ALSO LOTS
														OF SHATTERED ROCK ESPECIALLY 140 - 141
		141.1	144.65	0.22					6	10A	6%	COAL		- ALL COMPACTED POWDER WITH RUBBLE
														- DULL LOOKING AND SOFT
		144.65	144.8	0.15								MDST		- BROKEN TO RUBBLE
28	144.7													- COALY INFILLINGS AND POLISHED SURFACES
		144.8	147.8	0.15					7	10A	5%	COAL		- FINE RUBBLE WITH SOME CHUNKS
														- DIRTY LOOKING - DULL AND SOFT
		147.8	160.0	12.01			148.1	66°			98%	SST		- MOOSE MTN SANDSTONE
29	152.0						149.0	73°						- MEDIUM GRAINED SST
							149.8	74°						- BEDDING DEVELOPMENT VARIES FROM GOOD TO POOR
30	160.35						151.3	73°						- MINOR COALY INFILLINGS - ISOLATED
							152.9	76°						- CROSS BEDDING PRESENT
							153.5	71°						- AT 153.35 SST IS VUGGY FOR 5cm AND

* MEASURED FROM THE HORIZONTAL PLANE

▲ ANGLE MEASURED FROM CORE OF AXIS

HOLE NO.

Crows Nest Resources LIMITED

CORE DESCRIPTION

PROJECT	

HOLE NO.	LOC # 2
CONTINUED	

BOX NO.	DEPTH AT TOP OF BOX	MARKER BLOCKS			GEOPHYS DEPTH		BEDDING ANGLE▲		SAMPLE NO.	SEAM NAME	SEAM RECOVERY	LITHO DESCRIPTION		
		FROM	TO	RECOVERY (m)	FROM	TO	DEPTH	ANGLE*				MAIN	MINOR	AMPLIFIED
							159.0	90°						BELOW SST CHANGES TO COARSE GRAINED
							159.8	37°						WITH MUCH LESS WELL DEVELOPED BEDDING
							155.35	98°						*AT 159.5 10cm OF VUGGY SST AGAIN
							156.5	92°						& NOT AS DEVELOPED AS ABOVE
							157.4	36°						
							158.49	34°						
							159.2	37°						
							1600	51°						

* MEASURED FROM THE HORIZONTAL PLANE

▲ ANGLE MEASURED FROM CORE OF AXIS

HOLE NO.

ENCLOSURE 23 - 3

MT. MICHEAL EWIN PASS THRUST SLICE

CORE DESCRIPTIONS DIAMOND HOLES

Hole: 5147 Date Start: 87/08/10

Northing = 5534029.2

Easting = 660378.7

Elevation = 1620.6

Orientation = 075°/67°

Length = 129.8 m

738

Crows Nest Resources
LIMITED

CORE DESCRIPTION

PROJECT	WA LINE CREEK
AREA	LOWER SOUTH PIT

DATE	BEGIN	
	END	

HOLE NO. LSP3 5147

PAGE 1 OF 6

HOLE PARTICULARS

LOCATION	NORTHING: 5534029.2 (m)		
	EASTING: 660378.7 (m)		
ELEVATION	1620.6	HOLE BEARING (AZ°)	075
TOTAL DEPTH	129.8	HOLE ANGLE (°)*	67

LOGGING

LOGS RUN	FULL SUITE
LOGGED BY	CENTURY
OTHER TESTS	

PRE-CORE INFORMATION

CASING LENGTH (m)	
OVERBURDEN DEPTH (m)	
OVERBURDEN TYPE	
WATER LEVEL (m)	

EXAMINATION

LOG USED	GAMMA/DEN
NO. OF SEAMS SAMPLED	1
EXAMINER (S)	JB
DATE	18/09/87

BOX NO.	DEPTH AT TOP OF BOX	MARKER BLOCKS FROM	MARKER BLOCKS TO	MARKER BLOCKS RECOVERY (m)	GEOPHYS DEPTH FROM	GEOPHYS DEPTH TO	BEDDING ANGLE▲ DEPTH	BEDDING ANGLE▲ ANGLE	SAMPLE NO.	SEAM NAME	SEAM RECOVERY	LITHO DESCRIPTION MAIN	LITHO DESCRIPTION MINOR	LITHO DESCRIPTION AMPLIFIED
1	9.1	9.1	22.2	12.71			9.3	54°			97	SST		- CORE RANGES FROM STICK TO RUBBLE
							10.6	53						- FINE TO COARSE GRAINED SST
2	13.25						11.4	56°						- BEDDING IS DOMINANTLY WELL DEFINED WITH
							12.1	56°						CROSS BEDDING PRESENT
3	17.45						13.15	53°						- IRON STAINING PRESENT
							13.9	54°						- SOME MINOR COALY INFILLINGS AND POLISHED
4	21.5						14.6	57°						SURFACES AT 18.0 AND 18.9 m
							15.4	51°						- AT 17.8m THERE IS A 2cm THICK MUD ZONE
							16.4	55°						CUTTING ACROSS BEDDING
							17.4	58°						- $CaCO_3$ INFILLINGS ON OPEN FRACTURES
							18.7	64°						
							19.3	67°						
							19.9	65°						
							20.6	56°						
							21.8	56						
		22.2	23.6	1.43			23.0	58°			89	SLST	SST	- STICK CORE TO BRECCIATED ZONE
							23.4	44°						→ DOMINANTLY BROKEN
							23.7	52°						- CORE IS SLST WITH VARYING AMTS OF
														FINE GRAINED SST - BEDDING IS INTERMITTENT
														BUT REGULAR
														- 22.2 - 22.4 COALY STRINGERS DOMINATE
														- 22.4 - 22.5 BRECCIA ZONE OF COALY AND
														ROCKY PIECES IN MUDDY MATRIX - ALSO
														PRESENT 22.95 - 23.0
														- SOME POLISHED SURFACES AND IRON STAINING
		23.6	25.9	1.6			24.2	56°			100	MDST		- DOMINANTLY STICK CORE WITH RUBBLE AT 24.0-24.1
														- NUMEROUS DRILL INDUCED FRACTURES
														- V. MINOR ISOLATED BANDING
5	25.4	25.4	26.9	1.5			25.4	32°			100	MDST	SST	- STICK CORE WITH MINOR BROKEN PIECES
							26.0	55°						- MDST WITH INTERMITTENT AMTS OF FINE
							26.35	59°						GRAINED SST BEDDING - BDG IS REGULAR AND
														CONSISTENT BUT DISSAPPEARS WITH DEPTH

* MEASURED FROM THE HORIZONTAL PLANE

▲ ANGLE MEASURED FROM CORE OF AXIS

HOLE NO.

BA-341

Crows Nest Resources LIMITED

CORE DESCRIPTION

PROJECT: LSP

HOLE NO. LSP #3 CONTINUED

BOX NO.	DEPTH AT TOP OF BOX	MARKER BLOCKS FROM	MARKER BLOCKS TO	MARKER BLOCKS RECOVERY (m)	GEOPHYS DEPTH FROM	GEOPHYS DEPTH TO	BEDDING ANGLE▲ DEPTH	BEDDING ANGLE▲ ANGLE	SAMPLE NO.	SEAM NAME	SEAM RECOVERY	LITHO DESCRIPTION MAIN	LITHO DESCRIPTION MINOR	LITHO DESCRIPTION AMPLIFIED
		26.9	31.05	3.89			27.6	49°			94	SST		- COARSE GRAINED SST
6	29.9						28.3	45°						- STICK TO RUBBLE → DOMINANTLY SEMI STICK
							29.2	44°						- NUMEROUS COALY STRINGERS AND INFILLINGS
							29.7	53°						- IRON STAINING
							30.9	52°						- 26.9-27.1 SLST POCKET
														- BEDDING IS VISIBLE BUT NOT WELL DEVELOPED
		31.05	32.5	1.45							100	SLST	MOST	- STICK CORE WITH DRILL INDUCED FRACTURES
														- NO VISIBLE BANDING
														- MINOR IRON STAINING
														- CORE IS SILTY MOST OR MUDDY SLST
		32.5	35.5	2.97			33.1	51°			96	SLST	SST	- STICK CORE TO RUBBLE → DOMINANTLY BROKEN
7	33.95						35.4	49°						- CORE IS SLST WITH VARYING AMTS OF
														SST + SOME AREAS ARE V. SST RICH
														- NUMEROUS COALY ZONES AND STRINGERS
														- AT 33.95-34.0 MUD LAYER
														- 34.0-34.6 CORE IS V. RICH IN $CaCO_3$ → RUBBLE
														ZONE
		35.5	40.5	4.9			37.1	54°			98	SLST		- DOMINANTLY STICK CORE WITH RUBBLE
8	37.5						38.1	48°						- CORE IS SLST WITH V.V. MINOR SST AS ABOVE
							36.9	47°						→ AMT OF SST IS MUCH LESS THAN ABOVE
							39.3	98°						- IRON STAINING PRESENT
							39.95	50°						- SOME POLISHED SURFACES AND $CaCO_3$
														- AT 36.5-36.6 MUDDY RUBBLE ZONE
		40.5	45.35	4.56			40.7	51°			94	SST		- CORE VARIES FROM STICK TO RUBBLE
9	41.35						42.3	58°						→ DOMINANTLY SEMISTICK TO BROKEN
							42.7	51°						- SST RANGES FROM FINE TO COARSE GRAINED
							43.6	49°						- BEDDING ALSO VARIES FROM WELL DEFINED
														TO MASSIVE → NOT CONSISTENT
														- NUMEROUS COALY STRINGERS → COALY ZONES
														AT 41.1-41.5, 42.6-42.7
														- AT 43.3-43.35 AND 43.6-43.85, MASSIVE
														IRON STAINING → V. SOFT CONTORTED ALMOST
														MUDLIKE MATERIAL
10	45.35	45.35	45.6	0.25							100	MOST		- STICK CORE WITH LOTS OF DRILL INDUCED FRACTURES
														- NO BANDING VISIBLE
		45.6	48.9	3.03			45.7	49°			92	SST		- STICK CORE TO RUBBLE → DOMINANTLY SEMI STICK
							46.7	50°						- CORE IS MOD TO COARSE GRAINED SST WITH
							47.3	50°						NUMEROUS COALY INFILLINGS AND POLISHED
							48.2	56°						SURFACES
							49.8	61°						- BEDDING IS NOT WELL DEFINED

* MEASURED FROM THE HORIZONTAL PLANE

▲ ANGLE MEASURED FROM CORE OF AXIS

HOLE NO.

Crows Nest Resources LIMITED

CORE DESCRIPTION

PROJECT: LOWER SOUTH PIT

HOLE NO. CONTINUED: LSP 3

BOX NO.	DEPTH AT TOP OF BOX	MARKER BLOCKS FROM	MARKER BLOCKS TO	MARKER BLOCKS RECOVERY (m)	GEOPHYS DEPTH FROM	GEOPHYS DEPTH TO	BEDDING ANGLE▲ DEPTH	BEDDING ANGLE▲ ANGLE	SAMPLE NO.	SEAM NAME	SEAM RECOVERY	LITHO DESCRIPTION MAIN	LITHO DESCRIPTION MINOR	LITHO DESCRIPTION AMPLIFIED
		49.9	55.6	6.13			52.2	55°			91	MDST		- DOMINANTLY STICK CORE WITH DRILL INDUCED FRACTURES AND SOME RUBBLE POCKETS - RUBBLE 48.9 - 49.1 , 50.45 - 50.5 , 53.6 - 54.5 - 49.35 - 49.55 COAL SPLIT - 51.6 - 52.9 MINOR SLST BANDING - POLISHED SURFACES PRESENT - MINOR COALY INFILLINGS
11	49.3													
12	53.55													
		55.6	59.1	2.91	55.5	59.2			1	Q ?	69%	COAL		- CORE HAS 2 DISTINCT ZONES @ 55.6 - 57.1 IS STICK CORE, HARD AND BRIGHT, GOOD CLEAN LOOKING COAL @ 57.1 - 59.1 IS ALL COMPACTED POWDER AND V. SMALL RUBBLE, SOFT AND DULL, VERY DIRTY LOOKING - POOR RECOVERY IN ZONE @
13	59.1	59.1	60.55	1.35	59.2	60.6						MDST		- DOMINANTLY STICK CORE WITH RUBBLE AT TOP AND BASE - POLISHED SURFACES
		60.55	63.4	2.46	60.6	62.5			2	Q ?	79%	COAL		- STICK TO COMPACTED POWDER - DOMINANTLY BROKEN - DOMINANTLY HARD AND BRIGHT - SOME POLISHED SURFACES - POWDER 60.605 - 60.8 , 62.6 - 62.78
		63.9	65.8	2.29							95	MDST		- DOMINANTLY SEMI STICK - RUBBLE 65.5 - 65.8 - NO BANDING VISIBLE
14	63.8													
	-	65.8	68.9	3.02			66.1	68°			97	MDST	SST	- STICK CORE WITH POLISHED SURFACES - SLST WITH SST BANDING ANGLE VARIES AND CONSISTENCY OF BEDDING VARIES CROSS BEDDING PRESENT
15							67.3	44°						
		68.9	72.0	2.96			71.8	57°			95	SST		- 68.9 - 69.85 STICK CORE MASSIVE - 69.85 - 70.5 RUBBLE - 70.5 - STICK TO RUBBLE - ALL FINE GRAINED, BEDDING MODERATELY DEVELOPED BUT LOTS OF CROSS BEDDING - LOTS OF $CaCO_3$ ON OPENED AND CLOSED FRACTURES
16	71.8													
		72.0	72.65	0.4							62	MDST	MUD	- RUBBLE AND CRUSHED ROCK - CORE IS MOST PIECES IN MUD - ESPECIALLY MUDDY 72.55 - 72.65 - POLISHED SURFACES ON MOST PIECES

* MEASURED FROM THE HORIZONTAL PLANE

▲ ANGLE MEASURED FROM CORE OF AXIS

HOLE NO. ____

Crows Nest Resources
LIMITED

CORE DESCRIPTION

PROJECT: LOWER SOUTH PIT

HOLE NO. CONTINUED: LSP #3

BOX NO.	DEPTH AT TOP OF BOX	MARKER BLOCKS FROM	MARKER BLOCKS TO	MARKER BLOCKS RECOVERY (m)	GEOPHYS DEPTH FROM	GEOPHYS DEPTH TO	BEDDING ANGLE▲ DEPTH	BEDDING ANGLE▲ ANGLE	SAMPLE NO.	SEAM NAME	SEAM RECOVERY	LITHO DESCRIPTION MAIN	LITHO DESCRIPTION MINOR	LITHO DESCRIPTION AMPLIFIED
		72.65	75.0	2.35			74.05	67°			100	SST		- DOMINANTLY STICK CORE
							74.3	63°						- 72.65 - 73.8 MASSIVE
							74.8	62°						- 73.8 - 75.0 BEDDING VISIBLE BUT LOTS OF CROSS BEDDING
														- $CaCO_3$ INFILLED FRACTURES MOSTLY CLOSED
														- POLISHED SURFACES
		75.0	76.55	1.5			75.2	69°			97	SLST		- DOMINANTLY STICK CORE, MINOR BROKEN
17	75.85													- V. ISOLATED BANDING IN FIRST 1m OF SST
														- CLEAN SURFACES
		76.55	77.75	1.16			76.85	60°			97	SLST	SST	- STICK CORE TO BROKEN
							77.35	57°						- SLST WITH VARYING AMTS OF SST
														- CROSS BEDDING PREDOMINANTS
														- $CaCO_3$ INFILLINGS
														- MINOR AMTS POLISHED SURFACES
		77.75	80.45	2.7			78.5	63°			100	SST		- RUBBLE TO STICK CORE
18	79.5						79.1	64°						- MEDIUM TO FINE GRAINED SST
							79.7	58°						- LOTS OF POLISHED SURFACES
							80.1	60°						- MINOR $CaCO_3$ INFILLINGS
														- BEDDING IS WELL DEVELOPED WITH SOME CROSS BEDDING + MEDIUM GRAINED + MOSTLY MASSIVE
		80.45	82.05	1.59							96	SLST		- DOMINANTLY STICK CORE WITH NUMEROUS DRILL INDUCED FRACTURES
														- V. MINOR POLISHED SURFACES
														- NO BANDING
														- 81.85 - 82.05 IS MDST RICH
														- AT 81.1 THERE IS A 3 cm MUD LAYER
		82.05	87.4	5.11			83.0	69°			96	SST		- DOMINANTLY STICK CORE WITH BROKEN AND RUBBLE IN LAST 0.5m
19	93.1						83.55	69°						- MED TO FINE GRAINED, BEDDING AS ABOVE
							84.3	70°						- $CaCO_3$ INFILLINGS
							85.5	70°						- POLISHED SURFACES
							86.3	61°						- 82.05 - 83.2 DISTORTED BEDDING
							86.8	71°						- 86.9 2cm THICK MUD LAYER
							87.2	48°*						* BEDDING STEEPENS AT BASE IN RUBBLE ZONE - APPROX IS ~48° BUT HARD TO TELL DUE TO RUBBLE OF CORE
20	87.4	87.4	96.1	0.45							64	SST		* FAULT ZONE * 1 METRE !!
														- CORE IS ALL RUBBLE WITH 2 CHUNKS 7.5cm
														- NUMEROUS POLISHED SURFACES
														- SOME $CaCO_3$ INFILLING + SMALL FRACTURES
														- SOME BEDDING IS VISIBLE ON BIGGER

* MEASURED FROM THE HORIZONTAL PLANE

▲ ANGLE MEASURED FROM CORE OF AXIS

HOLE NO. ____

Crows Nest Resources LIMITED

CORE DESCRIPTION

PROJECT: LOWER SOUTH PIT

HOLE NO. LSP 03 CONTINUED

BOX NO.	DEPTH AT TOP OF BOX	MARKER BLOCKS FROM	MARKER BLOCKS TO	MARKER BLOCKS RECOVERY (m)	GEOPHYS DEPTH FROM	GEOPHYS DEPTH TO	BEDDING ANGLE▲ DEPTH	BEDDING ANGLE▲ ANGLE	SAMPLE NO.	SEAM NAME	SEAM RECOVERY	LITHO DESCRIPTION MAIN	LITHO DESCRIPTION MINOR	LITHO DESCRIPTION AMPLIFIED
														CHUNKS & NOT CONSISTENT OR REGULAR
		88.1	89.55	1.41			88.25	22°			97	SLST	SST	- STICK CORE
							88.4	17°						- SLST WITH MINOR AMTS OF FINE
							88.9	15°						GRAINED SST = INTERMITTENT
														- SOME BEDDING VISIBLE
														- SOME POLISHED SURFACES
		89.55	91.7	2.13							99	SLST		- STICK CORE
21	90.9													- NO BEDDING OR BANDING
														- V. MINOR POLISHED SURFACES
		91.7	93.8	2.08			91.85	12°			99	SLST	SST	- STICK CORE
							92.6	11°						- SLST WITH V.V. SMALL AMTS SST = BEDDING
														VISIBLE TO 93.3, THEN MASSIVE
		93.8	99.25	5.42			97.1	6°			99	SLST		- STICK CORE
22	95.25													- MASSIVE WITH V.V. MINOR BEDDING AT 97.1
														= ONE LONG BEDDING FRACTURE INFILLED
														WITH $CaCO_3$
		99.25	100.9	1.66			100.1	3°			100	SST		- STICK CORE V. FINE GRAINED
23	99.6													- CORE/BEDDING ANGLE IS ALMOST 0° = BEDDING
														TRACE CAN BE FOLLOWED OVER 1.2 m
														- CROSS BEDDING VISIBLE
														- $CaCO_3$ INFILLINGS
		100.9	105.8	4.93			101.7	5°			101	SLST	SST	- SLST WITH MINOR SST TRACES
24	103.75						103.9	6°						- STICK CORE WITH SOME DRILL INDUCED FRACTURES
							104.1	8°						- $CaCO_3$ INFILLINGS ALONG BEDDING AND CROSS JOINTS
							105.6	4°						- 104.6 - 104.85 BROKEN AND RUBBLE ZONE
		105.8	112.0	6.03			↑				97	SST		- FINE GRAINED
25	107.8							0°						- STICK CORE
							↓							- CORE IS DRILLED DOWN DIP IS CORE/BEDDING
														ANGLE IS 0° AND LOTS OF BULLSEYES →
														- CROSS BEDDING AND RIPPLE STRUCTURES VISIBLE
														- $CaCO_3$ INFILLINGS
		112.0	114.35	2.3			113.8	1°			98	SLST		- STICK TO RUBBLE = DOMINANTLY SLST-STICK
26	112.1													- V. MINOR BANDING
		114.35	121.9	7.45			120.2	8°			99	SST		- DOMINANTLY STICK CORE
27	116.1													- FINE GRAINED WITH MINOR AMTS OF SLST THAT
28	120.5													IS INTERMITTENT
														- CROSS BEDDING PREDOMINANT
														- BEDDING IS PARALLEL TO CORE AXIS OR JUST OFF

* MEASURED FROM THE HORIZONTAL PLANE

▲ ANGLE MEASURED FROM CORE OF AXIS

HOLE NO.

ENCLOSURE 23 - 4

MT. MICHEAL EWIN PASS THRUST SLICE

CORE DESCRIPTIONS DIAMOND HOLES

Hole: 5148 Date Start: 87/08/27

Northing = 5534074.9

Easting = 660460.6

Elevation = 1582.8

Orientation = 090°/90°

Length = 79.25 m

738

Crows Nest Resources LIMITED

CORE DESCRIPTION

PROJECT	LOWER SOUTH PIT
AREA	LINE CREEK

DATE	BEGIN	
	END	

HOLE NO. LSP4 9148 PAGE 1 OF 3

HOLE PARTICULARS

LOCATION	NORTHING: 5537074.7 (m)		
	EASTING: 660460.6 (m)		
ELEVATION	1582.8	HOLE BEARING (AZ°)	090
TOTAL DEPTH	79.25 m	HOLE ANGLE (°)*	90

LOGGING

LOGS RUN	FULL SUITE
LOGGED BY	CENTURY
OTHER TESTS	

PRE-CORE INFORMATION

CASING LENGTH	23.2	(m)
OVERBURDEN DEPTH		(m)
OVERBURDEN TYPE		
WATER LEVEL		(m)

EXAMINATION

LOG USED	GAMMA/DEN
NO. OF SEAMS SAMPLED	
EXAMINER (S)	JB
DATE	02/10/87

BOX NO.	DEPTH AT TOP OF BOX	MARKER BLOCKS FROM	MARKER BLOCKS TO	MARKER BLOCKS RECOVERY (m)	GEOPHYS DEPTH FROM	GEOPHYS DEPTH TO	BEDDING ANGLE* DEPTH	BEDDING ANGLE* ANGLE	SAMPLE NO.	SEAM NAME	SEAM RECOVERY	LITHO DESCRIPTION MAIN	LITHO DESCRIPTION MINOR	LITHO DESCRIPTION AMPLIFIED
1	23.2	23.2	23.25	0.05							100	SST		- RUBBLE CORE → LOTS OF SLICKENSIDES
														→ POSSIBLY JUST FALL BACK FROM ABOVE
														IN OVERBURDEN
														- FINE GRAINED SST
		23.25	31.35	1.84					1	?	72 %	COAL		- CORE RANGES FROM COMPACTED POWDER TO STICK
2	24.25													- CORE IS DOMINANTLY BROKEN
														- COMPACTED POWDER AT: 25.7-26.5, 28.9-29.0,
														30.25-30.35
														- COAL IS MOSTLY BRIGHT AND HARD
														- IRON STAINING PRESENT ON FRACTURE SURFACES
		31.35	33.2	1.63							88 %	MDST		- 31.35 - 32.0 RUBBLE
														- 32.0 - 33.2 STICK TO SEMI STICK MOSTLY SLICKENSIDED
														- CORE IS MDST WITH ISOLATED COALY ZONES
				1										→ ~ 10% COAL
														- POLISHED SURFACES
														- IRON STAINING
		33.2	40.95	6.26					2	?	81	COAL		- CORE RANGES SEMI STICK TO COMPACTED POWDER
3	33.3													→ DOMINANTLY BROKEN
A	38.1													- COAL RANGES GREATLY IN HARDNESS BUT IS VERY
														BRIGHT
														- IRON STAINING ON FRACTURE SURFACES
														- MDST SPLITS AT 36.0 - 36.2 AND 37.5-37.75
														- SHATTERED 35.7 - 35.8 m
		40.95	42.8	1.59			42.2	53°			86	MDST		- RUBBLE TO SEMI STICK → DOMINANTLY BROKEN
							42.55	48°						- 40.95 - 41.7 RUBBLE WITH MINOR COALY
														INTERBEDDED ZONES
														- POLISHED SURFACES
														- MINOR ISOLATED BANDING
		42.8	43.65	0.91					3	?	67	COAL		- SEMI STICK AND POWDERY RUBBLE → ~ 40% SEMI STICK
5	43.0													- COAL IS BRIGHT AND FAIRLY HARD
														- SHATTERED APPEARANCE 43.0-43.4

* MEASURED FROM THE HORIZONTAL PLANE

▲ ANGLE MEASURED FROM CORE OF AXIS

HOLE NO.

BA-341

Crows Nest Resources LIMITED

CORE DESCRIPTION

PROJECT: LOWER SOUTH PIT

HOLE NO. / CONTINUED: LSP #4

BOX NO.	DEPTH AT TOP OF BOX	MARKER BLOCKS FROM	MARKER BLOCKS TO	MARKER BLOCKS RECOVERY (m)	GEOPHYS DEPTH FROM	GEOPHYS DEPTH TO	BEDDING ANGLE▲ DEPTH	BEDDING ANGLE▲ ANGLE	SAMPLE NO.	SEAM NAME	SEAM RECOVERY	LITHO DESCRIPTION MAIN	LITHO DESCRIPTION MINOR	LITHO DESCRIPTION AMPLIFIED
		43.85	46.1.	1.97			44.7	27°			98	MDST		- RUBBLE TO STICK CORE - DOMINANTLY BROKEN
														- MINOR ISOLATED BANDING
														- POLISHED SURFACES
														- V. MINOR ISOLATED COAL
		46.1	47.2	0.62					4	?	56	COAL		- BROKEN TO COMPACTED POWDER
														- COAL IS DULL AND FAIRLY HARD
														- COAL APPEARS V. GRAINY CZ GRANULAR
		47.2	47.6	0.4							100	MDST		- STICK CORE
														- MDST WITH V. MINOR COAL STRINGERS
														- POLISHED SURFACES
6	47.6	47.6	48.15	0.26							47	COAL	MDST	- STICK MDST POWDERY COAL
														- MDST AND COAL LAYERS ~ 8cm THICK EACH
														- ~ 45% MDST
														- COAL IS REALLY SHATTERED
		48.15	49.0	0.79			48.7	42°			93	MDST		- SEMI STICK TO RUBBLE → DOMINANTLY SEMI STICK
														- MINOR ISOLATED BANDING
														- V. MINOR POLISHED SURFACES
		49.0	49.4	0.32							80	COAL		- ALL RUBBLE AND POWDER
														- V. DIRTY LOOKING COAL
														- DULL AND MEDIUM HARDNESS
		49.9	55.6	6.16			53.8	56°			99	MDST		- STICK CORE TO RUBBLE → DOMINANTLY STICK TO SEMI STICK
7	51.6													- NUMEROUS DRILL INDUCED FRACTURES
														- POLISHED SURFACES
														- MINOR ISOLATED BANDING
														- 53.0 - 53.6 MUDDY RUBBLE → POSSIBLE MYD ZONE?
8	55.6	55.6	56.35	0.75			56.2	37°			100	SST		- STICK TO SEMI STICK CORE
														- FINE GRAINED SST
														- DOMINANTLY MASSIVE WITH SOME MINOR BEDDING
		56.35	56.9	0.65							100	MDST		- STICK CORE
														- NO VISIBLE BANDING
		56.9	57.05	0.15			57.45	42°			100	SST		- STICK CORE
														- SAME AS ABOVE WITH SOME BEDDING AND CROSS BEDDING
		57.05	57.45	0.38							95	MDST		- BROKEN AND RUBBLE
														- NO VISIBLE BANDING

* MEASURED FROM THE HORIZONTAL PLANE

▲ ANGLE MEASURED FROM CORE OF AXIS

HOLE NO.

Crows Nest Resources LIMITED

CORE DESCRIPTION

PROJECT: LOWER SOUTH PIT

HOLE NO: LSP #4 CONTINUED

BOX NO.	DEPTH AT TOP OF BOX	MARKER BLOCKS FROM	MARKER BLOCKS TO	MARKER BLOCKS RECOVERY (%)	GEOPHYS DEPTH FROM	GEOPHYS DEPTH TO	BEDDING ANGLE▲ DEPTH	BEDDING ANGLE▲ ANGLE	SAMPLE NO.	SEAM NAME	SEAM RECOVERY	LITHO DESCRIPTION MAIN	LITHO DESCRIPTION MINOR	LITHO DESCRIPTION AMPLIFIED
		57.45	57.85	0.4							100	SST		- DOMINANTLY STICK - MASSIVE MEDIUM GRAINED SST - V MINOR IRON STAINING
		57.85	58.55	0.62							89	mSST		- STICK TO RUBBLE → NUMEROUS DRILL INDUCED FRACTURES - NO VISIBLE BANDING
		58.55	60.1	1.55			59.1	29°			100	SST		- DOMINANTLY STICK CORE - FINE TO MEDIUM GRAINED SST - SOME BEDDING DEVELOPMENT BUT INCONSISTENT
9	59.35						59.4	30						- MINOR POLISHED SURFACES - MINOR $CaCO_3$ INFILLINGS
							60.0	39°						
		60.1	63.65	3.43			60.4	36°			97	mSST	SST	- STICK TO RUBBLE → DOMINANTLY SEMI STICK
10	63.2						61.0	34°						- CORE IS mSST WITH VARYING AMTS OF FINE GRAINED SST → BEDDING WELL DEVELOPED WHERE SST PRESENT - ISOLATED POLISHED SURFACES
							61.65	41°						
							62.1	36°						
							62.9	40°						
							63.4	41°						
		63.65	67.15	3.44							98	mSST		- STICK CORE WITH DRILL INDUCED FRACTURES - MINOR $CaCO_3$ INFILLINGS - AT 67.0 A 3cm MUD LAYER IS PRESENT - NO VISIBLE BANDING
		67.15	79.25	12.04			67.9	43°			99.5	SST		- DOMINANTLY STICK CORE WITH VUGS BROKEN AND RUBBLE - AT 72.98 - 73.00 MUD LAYER - DEVELOPMENT OF BEDDING VARIES GREATLY OVER RUN → WELL DEVELOPED TO MASSIVE - 60% BEDDING VISIBLE - MINOR $CaCO_3$ INFILLINGS - IRON STAINING
11	67.20						68.6	49°						
							69.8	56°						
12	71.0						70.8	43°						
							71.8	49°						
13	75.15						73.9	47°						
							74.3	49°						
							75.6	53°						
							76.4	41°						
							77.3	49°						
							78.35	53°						
							79.2	55°						

* MEASURED FROM THE HORIZONTAL PLANE

▲ ANGLE MEASURED FROM CORE OF AXIS

HOLE NO.

ENCLOSURE 23 - 5

MT. MICHEAL EWIN PASS THRUST SLICE

CORE DESCRIPTIONS DIAMOND HOLES

Hole: 5149 Date Start: 87/08/30

Northing = 5533948.6

Easting = 660498.3

Elevation = 1572.4

Orientation = 260°/55°

Length = 81.1 m

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Crows Nest Resources LIMITED

CORE DESCRIPTION

PROJECT	LOWER SOUTH PIT
AREA	

DATE — BEGIN: 03/09/87 — END:

HOLE NO. LSPS 87-89 — PAGE 1 OF 3

HOLE PARTICULARS

LOCATION	NORTHING: 5533748.C (a)		
	EASTING: 660498.3 (a)		
ELEVATION	1572.9	HOLE BEARING (AZ°)	260
TOTAL DEPTH	81.1	HOLE ANGLE (°)*	55

LOGGING

LOGS RUN	FULL SUITE
LOGGED BY	CENTURY
OTHER TESTS	

PRE-CORE INFORMATION

CASING LENGTH	15.8	(a)
OVERBURDEN DEPTH		(a)
OVERBURDEN TYPE		
WATER LEVEL		(a)

EXAMINATION

LOG USED	GAMMA/DEN
NO. OF SEAMS SAMPLED	1
EXAMINER (S)	JB
DATE	09/09/87

BOX NO.	DEPTH AT TOP OF BOX	MARKER BLOCKS FROM	MARKER BLOCKS TO	MARKER BLOCKS RECOVERY (a)	GEOPHYS DEPTH FROM	GEOPHYS DEPTH TO	BEDDING ANGLE* DEPTH	BEDDING ANGLE* ANGLE	SAMPLE NO.	SEAM NAME	SEAM RECOVERY	LITHO DESCRIPTION MAIN	LITHO DESCRIPTION MINOR	LITHO DESCRIPTION AMPLIFIED
1	15.8	15.8	19.3	2.1'			16.1	46°			84	SST		- CORE VARIES FROM STICK TO RUBBLE
							16.4	47°						- SST IS FINE GRAINED
							16.95	33°						- BEDDING IS FAIRLY CONSISTENT AND REGULAR
							17.5	39°						WITH A FEW MINOR INTRUPTIONS
							17.9	35°						- BUBBLE AT 16.2 - 16.3, 16.45 - 16.9, 17.6 -
														17.75, 17.9 - 18.2
														- MINOR IRON STAINING
														- AT 16.95 BEDDING STARTS OF REGULARLY BUT
														APPEARS TO BE DRAGGED DOWN →
														- CROSS BEDDING PRESENT
		18.3	21.6	3.09			18.5	43°			94	SLST	SST	- DOMINANTLY SLST WITH INTERBEDDED
2	20.3						20.0	45°						VARYING AMTS OF FST
							20.5	43°						- CORE IS DOMINANTLY STICK WITH BROKEN ZONES
							21.0	36°						- MINOR IRON STAINING AND $CaCO_3$ INFILLINGS
														- BEDDING IS MORE IRREGULAR THAN ABOVE
		21.6	23.15	1.15			22.6	43°			74	SLST		- CORE RANGES FROM STICK TO BROKEN
														- V. MINOR SST WISPS IN ISOLATED SPOTS
														- IRON STAINING PRESENT
		23.15	23.5	0.35			23.2	51°			100	SST		- STICK CORE
														- REGULAR BEDDING
		23.5	25.0	1.21							81	SLST		- STICK TO RUBBLE → DOMINANTLY SEMISTICK
3	24.65													- IRON STAINING
														- NO VISIBLE BANDING
														- SOME POLISHED SURFACES
		25.0	29.95	4.65			25.5	41°			94	SLST	SST	- SLST WITH VARYING AMTS OF INTERBEDDED SST
4	26.95						26.3	40°						- SST RANGES FROM FST TO MST
							26.8	31°						- BEDDING HAS SOME IRREGULAR UNDULATIONS
							28.0	39°						- DOMINANTLY STICK CORE WITH MINOR BUBBLE
							26.7	42°						- AT 29.0 THERE IS A 2" MUD LAYER
							29.6	30°						

* MEASURED FROM THE HORIZONTAL PLANE

▲ ANGLE MEASURED FROM CORE OF AXIS

HOLE NO.

BA-341

Crows Nest Resources LIMITED

CORE DESCRIPTION

PROJECT: LINE CREEK – LOWER SOUTH PIT

HOLE NO. LSP S (CONTINUED)

BOX NO.	DEPTH AT TOP OF BOX	MARKER BLOCKS FROM	MARKER BLOCKS TO	MARKER BLOCKS RECOVERY (m)	GEOPHYS DEPTH FROM	GEOPHYS DEPTH TO	BEDDING ANGLE▲ DEPTH	BEDDING ANGLE▲ ANGLE	SAMPLE NO.	SEAM NAME	SEAM RECOVERY	LITHO DESCRIPTION MAIN	LITHO DESCRIPTION MINOR	LITHO DESCRIPTION AMPLIFIED
		29.95	33.4	3.4			30.2	36°			101	SST		- FINE TO MEDIUM GRAINED
5	33.1						30.9	28°						- DOMINANTLY STICK CORE WITH MINOR RUBBLE
							31.6	28°						AND BROKEN ZONES
							32.0	31°						- AT 32.2 COALY STRINGER
							32.6	35°						- BEDDING IS CONSISTENT BUT NOT REGULAR
							33.2	21°						
		33.4	40.6	6.7			34.4	34°			93	SLST	SST	- DOMINANTLY SLST WITH VARYING AMTS OF
6	37.3						35.4	32°						FINE TO MEDIUM SST
							37.0	34°						- CORE RANGES FROM STICK TO RUBBLE
							37.6	33°						- AT 33.4, 33.8, 34.0 AND 37.5 THERE
							39.6	31°						ARE 2cm MUD ZONES
							40.55	31°		6				- AT 40.5 COALY RUBBLE ZONE
														- IRON STAINING
		40.6	44.1	3.15	40.8	43.5(?)	40.9	29°			90	SST		- DOMINANTLY STICK CORE WITH BROKEN ZONES
7	41.5						41.9	31°						- COARSE GRAINED SST
							42.5	28°						- FAINT BEDDING WITH LOTS OF CROSS BEDDING
							43.3	22°						- AT 43.7 THERE IS A MUD LAYER AND A
							44.0	26°						RUBBLE ZONE FOR 15cm
		44.1	45.2	1.1							100	SLST		- STICK CORE
														- $CaCO_3$ INFILLINGS
														- NO BEDDING VISIBLE
		45.2	45.55	0.35			45.3	24°			100	SST		- STICK CORE
														- FINE GRAINED
														- BEDDING IS CONSISTENT BUT IRREGULAR
														- MINOR CLOSED $CaCO_3$ INFILLED FRACTURES
		45.55	57.8	8.3			48.3	30°			68	MDST		- CORE RANGES GREATLY FROM STICK TO RUBBLE
8	46.35						50.7	36°						- NUMEROUS POLISHED SURFACES THRU RUN
							51.25	31°						- MINOR INCONSISTENT BANDING
9	50.3						51.9	17°						- COALY AT BASE 54.9 – 55.8
							52.6	16°						- VERY POOR RECOVERY ESPECIALLY
10	56.1						54.0	16°						AT BASE
		57.8	77.0	5.25	56.45	76.85			1	8(?)	27	COAL		- DOMINANTLY CRUSHED/CONTORTED POWDER WITH
11	69.6													ISOLATED BROKEN PIECES
														- COAL IS VERY SOFT BUT PIECES ARE HARD
														- BRIGHTNESS VARIES GREATLY – V. DULL TO BRIGHT
														- OVERALL RECOVERY IS V. LOW
		77.0	78.15	1.15							100	MDST		- 77.0 – 77.4 BROKEN WITH RUBBLE
														- 77.4 – 78.15 STICK CORE
														- COALY INFILLINGS AND POLISHED SURFACES
														- GETTING SILTY AT BASE

* MEASURED FROM THE HORIZONTAL PLANE

▲ ANGLE MEASURED FROM CORE OF AXIS

HOLE NO.

Crows Nest Resources LIMITED

CORE DESCRIPTION

PROJECT: LOWER SOUTH PIT

HOLE NO. CONTINUED: LSP

BOX NO.	DEPTH AT TOP OF BOX	MARKER BLOCKS FROM	MARKER BLOCKS TO	MARKER BLOCKS RECOVERY (m)	GEOPHYS DEPTH FROM	GEOPHYS DEPTH TO	BEDDING ANGLE▲ DEPTH	BEDDING ANGLE▲ ANGLE	SAMPLE NO.	SEAM NAME	SEAM RECOVERY	LITHO DESCRIPTION MAIN	LITHO DESCRIPTION MINOR	LITHO DESCRIPTION AMPLIFIED
		78.15	79.0	0.75			78.3	39°			88	SST	SLST	- STICK TO BROKEN CORE
12	78.45						78.9	46°						- SST WITH INCONSISTENT AMTS OF SLST
														- BEDDING IS CONSISTENT BUT IRREGULAR
														AND CROSS BEDDING PRESENT
														-$CaCO_3$ INFILLINGS ALSO PRESENT
		79.45	81.1	1.6							97	MDST		- STICK TO RUBBLE & PREDOMINANTLY BROKEN
							80.6	57°						- POLISHED SURFACES
														- MINOR BANDING
														-RUBBLE 79.1-79.85 AND 80.7-81.1
									4					

▲ ANGLE MEASURED FROM THE HORIZONTAL PLANE

▲ ANGLE MEASURED FROM CORE OF AXIS

HOLE NO.

ENCLOSURE 23 - 6

MT. MICHEAL EWIN PASS THRUST SLICE

CORE DESCRIPTIONS DIAMOND HOLES

Hole: 5150 Date Start: 87/09/02

Northing = 5533945.8

Easting = 660495.3

Elevation = 1522

Orientation = 069°/54°

Length = 70.1 m

738

Crows Nest Resources
LIMITED

CORE DESCRIPTION

PROJECT	LINE CREEK
AREA	LOWER SOUTH PIT

DATE	
BEGIN	
END	

HOLE NO. LSP #6

PAGE 1 OF 2

5150

HOLE PARTICULARS

LOCATION	NORTHING: 5523745-8 (m)		
	EASTING: 660475-3 (m)		
ELEVATION	1572.0	HOLE BEARING (Az°)	69
TOTAL DEPTH	701	HOLE ANGLE (-)°	54

LOGGING

LOGS RUN	NONE
LOGGED BY	
OTHER TESTS	

PRE-CORE INFORMATION

CASING LENGTH	12.2	(m)
OVERBURDEN DEPTH		(m)
OVERBURDEN TYPE		
WATER LEVEL		(m)

EXAMINATION

LOG USED	—
NO. OF SEAMS SAMPLED	0
EXAMINER (S)	JB
DATE	02/11/87

BOX NO.	DEPTH AT TOP OF BOX	MARKER BLOCKS FROM	MARKER BLOCKS TO	RECOVERY (m)	GEOPHYS DEPTH FROM	GEOPHYS DEPTH TO	BEDDING ANGLE* DEPTH	BEDDING ANGLE* ANGLE	SAMPLE NO.	SEAM NAME	SEAM RECOVERY	LITHO DESCRIPTION MAIN	MINOR	AMPLIFIED
1	12.2	12.2	13.0(?)	0.38								SST		- SEMI STICK TO RUBBLE → DOMINANTLY RUBBLE
														- FINE GRAINED WITH MINOR BEDDING
														- RECOVERY AND BASE DEPTH UNCERTAIN - YOUR GUESS IS AS GOOD AS MINE !
		13.0	16.9	0.53								SST	OTHER	- ALL RUBBLE - ANGULAR AND ROUNDED
														- POSSIBLY BOULDER DRILLING OR CAVING
		16.9	16.8	0.37			16.6	43°				SST		- STICK TO RUBBLE
														- BEDDING WELL DEVELOPED
		16.8	19.8	0.47								MUD		- MUD WITH RIVE PEBBLES AND RUBBLE
		19.9	22.9	0.98								SST	OTHER	- RUBBLE TO STICK → DOMINANTLY BROKEN
														- PROBABLY BOULDER DRILLING / CAVING
		22.9	23.05	0.15								MUD		- VERY LITTLE ROCK CHUNKS IN MUD
														- SLIGHTLY COALY
		23.05	36.75	12.25			23.55	22°				SST		- MEDIUM GRAINED TO FINE GRAINED
							24.7	24°						- BEDDING VARIES GREATLY AS DOES ORIENTATION OF
2							25.4	25°						CORE → SEE GEOTECH
							25.9	18°						- IRON STAINING
3							26.7	24°						- POLISHED SURFACES / INTERMITTENT
							28.5	28°						- ISOLATED $CaCO_3$ INFILLINGS
4							29.6	QUERY	JOINING					- RUBBLE AT 24.9-25.05, 29.3-29.6, 31.1-31.4, 33.5-33.6
							30.6	29°						34.9-35.6
5							33.9	15°						- COALY AT 23.5, 25.0, 27.9, 28.9, 30.35-30.4
							36.0	0°	VERTICAL					33.5
														- VISIBLE BEDDING ATTITUDE CHANGES
														- NUMEROUS COALY SURFACES
														- CROSS BEDDING VISIBLE
														- 28.9 - 29.9 VERY CONTORTED BEDDING
														- 29.9 - 30.4 ≈ VERTICAL BEDDING
														- SHATTERED VERICALLY 31.6 - 33.2 ALONG BEDDING

* MEASURED FROM THE HORIZONTAL PLANE

▲ ANGLE MEASURED FROM CORE OF AXIS

HOLE NO.

BA-341

Crows Nest Resources LIMITED

Northing
Easting
Elev

Hole direction 064/50

CORE DESCRIPTION

PROJECT

HOLE NO. LGP 6 / 5160 CONTINUED

PAGE 2 OF 2

BOX NO.	DEPTH AT TOP OF BOX	MARKER BLOCKS FROM	MARKER BLOCKS TO	MARKER BLOCKS RECOVERY (m)	GEOPHYS DEPTH FROM	GEOPHYS DEPTH TO	BEDDING ANGLE▲ DEPTH	BEDDING ANGLE▲ ANGLE	SAMPLE NO.	SEAM NAME	SEAM RECOVERY	LITHO DESCRIPTION MAIN	LITHO DESCRIPTION MINOR	LITHO DESCRIPTION AMPLIFIED
		36.75	37.75	0.5%								SST		- ALL RUBBLE AND COALY MUDDY MATRIX
														- MASSIVE IRON STAINING THROUGHOUT ALL CRANGE
		37.75	60.7	20.01			38.6	22°			87%	SST		- CORE VARIES FROM STICK TO RUBBLE. AS NOTED
6	40.0						39.2	9°						- LOTS OF COALY SURFACES
							40.2	10°						- IRON STAINING PRESENT
7	43.7						40.55	30°						- BEDDING DEVELOPMENT RANGES GREATLY
							41.2	22°						- SST IS MEDIUM TO FINE GRAINED
8	47.15						42.2	21°						
							42.8	0°	VERTICAL					- 37.15-38.5 VERTICAL CONTORTED BEDDING
9	50.9						43.4	29°						- 40.0-40.15 COALY RUBBLE
							43.8	17°						- 44.8-45.0 VERY RUBBLY
10	55.0						44.0	0°	VERTICAL					- 45.85-47.5 VERY BROKEN, LOTS OF COALY SURFACES
							45.0	18°						
							45.2	20°						- AT 44.7 THERE IS A VISIBLE CONTACT - ½ IS VERTICAL BDS OTHER ½ IS COARSER ~ 45° BEDDING & A COALY SURFACE SEPARATES THEM
							45.5	38°						
							46.6	9°						
							47.2	0°	VERTICAL					- 47.8-48.3 RUBBLE AND BROKEN
							47.55	10°						- 51.4-52.4 - RUBBLE AND BROKEN
							47.6	21°						- 53.8-55.5 - BEDDING DISAPPEARS
							47.8	0°	VERTICAL					- 55.5 - 56.4 - COARSE GRAINED WITH NUMEROUS COALY STRINGERS AND INFILLINGS - BEDDING IS NOT WELL DEVELOPED
							49.3	19°						
							50.0	18°						
							51.0	19°						
							51.9	15°						
							53.0	18°						
							53.8	32°						
							55.5	38°						
							59.3	41°						
		60.7	68.0	7.03			62.0	13°				MDST		- DOMINANTLY STICK CORE WITH MINOR AMTS OF BROKEN AND RUBBLE
11							64.9	21°						- MINOR ISOLATED BANDING
							65.7	44°						- LOTS OF IRON STAINING
12														- MINOR POLISHED SURFACES
		68.0	70.10	2.14			69.1	48°				SST		- STICK CORE
							69.6	52°						- 68.0 - 69.0 IS MASSIVE - NO BEDDING
							70.1	60°						- 69.0 - 70.1 BEDDING IS PRESENT BUT LOTS OF CROSS BEDDING

▪ MEASURED FROM THE HORIZONTAL PLANE

▲ ANGLE MEASURED FROM CORE OF AXIS

HOLE NO.

ENCLOSURE 24

MT. MICHAEL EWIN PASS THRUST SLICE

COAL INTERSECTION DATA ROTARY HOLES

HOLE No. 5113

LOCATION= northing, 0 easting, 0 elevation, 0

GEOL. LENGTH	NORTH	EAST	ELEV	TOP/BOTTOM	CODE
0.00	5533966.00	660409.00		1620.13	5113
101.00	5533979.21	660452.91		1530.14	TD

HOLE No. 5114

LOCATION= northing, 0 easting, 0 elevation, 0

GEOL. LENGTH	NORTH	EAST	ELEV	TOP/BOTTOM	CODE
0.00	5533965.80	660408.30		1620.00	5114
50.70	5533969.05	660418.34		1570.43	t 9
52.00	5533969.12	660418.67		1569.17	b
95.40	5533971.81	660431.02		1527.67	t 9
132.70	5533973.99	660444.26		1492.88	b
145.00	5533974.42	660449.04		1481.56	td

HOLE No. 5115

LOCATION= northing, 0 easting, 0 elevation, 0

GEOL. LENGTH	NORTH	EAST	ELEV	TOP/BOTTOM	CODE
0.00	5534029.00	660378.00		1620.54	5115
62.50	5534026.34	660368.85		1558.80	t 9u
63.80	5534026.28	660368.70		1557.51	b
133.40	5534022.20	660365.74		1488.17	t 10r
144.40	5534021.40	660366.35		1477.22	b
148.70	5534021.06	660366.84		1472.97	t 10a
156.10	5534020.46	660367.68		1465.64	b
205.60	5534016.24	660373.30		1416.64	td

738

HOLE No. 5131
LOCATION= northing, 0 easting, 0 elevation, 0

GEOL. LENGTH	NORTH	EAST	ELEV	TOP/BOTTOM	CODE
0.00	5534166.14	660428.30		1598.50	5131
43.00	5534166.14	660428.30		1555.50	t 8
48.10	5534166.14	660428.30		1550.40	b
48.70	5534166.14	660428.30		1549.80	t 8
50.20	5534166.14	660428.30		1548.30	b
50.70	5534166.14	660428.30		1547.80	t 8
56.60	5534166.14	660428.30		1541.90	b
57.40	5534166.14	660428.30		1541.10	t 8
57.90	5534166.14	660428.30		1540.60	b
59.10	5534166.14	660428.30		1539.40	t 8
61.00	5534166.14	660428.30		1537.50	b
72.00	5534166.14	660428.30		1526.50	td

HOLE No. 5132
LOCATION= northing, 0 easting, 0 elevation, 0

GEOL. LENGTH	NORTH	EAST	ELEV	TOP/BOTTOM	CODE
0.00	5534156.20	660397.80		1601.90	5132
62.50	5534156.20	660397.80		1539.40	t cl
63.00	5534156.20	660397.80		1538.90	b
128.00	5534156.20	660397.80		1473.90	td

HOLE No. 5133
LOCATION= northing, 0 easting, 0 elevation, 0

GEOL. LENGTH	NORTH	EAST	ELEV	TOP/BOTTOM	CODE
0.00	5534154.60	660365.40		1605.60	5133
52.70	5534154.60	660365.40		1552.90	t 8u
56.20	5534154.60	660365.40		1549.40	b
57.50	5534154.60	660365.40		1548.10	t 8u
61.60	5534154.60	660365.40		1544.00	b
64.50	5534154.60	660365.40		1541.10	t 81
66.20	5534154.60	660365.40		1539.40	b
67.40	5534154.60	660365.40		1538.20	t 81
72.00	5534154.60	660365.40		1533.60	b
72.60	5534154.60	660365.40		1533.00	t 81
76.50	5534154.60	660365.40		1529.10	b
91.00	5534154.60	660365.40		1514.60	td

HOLE No. 5134
LOCATION= northing, 0 easting, 0 elevation, 0

GEOL. LENGTH	NORTH	EAST	ELEV	TOP/BOTTOM	CODE
0.00	5534165.00	660371.90		1605.80	5134
37.00	5534156.58	660350.74		1576.64	br
70.00	5534149.12	660331.99		1550.54	t 9
76.80	5534147.58	660328.13		1545.15	b
120.00	5534137.71	660303.32		1511.19	td

HOLE No. 5135
LOCATION= northing, 0 easting, 0 elevation, 0

GEOL. LENGTH	NORTH	EAST	ELEV	TOP/BOTTOM	CODE
0.00	5534091.70	660373.80		1607.50	5135
54.30	5534082.12	660349.72		1559.79	t c1
56.70	5534081.70	660348.68		1557.66	b
115.00	5534071.90	660324.04		1505.75	td

HOLE No. 5136
LOCATION= northing, 0 easting, 0 elevation, 0

GEOL. LENGTH	NORTH	EAST	ELEV	TOP/BOTTOM	CODE
0.00	5534091.70	660373.80		1607.50	5136
44.80	5534090.61	660371.06		1562.80	t 8u
47.60	5534090.57	660370.95		1560.01	b 8u
50.50	5534090.52	660370.84		1557.11	t 81
56.40	5534090.46	660370.70		1551.21	b
130.00	5534089.56	660368.42		1477.65	td

HOLE No. 5137
LOCATION= northing, 0 easting, 0 elevation, 0

GEOL. LENGTH	NORTH	EAST	ELEV	TOP/BOTTOM	CODE
0.00	5534091.30	660375.90		1607.40	5137
87.70	5534112.84	660430.04		1541.86	t 8
89.50	5534113.30	660431.17		1540.54	b
91.30	5534113.75	660432.31		1539.22	t 81
106.10	5534117.50	660441.75		1528.45	b
140.00	5534126.39	660464.07		1504.55	td

HOLE No. 5138

LOCATION= northing, 0 easting, 0 elevation, 0

GEOL. LENGTH	NORTH	EAST	ELEV	TOP/BOTTOM	CODE
0.00	5534179.80	660477.70		1591.80	5138
63.00	5534179.80	660477.70		1528.80	t cl
65.00	5534179.80	660477.70		1526.80	b
100.00	5534179.80	660477.70		1491.80	t Bu
103.00	5534179.80	660477.70		1488.80	b
105.00	5534179.80	660477.70		1486.80	t Bu
106.00	5534179.80	660477.70		1485.80	b
121.00	5534179.80	660477.70		1470.80	t Bl
124.00	5534179.80	660477.70		1467.80	b
126.50	5534179.80	660477.70		1465.30	t Bl
127.50	5534179.80	660477.70		1464.30	b
146.00	5534179.80	660477.70		1445.80	td
0.00	5534179.80	660477.70		1591.80	5138
100.00	5534180.92	660475.78		1491.83	t Bu
103.00	5534180.96	660475.71		1488.83	b
105.00	5534180.99	660475.67		1486.83	t Bu
106.00	5534181.00	660475.65		1485.83	b
121.00	5534181.18	660475.33		1470.83	t Bu
124.00	5534181.22	660475.27		1467.83	b
126.50	5534181.25	660475.22		1465.34	t Bl
127.50	5534181.26	660475.20		1464.34	b
146.00	5534181.49	660474.80		1445.84	td

HOLE No. 5139

LOCATION= northing, 0 easting, 0 elevation, 0

GEOL. LENGTH	NORTH	EAST	ELEV	TOP/BOTTOM	CODE
0.00	5534206.10	660342.00		1630.30	5139
87.20	5534211.00	660341.85		1543.27	t B
108.00	5534212.73	660341.80		1522.54	b
170.00	5534218.03	660341.65		1460.77	td

HOLE No. 5140

LOCATION= northing, 0 easting, 0 elevation, 0

GEOL. LENGTH	NORTH	EAST	ELEV	TOP/BOTTOM	CODE
0.00	5534277.00	660385.80		1633.40	5140
68.20	5534276.41	660384.32		1565.25	t 8
74.70	5534276.17	660383.71		1558.78	b
76.00	5534276.12	660383.58		1557.49	t 8
86.00	5534275.74	660382.65		1547.54	b
87.00	5534275.71	660382.55		1546.55	t 8
88.50	5534275.65	660382.41		1545.05	b
108.30	5534274.78	660380.23		1525.40	t 9
110.60	5534274.66	660379.93		1523.12	b
119.50	5534274.19	660378.75		1514.31	t 9
121.20	5534274.10	660378.52		1512.63	b
146.00	5534272.58	660374.68		1488.18	td

ENCLOSURE 25

MT. MICHAEL EWIN PASS THRUST SLICE

COAL INTERSECTION DATA DIAMOND HOLES

LSP length,	HOLE No. 5145 tilt from vert,	5/10/87 azimuth from TN,
0	25	245
5	24.2	241.9
15	24.2	241.9
25	24.2	241.9
35	24.2	241.9
45		

LSP HOLE No. 5145 5/10/87

LOCATION= northing, 5534171.9 easting, 660431.3 elevation, 1597.8

GEOL. LENGTH	NORTH	EAST	ELEV	TOP/BOTTOM	CODE
0.00	5534171.90	660431.30		1597.80	lsp1 (5/95)
39.90	5534163.81	660417.05		1561.42	ob
42.40	5534163.32	660416.18		1559.13	t c1
48.90	5534162.06	660413.90		1553.17	b
52.00	5534161.48	660412.82		1550.33	t c1
52.20	5534161.45	660412.75		1550.14	b
53.00	5534161.30	660412.47		1549.41	t 8
65.30	5534159.05	660408.19		1538.10	b
67.00	5534158.74	660407.60		1536.53	t 8
68.90	5534158.40	660406.93		1534.79	b
69.00	5534158.38	660406.90		1534.70	c 42
74.70	5534157.36	660404.91		1529.45	c 36
80.30	5534156.37	660402.96		1524.29	c 43
82.20	5534156.04	660402.31		1522.54	c 48
89.30	5534154.81	660399.85		1516.00	c 49
91.90	5534154.36	660398.95		1513.60	c 68
97.70	5534153.38	660396.96		1508.24	c 75
101.00	5534152.82	660395.84		1505.19	c 70
103.15	5534152.45	660395.11		1503.20	c 72
106.25	5534151.93	660394.05		1500.33	c 50
111.40	5534151.07	660392.31		1495.56	c 66
115.20	5534150.44	660391.04		1492.04	c 12
120.50	5534149.57	660389.27		1487.12	c 53
124.50	5534148.94	660387.98		1483.38	c 40
124.80	5534148.89	660387.89		1483.10	t c1
124.80	5534148.89	660387.89		1483.10	b
130.20	5534148.03	660386.15		1478.06	c 37
145.40	5534145.57	660381.26		1463.88	c 29
160.80	5534142.04	660374.20		1449.99	c 34
168.75	5534141.72	660373.55		1442.18	t c1
170.20	5534141.46	660373.07		1440.83	b
177.30	5534140.37	660370.82		1434.51	c 35
179.10	5534140.03	660370.12		1432.56	c 41
181.25	5534139.68	660369.41		1430.57	c 43
193.00	5534137.94	660365.86		1420.57	c 31
197.90	5534136.99	660363.91		1415.08	c 33
202.60	5534136.24	660362.36		1410.71	c 20
210.10	5534135.04	660359.89		1403.73	c 22
215.60	5534134.17	660358.07		1398.61	c 28
221.10	5534133.30	660356.26		1393.49	c 41
225.10	5534132.67	660354.94		1389.77	c 34
228.70	5534132.10	660353.76		1386.42	c 34
228.90	5534132.07	660353.69		1386.23	td

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PROJECTION TO SECTION I-J HOLE No. 5145

angle grid north clockwise of true north= 1.7 degrees
PROJECTION ALONG AZIMUTH OF 335 (from True North) PLUNGE= 15
horizontal projection distance from collar to section = 4.13

SECTION POINT 1
5534093 NORTH, 660200 EAST

SECTION POINT 2
5534237 NORTH, 660600 EAST

GEOL. LENGTH	NORTHING	EASTING	ELEVATION	TOP/BOTTOM	CODE
0	5534175.59	660429.43	1596.69	lspl (5145)	
39.9	5534170.01	660413.92	1559.55	ob	
42.4	5534169.67	660412.98	1557.22	t	c1
48.9	5534168.78	660410.51	1551.15	b	
52	5534168.36	660409.35	1548.26	t	c1
52.2	5534168.34	660409.28	1548.07	b	
53	5534168.23	660408.98	1547.32	t	8
65.3	5534166.58	660404.4	1535.83	b	
67	5534166.35	660403.76	1534.24	t	8
68.9	5534166.1	660403.05	1532.47	b	
69	5534166.08	660403.02	1532.38	c	42
74.69	5534165.32	660400.9	1527.06	c	36
80.3	5534164.58	660398.83	1521.83	c	43
82.19	5534164.32	660398.13	1520.05	c	48
89.3	5534163.39	660395.52	1513.42	c	49
91.9	5534163.05	660394.58	1510.99	c	68
97.69	5534162.29	660392.48	1505.56	c	75
101	5534161.86	660391.28	1502.47	c	70
103.15	5534161.58	660390.51	1500.46	c	72
106.25	5534161.18	660389.39	1497.55	c	50
111.4	5534160.51	660387.55	1492.72	c	66
115.19	5534160.03	660386.21	1489.15	c	12
120.5	5534159.36	660384.34	1484.17	c	53
124.5	5534158.87	660382.98	1480.4	c	40
124.6	5534158.83	660382.88	1480.11	t	c1
124.8	5534158.83	660382.88	1480.11	b	
130.19	5534158.17	660381.05	1475.01	c	37
145.39	5534156.31	660375.86	1460.66	c	29
166.8	5534153.61	660368.37	1440.52	c	34
168.75	5534153.36	660367.69	1438.68	t	c1
170.19	5534153.18	660367.18	1437.32	b	
177	5534152.32	660364.8	1430.92	c	35
179.1	5534152.06	660364.06	1428.95	c	41
181.25	5534151.79	660363.31	1426.93	c	43
192	5534150.44	660359.56	1416.81	c	31
197.69	5534149.7	660357.51	1411.26	c	33
202.6	5534149.11	660355.88	1406.64	c	20
210.1	5534148.18	660353.28	1399.78	c	22
215.6	5534147.49	660351.37	1394.61	c	38
221.1	5534146.8	660349.46	1389.44	c	41
225.1	5534146.3	660348.08	1385.67	c	34
228.59	5534145.86	660346.83	1382.28	c	34
228.89	5534145.83	660346.76	1382.1	td	

735

HOLE No. 5146

length,	tilt from vert,	azimuth from TN,
0	40	250
10	37.7	252.1
20	37.7	252.1
30	37.6	252.1
40	37.1	251.6
50	36.8	251.6
60	36.6	251.4
70	36.6	251.2
80	36.3	251
90	36.2	250.8
100	36.3	250.6
110	36.1	250.4
120	36	250.3
129.8	36.1	250.3

HOLE No. 5146

LOCATION= northing, easting, elevation,
5534076.3 660462.7 1582.8

GEOL. LENGTH	NORTH	EAST	ELEV	TOP/BOTTOM	CODE
0.00	5534076.00	660463.00	1583.00	lsp2	
15.70	5534072.62	660453.85	1570.70	t	cl
19.15	5534071.91	660451.86	1567.97	b	
33.00	5534069.07	660443.89	1557.01	c	47
40.00	5534067.63	660439.91	1551.43	c	40
46.00	5534066.38	660436.52	1546.65	c	50
51.00	5534065.35	660433.70	1542.64	c	56
57.00	5534064.12	660430.34	1537.83	c	46
62.00	5534063.08	660427.54	1533.82	c	56
70.30	5534061.36	660422.90	1527.16	t	8
77.50	5534059.85	660418.89	1521.37	b	
79.00	5534059.54	660418.06	1520.16	c	51
84.00	5534058.49	660415.29	1516.13	c	69
92.00	5534056.81	660410.88	1509.67	c	53
99.00	5534055.32	660407.01	1504.03	c	50
100.00	5534055.11	660406.46	1503.22	c	36
105.00	5534054.04	660403.70	1499.19	c	52
107.00	5534053.62	660402.60	1497.58	c	24
108.00	5534053.40	660402.05	1496.77	c	24
112.00	5534052.54	660399.86	1493.54	c	24
117.00	5534051.47	660397.11	1489.50	c	30
121.00	5534050.62	660394.93	1486.26	c	48
125.00	5534049.76	660392.74	1483.02	c	47
129.95	5534048.69	660390.02	1479.03	t	10
136.45	5534047.30	660386.46	1473.77	b	
141.75	5534046.16	660383.55	1469.49	t	10
148.15	5534044.78	660380.04	1464.32	b	
158.00	5534042.66	660374.63	1456.36	c	40
154.00	5534043.52	660376.83	1459.59	c	38
156.20	5534043.05	660375.62	1457.82	td	

PROJECTION TO SECTION m-n HOLE No. 5146

angle grid north clockwise of true north= 1.7 degrees
PROJECTION ALONG AZIMUTH OF 335 (from True North) PLUNGE= 15
horizontal projection distance from collar to section = 14.51

SECTION POINT 1
5533966 NORTH, 660200 EAST

SECTION POINT 2
5534110 NORTH, 660600 EAST

GEOL. LENGTH	NORTHING	EASTING	ELEVATION	TOP/BOTTOM	CODE
0	5534063.02	660469.52	1586.89	lso2 (5146)	
15.69	5534059.72	660460.33	1574.57	t	c1
19.14	5534059	660458.35	1571.84	b	
33	5534056.14	660450.39	1560.88	c	47
40	5534054.7	660446.4	1555.3	c	40
46	5534053.48	660443	1550.51	c	50
51	5534052.46	660440.18	1546.5	c	56
57	5534051.25	660436.8	1541.69	c	45
62	5534050.23	660433.99	1537.67	c	56
70.3	5534048.56	660429.33	1530.99	t	8
77.5	5534047.1	660425.3	1525.18	b	
79	5534046.8	660424.46	1523.97	c	51
84	5534045.8	660421.67	1519.93	c	59
92	5534044.19	660417.21	1513.45	c	53
99	5534042.79	660413.31	1507.78	c	50
100	5534042.59	660412.75	1506.97	c	36
105	5534041.58	660409.96	1502.93	c	52
107	5534041.18	660408.85	1501.3	c	24
108	5534040.98	660408.29	1500.49	c	24
112	5534040.18	660406.07	1497.24	c	24
117	5534039.18	660403.29	1493.18	c	30
121	5534038.38	660401.07	1489.92	c	48
125	5534037.58	660398.85	1486.67	c	47
129.94	5534036.59	660396.1	1482.65	t	10
136.44	5534035.29	660392.49	1477.37	b	
141.75	5534034.23	660389.54	1473.06	t	10
148.14	5534032.95	660385.98	1467.86	b	
158	5534030.98	660380.5	1459.86	c	40
154	5534031.78	660382.73	1463.11	c	38
156.19	5534031.34	660381.5	1461.32	tc	

HOLE No. 5141

length,	tilt from vert,	azimuth from TN,
0	15	75
10	13.3	75.1
20	13.3	75.1
30	13.6	75.2
40	14	75.2
50	13.6	74.6
60	13.8	74.5
70	14	74.5
80	14.1	74.6
90	14.4	74.8
100	14.3	74.9
110	14.2	74.8
120	13.8	74.6
130	14.9	74.8
130.9	15.1	74.8

LSP HOLE No. 5147 5/10/87
LOCATION= northing, 5534029.2 easting, 660378.7 elevation, 1620.6

GEOL. LENGTH	NORTH	EAST	ELEV	TOP/BOTTOM	CODE (5147)
0.00	5534029.20	660378.70		1620.60	LSP3
9.00	5534029.83	660380.82		1611.88	ob
12.10	5534030.04	660381.50		1608.86	c 56
23.00	5534030.75	660383.91		1598.25	c 58
26.35	5534030.98	660384.65		1594.99	c 54
30.90	5534031.28	660385.68		1590.57	c 52
37.10	5534031.70	660387.03		1584.55	c 58
39.95	5534031.89	660387.75		1581.78	c 50
43.60	5534032.15	660388.60		1578.24	c 49
48.20	5534032.46	660389.64		1573.77	c 56
52.20	5534032.74	660390.54		1569.89	c 55
55.50	5534032.97	660391.28		1566.68	t c1
59.20	5534033.23	660392.13		1563.09	b
60.60	5534033.33	660392.45		1561.73	t c1
62.50	5534033.46	660392.88		1559.88	b
66.10	5534033.72	660393.70		1556.39	c 68
71.80	5534034.12	660395.02		1550.86	c 57
75.20	5534034.37	660395.81		1547.56	c 69
80.10	5534034.72	660396.95		1542.80	c 60
85.50	5534035.11	660398.21		1537.57	c 70
87.20	5534035.23	660398.61		1535.92	f1
88.25	5534035.30	660398.86		1534.90	c 22
91.85	5534035.57	660399.72		1531.42	c 12
100.10	5534036.16	660401.67		1523.42	c 6
120.20	5534037.58	660406.37		1503.93	c 8
129.20	5534038.24	660408.49		1495.21	c 12
129.80	5534038.28	660408.64		1494.63	td

PROJECTION TO SECTION M-N HOLE No. 5147

angle grid north clockwise of true north= 1.7 degrees
PROJECTION ALONG AZIMUTH OF 335 (from True North) PLUNGE= 15
horizontal projection distance from collar to section = 1.07

SECTION POINT 1
5533966 NORTH, 660200 EAST

SECTION POINT 2
5534110 NORTH, 660600 EAST

GEOL. LENGTH	NORTHING	EASTING	ELEVATION	TOP/BOTTOM	CODE
0	5534030.15	660378.21	1620.31	LSP3 (5/47)	
9	5534030.9	660380.28	1611.55	ob	
12.1	5534031.14	660380.94	1608.52	c	56
23	5534031.98	660383.28	1597.88	c	58
26.35	5534032.24	660384.01	1594.61	c	54
30.89	5534032.6	660385.01	1590.17	c	52
37.09	5534033.09	660386.38	1584.12	c	58
39.95	5534033.33	660387.02	1581.35	c	50
43.59	5534033.62	660387.85	1577.79	c	49
48.2	5534033.99	660388.87	1573.31	c	56
52.2	5534034.31	660389.75	1569.41	c	55
55.5	5534034.57	660390.47	1566.19	t	cl
59.2	5534034.86	660391.3	1562.59	b	
60.59	5534034.98	660391.61	1561.23	t	cl
62.5	5534035.13	660392.03	1559.37	b	
66.09	5534035.42	660392.84	1555.87	c	68
71.8	5534035.88	660394.13	1550.32	c	57
75.19	5534036.16	660394.9	1547.01	c	69
80.09	5534036.56	660396.01	1542.24	c	60
85.5	5534037	660397.24	1536.99	c	70
87.19	5534037.15	660397.64	1535.34	fl	
88.25	5534037.23	660397.88	1534.32	c	22
91.64	5534037.54	660398.72	1530.82	c	12
100.09	5534038.22	660400.63	1522.8	c	5
120.19	5534039.87	660405.21	1503.24	c	8
129.19	5534040.62	660407.29	1494.49	c	12
129.8	5534040.67	660407.43	1493.91	td	

HOLE No. 5148

length,	tilt from vert.	azimuth from TN.
0	0	310
10	2.5	319.8
20	2.5	319.8
30	2.5	319.8
40	1.7	325.5
50	2.4	342.7
60	2.3	343.3
70	2.2	343.7
79.7	2.4	343.2

PROJECTION TO SECTION K-L HOLE No. 5148

angle grid north clockwise of true north= 1.7 degrees
PROJECTION ALONG AZIMUTH OF 335 (from True North) PLUNGE= 15
horizontal projection distance from collar to section = 43.89

SECTION POINT 1
5534025 NORTH, 660200 EAST

SECTION POINT 2
5534171 NORTH, 660600 EAST

DEPTH	LENGTH	NORTHING	EASTING	ELEVATION	TOP/BOTTOM	CODE
0		5534114.11	660443.67	1571.03	loc4 (5148)	
28.89		5534114.04	660440.67	1547.95	t	6
31.6		5534114.01	660440.56	1539.75	b	
33.7		5534114	660440.56	1537.67	t	8
41.2		5534113.98	660440.52	1530.24	b	
42.2		5534113.98	660440.51	1529.25	c	53
42.7		5534113.98	660440.51	1528.75	t	cl
43.7		5534113.98	660440.51	1527.76	b	
44.7		5534113.98	660440.53	1516.83	c	27
45.59		5534113.98	660440.5	1525.88	t	cl
47.4		5534113.98	660440.51	1524.1	b	
47.59		5534113.98	660440.51	1523.9	t	cl
48.15		5534113.98	660440.52	1523.36	b	
1.7		5534113.98	660440.52	1522.82	c	42
9		5534113.98	660440.52	1522.52	t	cl
49.4		5534113.98	660440.52	1522.12	b	
53.79		5534113.99	660440.55	1517.78	c	36
56.2		5534114	660440.56	1515.41	c	37
58		5534114	660440.57	1513.63	c	42
60		5534114	660440.58	1511.65	c	33
63.4		5534114.01	660440.6	1508.29	c	41
68		5534114.02	660440.63	1503.74	c	43
75.59		5534114.04	660440.67	1496.23	c	53
79.19		5534114.04	660440.69	1492.67	c	55
79.35		5534114.04	660440.69	1492.62	td	

LSP HOLE No. 5148 9/10/87
LOCATION: northing. 5534074.9 easting. 660460.6 elevation. 1562.8

DESC. LENGTH	NORTH	EAST	ELEV	TOP/BOTTOM	CODE
0.00	5534074.90	660460.60		1562.80	lsp4 (5/+8)
28.30	5534075.49	660460.07		1559.52	t 8
31.60	5534075.76	660459.83		1551.23	b
33.70	5534075.83	660459.76		1549.13	t 8
41.20	5534076.02	660459.62		1541.63	b
42.20	5534076.05	660459.60		1540.63	c 53
42.70	5534076.06	660459.59		1540.13	t cl
43.70	5534076.08	660459.57		1539.13	b
44.70	5534076.30	660459.49		1538.14	c 27
45.60	5534076.14	660459.54		1537.23	t cl
47.40	5534076.21	660459.52		1535.44	b
47.60	5534076.22	660459.52		1535.24	t cl
48.15	5534076.24	660459.51		1534.69	b
48.70	5534076.26	660459.50		1534.14	c 42
49.00	5534076.27	660459.50		1533.84	t cl
49.40	5534076.29	660459.49		1533.44	b
53.80	5534076.46	660459.43		1529.04	c 36
56.20	5534076.56	660459.40		1526.64	c 37
58.20	5534076.62	660459.38		1524.84	c 42
60.00	5534076.70	660459.35		1522.85	c 33
63.40	5534076.83	660459.31		1519.45	c 41
68.00	5534077.00	660459.25		1514.85	c 43
75.60	5534077.28	660459.16		1507.26	c 53
79.20	5534077.42	660459.11		1503.66	c 55
79.25	5534077.42	660459.11		1503.61	td

L.S.P HOLE No. 5149 16/9/87

length,	tilt from vert,	azimuth from TN,
0	35	260
10	36.4	259.2
20	36.4	259.2
30	36.2	259.2
40	35.9	257.5
50	35.9	257.7
60	35.4	256.2
70	35.3	255
80	34.9	255
81.9	35	254.4

L.S.P HOLE No. 5149 16/9/87
LOCATION= northing. 5533948.6 easting. 660498.3 elevation. 1572.4

GEOL. LENGTH	NORTH	EAST	ELEV	TOP/BOTTOM	CODE
0.00	5533948.60	660498.30		1572.40	top
16.10	5533946.59	660489.06		1559.37	c 46
17.90	5533946.36	660488.02		1557.92	c 35
22.60	5533945.76	660485.30		1554.14	c 43
28.00	5533945.07	660482.17		1549.79	c 39
40.55	5533943.37	660474.98		1539.64	c 31
51.25	5533941.85	660468.90		1530.97	th
54.00	5533941.46	660467.33		1528.75	c 16
56.45	5533941.09	660465.96		1526.75	t cl
76.85	5533937.80	660454.63		1510.11	b
78.30	5533937.56	660453.84		1508.92	c 39
80.60	5533937.18	660452.58		1507.03	c 57
81.10	5533937.10	660452.30		1506.62	td

PROJECTION TO SECTION Q-R HOLE No. 5149

angle grid north clockwise of true north= 1.7 degrees
PROJECTION ALONG AZIMUTH OF 340 (from True North) PLUNGE= 15
horizontal projection distance from collar to section = 2.31

SECTION POINT 1
5533838 NORTH, 660200 EAST

SECTION POINT 2
5533983 NORTH, 660600 EAST

GEOL. LENGTH	NORTHING	EASTING	ELEVATION	TOP/BOTTOM	COD.
0	5533946.44	660499.15	1573.02	top	
16.1	5533943.26	660490.38	1560.32	c	46
17.89	5533942.9	660489.39	1558.91	c	35
22.6	5533941.96	660486.8	1555.23	c	43
28	5533940.89	660483.83	1550.98	c	39
40.54	5533938.39	660476.96	1541.07	c	31
51.25	5533936.27	660471.11	1532.57	th	
54	5533935.73	660469.61	1530.39	c	16
56.45	5533935.25	660468.27	1528.43	t	cl
76.84	5533931.24	660457.24	1511.99	b	
78.3	5533930.96	660456.46	1510.81	c	39
80.59	5533930.52	660455.23	1508.95	c	57
81.09	5533930.42	660454.96	1508.54	td	

LSP HOLE No. 5150 16/11/87
LOCATION= northing, 5533945.8 easting, 660495.3 elevation, 1572

GEOL. LENGTH	NORTH	EAST	ELEV	TOP/BOTTOM	CODE
0.00	5533945.80	660495.30	1572.00	LSP6 (5/50)	
16.60	5533949.57	660504.30	1558.57	C	
16.60	5533949.57	660504.30	1558.57	c	43
23.55	5533951.14	660508.07	1552.95	c	22
28.50	5533952.26	660510.75	1548.94	c	18
36.00	5533953.97	660514.82	1542.88	c	2
40.20	5533954.92	660517.10	1539.48	c	10
46.60	5533956.37	660520.57	1534.30	c	9
47.80	5533956.64	660521.22	1533.33	c	3
53.00	5533957.82	660524.04	1529.12	c	16
55.50	5533958.39	660525.40	1527.10	c	58
62.00	5533959.86	660528.92	1521.84	c	13
65.70	5533960.70	660530.93	1518.85	c	44
70.10	5533961.70	660533.31	1515.29	c	60
70.10	5533961.70	660533.31	1515.29	td	

PROJECTION TO SECTION Q-R HOLE No. 5150

angle grid north clockwise of true north= 1.7 degrees
PROJECTION ALONG AZIMUTH OF 335 (from True North) PLUNGE= 15
horizontal projection distance from collar to section = .71

SECTION POINT 1
5533838 NORTH, 660200 EAST

SECTION POINT 2
5533983 NORTH, 660600 EAST

GEOL. LENGTH	NORTHING	EASTING	ELEVATION	TOP/BOTTOM	CODE
0	5533945.16	660495.62	1572.19	LSP6 (5/50)	
16.6	5533948.5	660504.83	1558.88	C	
16.6	5533948.5	660504.83	1558.88	c	43
23.54	5533949.9	660508.69	1553.31	c	22
28.5	5533950.89	660511.44	1549.35	c	18
36	5533952.4	660515.6	1543.34	c	2
40.2	5533953.25	660517.93	1539.97	c	10
46.59	5533954.53	660521.48	1534.84	c	9
47.79	5533954.78	660522.15	1533.88	c	3
53	5533955.82	660525.04	1529.72	c	16
55.5	5533956.33	660526.43	1527.71	c	58
62	5533957.63	660530.03	1522.5	c	13
65.69	5533958.38	660532.09	1519.54	c	44
70.09	5533959.26	660534.53	1516.01	c	60
70.09	5533959.26	660534.53	1516.01	td	

VERTICAL DEVIATION

738

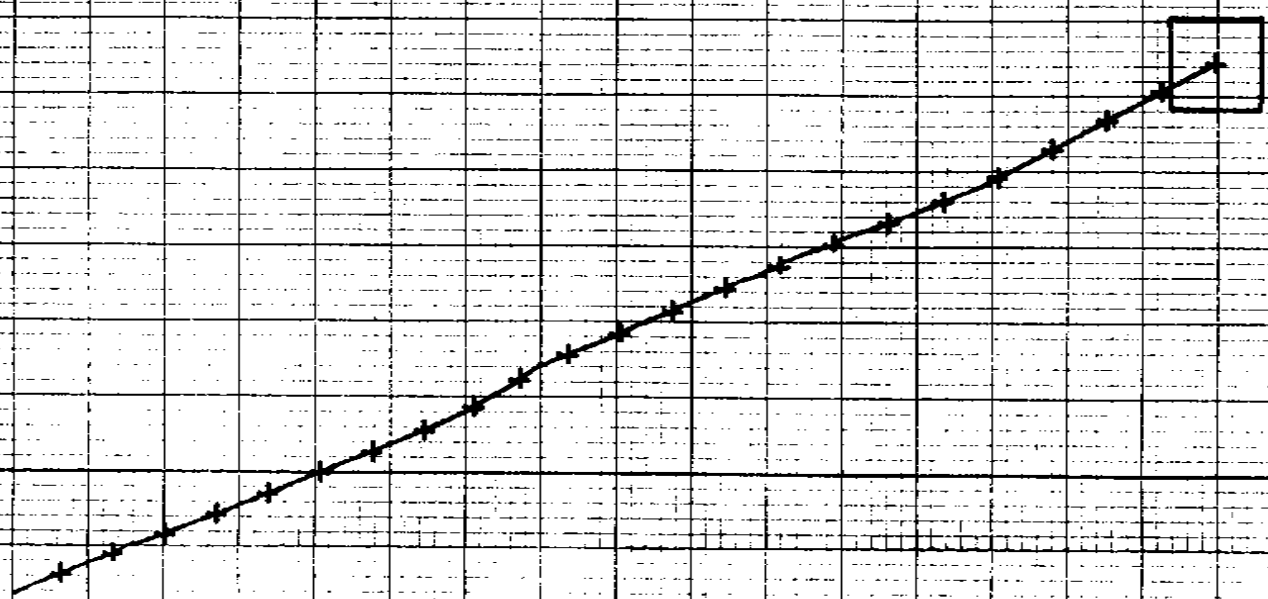
COMPU-LOG V8L1 DEVIATION
DATA FROM : V8L2*A

CLIENT : CROWS NEST RESOURCES
LOCATION : LOWER SOUTH PIT
HOLE ID : LSP-1 5145
DATE OF LOG : 08-21-87
PROBE : 9055A 0010

SCALE: 5.00 M/DIV
MAG DECL: 19.5
TRUE DEPTH: 211.8 M
AZIMUTH: 246.1
DISTANCE: 87.39 M

+ = 10.0 M INCR
△ = TOP OF ZONE
◇ = BOTTOM OF ZONE

TRUE NORTH ↑



CENTURY GEOPHYSICAL CORP. PART NO. 786-0040

CENTURY GEOPHYSICAL CORPORATION

* * * * * * * * VERTICAL DEVIATION * * * * * * * * *

COMPU-LOG V8L1 DEVIATION

CLIENT : CROWS NEST RESOURCES

HOLE ID : LSP-1 5145

LOCATION : LOWER SOUTH PIT

DATE OF LOG : 08-21-81

DATA FROM : V8L2*A

PROBE : 9055A 0010

TD = TOTAL DEPTH
T = TOP OF ZONE
B = BOTTOM OF ZONE

	DEPTH	TRUE DEPTH	NORTH DEV	EAST DEV	DISTANCE	AZIMUTH	SA	SAB
	.00	.00	.00	.00	.00	.0	.0	.0
	10.00	9.11	-1.93	-3.61	4.09	241.9	24.2	241.8
	20.00	18.23	-3.86	-7.23	8.19	241.9	24.2	241.8
	30.00	27.35	-5.79	-10.84	12.29	241.9	24.2	241.8
	40.00	36.46	-7.72	-14.46	16.39	241.9	24.2	241.8
	50.00	45.62	-9.32	-18.13	20.39	242.8	23.6	246.4
	60.00	54.81	-10.77	-21.79	24.31	243.7	23.1	248.3
	70.00	64.00	-12.24	-25.45	28.24	244.3	23.2	248.0
	80.00	73.20	-13.72	-29.07	32.15	244.7	23.0	247.7
	90.00	82.42	-15.17	-32.66	36.02	245.1	22.8	248.0
	100.00	91.65	-16.68	-36.19	39.85	245.3	22.5	246.9
	110.00	100.89	-18.20	-39.66	43.64	245.3	22.3	246.2
	120.00	110.15	-19.62	-43.11	47.37	245.5	21.9	247.6
	130.00	119.44	-21.23	-46.31	50.94	245.4	21.9	243.3
	140.00	128.73	-23.64	-45.37	54.48	245.6	20.5	239.3
	150.00	138.03	-24.62	-52.69	58.16	245.0	21.0	244.7
	160.00	147.31	-26.61	-56.13	61.86	245.1	21.7	247.5
	170.00	156.59	-27.37	-59.60	65.58	245.3	21.8	246.5
	180.00	165.88	-28.77	-63.04	69.29	245.5	21.7	247.6
	190.00	175.17	-30.15	-66.45	72.97	245.6	21.6	248.0
	200.00	184.48	-31.51	-69.86	76.63	245.7	21.5	248.1
	210.00	193.78	-32.82	-73.29	80.30	245.9	21.5	249.0
	220.00	203.08	-34.10	-76.73	83.96	246.0	21.5	249.6
TD	229.49	211.83	-35.39	-79.91	87.40	246.1	21.4	247.8

VERTICAL DEVIATION

COMPU-LOG V8L1 DEVIATION
DATA FROM : V8L2*A

CLIENT : CROWS NEST RESOURCES
LOCATION : LOWER SOUTH PIT
HOLE ID : LSP-2 5146
DATE OF LOG : 08-26-87
PROBE : 9055A 0010

SCALE: 5.00 M/DIV
MAG DECL: 19.5
TRUE DEPTH: 103.9 M
AZIMUTH: 250.3
DISTANCE: 77.70 M

+ = 5.0 M INCR
Δ = TOP OF ZONE
◇ = BOTTOM OF ZONE

TRUE NORTH ↑

* * * * * * * * VERTICAL DEVIATION * * * * * * * *

COMPU-LOG V8LI DEVIATION

CLIENT : CROWS NEST RESOURCES

HOLE ID : LSP-2 5146

LOCATION : LOWER SOUTH PIT

DATE OF LOG : 08-26-87

DATA FROM : V8L2*A

PROBE : 9055A 0010

TD = TOTAL DEPTH
T = TOP OF ZONE
B = BOTTOM OF ZONE

	DEPTH	TRUE DEPTH	NORTH DEV	EAST DEV	DISTANCE	AZIMUTH	SA	SAB
	.00	.00	.00	.00	.00	.0	.0	.0
	5.00	3.95	-.94	-2.91	3.06	252.1	37.7	252.0
	10.00	7.90	-1.88	-5.82	6.12	252.1	37.7	252.0
	15.00	11.85	-2.82	-8.74	9.18	252.1	37.7	252.0
	20.00	15.80	-3.76	-11.65	12.25	252.1	37.7	252.0
	25.00	19.76	-4.70	-14.57	15.31	252.1	37.7	252.0
	30.00	23.71	-5.65	-17.47	18.36	252.1	37.6	251.8
	35.00	27.68	-6.64	-20.35	21.40	251.9	37.4	251.1
	40.00	31.67	-7.69	-23.18	24.42	251.6	37.1	249.6
	45.00	35.67	-8.65	-26.02	27.42	251.6	36.9	251.3
	50.00	39.67	-9.60	-28.86	30.42	251.6	36.8	251.3
	55.00	43.67	-10.59	-31.69	33.41	251.5	36.7	250.8
	60.00	47.68	-11.60	-34.50	36.40	251.4	36.6	250.1
	65.00	51.70	-12.63	-37.29	39.38	251.3	36.5	249.8
	70.00	55.71	-13.65	-40.10	42.36	251.2	36.6	250.0
	75.00	59.73	-14.70	-42.88	45.33	251.1	36.5	249.3
	80.00	63.75	-15.75	-45.66	48.30	251.0	36.3	249.2
	85.00	67.78	-16.80	-48.43	51.26	250.9	36.3	249.2
	90.00	71.81	-17.86	-51.19	54.22	250.8	36.2	248.5
	95.00	75.84	-18.93	-53.94	57.17	250.7	36.2	248.7
	100.00	79.87	-19.96	-56.72	60.13	250.6	36.3	249.0
	105.00	83.90	-21.01	-59.49	63.09	250.5	36.3	249.2
	110.00	87.94	-22.09	-62.24	66.04	250.5	36.1	248.6
	115.00	91.98	-23.18	-64.97	68.98	250.4	36.0	248.1
	120.00	96.02	-24.25	-67.71	71.92	250.3	36.0	248.7
	125.00	100.06	-25.26	-70.48	74.87	250.3	36.0	249.0
TD	129.80	103.93	-26.22	-73.14	77.70	250.3	36.1	250.1

VERTICAL DEVIATION

COMPU-LOG V8L1 DEVIATION
DATA FROM : V8L2*A

CLIENT : CROWS NEST RESOURCES
LOCATION : LOWER SOUTH PIT
HOLE ID : LSP-3 5147
DATE OF LOG : 08-13-87
PROBE : 9055A 0010

SCALE: 2.50 M/DIV
MAG DECL: 19.5
TRUE DEPTH: 127.0 M
AZIMUTH: 74.8
DISTANCE: 31.50 M

+ = 5.0 M INCR
Δ = TOP OF ZONE
◇ = BOTTOM OF ZONE

TRUE NORTH ↑

PHYSICAL CORP. PART NO. 786-0040

738

* * * * * * * * VERTICAL DEVIATION * * * * * * * *

COMPU-LOG VSL1 DEVIATION

CLIENT : CROWS NEST RESOURCES — HOLE ID : LSP-3 5147

LOCATION : LOWER SOUTH PIT — DATE OF LOG : 08-13-87

DATA FROM : VSL2*R — PROBE : 9055A 0010

TD = TOTAL DEPTH
T = TOP OF ZONE
B = BOTTOM OF ZONE

	DEPTH	TRUE DEPTH	NORTH DEV	EAST DEV	DISTANCE	AZIMUTH	SR	SRB
	.00	.00	.00	.00	.00	.0	.0	0
	5.00	4.86	.29	1.11	1.15	75.1	13.3	75.0
	10.00	9.72	.59	2.23	2.30	75.1	13.3	75.0
	15.00	14.59	.89	3.34	3.46	75.1	13.3	75.0
	20.00	19.45	1.18	4.46	4.61	75.1	13.3	75.0
	25.00	24.32	1.48	5.58	5.78	75.1	13.4	75.3
	30.00	29.18	1.77	6.73	6.96	75.2	13.6	75.5
	35.00	34.03	2.07	7.83	8.15	75.3	13.8	75.5
	40.00	38.88	2.38	9.06	9.37	75.2	14.0	75.8
	45.00	43.74	2.73	10.16	10.52	75.0	13.3	72.7
	50.00	48.60	3.10	11.28	11.70	74.6	13.6	71.4
	55.00	53.46	3.45	12.42	12.89	74.5	13.7	73.0
	60.00	58.31	3.77	13.57	14.08	74.5	13.8	74.6
	65.00	63.16	4.09	14.73	15.29	74.5	13.9	74.4
	70.00	68.01	4.41	15.90	16.50	74.5	14.0	74.6
	75.00	72.87	4.72	17.06	17.70	74.5	13.9	75.1
	80.00	77.71	5.02	18.25	18.93	74.6	14.1	75.6
	85.00	82.56	5.32	19.43	20.17	74.7	14.3	76.1
	90.00	87.40	5.61	20.66	21.41	74.8	14.4	76.4
	95.00	92.24	5.91	21.87	22.65	74.9	14.3	76.3
	100.00	97.09	6.21	23.07	23.89	74.9	14.3	75.9
	105.00	101.93	6.55	24.29	25.15	74.9	14.5	74.4
	110.00	106.77	6.93	25.45	26.38	74.8	14.2	71.6
	115.00	111.62	7.32	26.60	27.59	74.6	14.0	71.5
	120.00	116.47	7.64	27.75	28.79	74.6	13.8	74.1
	125.00	121.32	7.98	28.92	29.98	74.7	13.9	77.5
	130.00	126.16	8.28	30.17	31.27	74.8	14.9	75.5
TD	130.90	127.03	8.26	30.40	31.50	74.8	15.1	76.5

VERTICAL DEVIATION

738

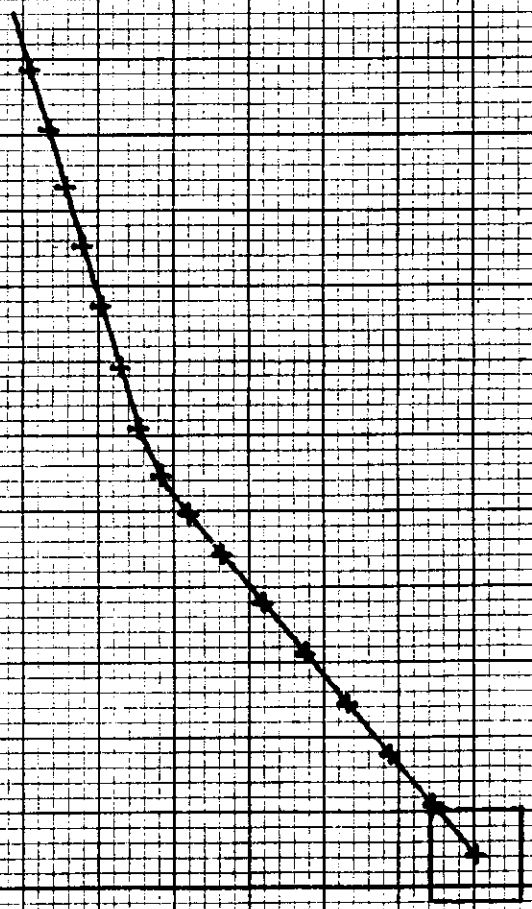
COMPU-LOG V8L1 DEVIATION
DATA FROM : V8L2*R

CLIENT : CROWS NEST RESOURCES
LOCATION : LINE CREEK PIT
HOLE ID : LSP-4 5/9-8
DATE OF LOG : 08-30-87
PROBE : 9055A 0010

SCALE: .25 M/DIV
MAG DECL: 19.5
TRUE DEPTH: 79.6 M
AZIMUTH: 331.2
DISTANCE: 3.19 M

+ = 5.0 M INCR
△ = TOP OF ZONE
◇ = BOTTOM OF ZONE

TRUE NORTH ↑



CENTURY GEOPHYSICAL CORPORATION

* * * * * * * * VERTICAL DEVIATION * * * * * * * *

COMPU-LOG V8LI DEVIATION

CLIENT : CROWS NEST RESOURCES HOLE ID : LSP-4 5148

LOCATION : LINE CREEK PIT DATE OF LOG : 08-30-87

DATA FROM : V8L2*A PROBE : 9055A 0010

TD = TOTAL DEPTH
T = TOP OF ZONE
B = BOTTOM OF ZONE

	DEPTH	TRUE DEPTH	NORTH DEV	EAST DEV	DISTANCE	AZIMUTH	SA	SAS
	.00	.00	.00	.00	.00	.0	.0	.0
	5.00	4.99	.16	-.14	.22	319.6	2.5	319.6
	10.00	9.99	.33	-.28	.44	319.6	2.5	319.6
	15.00	14.98	.50	-.42	.65	319.6	2.5	319.6
	20.00	19.98	.67	-.56	.88	319.6	2.5	319.6
	25.00	24.97	.84	-.71	1.10	319.6	2.5	319.6
	30.00	29.97	1.00	-.84	1.31	319.6	2.4	319.6
	35.00	34.96	1.13	-.93	1.46	319.6	1.5	319.6
	40.00	39.96	1.28	-1.04	1.64	320.4	1.7	320.0
	45.00	44.96	1.41	-1.12	1.80	321.7	1.5	334.4
	50.00	49.95	1.62	-1.18	2.00	323.9	2.4	343.2
	55.00	54.95	1.82	-1.24	2.21	325.7	2.4	342.7
	60.00	59.94	2.02	-1.30	2.41	327.2	2.3	343.3
	65.00	64.94	2.22	-1.36	2.60	328.5	2.3	343.6
	70.00	69.94	2.41	-1.41	2.80	329.6	2.2	343.7
	75.00	74.93	2.61	-1.48	3.00	330.5	2.3	342.4
TD	79.70	79.63	2.80	-1.53	3.19	331.2	2.4	343.2

CENTURY GEOPHYSICAL CORP. PART NO. 786-0040

VERTICAL DEVIATION

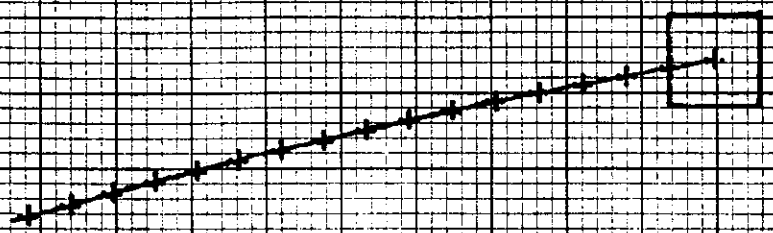
COMPU-LOG V8L1 DEVIATION
DATA FROM : V8L2*A

CLIENT : CROWS NEST RESOURCES
LOCATION : LINE CREEK PIT
HOLE ID : LSP-5 5/89
DATE OF LOG : 09-02-87
PROBE : 9055A 0010

SCALE: 5.00 M/DIV
MAG DECL: 19.5
TRUE DEPTH: 66.4 M
AZIMUTH: 257.1
DISTANCE: 47.95 M

+ = 5.0 M INCR
Δ = TOP OF ZONE
◇ = BOTTOM OF ZONE

TRUE NORTH



* * * * * * * * VERTICAL DEVIATION * * * * * * * * *

COMPU-LOG V8L1 DEVIATION

CLIENT : CROWS NEST RESOURCES HOLE ID : LSP-5 5/49

LOCATION : LINE CREEK PIT DATE OF LOG : 03-02-87

DATA FROM : V8L2*A PROBE : 9033A 0010

TD = TOTAL DEPTH
T = TOP OF ZONE
B = BOTTOM OF ZONE

	DEPTH	TRUE DEPTH	NORTH DEV	EAST DEV	DISTANCE	AZIMUTH	SA	SAB
	.00	.00	.00	.00	.00	.0	.0	.0
	5.00	4.62	-.55	-2.91	2.96	259.3	36.4	259.2
	10.00	9.24	-1.10	-5.83	5.93	259.3	36.4	259.2
	15.00	12.87	-1.65	-8.74	8.90	259.3	36.4	259.2
	20.00	16.09	-2.21	-11.66	11.86	259.3	36.4	259.2
	25.00	20.12	-2.76	-14.57	14.83	259.3	36.4	259.2
	30.00	24.15	-3.40	-17.46	17.79	259.0	36.2	257.5
	35.00	28.19	-4.06	-20.33	20.73	258.7	36.0	257.0
	40.00	32.24	-4.72	-23.19	23.65	258.5	35.9	256.8
	45.00	36.29	-5.41	-26.03	26.59	258.3	35.8	256.4
	50.00	40.34	-6.03	-28.90	29.53	258.2	35.9	257.7
	55.00	44.39	-6.72	-31.74	32.44	258.0	35.7	256.3
	60.00	48.47	-7.41	-34.56	35.34	257.9	35.4	256.2
	65.00	52.54	-8.12	-37.36	38.24	257.7	35.4	255.6
	70.00	56.62	-8.87	-40.16	41.13	257.5	35.3	255.9
	75.00	60.71	-9.63	-42.92	44.00	257.3	35.1	254.1
	80.00	64.81	-10.39	-45.69	46.86	257.2	34.9	255.0
TD	81.90	66.36	-10.69	-46.74	47.93	257.1	35.0	254.4

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