1235

The British American Oil Company Limited
Production Department
Exploratior Section
Calgary, Alberta

SURFACE STRATICRAPHIC INVESTIGATIONS AND STRUCTURAL RECONNAISSANCE, UPPER ELK RIVER AREA, BRITISH COLUMBIA

N.T.S. 82J & 82G

(RE: PERMITS NOS. 679, 682, 693, 694 and 695)

DURING THE PERIOD JULY 12 TO AUGUST 15, 1964

by

D.A. Lockie

March 31, 1965

Submitted in support of application for credit.
Sea affidavit by E.R. Link, date 16 march 1965.

TABLE OF CONTENTS

ILLUSTRATIONS

I, D.A. Lockie, employed by The British American Oil Company Limited as a Geologist in the period, November, 1957 to present, herein state that I have the following qualifications:

a) Graduate of the University of British Columbia B.A. (Honours Geology)

b) Member of the Alberta Society of Petroleum Geologists

c) Seven and one-half years varied experience applied in petroleum geology.

D.A. Lockie

Date March 31 1965

SURFACE STRATIGRAPHIC INVESTIGATIONS AND STRUCTURAL RECONNAISSANCE, UPPER ELK RIVER AREA BRITISH COLUMBIA N.T.S. 82J & 82G

by
D.A. Lockie
The British American Oil Company Limited

INTRODUCTION

This study complements previous Geological studies in the Fernie Basin area.

Previous reports submitted are five Geophysical reports dated October 1956, November 1957, June 1958, June 1964 and March 1965, a Well Completion report dated February 1962, and two Surface Geological reports dated October 4, 1963.

During the period of July 12 to August 15, inclusive, British American Surface Party CZ-l-64 was deployed in the Elk River Valley of southeastern British Columbia (Figure 1). The party measured seven Mississippian sections and one Upper Devonian section. Reconnaissance mapping suitable for construction of six regional structure sections and a general geologic map (Figure 3) was completed.

The party consisted of the following personnel:

D. Lockie	Party Chief (Geologist)
D. Capstick	Assistant (Geologist)
G. Schnegelsberg	" "
R. Bray	" "
m. Murrell	" "
F. Dawson	Cook
K. Blackwood	Helicopter Pilot
J. Flippo	Helicopter Engineer

The party was equipped with conventional tent camp equipment, a one-ton, four-wheel drive truck, and a four-door sedan. A helicopter from Alpine Helicopters, Calgary was used throughout the field period.

METHOD OF WORK

A base camp was established at the bridge on the Elk River road, near the junction of Crossing Creek and Elk River. Two-man crews were transported From camp to various upper Palaeozoic sections selected by aerial reconnaissance. Ground traverses mere completed across areas accessible with a four-wheel drive truck.

Stratigraphic sections were measured with a five-Foot staff and rock chip samples mere collected over ten-foot intervals. Structural reconnaissance was done by flying generally east and west traverses and recording geological data on aerial photographs.

A total of 79 hours and 10 minutes of helicopter time was used for the project.

Time distribution of the Party for the field season is as follows:

Days	Surveying	-	27
Days	moving	-	3
Poor	Weather	-	3
Days	Off		4
			37

From August 15 to September 15, 1964, two assistant geologists were assigned to office compilation of *the* field data and from August 15, 1964 to January 51, 1965 the author analysed the data and prepared a draft of this report. Small parts of the period February through March ware spent supervising reproduction of figures and the typing of the manuscript.

STRATIGRAPHY

A total of 20,509 feet of Permo-Carboniferous strata were measured, described and sampled. One Upper Devonian section of 4,415 feet was examined near Mt. Forsyth. The locations of these sections are shown on Figure 1. These sections have been plotted on stratigraphic strip logs (1" = 100') and are in the accompanying pocket.

Three sections measured in the High Rock Range (Tornado Ridge, Beehive Mountain, and Mount Scrimger) include full thickness of the Mount Head and Livingstone Formations. A fourth section at Weary Creek, was discontinued in lower Livingstone beds because of structural complications directly above the Lewis thrust plane.

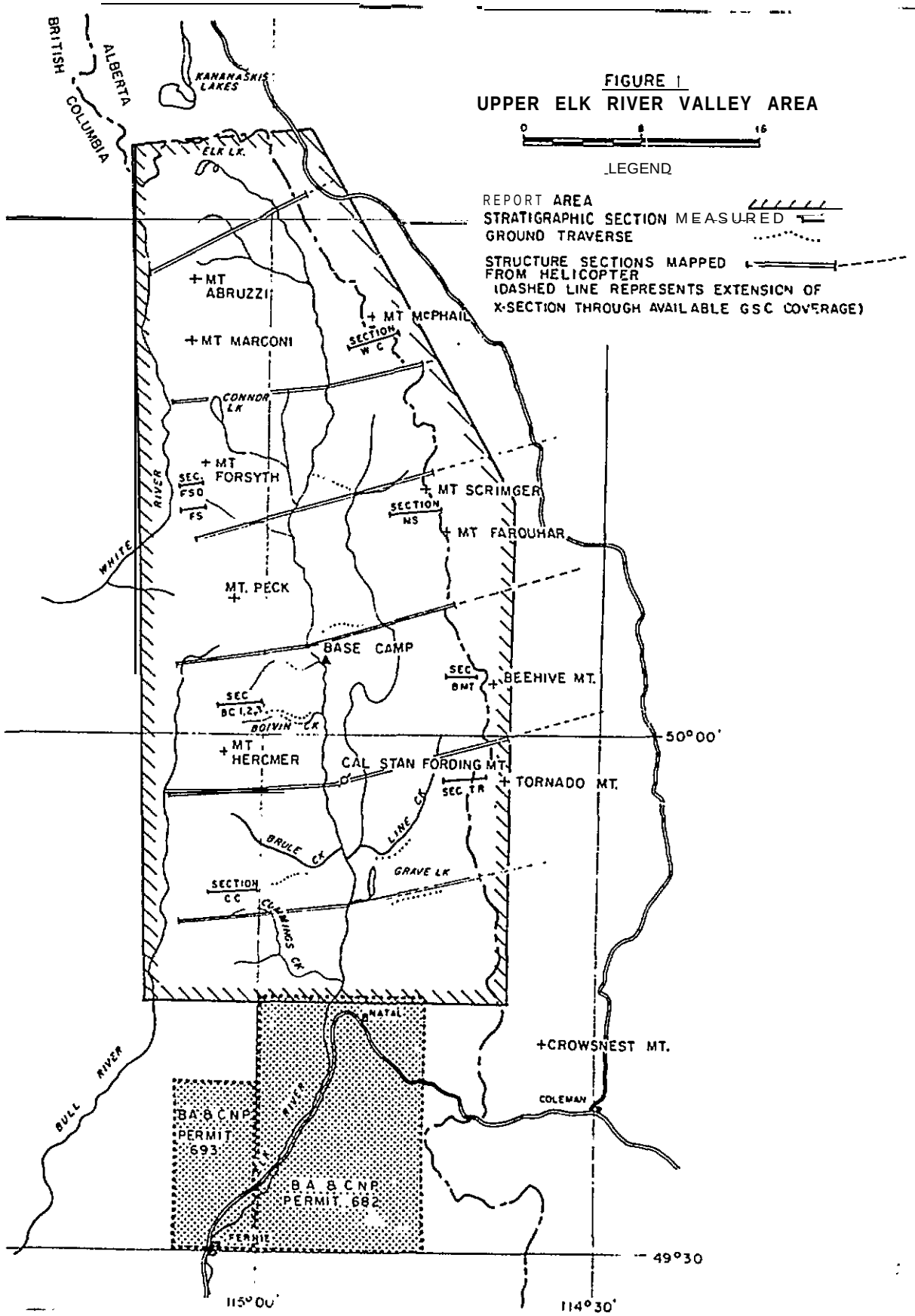
Three partial Mount Head and Livingstone sections were measured in the Bourgeau lineament. Structural complications and inaccessible exposures restricted stratigraphic work in this oart of the area.

Upper Devonian

Palliser, Alexo Formations, and Fairholme Group

One poorly exposed Upper Devonian section (FS/D) was examined near Mount forsyth.

The structurally thickened Palliser section at FS/D consists of fine to coarsely crystalline, cliff-forming lime-s tones. Sporadic outcrops of Alexo and Fairholme below the Palliser formation consist of brownish-weathering, calcareous siltstone and quartzite interbedded with finely crystaiiine, argillaceous limestone. Covered intervals at section FS/D may indicate recessive-weathering silt and shales in the fairholme Group.



Mississippian

Mississippian

Banff Formation

The Banff Formation in the project area is composed of dense microcrystalline limestones, partly argillaceous in the lower part. Nodules and stringers of chert are common and generally occur in cyclical alternation with the thin to medium bedded limestone. Fossil fragments are randomly distributed and rare, although thin fragmental limestone stringers do occur, particularly in the upper part of the formation. Unlike the dominantly shaly Banff Formation of Banff Park area, the dense siliceous carbonate sequence of the Banff Formation in the Upper Elk River Valley area is resistant to erosion and stands in cliff exposure generally undifferentiated physiographically from cliffs formed in Rundle strata.

Only the uppermost hundred feet of the Banff was examined, mainly to delineate the contact with the overlying Liwingstone Formation on which the stratigraphic investigation was concentrated. The contact in most sections is readily distinguished at the zone Of fairly abrupt upward transition from siliceous and cherty limestones of the Banff to the thick fragmental limestones of the Livingstone.

Livingstone Formation

The Livingstone Formation is well-exposed in the High Rock Range and consists of light grey, fine to coarsely crystalline fragmental limestones. The formation thickens westward across the study area. At Beehive Pass it is 900 feet thick whereas at Connor Lakes 2,200 feet of Livingstone have been recorded. The uooer contact was placed at the change from recessive-weathering, medium grey, well-bedded limestone of the Mount Head Formation to the light grey, massive, fragmental limestone units of the Livingstone. porosity is well-developed in the Mount Scrimger and beehive Mountain Sections.

mount Head Formation

Throughout the area medium grey, variably bedded, fossiliferous limestones of the Mount Head formation lie conformably above the Livingstone Formation. Thickness variation is from 600 feet in High Rock Range to more than 1,300 feet in the Bourgeau Range.

The upper contact was picked on the basis of lithology and weathering characteristics. The contact was arbitrarily placed at the top of rust-weathering, silty limestone unit usually overlain by siliceous limestone.

At Weary Creek the top of mount Head was placed directly above a five-foot rust-weathering silty limestone bed. At Mount Scrimger the top was picked at the occurrence of a ten-foot bed of brownish, silty dolomite. The rust-weathering beds are absent at Beehive Mountain where the upper contact was placed at the base of twelve feet of grey, cherty limestone. Both the siliceous zone and brownish-weathering characteristic mark the base of the Tunnel Mountain Formation at Tornado Ridge.

In the High Rock Range the Mount Head thins from about 1,000 feet at Weary Creek to 600 feet south of Tornado Ridge section. While no complete mount Head sections were measured in the Bourgeau Range, a similar north-south variation may be present in that area.

Tunnel Mountain Formation

The Tunnel mountain Formation is a fossiliferous fragmental limestone containing local developments of chert and calcareous sandstone. The problem of defining the upper contact was not undertaken in this study and the field procedure was to commence examination in lowermost quartzite oeds identified as Rocky Mountain strata.

In the High Rock Range the Tunnel mountain Formation varies from 500 to 1,000 feet in thickness. The formation thickens west across Elk Valley.

STRUCTURE

Six traverses were mapped between Cummings Creek and Elk Lakes (see figure 1). A spacing of approximately eight miles between structural traverses was chosen to provide the closest control in the time available for the project.

Two major tectonic features were examined along either side of Elk Valley: the Lewis thrust plate and the mountainous area west of Elk River referred to as the Bourgeau Range. A structural interpretation of the area is presented in the accompanying tectonic correlation diagram, figure 2.

Lewis Thrust Plate

The Lewis fault plate is basically a homoclinal structure formed in west-dipping hanging-wall beds. These beds range in age from Devonian along the base of the Lewis fault scarp to Jura-Cretaceous on the east side of Elk Valley.

Only two minor complications are present in the High Rock Range. A series of slice faults repeat Palaeozoic strata at Beehive mountain (Norris 1958). A southern extension of these faults occurs near Tornado pass where a small back-limb thrust splits off Lewis fault.

The second minor complication is a small normal fault (downthrown on the west) mapped at the headwaters of Aldridge Creek.

The Wisukitsak Range-Erickson Ridge lineament is the most complex structural element in the Lewis thrust plate. Wisukitsak Range, a prominent ridge of folded and faulted Permo-Pennsylvanian, Mississippian and Triassic rocks is bounded on the west by a normal fault, the Erickson fault. Fording Mountain anticline is on the west and downthrown side of this fault (Price 1961).

California Standard Fording mountain d-61-L, located on the axis of the anticline, drilled through structurally thickened Mississippian and Devonian above a major fault that places Devonian onto mississippian. Presumably this is the Lewis thrust. The well was dry and abandoned at a total depth of 16,540 (-10,702) feet in the Livingstone Formation.

The Greenhills Range, the north extension of Wisukitsak Range, is Formed in east-dipping Kootenay and Fernie beds, the west limb of a broad syncline. A normal Fault is present on the east side of Greenhills Range where Kootenay sediments are downthrown against grey-weathering carbonates identified as Mississippian. This Fault ends a Few miles north where east-dipping Kootenay beds pass undisturbed From Greenhills Range into the core of Alexander Creek sy. cline.

Bourgeau Lineamen t

West of Elk Valley rocks ranging in age From Triassic to Devonian are faulted and intensely Folded into a structurally disturbed belt underlying the Bourgeau Range.

from Mount Cadorna to Bingay Creek the Bourgeau is underlain by large open Folds. A Fault extending From mount Abruzzi to the junction of Bingay Creek and Elk River is the only major structural complication in this part of the Bourgeau Range.

Devonian rocks are exposed along the entire west side of the lineament and probably have a footwall relationship to the structurally complex pre-Devonian strata on the west side of Bull River and White River Valleys (Leech 1958).

The main elements of the Bourgeau south of Bingay are three thrust Faults. The First of these is a thrust extending From headwaters of Cummings Creek through Hornaday pass to the Phillips Peak area. This Fault Forms a straight lineament

in the west half of the Bourgeau where it raises a complex Devonian anticline onto intensely folded Mississippian rocks. This fold, which is almost symmetrical at Narboe Creek, becomes a near-isoclinal structure southwest of Cummings Creek.

The second major Fault is a low-angle thrust placing Mississippian onto Triassic and Permo-Pennsylvanian rocks. This fault extends from south of Telford Creek to Cummings Creek where the surface trace is more sensitive to topography as it swings northeast to merge with the Bourqeau fault.

A third thrust Fault repeats Permo-Pennsylvanian and Triassic strata along the east side of the Bourgeau Range and probably merges with the Bourqeau fauit near Boivin Creek.

of this fault (Price 1961).

References

Leach, G. B. 1958: Fernie Map-Area, West Half, British Columbia; Geol. Surv. Canada, Paper 58-10, (Report and Map 20-1958)

Norris, D. K. 1958: Beehive Mountain, Alberta and British Columbia, 82 J/2 E½, Geol. Surv. Canada, paper 58-5, (Report and map 14-1958)

Price, R.A. 1961: Fernie Map-Area East Half, Alberta and British Columbia, 82G E½, Geol. Surv. Canada, Paper 61-24, Report and map 35-1961

STRIP LOG GRAPHIC SYMBOLS

ROCK TYPES

- SHALE
- SILTSTONE
- SANDSTONE
- CONGLOMERATE
- LIMESTONE
- DOLOMITE
- ANHYDRITE
- SALT
- CHERT (LIGHT AND DARK)
- COAL
- IGNEOUS

MODIFIERS

- ARGILLACEOUS OR CLAY MATRIX
- SILTY
- ARENACEOUS, SANDY
- CALCAREOUS
- DOLOMITIC
- SILICEOUS
- ANHYDRITIC
- SALT CASTS
- CARBONACEOUS
- FOSSILIFEROUS
- NO SAMPLE
- NOT IDENTIFIABLE (INSUFFICIENT SAMPLE ETC.)
- FAULT 1220 (LEFT OF COLUMN)
- UNCONFORMITY

EXAMPLES

- ARGILLACEOUS SANDSTONE
- SHALE GRADING TO ARGILLACEOUS SANDSTONE
- SILTY SHALE
- SILTY DOLOMITE
- SANDY LIMESTONE
- SANDSTONE PARTLY SHALE
- CALCAREOUS SS CALCAREOUS SH
- LIMY DOLOMITE
- DOLOMITIC SS DOLOMITIC SH
- DOLOMITIC LIMESTONE
- SILICEOUS SANDSTONE
- SILICEOUS LIMESTONE
- ANHYDRITIC DOLOMITE
- ANHYDRITE AND ANHYDRITIC DOLOMITE
- DOLOMITE WITH SALT CASTS
- ANHYDRITE & ANHYDRITIC DOLOMITE WITH SALT CASTS
- CARBONACEOUS SHALE
- COAL AND CARBONACEOUS SHALE
- CALCAREOUS FOSSILIFEROUS SHALE
- FOSSILIFEROUS LIMESTONE

ACCESSORY MINERALS

- GLAUCONITE
- BENTONITE
- PYRITE
- IRONSTONE OR SIDERITE
- CHERT
- MICA

TEXTURES

- FRAGMENTAL
- OOLITIC OR PELLETIC
- STROMATOPOROIDAL

POROSITY

- POOR — I
- FAIR — II
- GOOD — III
- EXCELLENT — IIII
- VUGGY — V
- GRANULAR — G
- CRYSTALLINE — X
- FRACTURE — F
- OIL STAINING — •
- HYDROCARBONS — H

(LEFT OF COLUMN)

ENGINEERING SYMBOLS

- PERFORATIONS
- LOST CIRCULATION
- CASING SHOE
- CORE
- DRILL STEM TEST

(LEFT OF COLUMN)

SAMPLE LOG

ALBERTA

T. 26 R. 1 W5

GRAPHIC OIL COMPANY

NOGOOD NO 1

COMMENCED – JUNE 1 1950 (SPUDDED)

COMPLETED – SEPT 3, 1950 (RIG RELEASED)

ELEVATION 3744 K.B

REMARKS – CHECKED AGAINST E-LOG, SAMPLES

PRODUCTION D and A

8 CORE AT CONS BMO CORE NOT AVAILABLE

LOGGED BY – J DOE OCT /50

100

10 3/4" at 119'

Samples start at 190' in Colorado

200

Examination commenced at 240' in Blairmore

Sh lt gr, carb fl

Ss f g qtz, glau, arg, fl

Ss f/m g qtz, wrag gor, sh lt g

Sh dk gr calc, abd cst mar calc

Sh lt gr plas, sid spheres

GLAU 286

OST HORIZON 290

DST 290

300

frgs lt gr ch

ls lt yel-brn crs & cri, ch

ls lt gr f s, sl dolic

MISS 345

Dol lt gr soft, earthy, por few anhy blebs

Salt thin salt str, earthy dol, casts

Dol lt gr v f s, ti, shy str

Sh gr-grn dolic

400

Samples to TD

TD driller 445

TD E-Log 440

Core No 1 summarize

Dst No 1 summarize

500

BRITISH AMERICAN OIL CO LTD
CALGARY, ALBERTA

MAY, 1957

WS58

CZ-1-64 MS

SECTION NAME Mount Scrimger No. ii

LOCATION Section measured on the west ridge of Mount Molesworth one mile south of Mount Scrimger

Lat. 51° 45' Long. 114° 46'

MEASURED BY R Bray and M. Murrell

METHOD 2 ft. staff Measured down Date August 6, 1964

STRIP LOG BY R. Bray

STRAT. LIMITS Top of Banff to top of Etherington (Miss.)

UNIT	THICKNESS	POROSITY	LITHOLOGY	TEXTURE	BEDDING	FOSSILS	COLOUR (FRESH SURFACE)	REMARKS	ENVIRONMENT (INTERPRETED)
3									
Z									
a									
E									
Z									
SYLVAIA									
Z									
a									
E									
Z									
ROCKY MTN.									
?	12			F	III	F	brn.	Lowermost Orbiculoidea zone in the Rocky Mtn Quartzites is contains chert nodules	
				C			gy		
				F			brn grn		
				M				white chert nodules	
				F			lt gy brn.		
				C		F	M. gy	Silty laminations and white chert nodules	
				C					
	100			F			lt brn to gy.	Chert nodules	
				F					
				F				Quartz vugs	
				F					
				P					
				C			dk gy		
				M			gy		
				C			lt gy	Gy chert nodules	
				C			m. gy.		
	200			F			lt. brn.	Some coarse frag. lenses	
				F			lt. gy.		
				F		F	gy.	Lenses coarse frags Brachs & Solitary corals	
				C			brn.		
				F					
				C		F	gy	Solitary corals, blk. chert beds	
				F					
				C			dk gy	Poorly cemented siliceous nodules	
				C			m. brn		
				F					
3	300			F		F	gy	Scattered crinoid frags Siliceous nodules	
				F					
				F					
				F			lt. brn. dk gy.	Crossbedding	
				C			m. brn.	Siliceous nodules	
				C		F			
				M			dk gy	Coarse corals, branches	

TUNNEL MOU

AD FORMATION

400

500

600

700

800

900

1000

1100

Siliceous nodules

crossbedding.

Siliceous nodules

rugose corals, branchs.

Siliceous nodules.

Crossbedding

Quartz veins.

Branchs

rugose corals

Lithostrotion Columnics

siliceous bands + nodules

chert nodules

White chert nodules

Spiny silty bands

branchs

Lithographic Ls

branchs + Syringopora

Lithostrotion + rugose corals

Lithographic Ls

Syringopora, Lime mud matrix

Lithographic Ls.

Lithographic Ls.

Lithographic Ls.

rugose corals

rugose corals, slickensiding.

Lithographic Ls.

branchs + gastropods

Lithographic Ls.

rugose corals

gastropods Lithographic Ls

Lithographic Ls.

MOUNT HEAD FORMATION

900	C	–	E	dk gy	rugose corals	
	M	–				
	C	–				
	F	=	F	dk gy	rugose corals, slickensiding.	
	M	–		dk gy	lithographic Ls.	
	F	=	E	dk gy	cracks & gastropods	
	F	=		gy/dk gy	Lithographic Ls.	
	F	=	E	dk gy	rugose corals	
	C	–				
	C	–				
1000	C	–		gy		
	C	–				
	C	–				
	F	=	F	gy	gastropods Lithographic Ls	
	F	=				
	M	–		dk gy/gy	Lithographic Ls.	
	F	–		dk gy		
1100	F	=		dk gy		
	M	=				
	M	–	F	dk gy	rugose corals	
	M	–				
	M	=		gy		
	M	=		gy		
	M	–		gy		
	C	–		gy		
1200	M	–		gy		
	C	–				
	F	=		gy	40% gy chert bands and nodules	
	F	=				
	F	=		dk gy		
	C	–		gy	40% gy chert nod & bands	
	F	=				
	F	=		dk gy	gy chert nodules	
	M	–	F	dk gy	Syringopora, Lithostrotion	
	C	=	F	gy	Lithostrotion & Syringopora	
1300	M	–	F	gy	rugose corals	
	C	–				
	C	–		gy		
	C	–		lt. gy	gy chert nodules	
	C	–	F	gy	Syringopora	
	L	–	F	gy	rugose corals, Syringopora	
	C	–			white chert nodules	
	C	=		gy		
1400	F	–		lt. gy		
	C	–		gy	dolomitized case and recep beds	
	C	–				
	C	–				
	C	–				
	C	–				
	C	–				
	C	=		lt. gy		
1500	M	=	F	dk gy/gy	rugose corals	
	M	=		lt. brn		
	C	–		gy	Packs some lesser act	
	M	–		gy		
	C	–				

MOUNT

B 2

Depth	Rock type	Bed	Fossils	Colour	Fossil notes
	M	-	F	dk gy	Bryozoa, Brachiopods
	M	-	F	gy	rugose corals, brach
1200	C	-			
	?	=		lt brn	
	M	=	F	dk gy	Brachiopods & bryozoa
	C	-			
	M	=			
	F	=		dk gy	
	M	-		dk gy	
	M	-			
	S	=		Brn	
	F	=		gy	
1300	F	=		gy	
	F	=		dk gy	
	F	=			
	F	=	F	gy brn	Brachio
	M	=		gy	
	C	-	F	gy	Solitary
	S	-		gy	
	C	-			
1400	M	-			
	C	-		gy	
	C	-			
	M	-	F	dk gy	rugose
	C	-		gy	
	C	-			
	C	-			
	C	-			
	C	-			
1500	F	=	F	lt gy	rugose
	C	=	F		rugose corals, syringopora
	M	-		gy	
	C	-		gy	
	C	-		gy	
	C	-			
	C	-			
1600	C	-			
	C	-			
	C	-		gy	
	C	-		lt gy	
	F	=	F	lt gy	Bryozoa
	F	-		lt gy	
	M	=		gy	
	F	=			
	M	=			
1700	M	-	F	gy	rugose corals
	F	=		lt brn	
	F	=		dk gy	
	?	=		dk gy	
1800	F	-		gy	
	M	-		gy	
	C	-		gy	
	C	-	F	gy	rugose corals
	C	-		gy	
	C	-		gy	
1900	M	-		gy	
	F	-		gy	
	C	-		gy	
	C	-			
	C	-			
	C	-			
	C	-			
		-	F		rugose corals, bryozoa

ORMATION

LIVINGSTONE FORMATION

1900							
						94	
						94	
						94	
2000					F		rugose corals, bryozoa
						94	
						94	
2100						94	
						94	
2200							
2300						94	
						94	
						94	strong fetid odor H_2S?
2400							
					F		Brachiopods
						94	
2500					F		Brachiopods, Bryozoa
2600						94	rugose corals, branche
					F		rugose corals, branche
2700					F		

WS5B

SECTION NAME Beehive Mountain CZ-1-64 B.M.
No. 166.

LOCATION 11 - 1.0 PC mi. NE 1.0 mi. WSW of Beehive Mountain

Lat. 50° 04' Long. 114° 42'

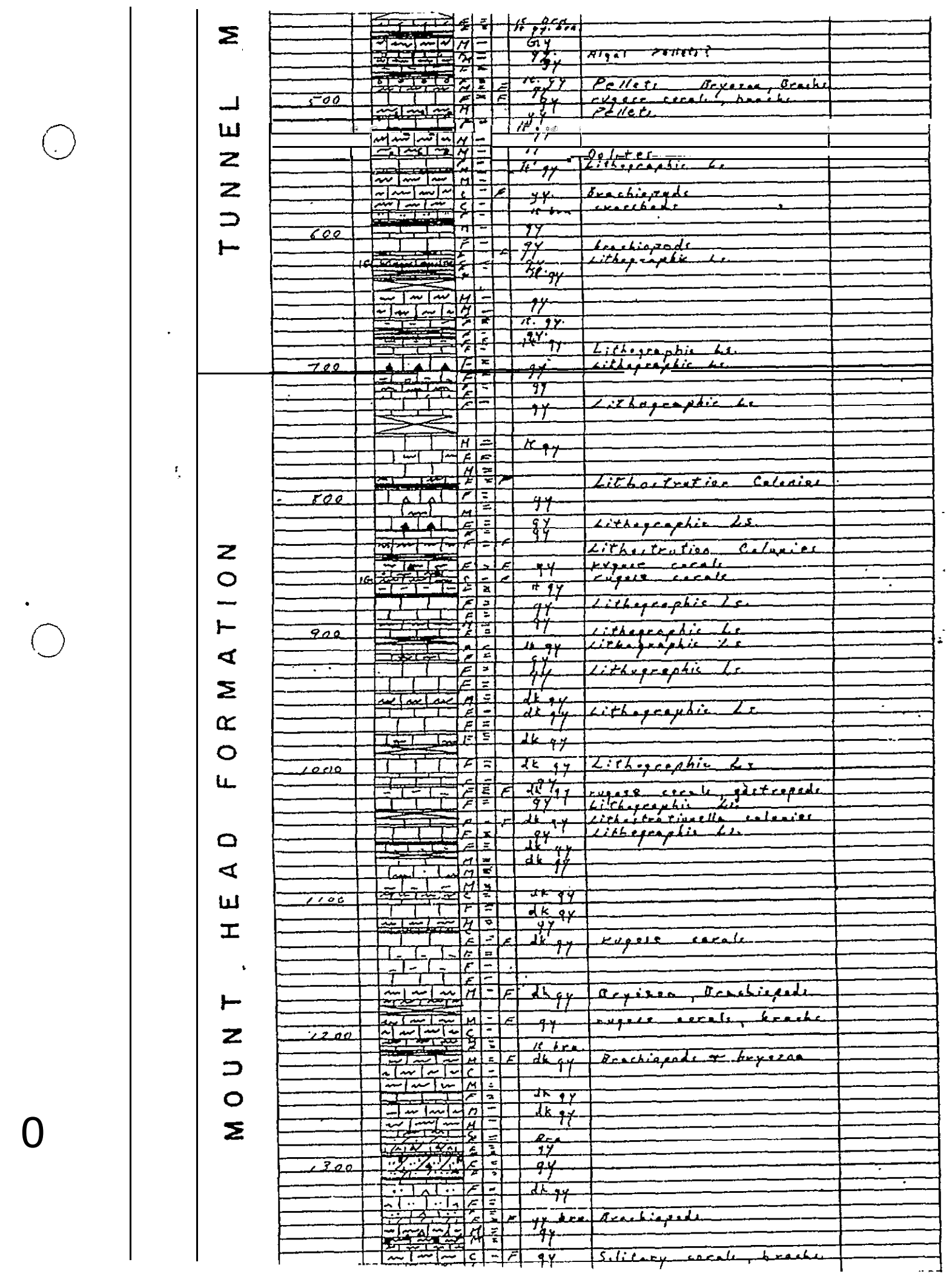
MEASURED BY R. Bray and M. Murrell

METHOD 5-foot staff Date July 19, 1964

STRIP LOG BY R. Bray

STRAT LIMITS Top of banff to base of Rocky Mountain

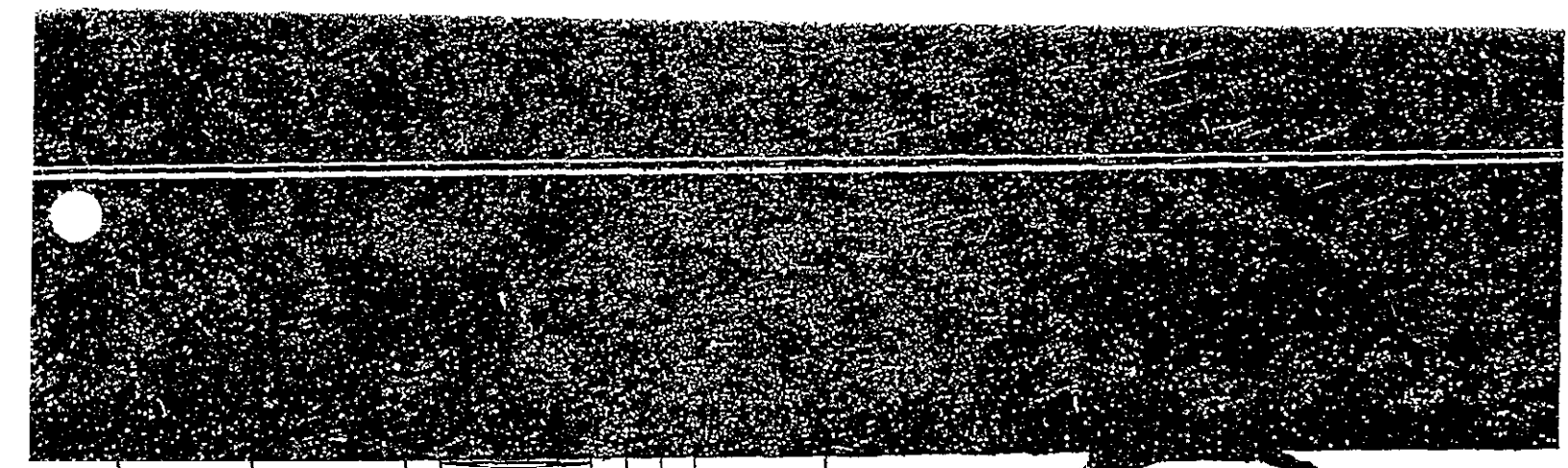
UNIT	THICKNESS	POROSITY	LITHOLOGY	TEXTURE	BEDDING	FOSSILS	COLOUR (FRESH SURFACE)	REMARKS	ENVIRONMENT (INTERPRETED)
PENNSYLVANIAN UNNEL MOUNTAIN FORMATION	? 1			F	=	F	lt. brn.	Orbiculoidea zone in grayish	
				F	=	F	brn. gy.	Brachiopod fragments	
		IV		C					
				F		F	lt. gy.	Archimedes sp.	
		IV		F			lt. gy.	Crossbedding	
				F			my.		
				F			lt. gy.		
	100			F			lt. gy.		
				F			lt. gy.		
				F			gy.		
				C			lt. gy.	Syringopora	
				M		F			
				F		F	lt. gy.	crystallid bryozoans stylolites	
	200			M			lt. gy.	Bryozoans	
				F			lt. gy.		
				F					
		IV		F			dk. gy.		
				C			dk. gy.		
				F			dk. gy.		
				M			dk. gy.		
	300			M			dk. gy.	Pellets	
				M			lt. gy.		
				M					
				F			lt. gy.	Oolites	
				M			dk. gy.		
		IV		M			lt. gy.		
	400			F			lt. gy.	Oolites	
				M					
				F			lt. gy. brn.		
				M			gy.		
				M			gy. gy.	Algal pellets?	
				M			lt. gy.	Pellets Bryozoa, Brachi	
	500			M		F	gy.	cryptocrystalline, Brachi	
				M			gy.	Pellets.	
				F			lt. gy.		
				M			gy.		
				M			gy.	Oolites	
				M			lt. gy.	Lithographic Ls	
				C		F	gy.	Brachiopods	
				C			brn.	cross-bedded	


TUNNEL M
MOUNT HEAD FORMATION
500
600
700
800
900
1000
1100
1200
1300
Algal pellets?
Pellets Bryozoa, Brachi
cygocs cecals, brache
Pellets
Oolites
Lithographic Ls
Brachiopods
cxocchaete
Brachiopods
Lithographic Ls
Lithographic Ls
Lithistrotinella calcaires
Lithographic Ls
Lithographic Ls
Lithographic Ls
Lithographic Ls
Lithographic Ls
Lithistrotinella calcaires
cygocs cecals
Lithographic Ls
Lithographic Ls
Lithographic Ls
Lithographic Ls
Lithographic Ls
cygocs cecals, gastropods
Lithographic Ls
Lithistrotinella calcaires
Lithographic Ls
cygocs cecals
Bryozoa, Brachiopods
cygocs cecals, brache
Brachiopods & bryozoa
Brachiopods
Siliceous cecals, brache

MOUNT HEAD F

		F	F	F	dk gy/gy		rugose coral, gastropods
		F	=		gy		Lithographic Ls
		P	-	F	dk gy		Lithostrotionella colonies
		F	=		gy		Lithographic Ls
		F	=		dk gy		
		M	=		dk gy		
		M	=				
1100		M	=		dk gy		
		F	=		dk gy		
		M	=		gy		
		F	=	F	dk gy		rugose coral
		F	=				
		F	-				
		F	-				
		M	-	F	dk gy		Bryozoa, Brachiopods
		M	-	F	gy		rugose coral, brache
1200		C	-				
		M	=		lt brn		
		M	=	F	dk gy		Brachiopods & bryozoa
		C	-				
		M	=				
		F	=		dk gy		
		M	-		dk gy		
		M	-				
		C	=		Brn		
		C	=		gy		
1300		C	=		gy		
		F	-		dk gy		
		F	=				
		F	=	F	gy brn		Brachiopods
		M	=		gy		
		C	-	F	gy		Solitary coral, brache
		M	-		gy		
		C	-				
1400		M	-				
		C	-		gy		
		C	-				
		C	-				
		M	-	F	dk gy		rugose coral, brache
		C	-		gy		
		C	-				
		C	-				
		C	-				
		C	=	F			rugose coral
		M	=	F			rugose coral, bryozoa
		M	-		gy		
16		C	=		gy		
		C	=		gy		
110		C	=				
		C	=				
1600	110	C	=				
	16	C	=		gy		
		C	=		lt gy		
		F	=	C	dk gy		Bryozoa
		M	=		lt gy		
		F	=		gy		
	110	M	=				
	110	F	=				
	110	C	=				
1700		M	=	F	gy		rugose coral
		C	=		lt brn		
		F	=		dk gy		
		P	=		dk gy		
1800		C	=		gy		
		M	=		gy		

NASA



B

1400

1500

1600

1700

1800

1900

lt. gy.

lt. gy.

lt. br.

m. br. gy. interbeds

lt. gy.

lt. gy. lenses of

lt. br.

lt. gy.

lt. gy br. blastoids

m. dk gy.

lt. br. quite soft

lt. gy br.

m. gy.

m. gy. br. laminated

m. br. poorly bedded, soft

lt br.

lt br.

m. gy. laminated

lt. gy.

m. gy. limonite

m. gy frag. beds are lenselike

varying from f. to cs.

lt. br. recessive

3-4' lenses of f-m. frag

m. gy.

frag. beds lenselike and

frag. size quite variable

0

0

N

a

N

MISSISSIPPIAN

NGOI-ONW FORMATION

	M		lt. gy br.		
	M				
1600	M				
	F				
	C		m. gy.		
	C				
	M		m. gy. br.	laminated	
	M				
			m. br.	poorly bedded, soft.	
			lt. br.		
1700	F		lt. br.		
	F				
	C	✓	m. gy.	laminated	
	F		lt. gy.		
	F	✓	m. gy.	limonite	
	M	✓	m. gy.	frag. beds are lenselike	
	M	✓		varying from f. to c.s.	
	M				
	F				
1800	M				
	M				
	M				
	M				
	M				
	F				
	F		lt. br.	recessive	
	M			3-4' lenses of f-m. frag.	
1900	M		m. gy.		
	M			frag. beds lenselike and	
	M			frag. size quite variable	
	M				
	M				
	M				
	M				
	M				
	M				
2000	M				
	M				
	M				
	M				
	F		lt. br.	interfingering lenses of f.	
	F	✓		frag.	
	F				
	F				
	F				
	F	✓			
2100	F				
	M	✓	lt. gy.		
	M	✓			
	M	✓			
	F	✓			
	M	✓			
	M		lt. gy.	lenses of cs frag.	
	M				
	M				
2200	M				
	M				
	M				
	F			lenses of m-cs. frag	
	F	✓			
	F				
	F	✓			
	F				
	M	✓			
2300	F		lt. gy.		
	M			interbeds of f. sl.	
	M				
	M				
	M				
	M				
	M				
	M				
	M				

LIVINGSTO

0

2300

2400

2500

2600

0

2700

2800

FORMATION

3

3000

lt. gy. interbeds of f. x l.

lt. gy. sucrosic, interbeds of m. frag

lt. gy. floating frag matrix f. x l.

lt. gy. crin. lenses

m. brgy.

ltbgy. lenses of m-cs crin. ls. 2-3' thick

lt gy interbeds of cs. frag and f. x l. ls.

cs. crin lenses

lt. br. lt gy / lt. gy cs. crin. lense.

lt. gy matrix f. x l. lenses of m-cs frag. ls

lt. br

lt. br some cs. crin. lenses

about 200' of same follow in rubbled outcrop

MEASURED BY D. CAPSTICK G. SCHNEGELSBERG

METHOD 5' STAFF STARTING IN ROCKY MTN Date JULY 19-22 /64

STRIP LOG BY G. SCHNEGELSBERG

STRAT LIMITS BANFF TO ROCKY MTN.

British American Oil Company Limited
Calgary, Alberta

STRATIGRAPHIC STRIP LOGS

UNIT	THICKNESS	POROSITY	LITHOLOGY	TEXTURE	BEDDING	FOSSILS	COLOUR (FRESH SURFACE)	REMARKS
TUNNEL MOUNTAIN FORMATION				F			lt. gy.	some 6" beds of cs. frag.
				F			dk. gy.	
				F			lt br. gy.	
				F			lt. br. gy.	minor stringers of silic. Ls.
				M		✓	m. gy.	brach frags.
				F		✓	lt. gy. br.	bryozoans
				F		✓	dk. gy.	bryozoans
				F				
	100			F			m. gy.	
				F		✓		
				F		✓	lt. br. gy.	qtz. vugs
				C			lt. gy.	syringopore
				C			m. gy.	lenses of cs. frag.
				F				
				F		✓		thin bed of brachs.
				C			m-dk. gy.	brownish interbeds of f. xl.
				C				
	200			F			m-dk. gy.	
				F				
				F		✓		
				F				
				F			lt. gy.	lense of cs. xl. Ls. porous
		qv		C		✓	lt. gy.	lense-like crin beds.
				C			lt. gy.	
				F			lt. gy.	
	300			F		✓	m. br.	
				M		✓	lt. gy.	lithostration, horncorals
				M		✓		
				F		✓	m. gy.	lithostration, some cs. frag lenses
				F		✓		
				F			gy. br.	
				M			m. gy.	
				M				
				F		✓		
				F		✓	m. gy.	
	400			C		✓		
				F			dk. gy.	
				M				
				M			lt. gy.	some interbeds of recessive Ls.
				M				
				F			m. gy.	
				F				
				M		✓		crinoidal
				F				
				M		✓	lt. gy.	leached porosity
	500			F		✓	m. gy.	corals
				F		✓		
				M		✓	lt. gy	
				F		✓	lt. gy.	
				F		✓		
				F		✓	m. gy.	
				F		✓	lt. gy.	v.f. lam.
				F			lt. gy.	

TUNN

MOUNT HEAD FORMATION

			M	=	✓			crinoidal	
			F	≅					
			M	=	✓	lt. gy.		leached porosity	
500			F	=	✓	m. gy.		corals	
			F	–	✓				
			M	=	✓	lt. gy			
			F	–	✓	lt. gy.			
			F	=	✓				
			F	=	✓	m. gy			
			F	=		lt. gy		v.f. lam.	
			F	=		lt. gy.			
			F		✓	m. gy		thin bed of brachs	
			F	=		m. gy			
600			M	=	✓				
			F	≅		lt. br. gy			
			F	=	✓	lt. gy.		silicified corals	
			F	=	✓				
			F	=		lt. gy.		brecciated, rusty weath.	
			M	=	✓	lt. gy. gr.			
			F	=		lt. gy. br.			
				=					
			F	=		lt. br.		lithographic	
700			F	=					
			M	=	✓				
			F	=	✓				
				=		lt. br.			
			M	=		m. gy. br.		lime mud matrix	
			M	=					
			F	=					
			F	=	✓	dk. gy.			
			M	=					
			M	=		m. gy			
800			M	=					
			F	=	✓			qtz filled vugs	
			F	–	✓	dk. gy.		conchoidal fractures	
			F	=	✓				
			M	=	✓				
			C	=	✓	m. gy.		solitary corals common	
			M	=	✓				
			M	=	✓				
			C	=	✓				
			M	=	✓				
900			M	=	✓				
			F	=		m br.			
			F	=					
			F	=	✓	lt. br			
			F	=	✓				
			F	=	✓				
			F	=	✓				
			F	=	✓				
			F	=		dk. gy			
			M	=		m. gy			
1000			F	=		dk. gy			
			M	=		m. gy			
			F	=		dk gy			
			M	=		m. gy			
			F	=		dk. gy			
			M	=		m. gy			
			F	=		dk. gy			
			F	=		m. gy. br			
			F	=					
			F	=					
1100			M	=		dk. gy.			
			F	=					
			F	=		lt. br.			
			F	=		dk. gy.		lense of cs. frag. + shale	
			F	=		dk. gy			
			F	=					
			F	=					
			F	=					
			F	=		m. gy.			
1200			F	=		br. gy			
			C	=	✓	gy. gy. br.			
			F	=	✓	lt. br.		this unit displays rythmic layering	
			M	=					
			F	=					
			F	=					
			M	=					

M

		F	=			m gy.	
1200		F	=			br. gy.	
		C	=	✓		gy. br.	
		F	=	✓		lt. br.	this unit displays rythmic layering
		M	=				
		F	≡				
		F	≡				
		M	=				
		F	≡				
		F	=	✓		m br.	syringopora
		F	-	✓			
1300		F	=			m. br.	
		M	=	✓			
		F	=				
		M	-	✓		m. gy. br.	
		F	-				
		F	-				
		M	-			lt. gy.	
1400		C	=	✓		lt gy.	
		M	=	✓			
		C	=	✓			
		C	=	✓			
		F	=			lt. br.	
		C	-	✓		m. br. gy.	interbeds of thin clolo. bands
		F	=			lt. gy.	
1500		C	-			lt. gy.	lenses of porosity
		F	=			lt. br.	
		M				lt. gy.	
		M	-	✓		lt. gy. br.	blastoids
		F	=				
		M	-	✓		m. dk. gy.	
		F				lt. br.	quite soft
		M	-			lt. gy. br.	
		M	-				
1600		M	-				
		F	-				
		C	-			m. gy.	
		C	-				
		M	=			m. gy. or.	laminated
		M	=				
		F	~			m. br.	poorly bedded, soft
						lt. br.	
1700		F	=			lt br.	
		F	=				
		C	=	✓		m. gy.	laminated
		F	=			lt. gy.	
		F	=	✓		m. gy.	limonite
			=				
		M	-	✓		m. gy.	frag. beds are lenselike
		M	-	✓			varying from f to c s
		M	-				
		F	-				
1800		M	-				
		M	-				
		M	-				
		M	-				
		M	-				
		F	=				
		F	=			lt. br.	recessive
		M	=				3-4' lenses of f-m. frag
		M	=				
1700		M	-			m. gy.	
	a	M	-				frag. beds lenselike and
		M	-				frag. size quite variable
		M	-				
	b	M	-				
		M	-				

MOUN

IPPIAN

)RMATIÓN

B

			F	=		gy	40% gy	
			F	=			and dk	
			F	=		dk gy		
			F	=		gy	Mostly gy	
			F	=		dk gy	gy shale	
			H	=	F	dk gy	Lycingaf	
1300			C	=	F	gy	Lithocrest	
			H	=	F	gy	rugose	
			C	=				
			C	=		gy		
			C	=				
			C	=		lt. gy	lt. chert	
			C	=		gy	lt. spring	
			C	=	F	gy	rugose ...	
			C	=				
			C	=			white sh	
1400			C	=		gy		
			C	=		lt. gy		
			C	=		gy	Lolean tired rugose and	
			C	=			recep bands	
			C	=				
			C	=				
	IIX		C	=				
			C	=				
			C	=		lt. gy		
			C	=				
1500			M	=	F	dk gy lt. brn	rugose corals	
			M	=				
	VGR		C	=		gy	Pacific cane leaves set	
			H	=		gy		
	IV		C	=				
	IV		C	=		gy		
	IV		C	=				
			C	=				
			C	=				
1600			M	=		dk gy	blk chert bands + nodules	
			C	=				
			C	=	F	gy	Bryozoa, scattered siliceous nodules	
			C	=				
			M	=	F	gy	rugose corals	
			F	=				
			M	=		gy lt. brn		
			M	=				
			M	=		dk gy	siliceous nodules	
1700			C	=				
			M	=		lt. brn gy	chert and siliceous nod.	
			C	=		gy		
	IIV		F	=		gy		
	IG		C	=		gy		
			C	=				
	IIIG		C	=		gy		
			M	=				
			M	=				
			C	=				
	IV		M	=		gy		
			F	=		gy		
1800	IG		F	=	F	gy	Bitumen occurs in patches	
	IIG		H	=			Bryozoa	
	IIA		F	=				
	H		F	=		lt. gy		
			C	=				
	IIG		C	=		gy		
	IIV		C	=				
	IIG		C	=				
	IIIV		C	=				
1900	IIG		C	=				
	IIIV		C	=				
	IIG		C	=				
	IIIV		C	=				
	IIG		C	=		gy to lt. brn		
	IIIV		C	=				
	IIG		F	=				
			F	=			rugose corals	

LIVINGSTONE FORMATI

1900

2000

2100

2200

2300

2400

2500

gy to lt brn.

rugose coral

gy

Bryozoa

scattered brachiopods

lt gy

gy

Pyrite nodules

lt. brn chert nodules + stringers

Bryozoa

small siliceous nodules

chert nodules

gy

gy

gy

gy

chert nodules

cover of coarse frag. chert nodules

gy

gy

gy

lt. chert nodules + bands

WS5B

CZ-1-64 BC-1

SECTION NAME B n Creek (1) **No.** viii

LOCATION Ridge North of head waters f
Creek

Lat 50° 02' Long. 115° 00'

MEASURED BY R. Bray and M. Murrell

METHOD 5-foot staff Date July 28, 1964

STRIP LOG BY R Bray

STRAT LIMITS Base of Mount Head to base of Rocky Mountain

UNIT	THICKNESS	POROSITY	LITHOLOGY	TEXTURE	BEDDING	FOSSILS	COLOUR (FRESH SURFACE)	REMARKS	ENVIRONMENT (INTERPRETED)
PENNSYLVANIAN WL MOUNTAIN FORMATION	0 100 200 300 400 500			F	=	F	lt. brn	Orbiculoidea	
				F	=		lt brn		
				M	=	F	dk gy	Brachs, rugose corals	
				C	=		dk gy. lt brn.	Lithostrotionella	
				M	=	F	dk gy	Brachiopods	
				C	=		lt brn		
				M	=	F	lt gy	Brachiopods	
				M	=				
				C	=				
				C	=	F	dk gy	Brachiopods	
				C	=				
				C	=		lt. brn		
				M	=	F	gy	Brachs, rugose corals	
				F	=	F	m. gy brn.	Brachiopods	
				M	=				
				C	=	C	gy gy	Lithostrotion and fistulipora colonies	
				C	=				

W a

MISSISSIPPIAN FORMATION

TENNESSEE MOUNTAIN 3

				M	=				
				M	–	F	dk gy	Brachiopods	
			15	C			lt gy brn		
				M	–	F	lt gy	Brachiopods	
				M	–				
400				C	–				
				C	–	F	dk gy	Brachiopods	
				C	–				
				C	–		lt. brn		
				M	=	F	gy	Brachs, rugose corals	
				F	=				
				M	=	F	m. gy brn.	Brachiopods	
				M	=		gy		
				C	–	F	gy gy	Lithostrotion and Lithostrotionella colonies	
500				C	–				
				M	–		gy		
				M	–		dk gy		
				C	–		dk gy		
				C	–				
				A	=		dk. gy.		
				C	–	F	gy gy	rugose corals	
				C	–				
				C	–				
600				F	–	F	dk gy	Brachiopods (Spiriferids)	
				M	–				
				M	=				
				C	–				
				C	=				
				F	–				
				C	–				
				C	–				
-?				C	–				
700				C	=	F	dk gy	Brachiopods	
				C	=		dk gy		
				C	=	F	dk gy	Brachiopods	
				C	=		lt. brn.		
				M	=	F	dk gy	Brachiopods	
				F	=				
				F	=	F	dk gy	Productid Brachiopods	
				F	=				
				F	=				
800				M			dk gy	Crossbeds	
				F	=	F	dk gy	Brachiopods	
				F	=				
				F	=				
				F	=	F	lt. brn	Productid Brachiopods	
				F	=				
				M	=	F	dk gy.	Productid Brachiopods	
				M	=		dk. gy.		
				F	=		lt gy.		
900				F	=	F	gy	Brachiopods	
				M	=	F	dk gy	Brachiopods, bryozoa	
				M	=				
				C	=				
				M	=				
				M	=	F	dk gy.	Lithostrotionella	
				F	=		lt. gy.	Crossbeds	
				M	=	F	gy	Bryozoa	
				F	=				
1000				F	=				
				F	=	F	dk gy.	Brachiopods, Bryozoa	
				F	=				
				F	=	F	gy	Brachiopods, Bryozoa	
				F	=		lt. brn.		
				M	–		dk gy		
				C	–		gy		
				C	–				
1100				F	–		dk gy		
				M	–	F	dk gy	rugose corals	
				C	–				
				C	=				
				M	=	F	dk gy.	Spiriferid Brachiopods	
				C	–		dk gy		
				C	–	F	dk gy	rugose corals, Brachs	
				C	–				
				C	–				
				C	–				
1200				C	–	F		lithostration, Syringopora	
				C	–				
				C	–				
				F	=	F	lt. gy	Brachiopods, Bryozoa	
				F	=				
				M	=	F	dk gy	lithostration	
				M	=	F	dk gy	lithostration	
				C	–				
				C	–		gy		

Z

MISSISSIPPIAN

MOUNT HEAD FORMATION

325 FWT EXPOSED)

1000

1100

1200

1300

1400

1500

1600

1700

1800

lt. gy. Crossbeds

gy Bryozoa

dk gy Brachiopods, Bryozoa

gy Brachiopods, Bryozoa

lt. brn.

dk gy

gy

dk gy rugose corals

brn

dk gy spiriferid Brachiopods

dk gy rugose corals, Brachs

lithostration, Syringopora

lt. gy Brachiopods, Bryozoa

dk gy lithostration

dk gy lithostration

gy

dk gy Lithographic Ls

gy

dk gy

gy

dk gy

gy

lt. brn.

dk gy

gy Brachs rugose corals

Productid Brachiopods

dk gy lithographic Ls. Calcisphere

dk gy

dk gy

dk gy

dk gy

dk gy Lithographic Ls

dk gy

dk gy

gy rugose corals

dk gy rugose corals

dk gy

lt. gy

dk gy Brachs, lithostration colonies

rugose corals

dk gy

dk gy rugose corals

dk gy rugose corals

dk gy rugose corals

dk gy rugose corals

dk gy rugose corals

WS58

CZ-1-64/BC-3

SECTION NAME BOLVIN CREEK (3) No. X

LOCATION A RIDGE NORTH OF THE HEADWATERS OF BOLVIN CREEK LAT 50° 02' N LONG 115° 00' W

MEASURED BY O. LOCKIE D. CAPSTICK

METHOD 5' STAFF Date AUG 3 1964

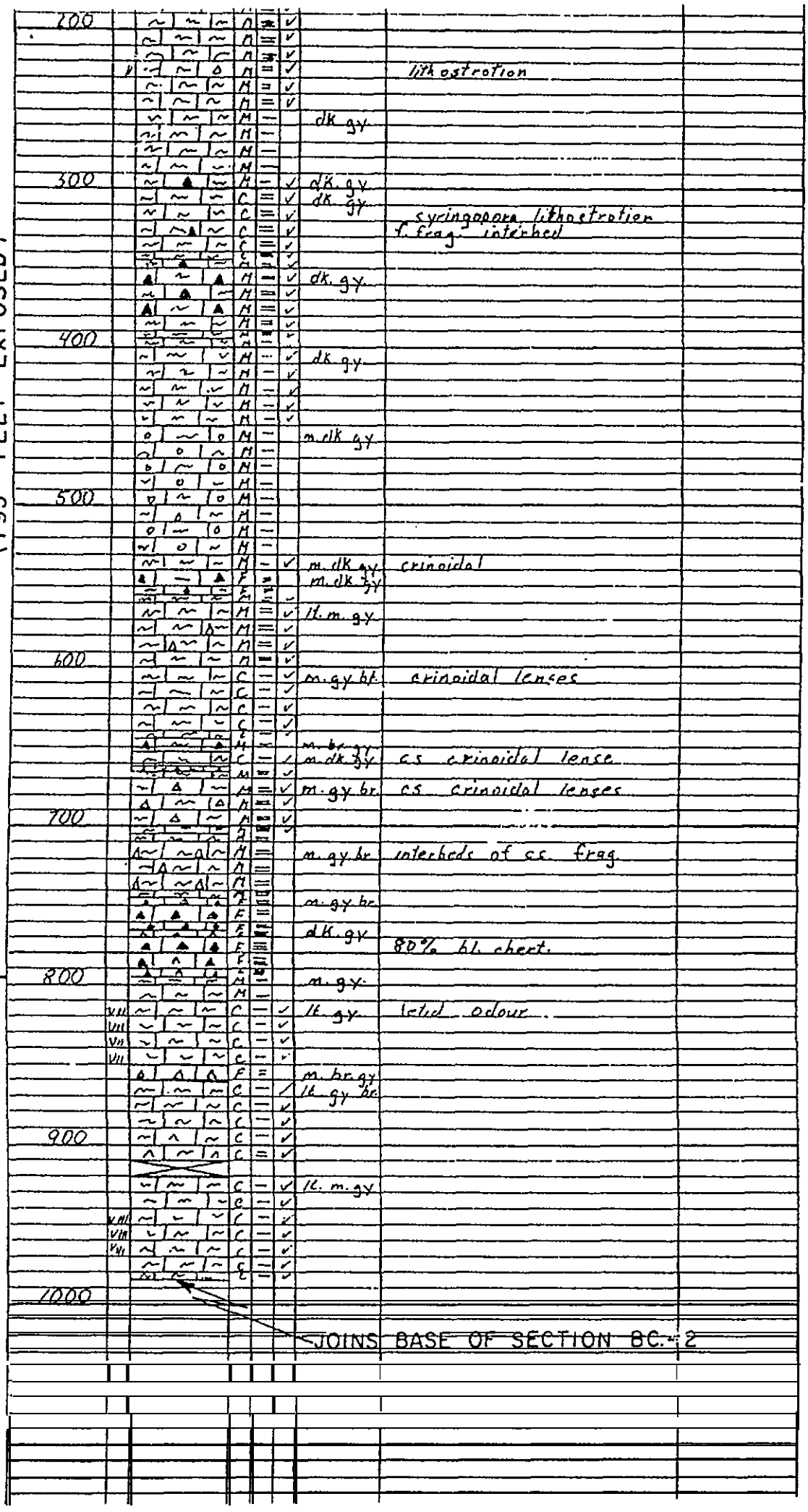
STRIP LOG BY G. SCHNEGELSBERG

STRAT LIMITS MT. HEAD

UNIT	THICKNESS	POROSITY	LITHOLOGY	TEXTURE	BEDDING	FOSSILS	COLOUR (FRESH SURFACE)	REMARKS	ENVIRONMENT (INTERPRETED)
MT. HEAD FORMATION (795 FEET EXPOSED)							dk. gy.		
	100							LITHOSTROTIONELLA	
								SYRINGOPORA	
							dk. gy m. gy. dk gy-bl.		
	200							lithostrotion	
							dk. gy		
	300						dk. gy dk. gy	syringopora lithostrotion f. frag. interbed	
							dk. gy.		
	400						dk. gy.		
							m dk. gy		
	500						m dk. gy	crinoidal	

MISSISSIPPIAN

NGSTONE FORMATION | MOUNT HEAD FORMATION (795 FEET EXPOSED)



WS56

SECTION NAME BOIVIN CREEK (2) — C Z -I-L 4/BC-2 No. ix

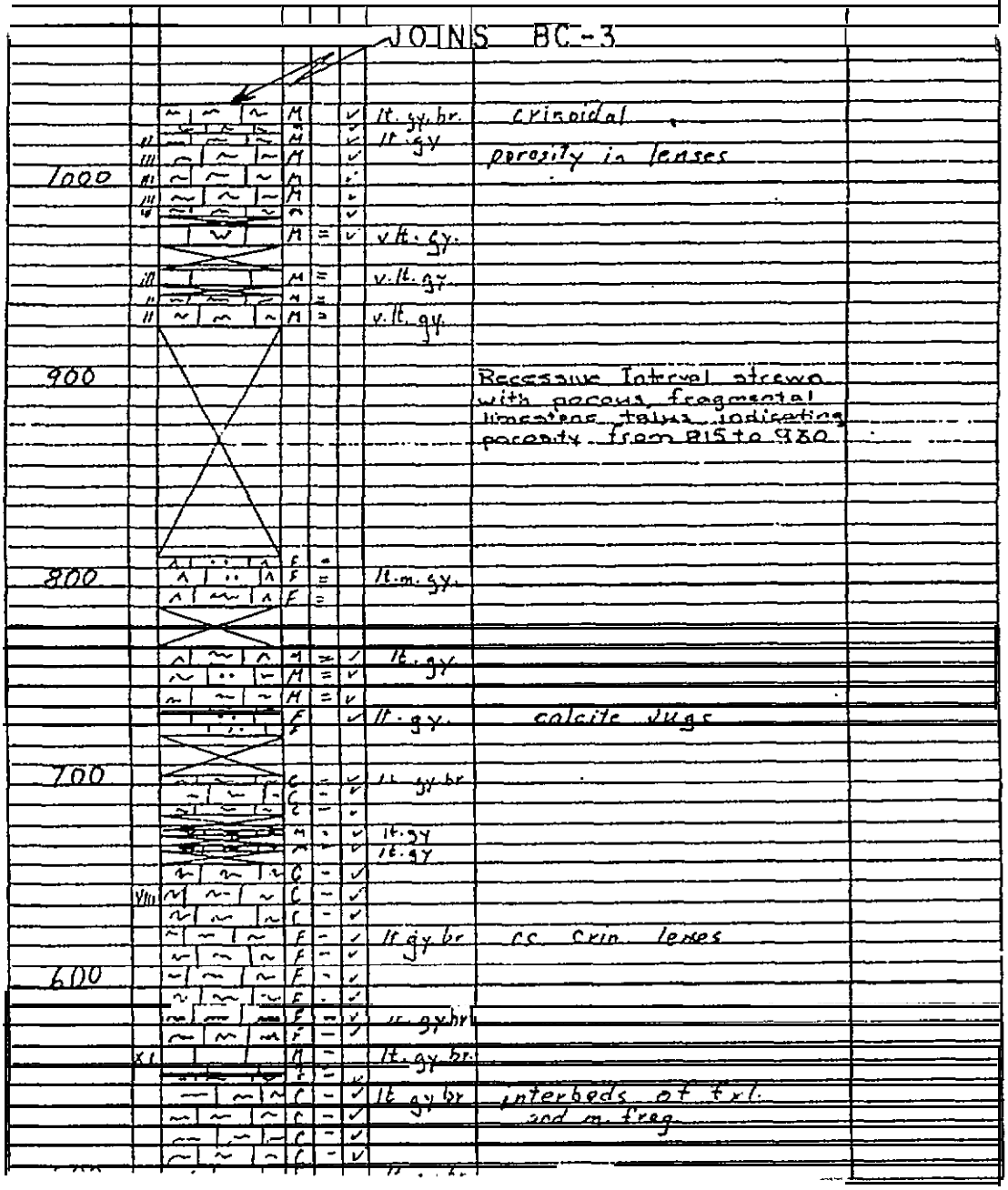
LOCATION A RIDGE NORTH OF THE HEADWATERS OF BOIVIN CREEK
LAT 50° 02' N LONG 115° 00' W

MEASURED BY D. LOCKIE D. CAPSTICK

METHOD 5' STAFF Date AUG 2 1964

STRIP LOG BY G. SCHNEGELSBERG

STRAT LIMITS LIVINGSTONE



UNIT	THICKNESS	POROSITY	LITHOLOGY	TEXTURE	BEDDING	FOSSILS	COLOUR (FRESH SURFACE)	REMARKS	ENVIRONMENT (INTERPRETED)

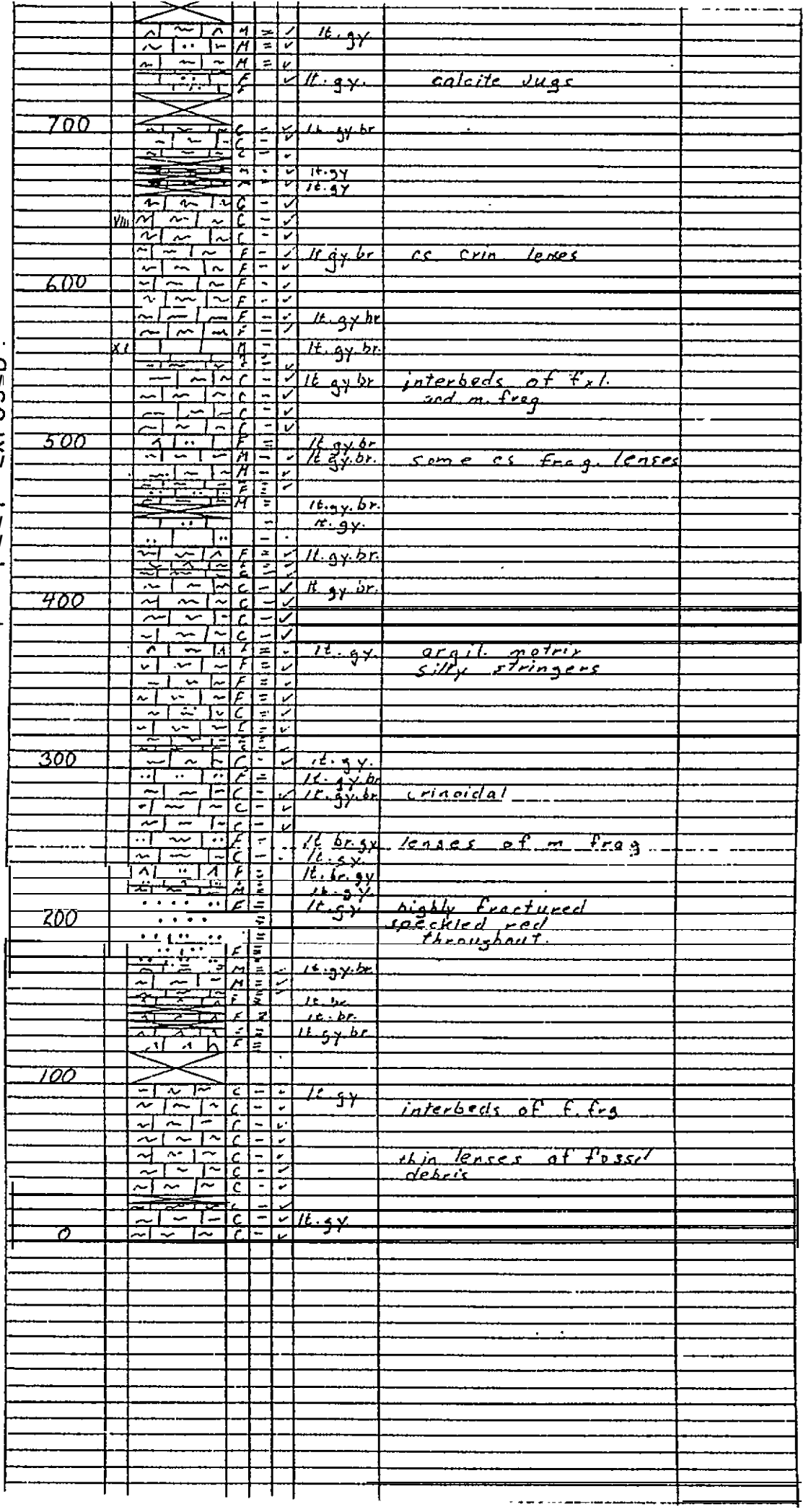
FORMATION (EXPOSED)

MISSISSIPPIAN

FORMATION

LIVINGSTON, WV.

040 FWT WXPOSSD.



MISSISSIPPIAN

LIVINGSTONE FORMATION

1200

1300

1400

1500

1600

1700

1800

1900

m. gy.

m. br.

lt. gy.

lt. m. gy.

m. gy. br.

lt. gy.

lt. gy. br.

lt. gy.

lt. gy.

lt. gy. br.

m. br.

recessive, rusty, some sand. crse. lenses

Crinoidal

crin

Crinoi

coral

cross

CS

extremely cs. crin. some f. laminated sparry calcite matrix

minor interbeds of

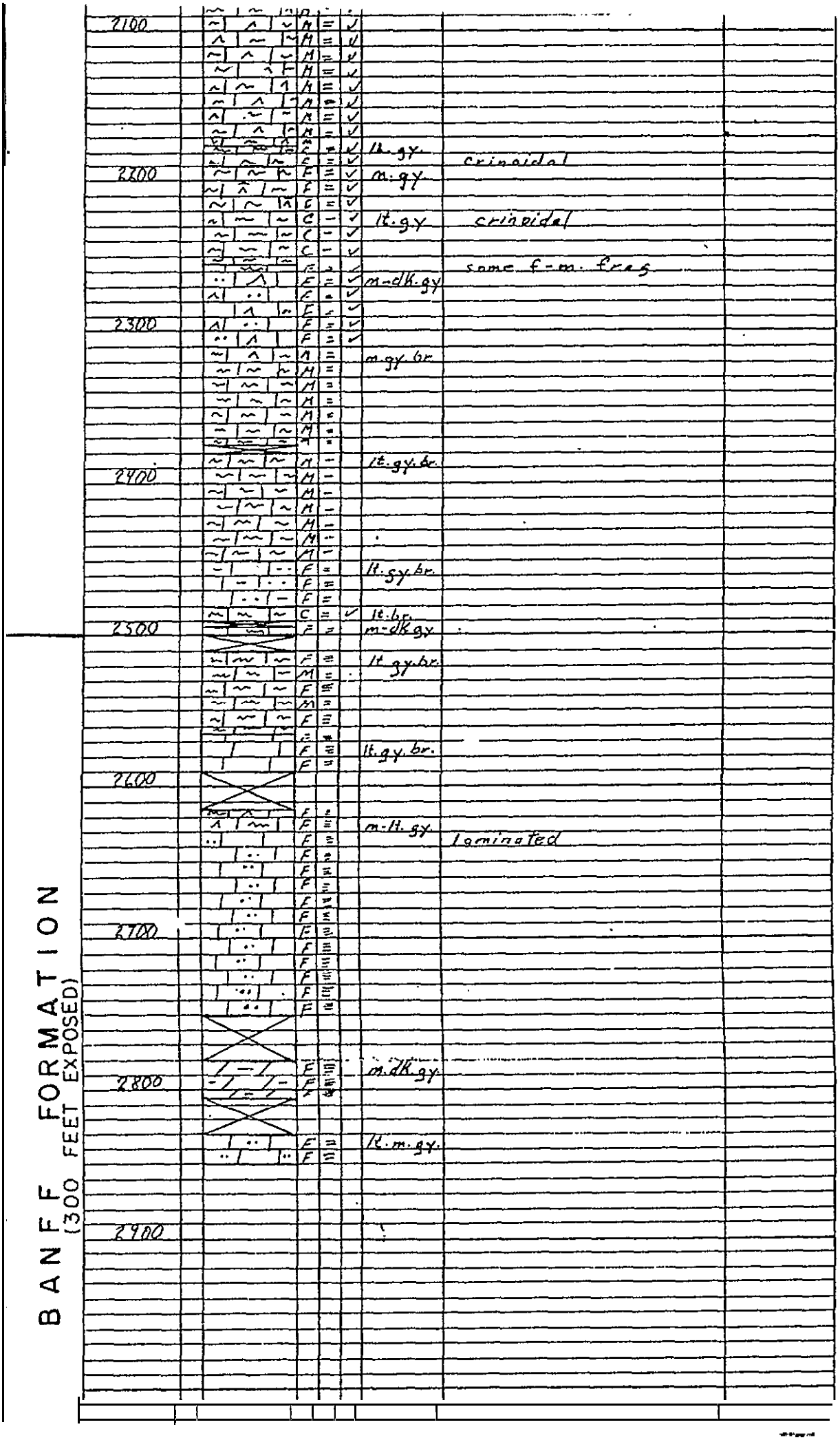
B 2

FORMATION

MISSISSIPPIAN

LIVINGSTONE

1400						m.gy.bn	
						lt.gy.	crinoi. coral recrys. cs.
						lt.gy.br. lt.gy	
1500							
1600							
1700							
1800							
						lt.gy br.	extremely cs. crin. some f. laminated sparry calcite matrix
1900						m. br.	minor interbeds of cs crin.
2000							
						lt.gy.	interbeds of f cs. crin.
2100							
						lt. gy.	crinoidal
2200						m. gy.	
						lt. gy	crinoidal
						m-dk. gy	some f-m. frags
2300							


BANFF FORMATION
(300 FEET EXPOSED)
2100
2200
2300
2400
2500
2600
2700
2800
2900
lt. gy.
crinoidal
m. gy.
lt. gy
crinoidal
some f-m. frags
m-dk. gy
m. gy. br.
lt. gy. br.
lt. gy. br.
m-dk gy
lt gy br.
lt. gy. br.
m-H. gy.
laminated
m. dk. gy.
R. m. gy.

B

W330

CZ-1-64 / F.S. No. vii

SECTION NAME FORSYTH CREEK

LOCATION ON THE NORTH SIDE OF A PASS AT THE HEADWATERS OF BINGAY CREEK; 10 MILES WEST OF BRITT CK. RANGER STATION

LAT 50°13' N LONG 115° 08' W

MEASURED BY D. CAPSTICK G. SCHNEGELSBERG M. MURRELL

METHOD 5' STICK, BRUNTON; 100' TAPE Date AUG 11-14 / 1964

STRIP LOG BY G. SCHNEGELSBERG

STRAT LIMITS BANFF TO MOUNT HEAD

UNIT	THICKNESS	POROSITY	LITHOLOGY	TEXTURE	BEDDING	FOSSILS	COLOUR (FRESH SURFACE)	REMARKS	ENVIRONMENT (INTERPRETED)
MT. HEAD FM (150 FT EXPOSED)				F		✓	dk. gy.	Some F. frag.	
				M		✓			
				M		✓			
				M		✓	dk. gy	Some CS. frag.	
				M		✓			
				M		✓			
	100			M		✓			
				M		✓			
				F		✓	dKgy. bl.	heavily fractured, calcite infilled	
				F					
		III		M			m. gy.		
				M					
				M					
	200			M					
				M					
				M					
				F					
				M					
				M				lenses of frag ls.	
				M					
				M					
	300			M					
				M					
				M					
				M					
				M					
				M					
		II		M		✓			
				M		✓			
	400	III		M		✓		porosity in lenses	
		III		M		✓			
				M			m. gy		

MT. [illegible]
(150 FT

100

dKgy. bl. — heavily fractured, calcite infilled

m. gy.

200

lenses of frag ls.

300

porosity in lenses

400

m. gy.

porosity in lenses
fetid odour

500

strong indications of good porosity in covered interval

m. gy.

600

fetid odour
porosity in lenses

700

m. gy.

FETID ODOUR
POROSITY IN LENSES

lt. gy. buff

800

sucrosic, recessive

cs. crin. lenses

lt. gy.

some m. xl. interbeds

m. gy.

900

lt. gy.

lt. tan.
lt. gy.

traces of intrafrag. porosity

1000

MISSISSIPPIAN

FORMATION

STONE

1000

1100

1200

1300

1400

1500

1600

1700

lt. gy.

lt. tan.
lc. gy.

traces of intercryst. porosity.

m. gy.

rusty, some calcareous siltstone

lt. gy

chalky

rotted odour

lt. gy

lt. gy.
lt. brn gy.

recessive, rusty, some sand size lenses

lt. gy

crinoidal

lt. gy.

crinoidal

lt. m gy.

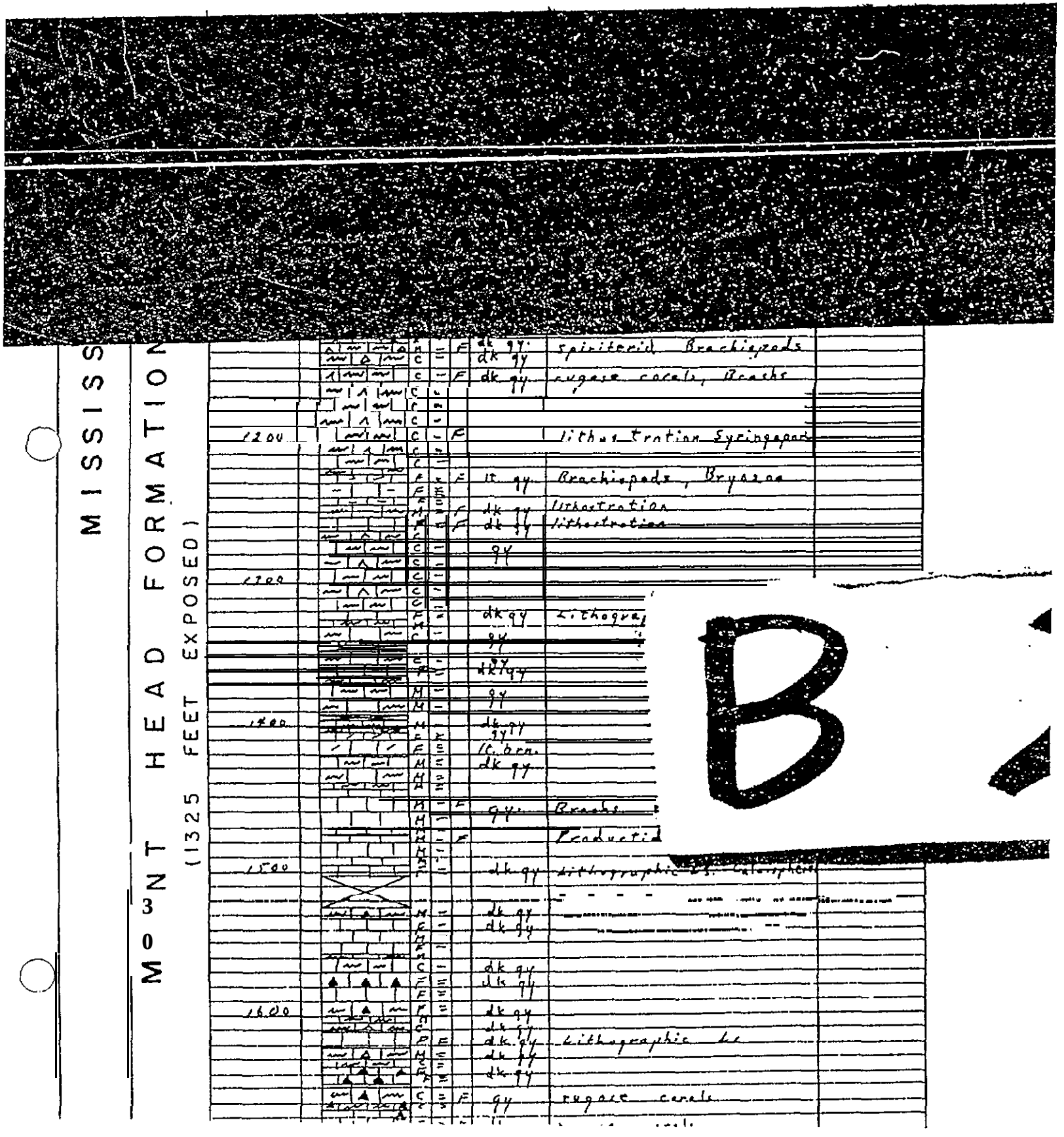
m. gy. brn

lt. gy.

crinoids, brachs, bryozoans, corals

lt. gy brn.
lt. gy

recessive
cs. crin.


MISSISSIPPIAN
MONT HEAD FORMATION
(1325 FEET EXPOSED)
1200
1300
1400
1500
1600
dk gy
spiriferid Brachiopods
rugose corals, Bryozoa
lithostrotion Syringopora
Brachiopods, Bryozoa
lithostrotion
lithostrotion
gy
lithograp
dk gy
gy
dk gy
gy
lt. brn.
dk gy
gy.
Bryozoa
Productid
dk gy
dk gy
dk gy
dk gy
dk gy
dk gy
dk gy
Lithographic Ls
gy
rugose corals

MOUNT HEAD FOR

(1325 FEET EXPOSED

B

1200 — gy

1400 — dk gy gy — lt. brn. dk gy

Reworked

Reworked

1500 — dk gy — lithographic b.s. Calcisphere

dk gy

dk gy

dk gy

dk gy

1600 — dk gy

dk gy

dk gy — Lithographic bs

dk gy

dk gy

gy — rugose corals

dk gy — rugose corals

1700 — dk gy — Reworked, lithostrotion colonies

gy — rugose corals

dk gy

dk gy — rugose corals

rugose corals

1800 — dk gy — rugose corals

dk gy — rugose corals

dk gy — rugose corals

dk gy — rugose corals

dk gy

1900 — dk gy — rugose corals

gy

dk gy — rugose corals

dk gy

dk gy

2000 — dk gy — rugose corals, brachs

dk gy — rugose corals

WSSS

CZ-1-64/C.C.
No. V

SECTION NAME CUMMINGS CREEK

LOCATION A RIDGE NORTH OF THE HEADWATERS OF CUMMINGS CREEK

LAT 49° 50' 30" N LONG 115° 03' W

MEASURED BY D. CAPSTICK G. SCHNEGELSBERG

METHOD 5' STAFF Date JULY 23 - 28 / 1964

STRIP LOG BY G. SCHNEGELSBERG

STRAT LIMITS MT. HEAD - LIVINGSTONE

UNIT	THICKNESS	POROSITY	LITHOLOGY	TEXTURE	BEDDING	FOSSILS	COLOUR (FRESH SURFACE)	REMARKS	ENVIRONMENT (INTERPRETED)
MT HEAD FORMATION (860 FEET EXPOSED)				M			m.gy.	calcite infilled fractures	
				M					
				F			m.gy.	calcite infilled fractures	
				F					
				F					
				F					
				F					
	100			F					
				C					
				C			m-dk gy		
				C					
				F			m gy		
				F				litho station	
				F					
				F					
				F					
	200			M			dk gy		
				F					
				M			lt. gy		
				F					
				M			lt gy	scattered corals	
				M					
				M					
				M					
				F			dk gy	crinoid debris	
	300			F					
				F					
				F					
				F					
				F			m.gy.br.	lenses of m. frag horn corals	
				F					
				F					
				M			m.gy.br.		
				M			m.br.gy	horn corals	
	400			M					
				M					
				C			m-dk gy	crinoids	
				C					
				M			m-dk gy	interbeds of f. xl. ls.	
				M					
				M					
				M					
				M					
	500			M					
				F			dk gy		
				F					
				C					
				F			m.br.		
				M			dk gy	breaks corals	
				M					
				M					

MISSISSIPPIAN

MOUNT HE

(OWW FE

500

600

700

800

900

1000

1100

1200

1300

dk. gy.

m. br.

dk. gy.

brach's. corals

hexa corals

m. dk. gy.

dk. gy.

corals

lt. gy.

lithostrotion bed

dk. gy.

lithostrotion, fetid odour

dk. gy.

v. cs. frag lenses

lt. gy. br.

lenses of cs. frag

m. gy. br.

m. gy. br.

lense of lithostrotion

m. gy.

calcite in filled fractures
zones of cs. frag.

lt-m. gy.

dk. gy. br.

recessive

lt. br.

lt-m. gy.

lt-m. gy.

m. gy.

lenses of cs. crin

slickensides

dk. gy.

m. gy.

lt. m. gy.

2' band of calc. clods.

lt. gy.

scattered lenses of cs frag

lt. gy.

lt. m. gy.

3' dol. lense

MISSISSIP

FORMATIO

LIVINGSTONE

(1710 FWT WXPSWD

1200

1300

1400

1500

1600

1700

1800

dk. gy.

m. gy

lt. m. gy

lt. gy

scattered lenses of cc frag

lt. gy.

lt. m. gy

3' ong. lense

m. gy br.

lt gy

lt. m. gy

lenses of m. frag

lt gy

lt. gy.

m. gy. br.

lt gy

lt. gy-br

m gy

lt. gy br.

lt. gy-br

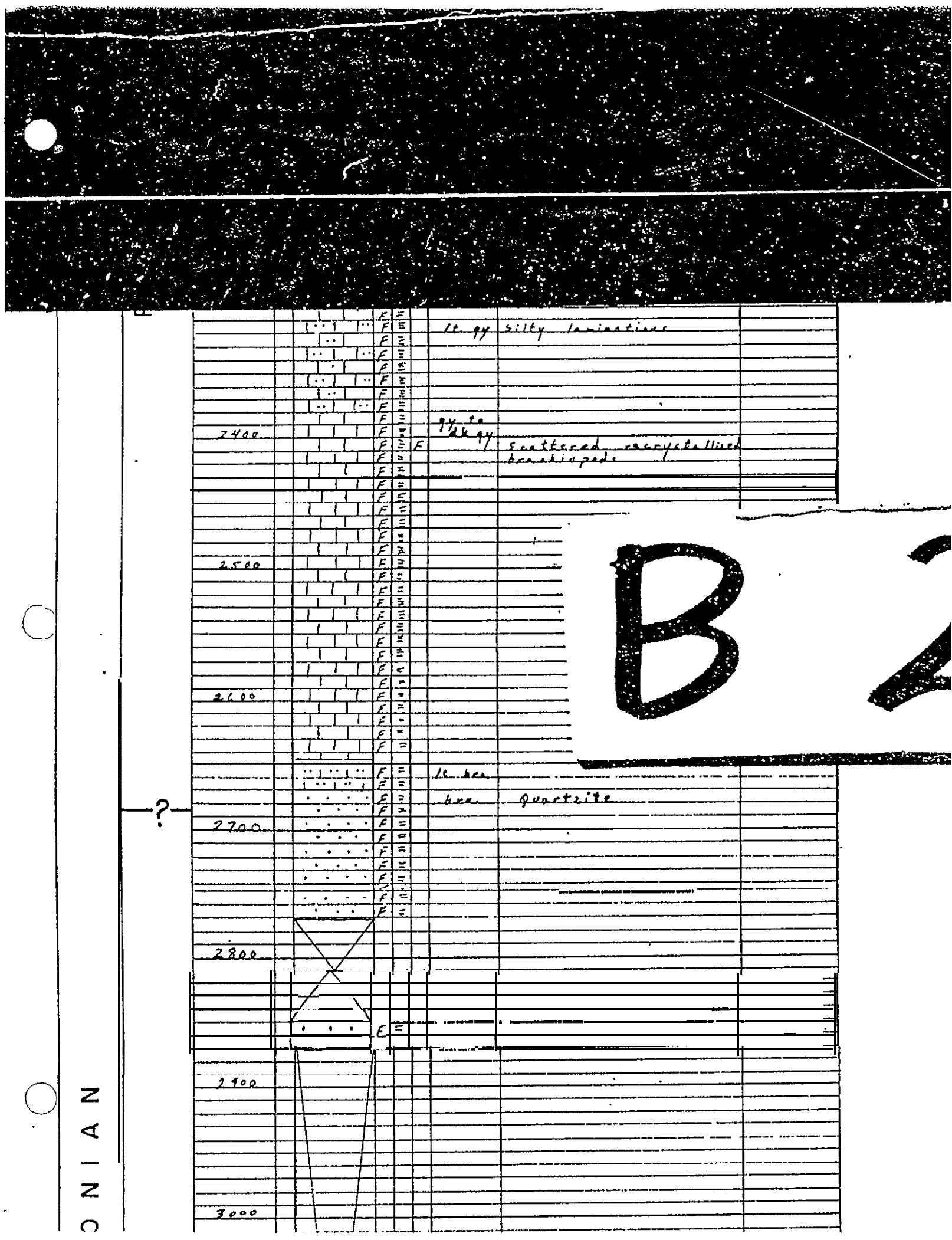
lt gy

lt. gy

lt. gy

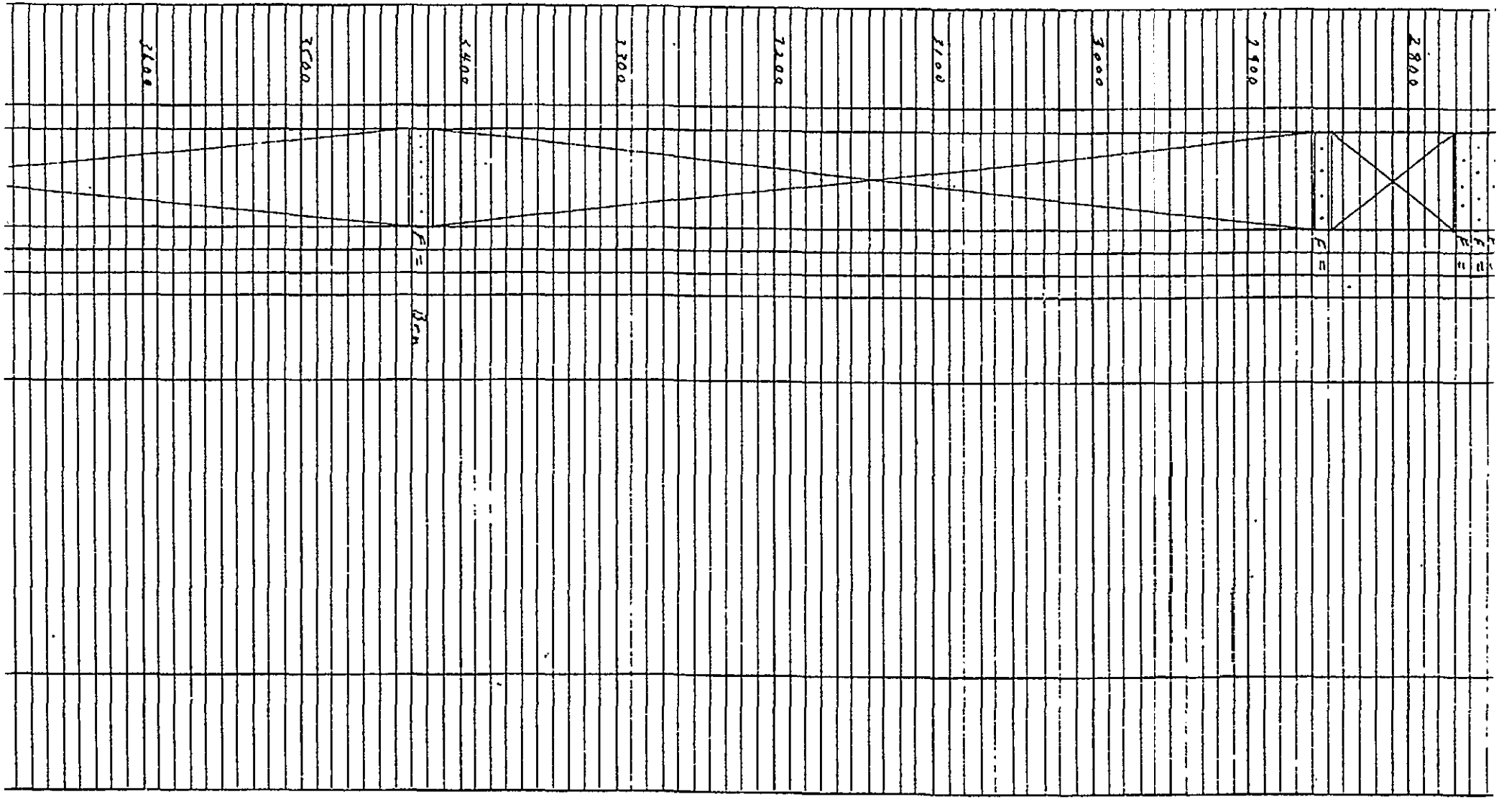
lt. gy

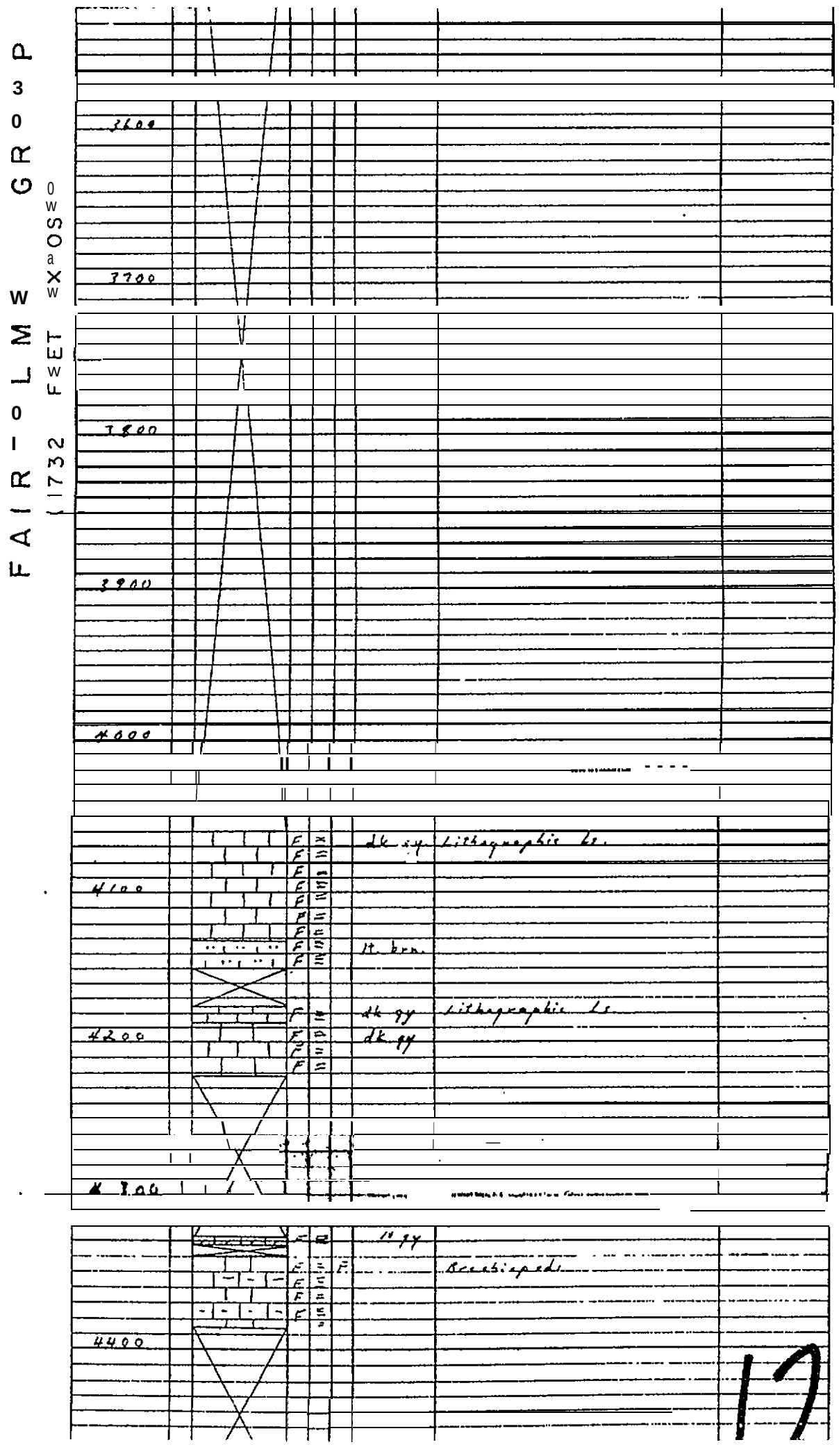
crinoids


lt. gy silty laminations
gy to dk gy
scattered recrystallized brachiopods
B
2400
2500
2600
2700
2800
2900
3000
?
lt. brn
brn
quartzite
F
E

GROUP

POSED)




FAIR-LAWN GROUP
1732 FWEL 0 WXOS aW
3600
3700
3800
3900
4000
4100
4200
4300
4400
dk gy Lithographic Ls.
lt. brn.
dk gy Lithographic Ls
dk gy
lt gy
Recrystallized

1935

WS58

CZ-1-64 FSD

SECTION NAME Forsyth Creek No. vi

LOCATION Section measured on the West side of ridge two miles due South of Mount Forsythe Lat 50° 14' Long. 165° 08'

MEASURED BY R. Bray and M. Murrell

METHOD 100 ft. Tape, Measured Down Date August 12, 1964

STRIP LOG BY R Bray

STRAT LIMITS Top Base of Fairholme to Base of Banff

UNIT	THICKNESS	POROSITY	LITHOLOGY	TEXTURE	BEDDING	FOSSILS	COLOUR (FRESH SURFACE)	REMARKS	ENVIRONMENT (INTERPRETED)
EXSHAW (STRUCTURLLY COMPLEX ZONE)				F			Blk	Exshaw Shale	
				F					
				F					
				F					
				F					
				F			brn.		
				F			Blk		
				F					
	100			F			dk gy		
				F			Blk		
				F			dk gy		
				F			Blk brn.		
				F			Blk		
	200								
				F					
				F					
				F					
				F					
?								Calcite veining and slickensides	
				F			JK gy	Scattered Crinoid Fmrs.	
				F					
				F					
				F					
	400			F					
				C			gy		
	500								
				C			gy to		
				C					
				C					

PALLISER FORMATION

2383 FEET EXPOSED

500

600

700

800

900

2100

2200

2300

2400

gy to yg

Abundant calcite veining

1200 ft. not recorded due to structural complications

Badly recrystallized coralla

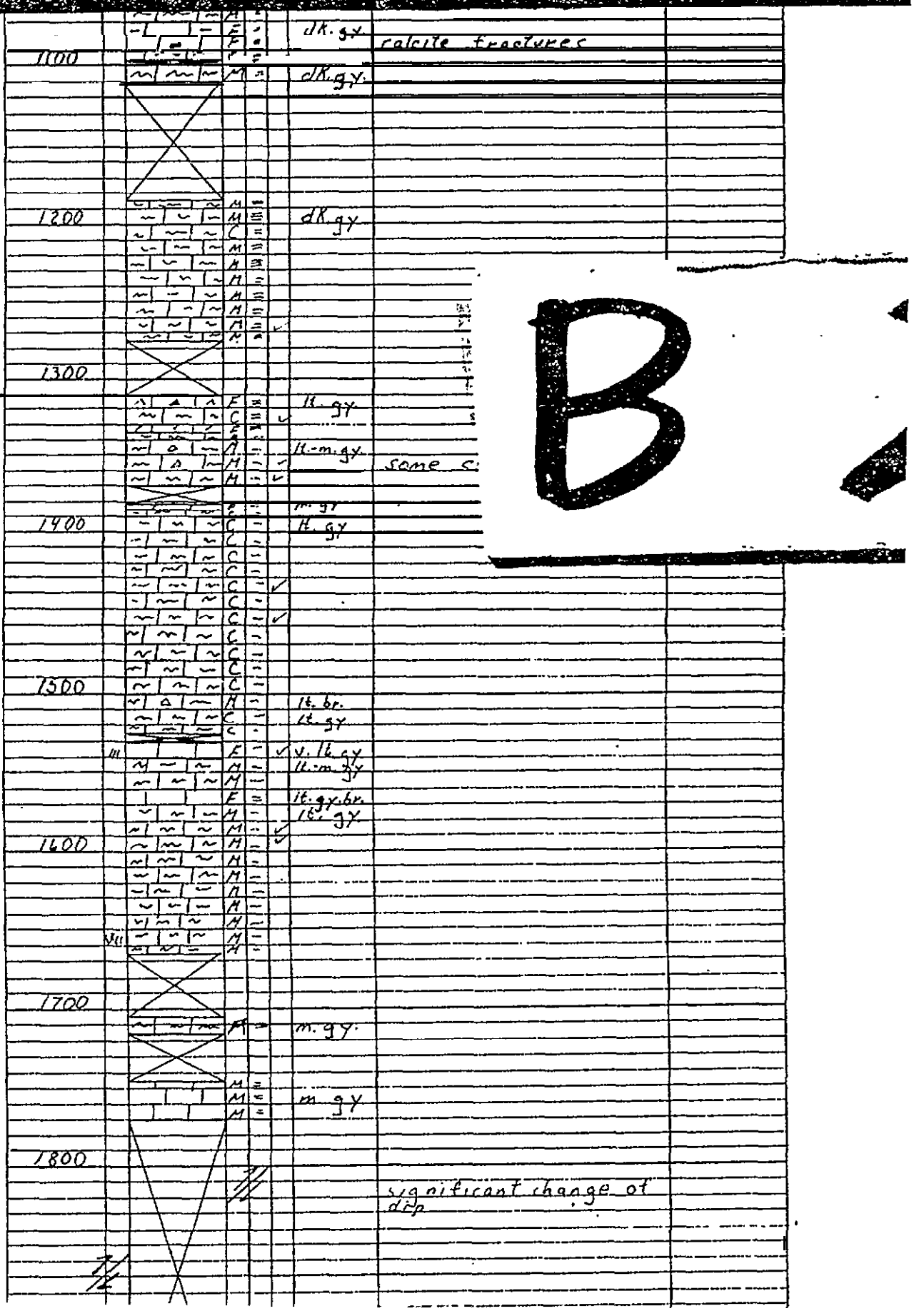
lithographic lm

lt gy silty laminations

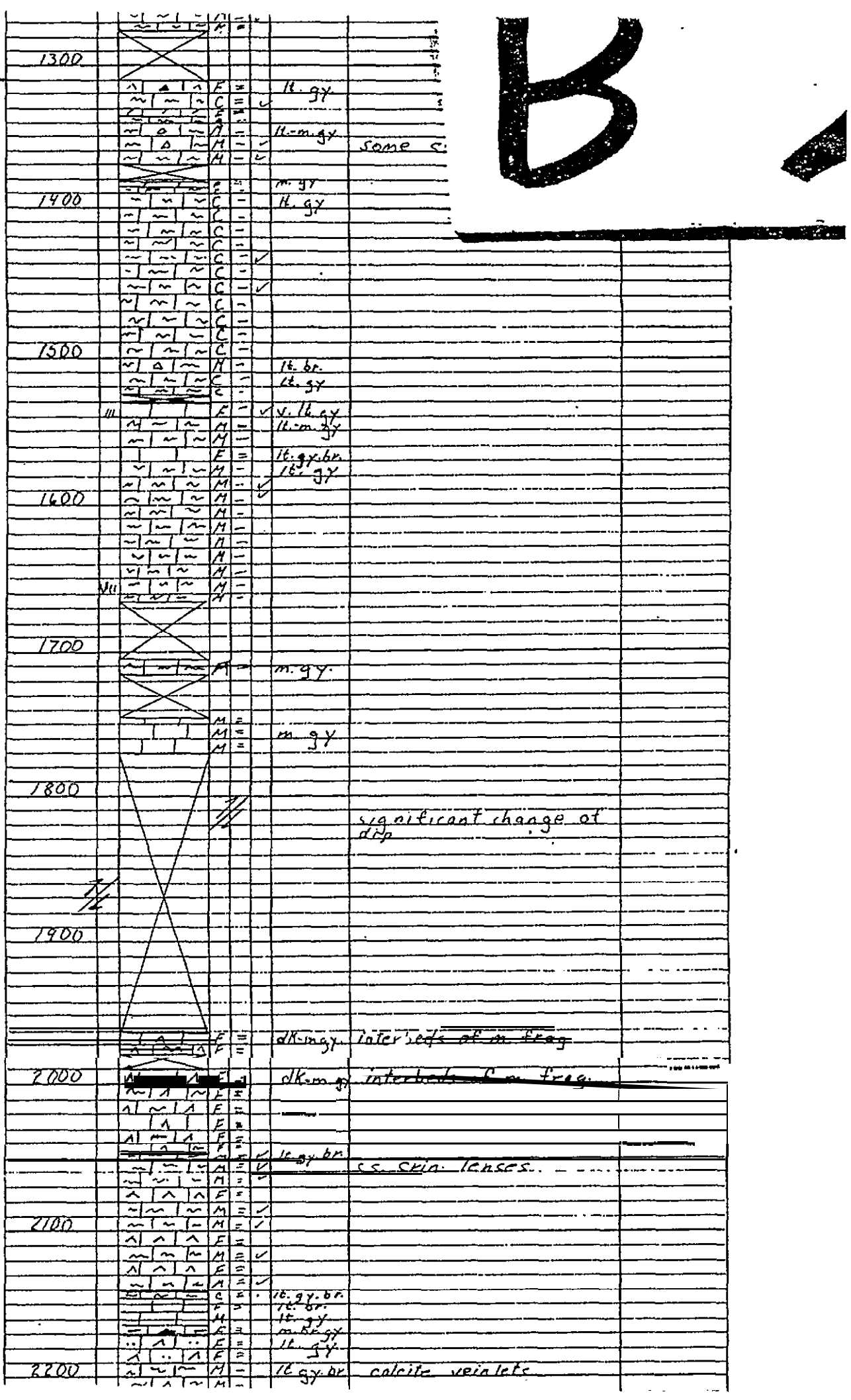
scattered recrystallized brachiopods

PALL SE
(22
2200
2300
2400
2500
2600
2700
2800
2900
?
lt gy
lithographic lm
lt gy
silty laminations
gy to
lt gy
scattered recrystallized
brachiopods
lt brn
brn
quartzite

MOUN


1100
1200
1300
1400
1500
1600
1700
1800
dk. gy.
calcite fractures
dk. gy.
dk. gy
lt. gy
lt.-m. gy.
some c
m. gy
lt. gy
lt. br.
lt. gy
v. lt. gy
lt.-m. gy
lt. gy. br.
lt. gy
m. gy.
m. gy
significant change of dip

B


1300
1400
1500
1600
1700
1800
1900
2000
2100
2200
lt. gy
lt.-m. gy
some c
m. gy
lt. gy
lt. br.
lt. gy
v. lt. gy
lt.-m. gy
lt. gy. br.
lt. gy
m. gy.
m. gy
significant change of dip
dk.-m gy.
dk.-m gy
lt gy. br
ss. seia. lenses.
lt. gy. br.
lt. br.
lt. gy
m. br. gy
lt. gy
lt gy. br
calcite veinlets

2000			dk-m gy	interbeds of m. frag.
			lt. gy. br.	cs. coin lenses
2100				
			lt. gy. br.	
			lt. br.	
			lt. gy	
			m. br. gy	
			lt. gy.	
2200			lt gy. br	calcite veinlets
2300			m. gy. br	
2400				
			m. gy.	
2500				
			m. gy. br.	
			lt. gy. br.	interbeds of cs. frag.
2600				
2700				
			m-dk gy	
				probable fault plane here
2800				
				200' of rubbled outcrop follow of much the same lx

B

NS58

CZ-1-64/W.C.

SECTION NAME WEARY CREEK No. iv

LOCATION SOUTH FACE OF RIDGE ON WEARY GAP WEST OF CONTINENTAL DIVIDE

LAT. 50°24' N. LONG. 114°51' W.

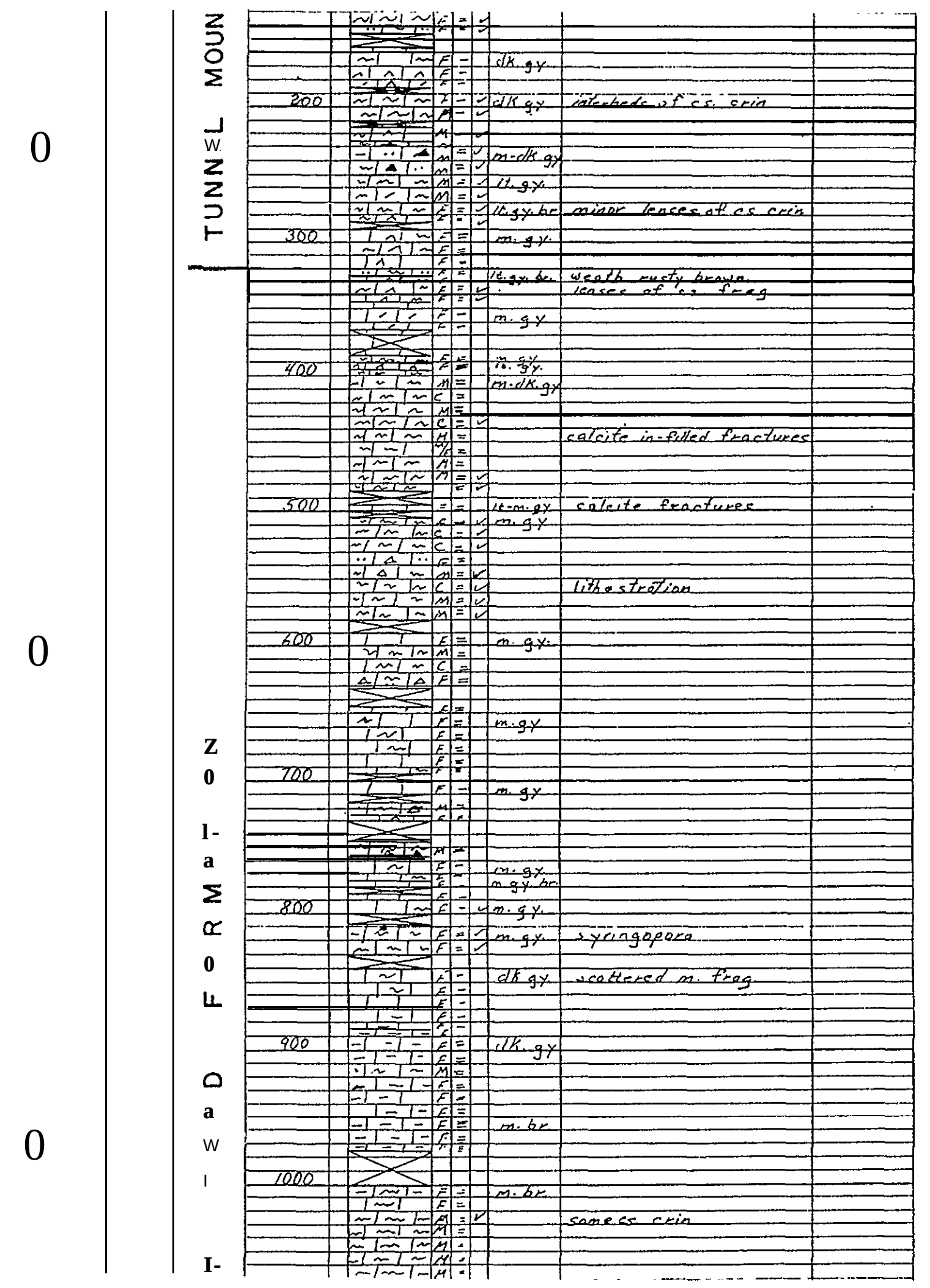
MEASURED BY D. CAPSTICK G. SCHNEGELSBERG

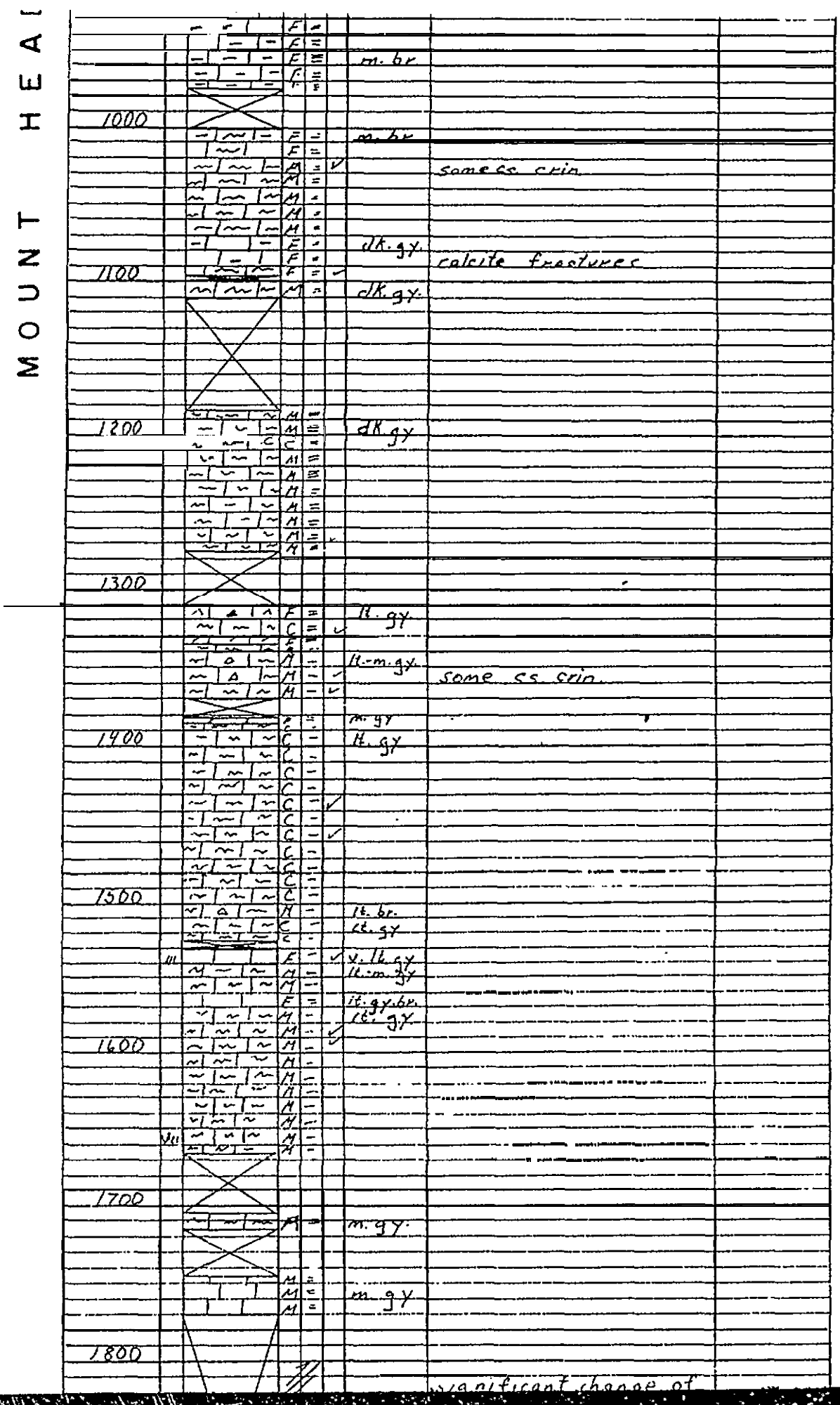
METHOD 5' STAFF STARTING IN ROCKY MTN. Date AUG 5-10/1964

STRIP LOG BY G. SCHNEGELSBERG

STRAT LIMITS ROCKY MTN. TO BANFF

UNIT	THICKNESS	POROSITY	LITHOLOGY	TEXTURE	BEDDING	FOSSILS	COLOUR (FRESH SURFACE)	REMARKS	ENVIRONMENT (INTERPRETED)
TUNNEL MOUNTAIN FM				M			lt. br.		
				M					
				F					
				F			m. gy.		
							lt. gy.	f. laminated	
	100			F					
				F			m-dk gy		
				F					
				F			dk. gy.		
				F					
	200			F			dk gy	interbeds of cs. grn	
				M					
				M			m-dk gy		
				M			lt. gy.		
				F			lt. gy. br.	minor lenses of cs grn	
	300			F			m. gy.		
				F					
				F			lt. gy. br.	weath. rusty brown. lenses of cs. f-mg	
				F					
				F			m. gy.		
	400			F			m. gy.		
				C			m-dk. gy.		
				M					
				C					


TUNNEL MOUN
FORMATION
Dawson
200
300
400
500
600
700
800
900
1000
dk. gy.
dk gy
interbeds of cs. crin
m-dk gy
lt. gy.
lt. gy. br.
minor leases of cs crin
m. gy.
lt. gy. br.
wealth rusty brown
leases of cs frag
m. gy
m. gy.
m-dk. gy
calcite in-filled fractures
lt-m. gy
calcite fractures
m. gy.
lithostration
m. gy.
m. gy.
m. gy.
m. gy.
m. gy. br.
m. gy.
syringopora
dk gy.
scattered m. frag
dk. gy.
m. br.
m. br.
some cs crin


MOUNT HEA
1000
m. br
m. br
some ss strin.
dk. gy.
calcite fractures
1100
dk. gy.
1200
dk gy
1300
lt. gy
lt.-m. gy.
some ss strin.
m. gy
1400
lt. gy
1500
lt. br.
lt. gy
v. lt. gy
lt.-m. gy
lt. gy. br.
lt. gy
1600
1700
m. gy.
m. gy
1800

MISSISSIPP

LIVINGSTONE FORMATION

WELL - 710 FEET EXPOSED

1100 — lt-m gy — traces of cc crin — slickensides

dk. gy.

m. gy

lt. m. gy

1200

1300 — lt. gy. — 2' band — scatter

lt. m. gy — 3' dol.

m. gy br.

1400 — lt gy

lt m gy — traces

1500 — lt. gy.

lt. gy.

m. gy br.

lt. gy.

lt. gy-br. m. gy

1600

lt. gy br.

lt. gy br

1700 — lt. gy.

lt. gy

lt. gy — crinoids

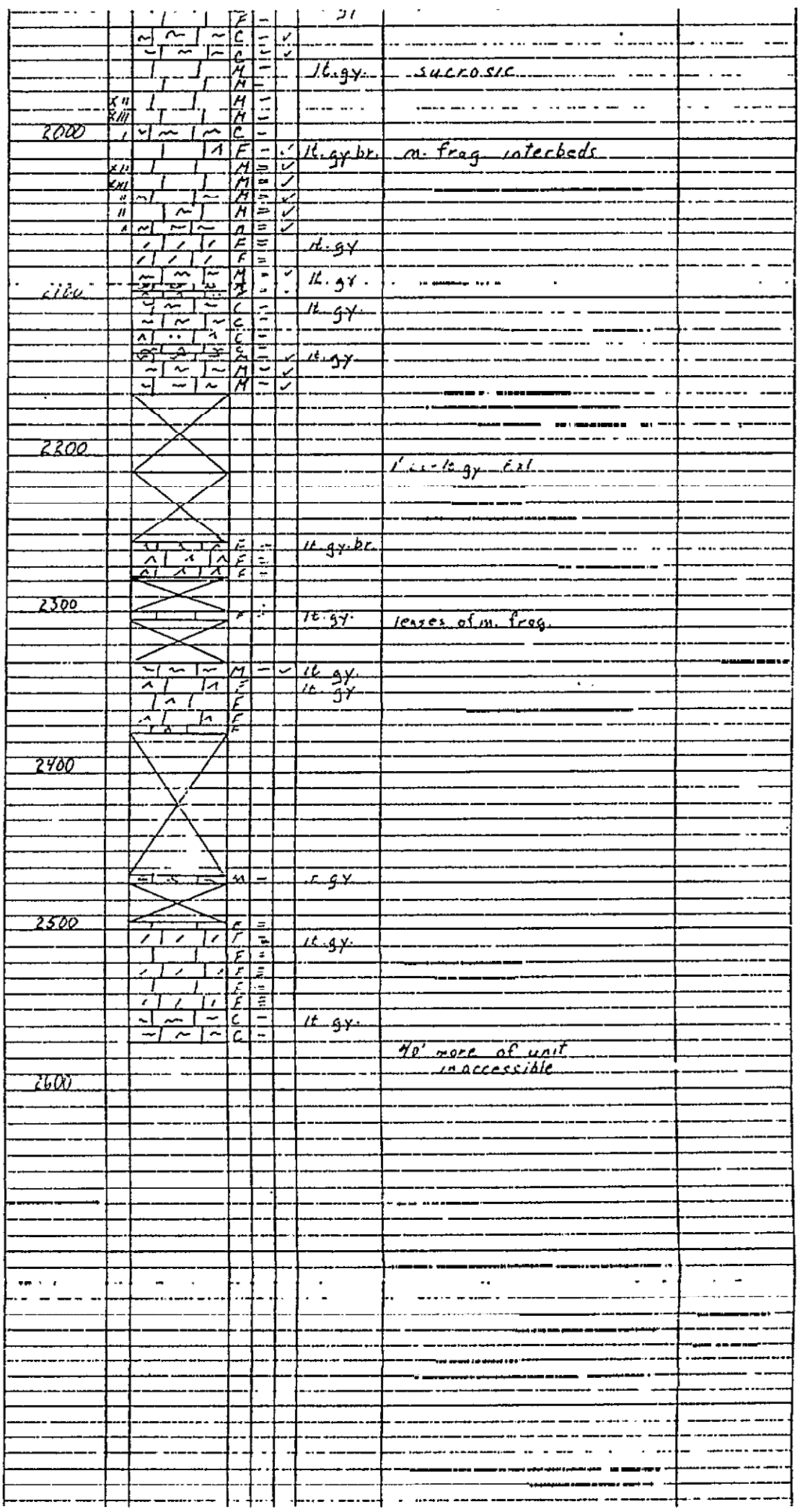
1800

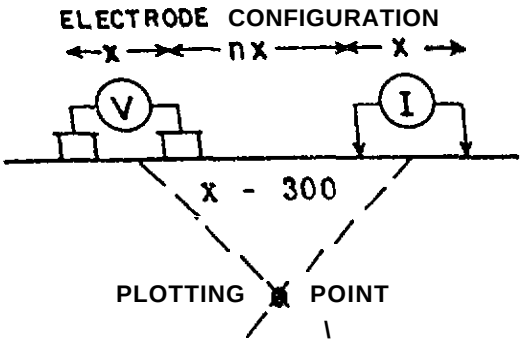
lt. gy

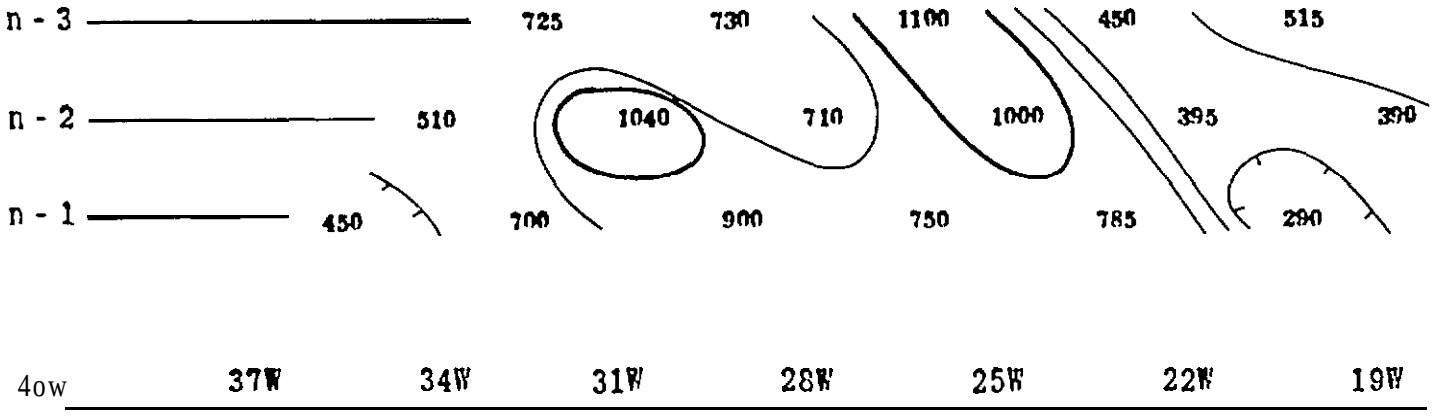
1900 — lt. gy. — highly laminated crinoids

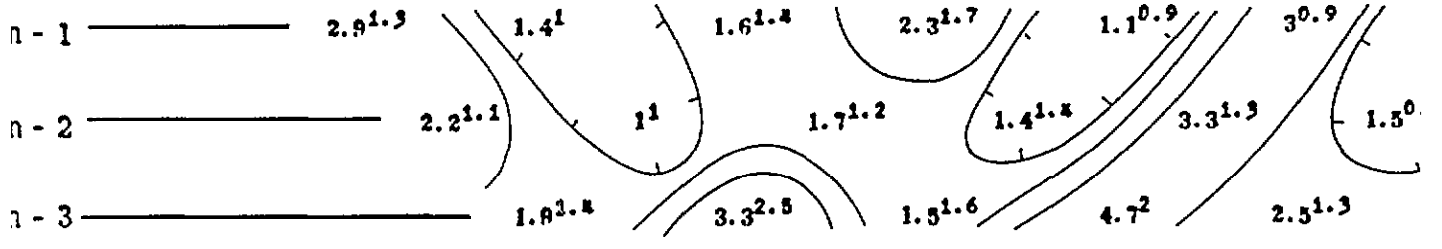
lt. gy.

lt. gy — sucrosic


2000
lt. gy.
sucrosic
lt. gy. br.
m. frag. interbeds
lt. gy.
2100
lt. gy.
lt. gy.
lt. gy.
2200
lt. gy. br.
2300
lt. gy.
lenses of m. frag.
lt. gy.
lt. gy.
2400
2500
lt. gy.
lt. gy.
40' more of unit inaccessible
2600







SURFACE PROJECTION
OF ANOMALOUS ZONES

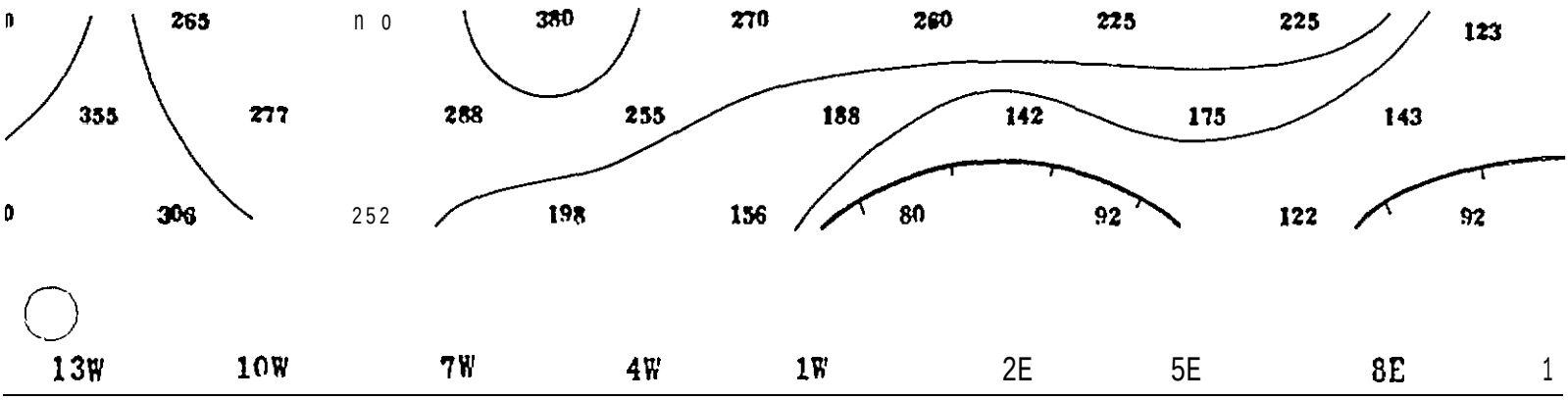
DEFINITE

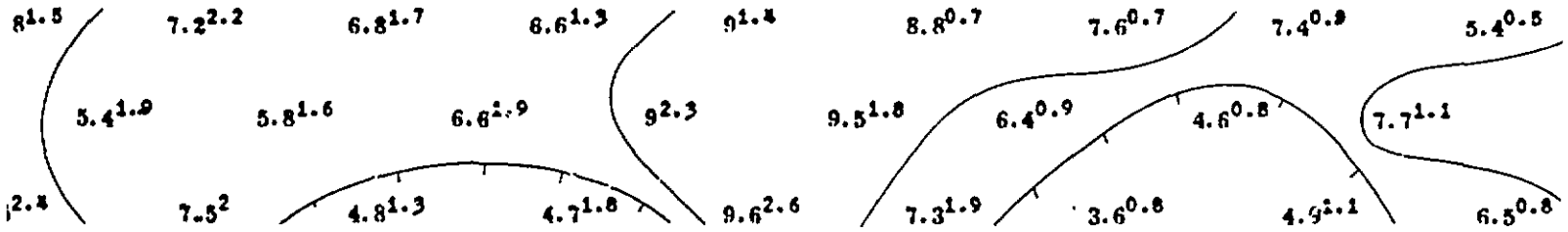
PROBABLE

POSSIBLE

MPHAR GEOPHYSICS LIMITED

IUCED POLARIZATION AND RESISTIVITY SURVEY





AMAX EXPLORATION, INC.

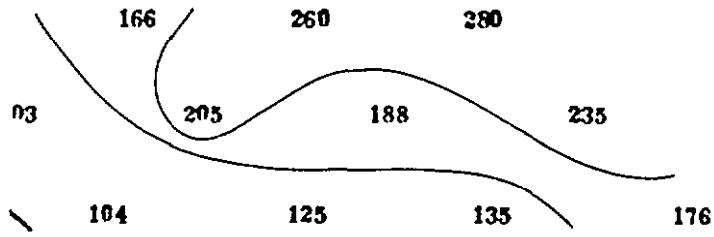
OSS CREEK PROPERTY, 'ENDAKO AREA-OMINECA M.D., B.C.

Scale-One inch= 300 Feet

NOTE LOGARITHMIC CONTOUR INTERVAL

DWG. NO.-I.F?-5056-E

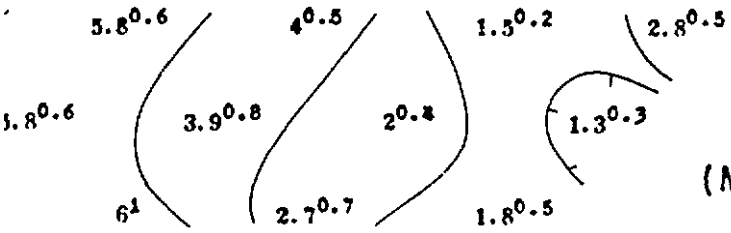
NOTE: CONTOURS AT LOGARITHMIC MULTIPLES OF 10-15-20-30-50-75-100



$\rho a/2\pi$
(OHM FEET)

35S

4E 17E 20E 23E 26E 29E



(M.F.) a

1235

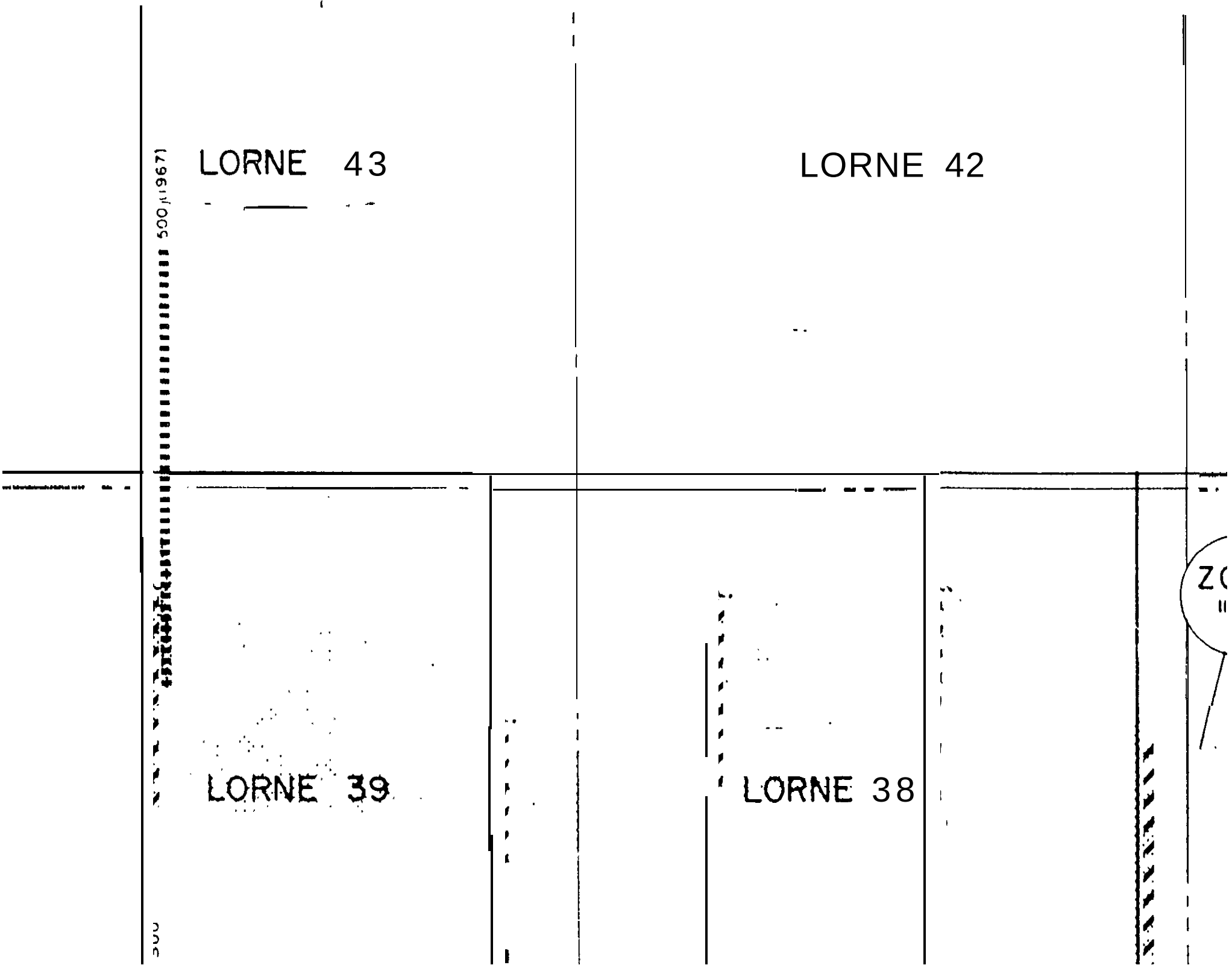
FREQUENCY 0-31-5 CPS

DATE SURVEYED SEPT 1967

APPROVED R.A. Beale

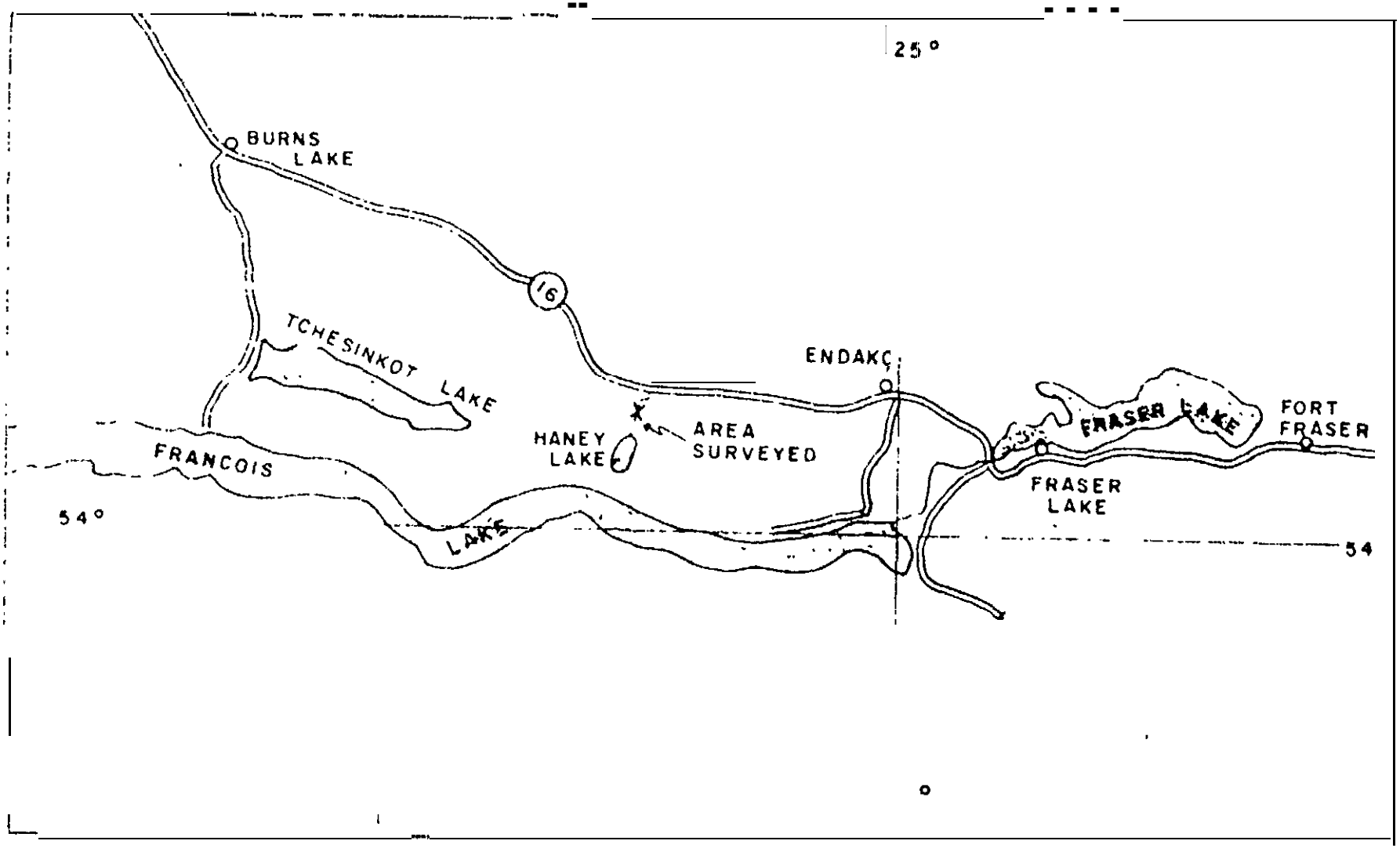
DATE Oct 19/67

GEOPHYSICAL SURVEYS


LORNE 43
LORNE 42
LORNE 39
LORNE 38

LOCATION MAP

SCALE: 1" = 10 MILES



LORNE 39

LORNE 38

LORNE 37

ZONE "E"

LORNE 9

LORNE 4

ZONE "B"

LORNE 3

LORNE 30

LORNE 29

ZONE "A"

LORNE 21

LORNE 6

LORNE 5

ZONE "D"

LORNE 32

LORNE 31

L-24W

LORNE 23

LORNE 8

ZONE "C"

LORNE 7

LORNE 34

LORNE 33

L-16W

L-11W

L-6W

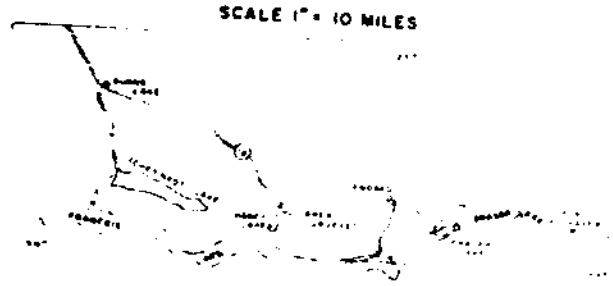
L-1W

L-4E

L-10E

1. ACCOMPANY GEOPHYSICAL REPORT FOR AMAX EXPLORATION INC. ON THE SAM ROSS CREEK PROPERTY, ENDAKO AREA, OMINECA M.D., PROVINCE OF BRITISH COLUMBIA, BY [illegible] DATED MARCH 11, 1968

LOCATION MAP
SCALE 1" = 10 MILES



AMAX EXPLORATION, INC.

SAM ROSS CREEK PROPERTY, ENDAKO AREA - OMINECA M.D., B.C.

SCALE

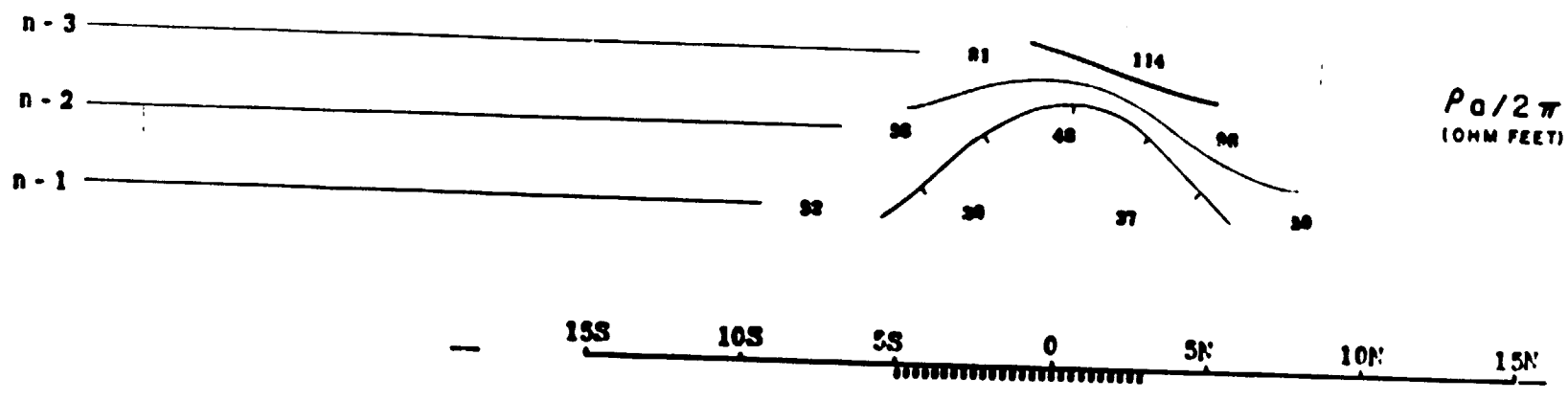
1" = 400' EQUALS FOUR HUNDRED FEET

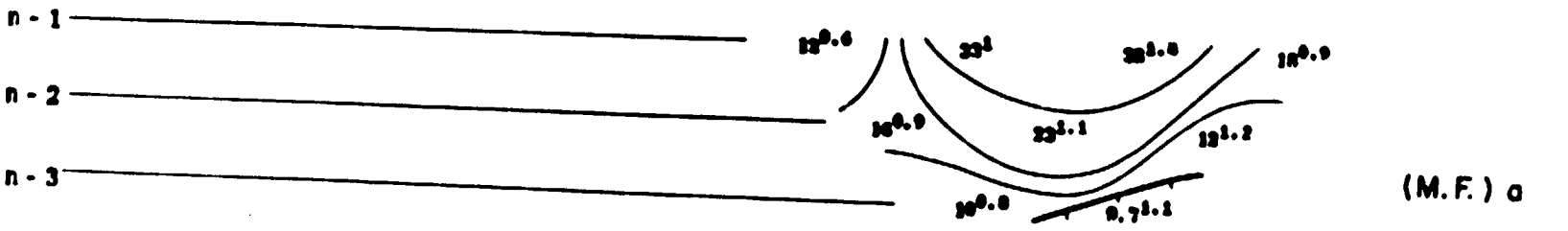
1235

DWG. NO. I.P.-[illegible]

McPHAR GEOPHYSICS LIMITED

INDUCED POLARIZATION AND RESISTIVITY SURVEY





LINE NO.-24 W

AMAX EXPLORATION, INC.

SAM ROSS CREEK PROPERTY, ENDAKO AREA—OMINECA M.D., B.C.

Scale—One inch = 500 Feet

NOTE LOGARITHMIC CONTOUR INTERVAL

1235

FREQUENCY 0.3 - 5 CPS

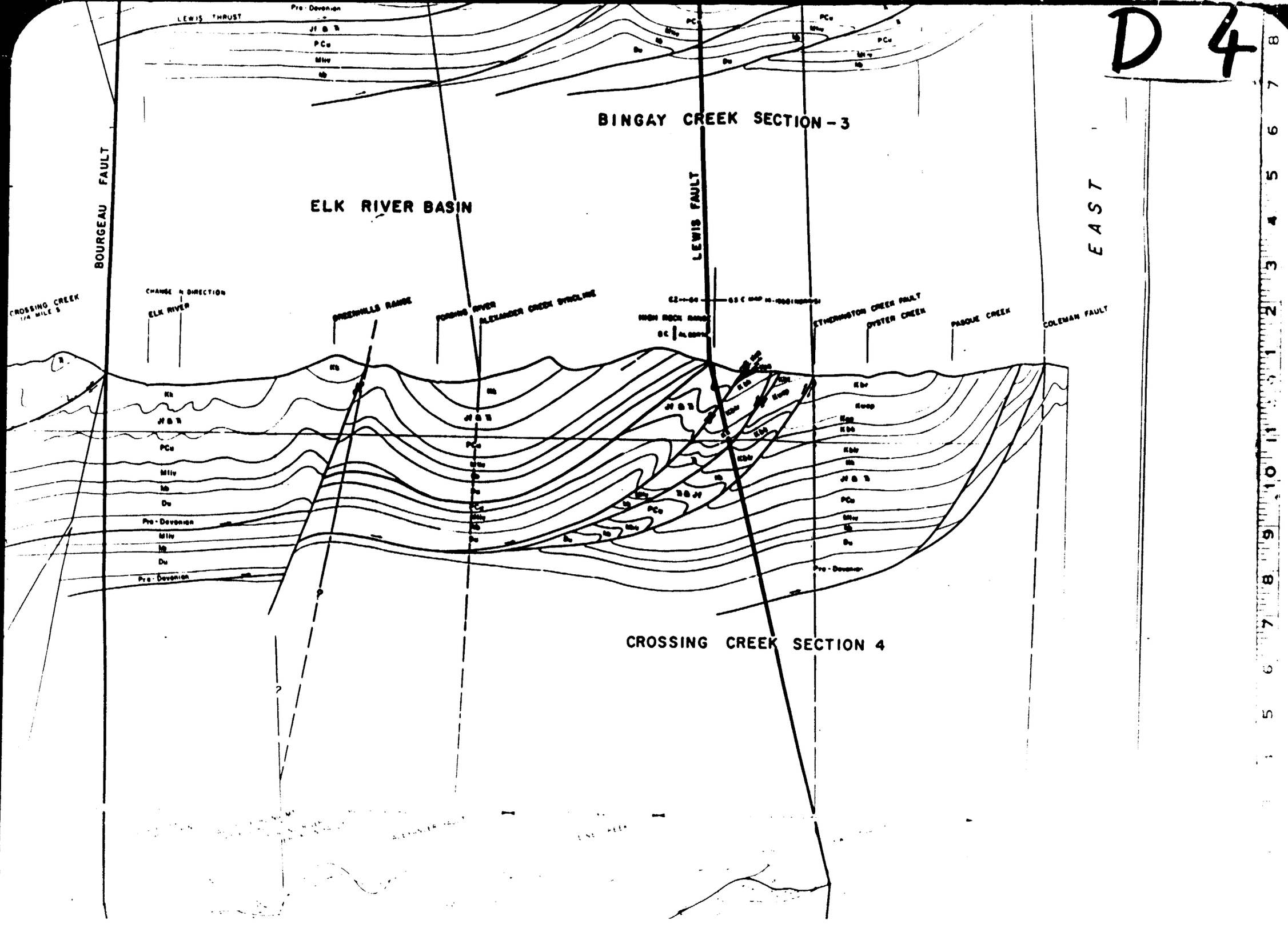
DATE SURVEYED SEPT. 1967

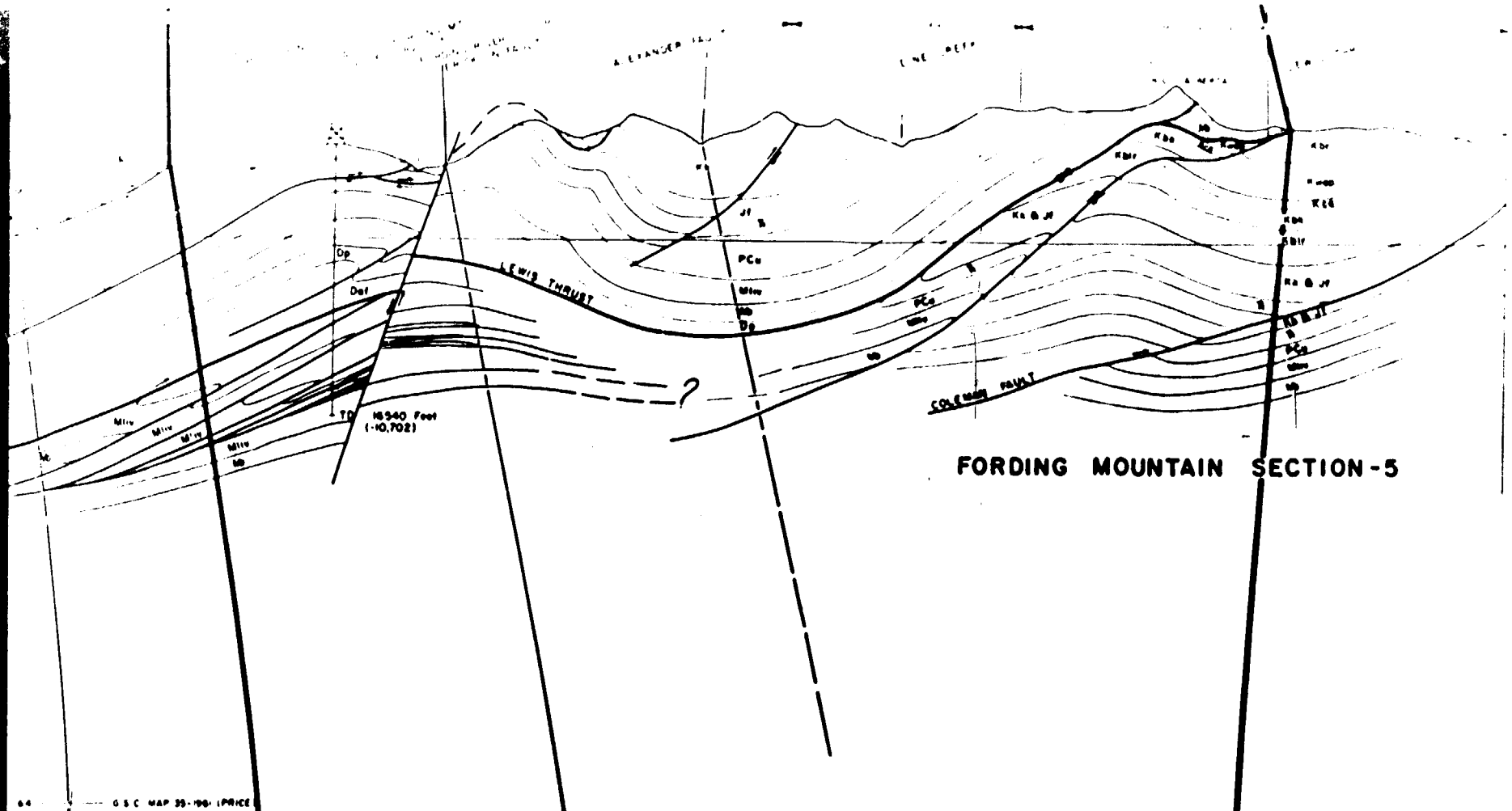
APPROVED [illegible]

DATE [illegible] 19/67

McPHAR GEOPHYSICS LIMITED

D 4


BINGAY CREEK SECTION - 3
ELK RIVER BASIN
BOURGEAU FAULT
LEWIS FAULT
LEWIS THRUST
EAST
CROSSING CREEK 1/4 MILE S
CHANGE N DIRECTION
ELK RIVER
GREENHILLS RANGE
FORDING RIVER
ALEXANDER CREEK SYNCLINE
HIGH ROCK RANGE
ETHERINGTON CREEK FAULT
OYSTER CREEK
PASQUE CREEK
COLEMAN FAULT
Pre-Devonian
CROSSING CREEK SECTION 4


LEWIS THRUST
TD 18540 Feet
(-10,702)
FORDING MOUNTAIN SECTION-5
WILSON FAULT
ELK RIVER
GRAVE CREEK
ERICKSON FAULT
MOUNTAIN RANGE
ALEXANDER FAULT
HIGH ROCK RANGE
LEWIS THRUST
ALLISON CREEK ANTICLINE
CROWSNEST SYNCLINE
COLEMAN FAULT
LEWIS THRUST
CUMMINGS CREEK SECTION-6

1235

THE BRITISH AMERICAN OIL CO. LTD. CALGARY EXPLORATION ZONE
PART OF 64
TO ACCOMPANY REPORT BY D.A. LOCKIE, JANUARY 1965

FIGURE 2

ELK RIVER VALLEY AREA

CORRELATION OF STRUCTURE SECTIONS

Scale 1-50,000 Horizontal & Vertical

British American Oil Company Limited
Calgary, Alberta

FIGURE 2
Structure Correlation Diagram

To accompany report by D.A. Lockie on Stratigraphic Investigations and Structure Reconnaissance, Upper Elk River Area, British Columbia, dated March 31, 1965.

D.A. Lockie

Scale: Horizontal = Vertical

FEET

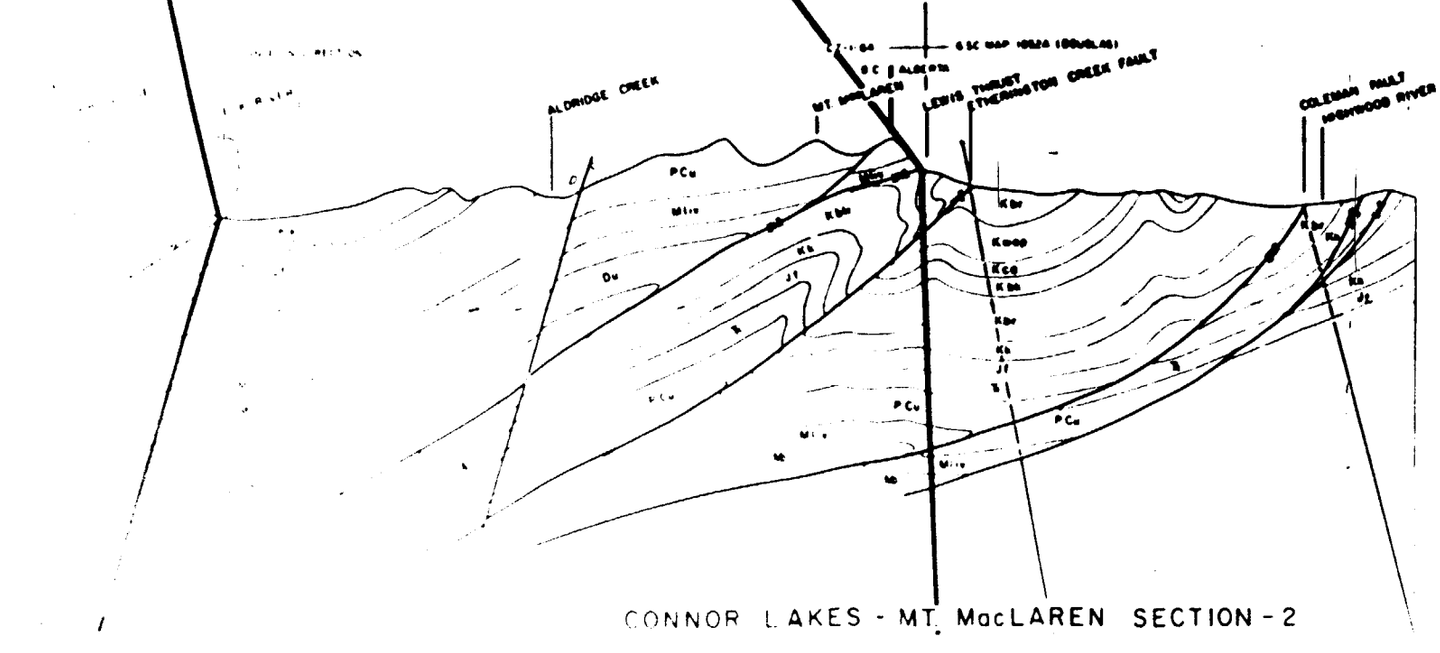
MILES

D 3

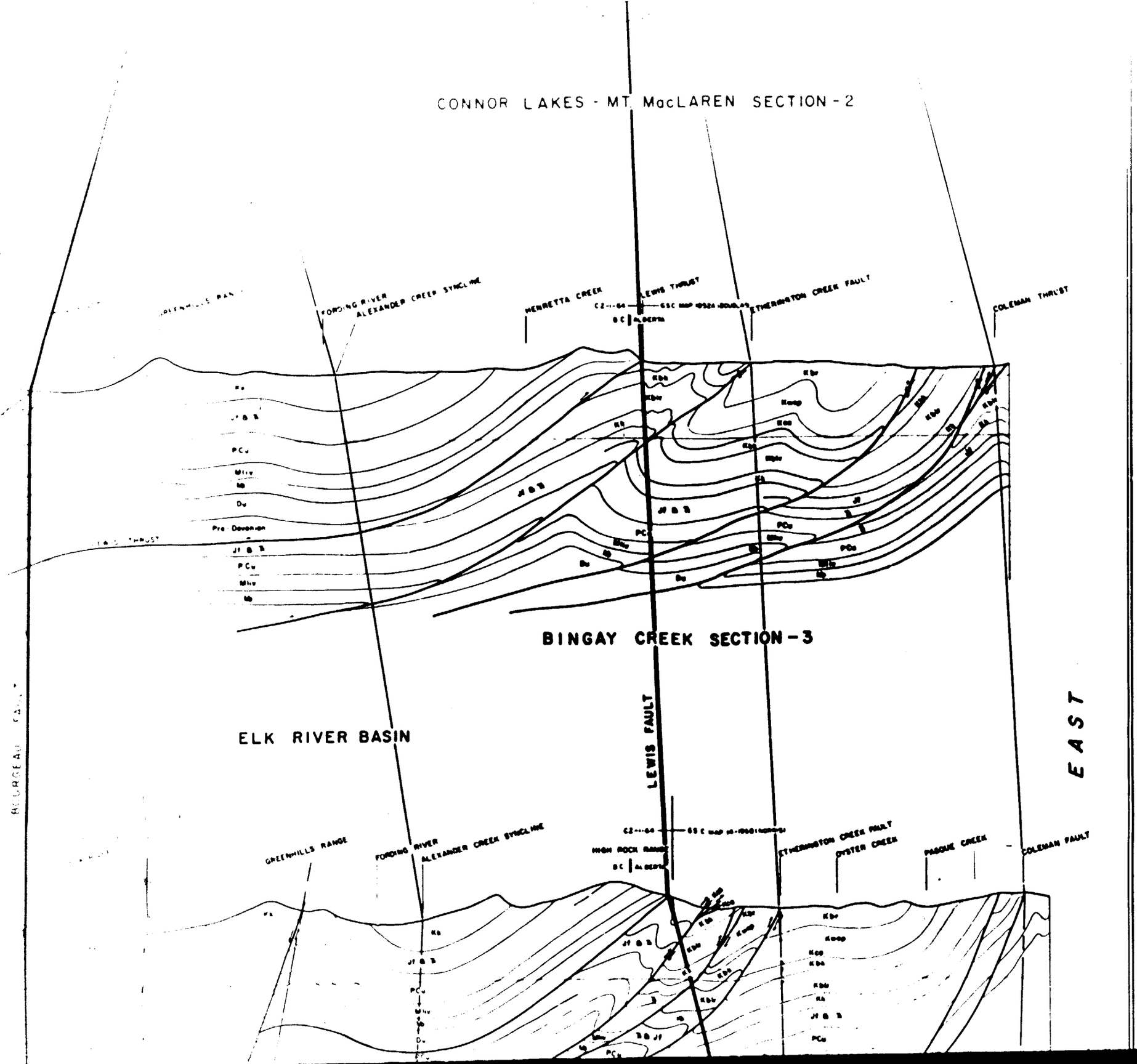
LEGEND

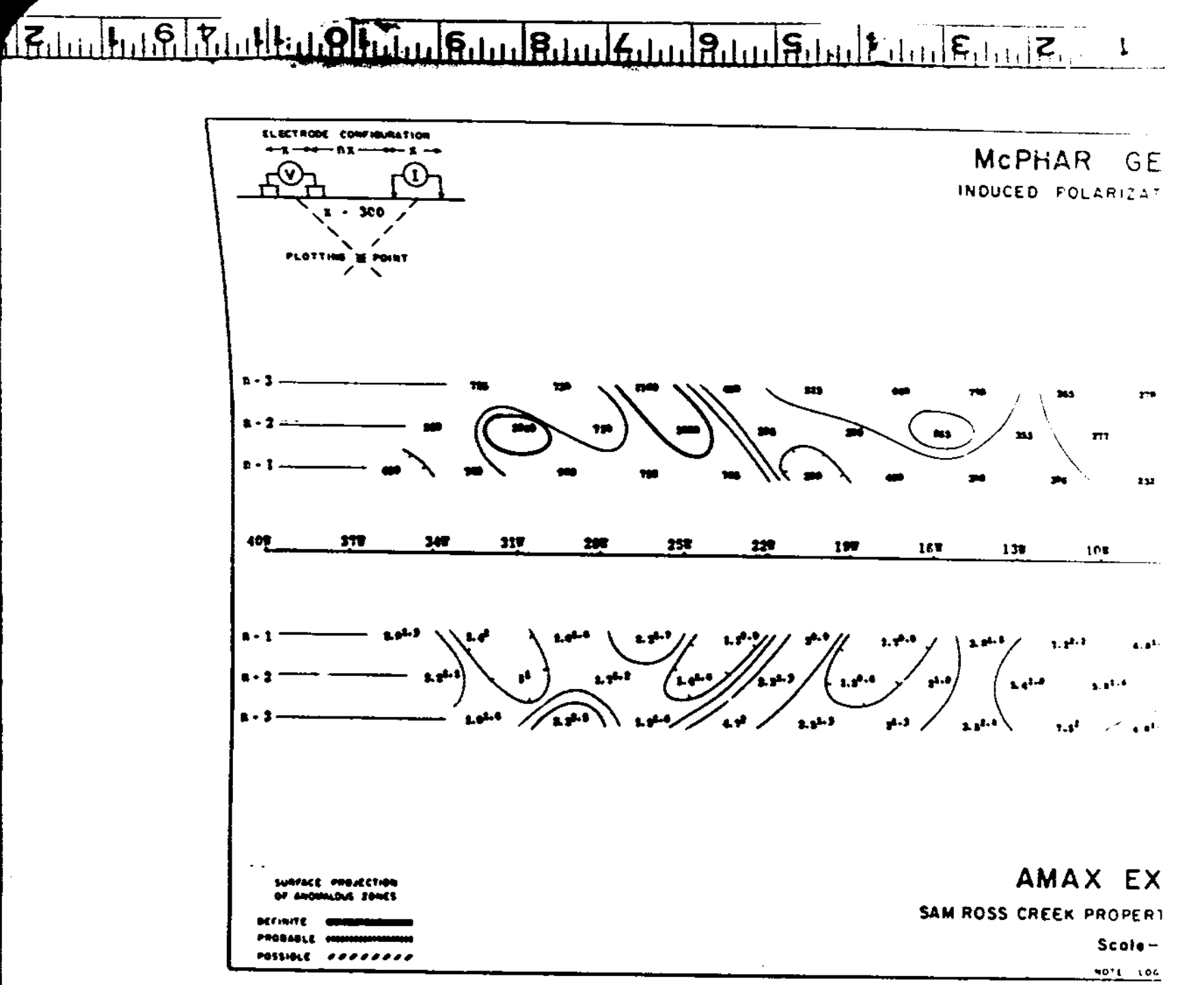
Ku	-	CRETACEOUS UNDIVIDED
Kbr	-	BELLY RIVER
Kwap	-	WAPIABI
Kca	-	CARDIUM
Kbs	-	BLACKSTONE
Kblr	-	BLAIRMORE
Kk	-	KOOTENAY
Jf	-	JURASSIC-FERNIE
Tr	-	TRIASSIC
PCu	-	PERMO-CARBONIFEROUS
Mlw	-	LIVINGSTONE
Mb	-	BANFF
Du	-	DEVONIAN UNDIVIDED
Dp	-	PALLISER
Daf	-	ALEXO-FAIRHOLME

...NA CREEK SECTION-1



CONNOR LAKES - MT. MacLAREN SECTION - 2


CONNOR LAKES - MT. MacLAREN SECTION - 2
FORDING RIVER
ALEXANDER CREEK SYNCLINE
MERRETTA CREEK
LEWIS THRUST
ETHERINGTON CREEK FAULT
COLEMAN THRUST
BINGAY CREEK SECTION - 3
ELK RIVER BASIN
LEWIS FAULT
EAST
GREENHILLS RANGE
FORDING RIVER
ALEXANDER CREEK SYNCLINE
HIGH ROCK RANGE
ETHERINGTON CREEK FAULT
OYSTER CREEK
PARQUE CREEK
COLEMAN FAULT

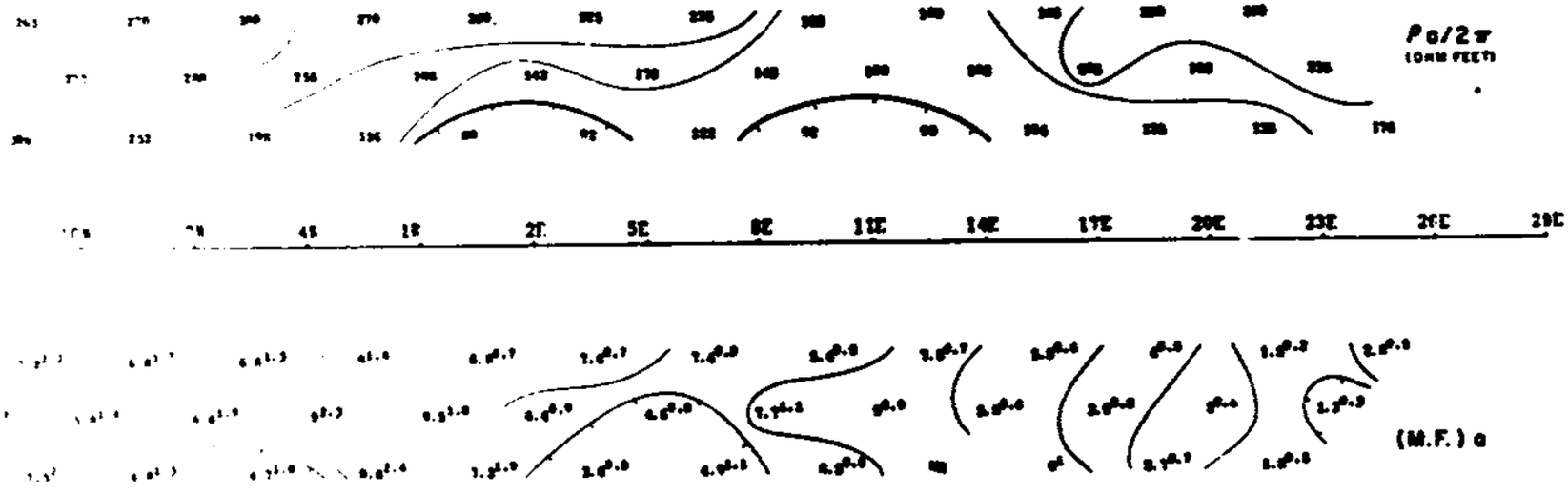

ELECTRODE CONFIGURATION
X
nX
X
V
I
X = 300
PLOTTING POINT
McPHAR GE
INDUCED POLARIZAT
n = 3
n = 2
n = 1
40W
37W
34W
31W
28W
25W
22W
19W
16W
13W
10E
n = 1
n = 2
n = 3
SURFACE PROJECTION
OF ANOMALOUS ZONES
DEFINITE
PROBABLE
POSSIBLE
AMAX EX
SAM ROSS CREEK PROPERT
Scale –

DWG. NO.-I.P.-5056-2

NOTE CONTOURS AT LOGARITHMIC MULTIPLES OF 1.0-1.5-2.0-3.0-5.0-7.5-10.0

AR GEOPHYSICS LIMITED

LARIZATION AND RESISTIVITY SURVEY



LINE NO.-35S

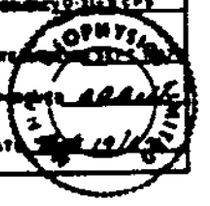
MAX EXPLORATION, INC.

EEK PROPERTY, ENDAKO AREA-OMINECA M.D., B.C.

Scale-One inch= 300 Feet

LOGARITHMIC CONTOUR INTERVAL

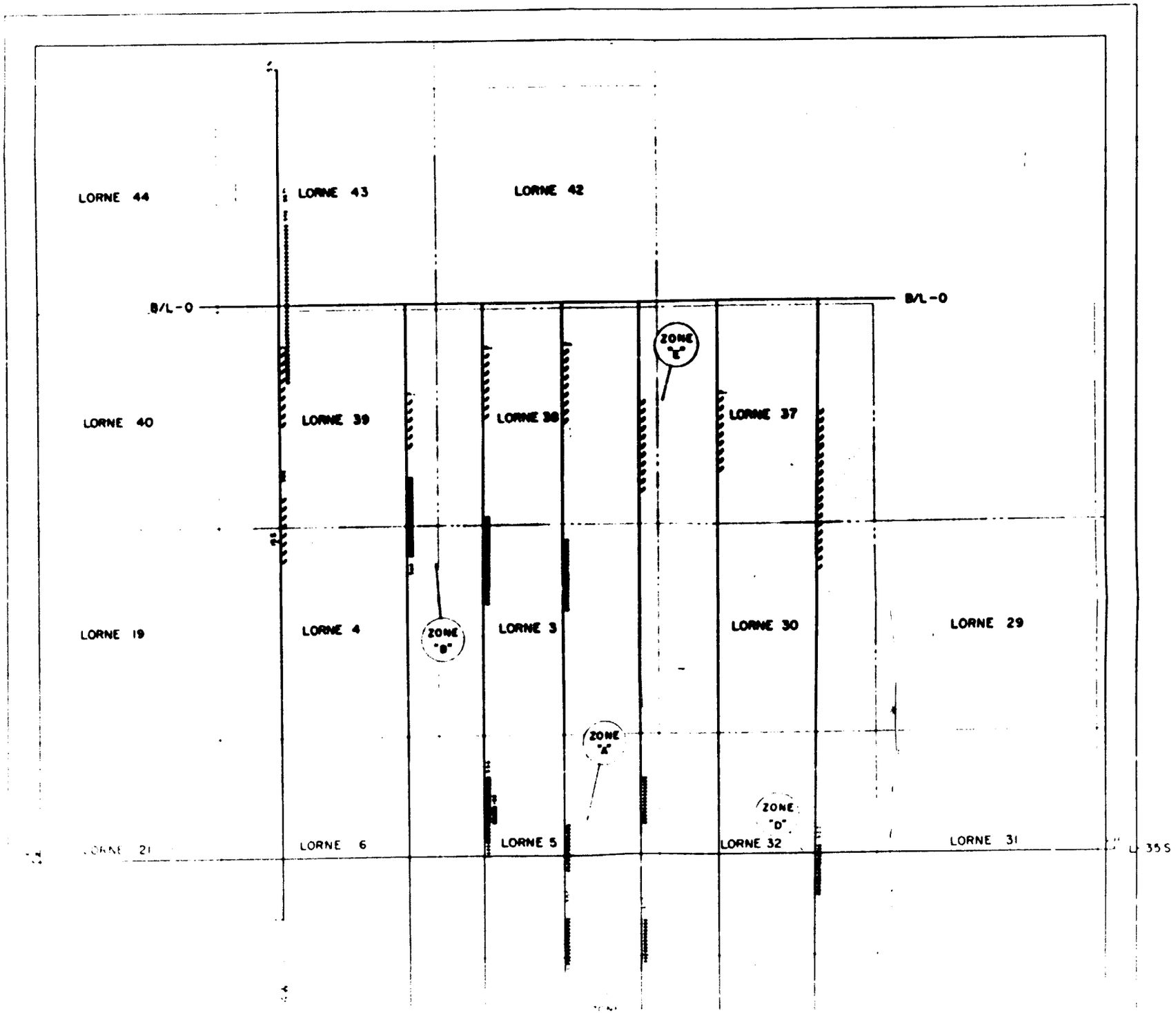
1235



McPHAR GEOPHYSICS LIMITED

INDUCED POLARIZATION AND RESISTIVITY SURVEY

PLAN MAP



LORNE 9

LORNE 8

LORNE 7

ZONE "C"

LORNE 34

LORNE 33

L-10W

L-11W

L-6W

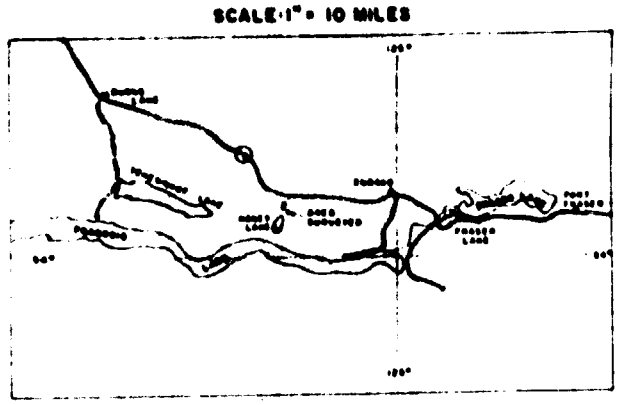
L-1W

L-4E

L-10E

TO ACCOMPANY GEOPHYSICAL REPORT FOR AMAX EXPLORATION INC., ON THE SAM ROSS CREEK PROPERTY, ENDAKO AREA, OMINECA M.D. PROVINCE OF BRITISH COLUMBIA, BY DR. R.A. BELL AND R.A. FOUNTAIN, B.A.Sc. DATED MARCH 11, 1968

LOCATION MAP
SCALE 1" = 10 MILES



ANOMALOUS I.P. ZONES

AMAX EXPLORATION, INC.

SAM ROSS CREEK PROPERTY, ENDAKO AREA - OMINECA M.D., B.C.

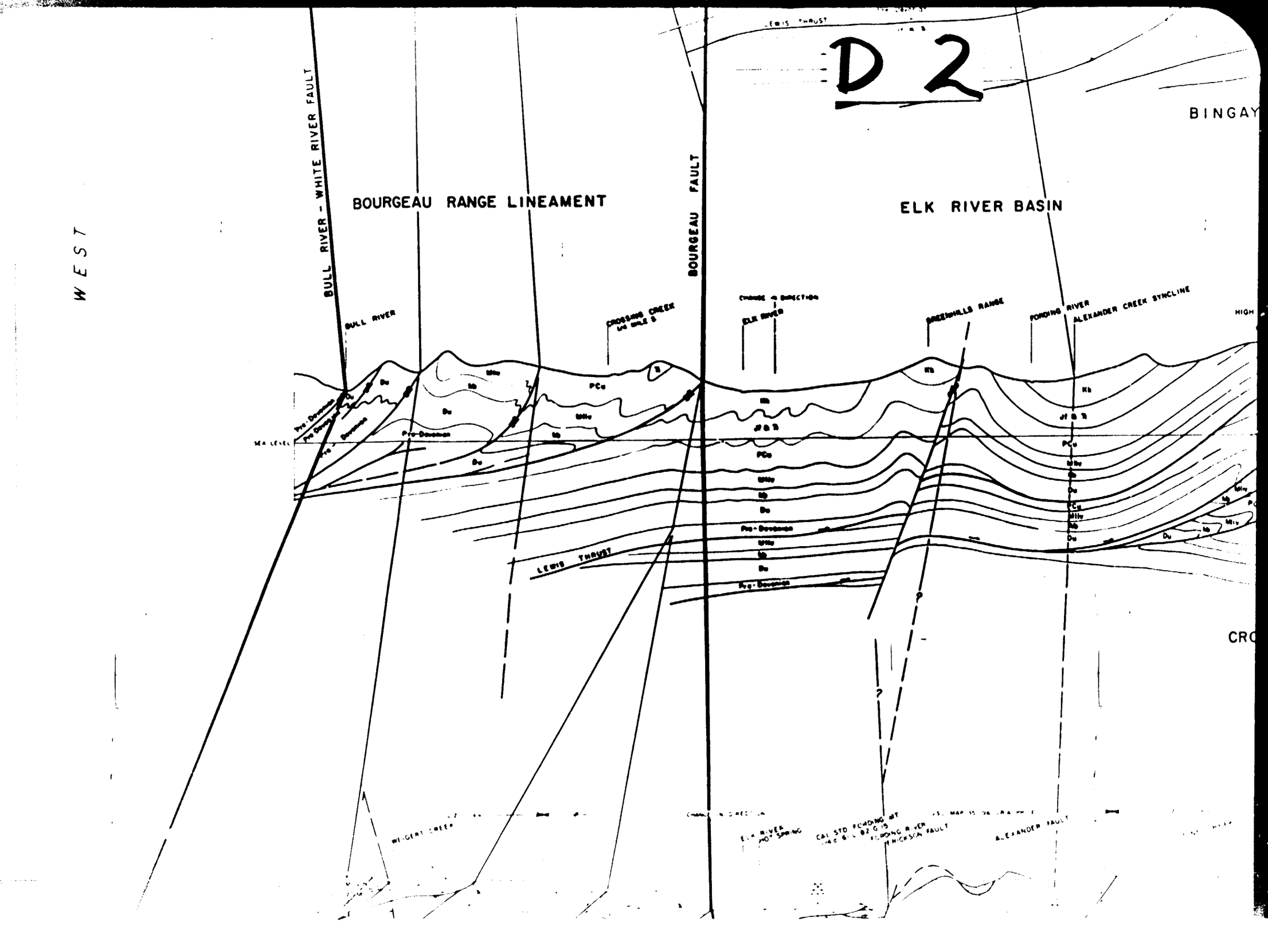
SCALE

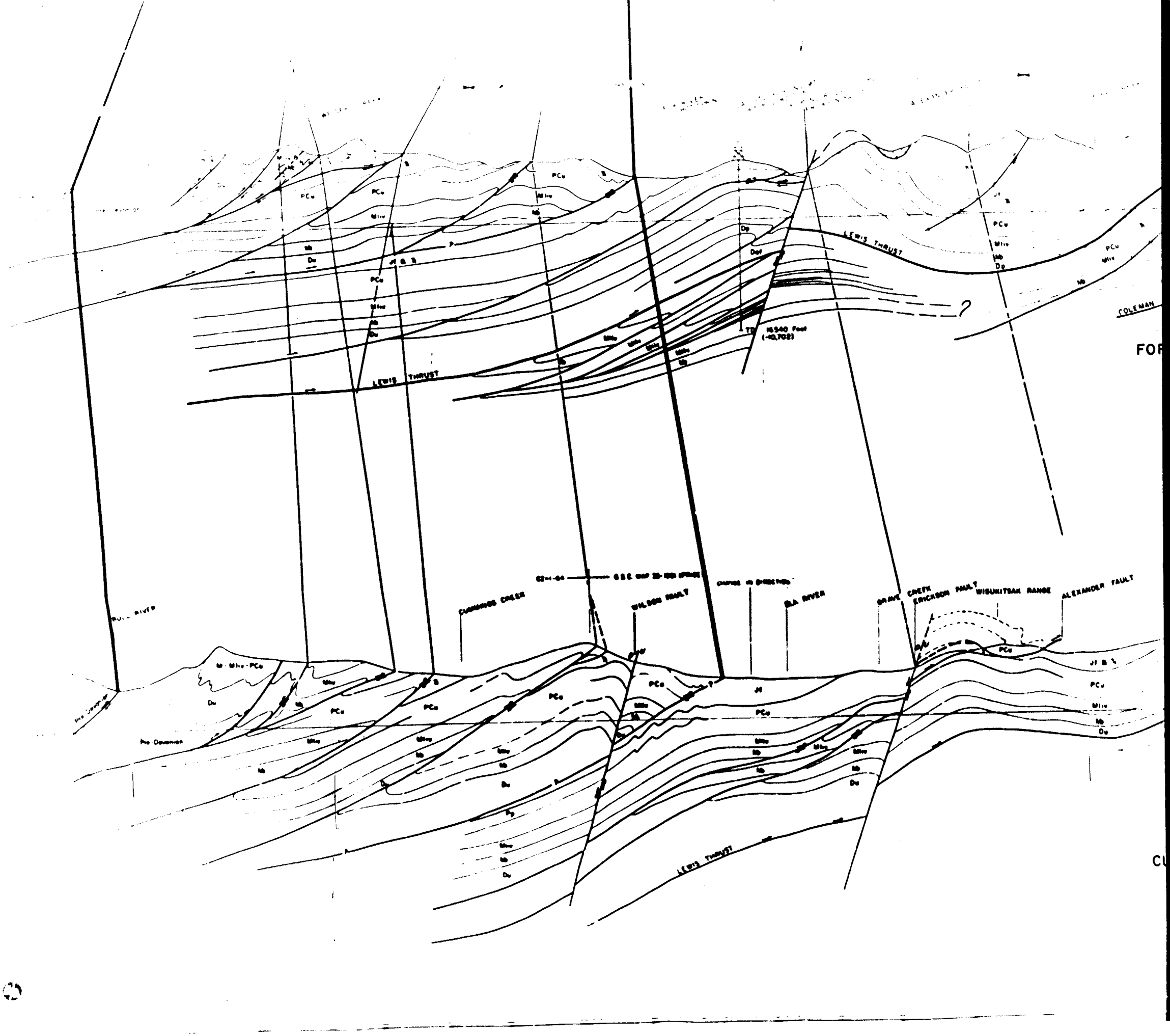
ONE INCH EQUALS FOUR HUNDRED FEET

1235

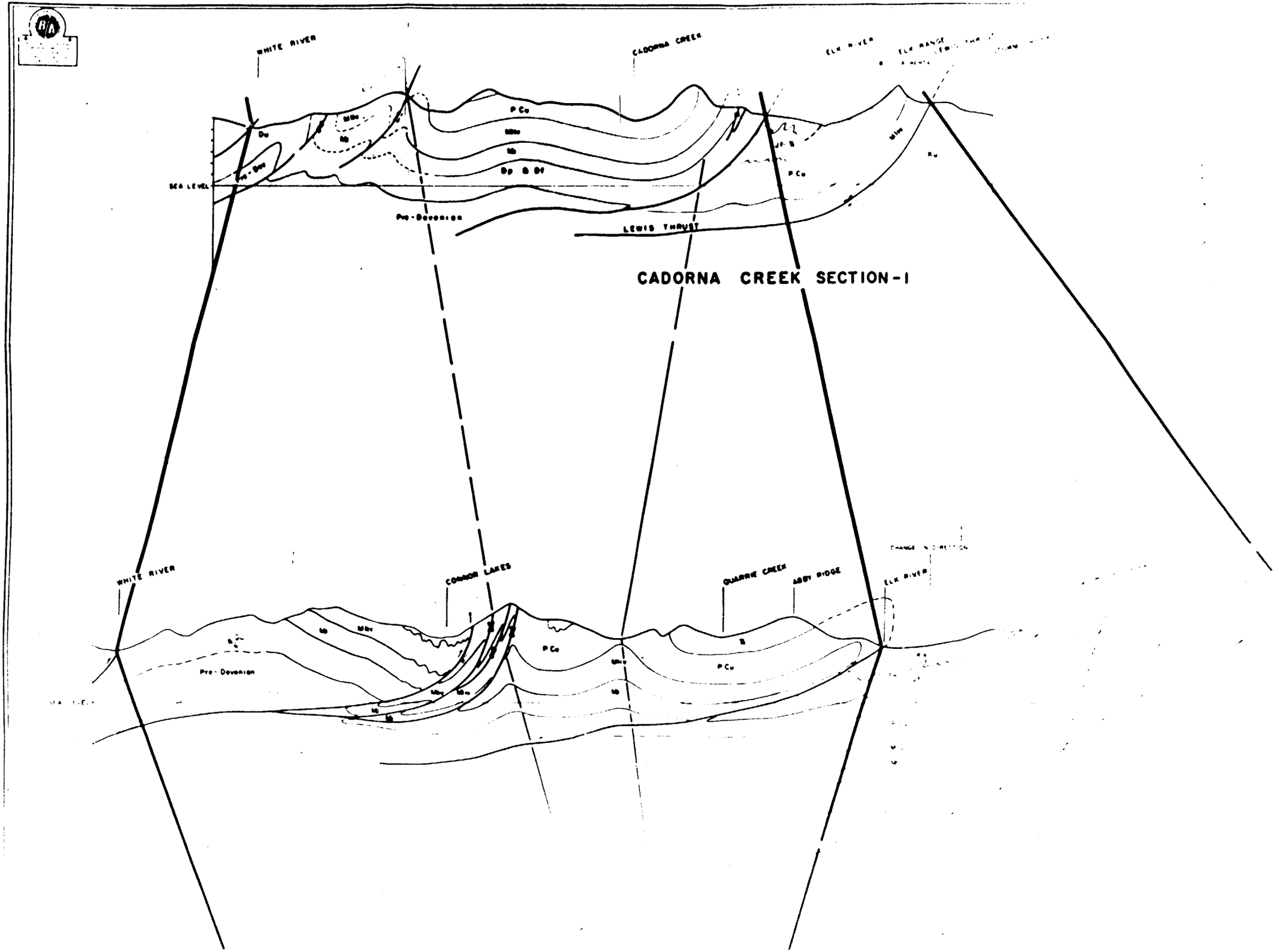
APPROVED R.A. Bell

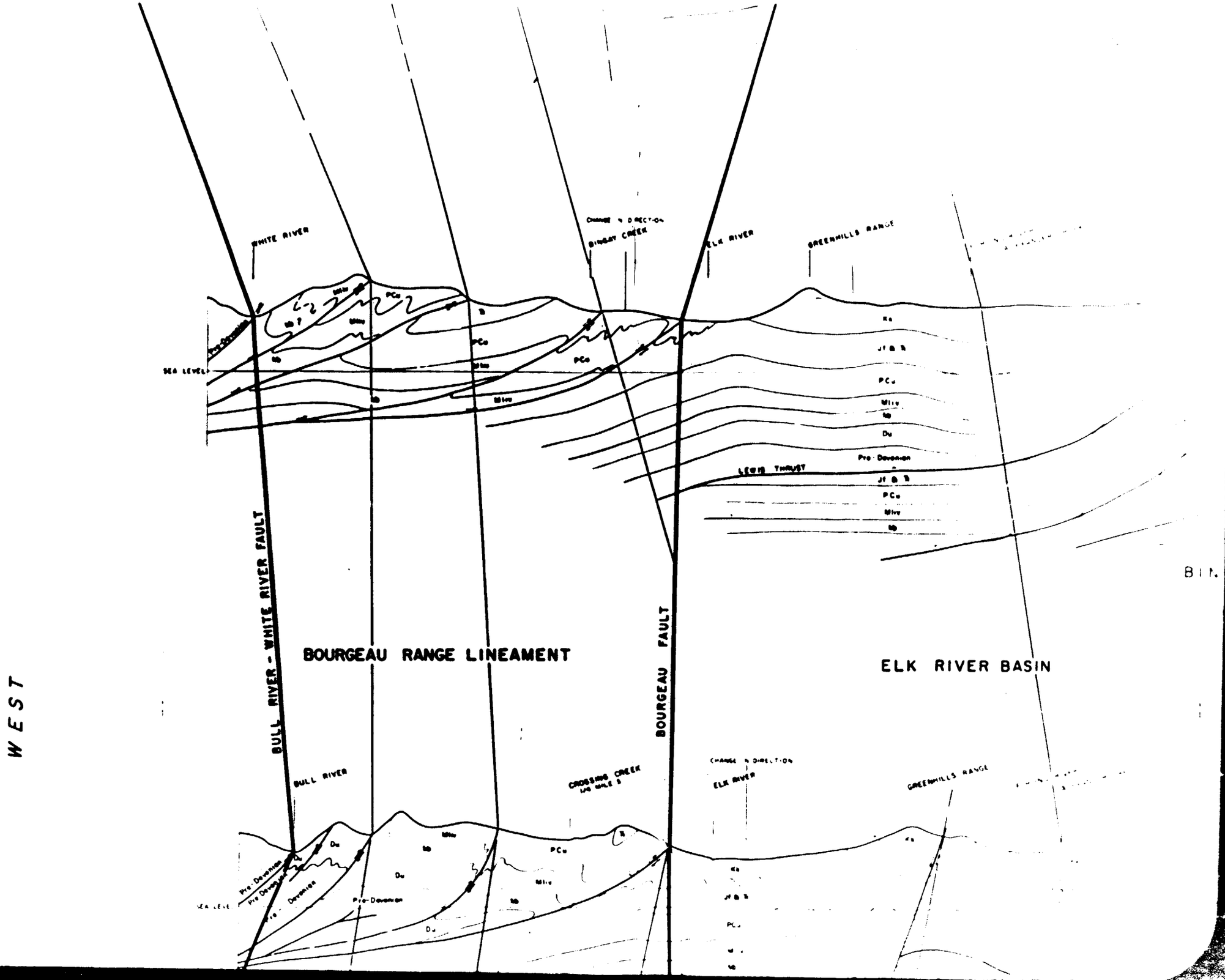
DWG.


D 2
WEST
BULL RIVER - WHITE RIVER FAULT
BOURGEAU RANGE LINEAMENT
BOURGEAU FAULT
ELK RIVER BASIN
BINGAY
LEWIS THRUST
BULL RIVER
CROSSING CREEK
ELK RIVER
GREENHILLS RANGE
PORDING RIVER
ALEXANDER CREEK SYNCLINE
HIGH
SEA LEVEL
Pre-Devonian
Du
Mb
PCu
LEWIS THRUST
CRO
ELK RIVER HOT SPRING
ALEXANDER FAULT

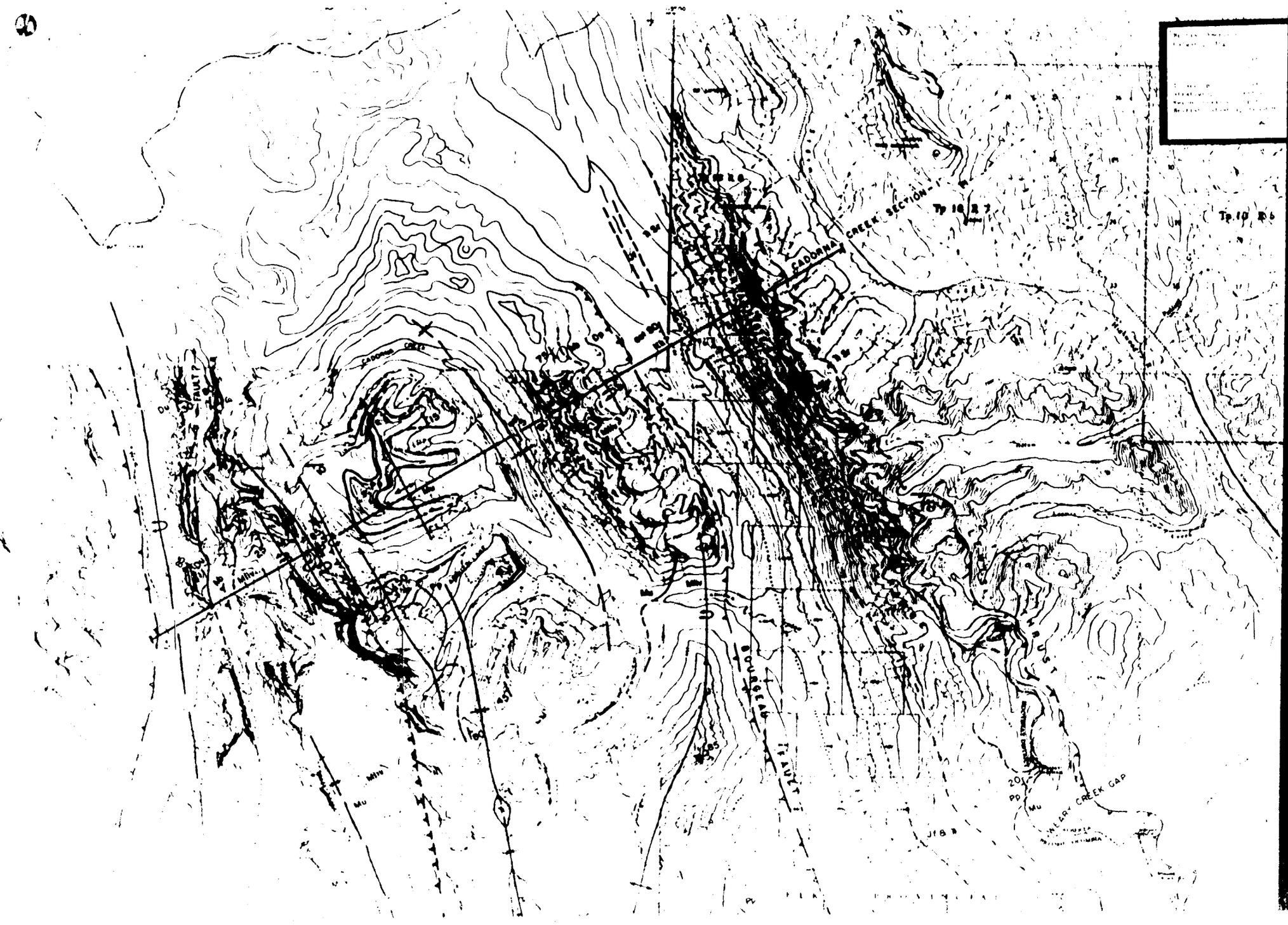

LEWIS THRUST
LEWIS THRUST
CUMMINGS CREEK
WILSON FAULT
BLA RIVER
GRAVE CREEK
ERICKSON FAULT
WISUKITSAK RANGE
ALEXANDER FAULT
COLEMAN
Pre-Devonian
PCu
Mlw
Mb
Du
Dp
Dsf
JT R S

D 1


WHITE RIVER
CADORNA CREEK
ELK RIVER
SEA LEVEL
Pre-Devonian
LEWIS THRUST
CADORNA CREEK SECTION-1
WHITE RIVER
CONDOR LAKES
QUARRIE CREEK
ABBY RIDGE
ELK RIVER
Pre-Devonian


WEST
WHITE RIVER
BINGAY CREEK
ELK RIVER
GREENHILLS RANGE
SEA LEVEL
LEWIS THRUST
BULL RIVER - WHITE RIVER FAULT
BOURGEAU FAULT
BOURGEAU RANGE LINEAMENT
ELK RIVER BASIN
BULL RIVER
CROSSING CREEK
Pre-Devonian
Du
PCu
Mlw
Mb
Jf & K
Ks

D 1


CADORNA CREEK SECTION
Tp 19 R 7
Tp 19 R 6
CADORNA CREEK
FAULT?
TKKP
DOUGLAS FAULT
MILLER CREEK GAP
Tu
Tkp
Tkm
Tkc
Tkl
Tkb
Tkv
Tkd
Tkg
Tkh
Tkf
Tkk
Tkn
Tkq
Tkr
Tks
Tkt
Tku
Tkw
Tkx
Tky
Tkz
Tkaa
Tkbb
Tkcc
Tkdd
Tkee
Tkff
Tkgg
Tkhh
Tkii
Tkjj
Tkkk
Tkll
Tkmm
Tknn
Tkoo
Tkpp
Tkqq
Tkrr
Tkss
Tktt
Tkuu
Tkvv
Tkww
Tkxx
Tkyy
Tkzz


LEWIS THRUST PLATE
ELK RIVER BASIN
ALEXANDER CREEK SYNCLINE
RANGE LINEAMENT
BULL RIVER
WHITE RIVER
Contorted
Tightly folded
HIGH
P R O V I N
E L K

D 2

MAIN RANGES SUB-PROVINCE

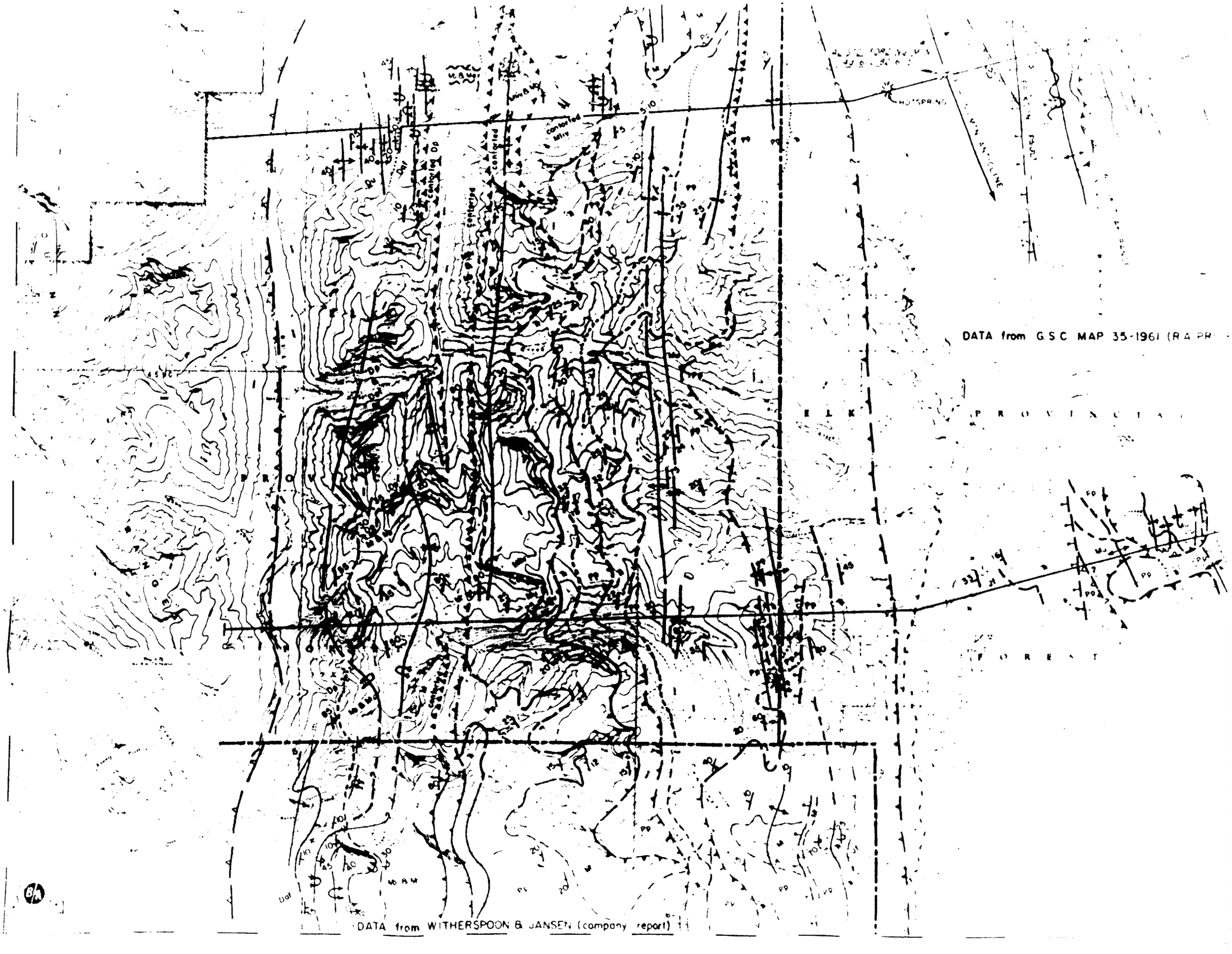
BOURGEAU RANGE LINEAMENT

BOURGEAU FAULT

THRUST PLATE

ELK RIVER BASIN

BASE CAMP


DATA from G.S.C. MAP 35-1961 (R.A. PR
DATA from WITHERSPOON & JANSEN (company report)

D 3

FIGURE 3

RECONNAISSANCE GEOLOGY MAP UPPER ELK RIVER AREA, BRITISH COLUMBIA

LEGEND

MESOZOIC

JURASSIC and CRETACEOUS

TRIASSIC

PENNSYLVANIAN and PERMIAN

MISSISSIPPIAN & PERMO PENN

MISSISSIPPIAN

DEVONIAN

DEVONIAN - MISSISSIPPIAN

PALEOZOIC

GEOLOGICAL BOUNDARY — Defined, approximate, assumed

ANTICLINE — Defined, approximate, overturned

SYNCLINE — Defined, approximate, overturned

THRUST FAULT — Defined, approximate, assumed

NORMAL FAULT — Defined, approximate, assumed

LOCATION OF STRUCTURE SECTION

NOTE: Thrust fault - teeth on hangingwall

Scale 1:50,000

THE BRITISH AMERICAN OIL CO LTD, CALGARY EXPLORATION ZONE
PARTY CZ-1-64
TO ACCOMPANY REPORT BY D.A. LOCHIE, JANUARY, 1965

MILES

British American Oil Company Limited
Calgary, Alberta

Figure 3
Reconnaissance Geology Map

To accompany a report by D.A. Lochie on Stratigraphic Investigations and Structural Reconnaissance, Upper Elk River Area, British Columbia, dated March 11, 1965

D.A. Lochie

TP 18 R 7

TP 18 R 6

TP 18 R 5

TP 18 R 4

TP 17 R 5

TP 17 R 4

TP 16 R 5

TP 16 R 4

TP 15 R 5

TP 15 R 4

ACTINOLITE CREEK SECTION

HEARY CREEK GAP

MACLAREN SECTION - 2

MOUNT MACLAREN
TP16 R6
TP16 R5
COLEMAN FAULT
ETHERINGTON CREEK FAULT
LEWIS THRUST
MOUNT ETHERINGTON
BINGAY CREEK SECTION
SECTION
ALEXANDER CREEK SYNCLINE
LEWIS THRUST PLATE
HIGH ROCK RANGE
THRUST
ETHERINGTON CREEK FAULT
COLEMAN FAULT

D 4

LEWIS THRUST PLATE

ROCKY RANGE

THRUST

SYNCLINE

CROSSING CREEK FAULT

RANGE

PROVINCIAL

FOREST

(Paleozoic)
Grey-weathering
carbonate
35
70

CROSSING CREEK SECTION - A

FORDING MOUNTAIN SECTION - B

BASE CAMP

ALTO FORDING MTN

HOT SPRING

FORDING MTN ANTICLINE

ERIKSON FAULT

DATA from G.S.C. MAP. 35-1961 (R.A. PRICE)

WISUKITSAK RANGE

FAULT

ALLISON ANTICLINE

CUMMINGS CREEK SECTION - 6

SINCLAIR et al RACEHORSE CREEK
15-29-9-5 W5
TD in JUR. FERNIE

P R O V I N C I A L F O R E S T

1235

VERTICALITY ANALYSIS

COMPANY MANALTA
WELL T92R-34 35
FIELD TELKWA
PROVINCE/COUNTY BRITISH COLUMBIA
COUNTRY/STATE CANADA

LOCATION TELKWA
PRVNC/CO. BRITISH COLUMBIA
FIELD TELKWA
WELL: T92R-34 35
COMPANY: MANALTA

LOCATION TELKWA | LSD | SEC | TWP | RGE
OTHER SERVICES: CCS

PERMANENT DATUM GROUND LEVEL ELEVATION N/A
LOG MEASURED FROM OOM ABOVE PERMANENT DATUM
DRILLING MEASURED FROM OOM
ELEVATIONS: KB N/A, DF N/A, GL N/A

DATE	2-OCT-92
RUN NUMBER	ONE
DEPTH-DRILLER	152.4M
DEPTH-LOGGER	152.0M
FIRST READING	152.0M
LAST READING	12.0M
CASING-DRILLER	12.8M
CASING-LOGGER	12.8M
BIT SIZE	155.0MM
HOLE FLUID TYPE	AIR/WATER
DENS./VISC.	1.00 / N/A
PH/FLUID LOSS	N/A
SAMPLE SOURCE	
RM @ MEAS TEMP	N/A
RMF @ MEAS TEMP	N/A
RMC @ MEAS TEMP	N/A
SOURCE: RMF/RMC	N/A / N/A
RM @ BHT	N/A
TIME SINCE CIRC	
MAX REC TEMP	N/A
EQUIPMENT/BASE	V222 / RDR
RECORDED BY	B PICHE
WITNESSED BY	T. BRAZZONI

BPB VERTICALITY ANALYSIS INTERPRETATION NOTES

1. ALL PLOTTED OUTPUT IS AUTOMATICALLY SCALED TO OBTAIN THE BEST VISUAL EFFECT WITHIN THE PHYSICAL SPACE AVAILABLE. THE MAXIMUM SCALES BEING 50000:1 (METRIC) AND 48000:1 (IMPERIAL), AND THE MINIMUM 1:1.

2. THE ANALYSIS IS DERIVED BY INTEGRATING 10CM. SAMPLED DATA DOWN THE BOREHOLE. THE LISTING SUPPLIED WILL CONTAIN A MAXIMUM OF 200 POINTS IN MULTIPLES OF 1, 2, 5, 10, 20, 50 OR 100 METRES/FEET DEPENDING ON THE TOTAL RANGE OF THE ANALYSIS. HOWEVER THE ANALYSIS IS CALCULATED FOR THE ENTIRE RANGE OF THE BOREHOLE AND THE FINAL BOREHOLE POSITION IS INCLUDED IN THE LISTING.

3. COMPUTED VERTICALITY MAY ONLY BE FULLY DERIVED IN OPEN SECTIONS OF THE BOREHOLE, AWAY FROM THE INFLUENCE OF ANY UNUSUAL MAGNETIC EFFECTS (AS THE AZIMUTH CALCULATIONS ARE DERIVED FROM THREE SOLID STATE MAGNETOMETERS). SO THE ANALYSIS WILL GENERALLY BEGIN AT THE END OF THE CASING AND ALL BOREHOLE POSITIONAL INFORMATION WILL RELATE TO THIS DEPTH.

4. UP TO TEN CROSS SECTIONS MAY BE REQUESTED FOR ANY BOREHOLE TO BE DISPLAYED AT ANY SCALE (THE DEFAULT SCALE IS THAT OF THE CROSS-SECTION FOR THE ENTIRE HOLE).

5. BOREHOLE POSITIONAL ERROR IS DERIVED ASSUMING THE FOLLOWING PARAMETERS.

	TILT(DEGREES)	AZIMUTH(DEGREES)
TYPICAL ERROR	+/- 0.3333	+/- 10
MAXIMUM ERROR	+/- 0.5	+/- 15

6. ERROR ANALYSIS MAY BE CALCULATED AND PLOTTED FROM THE DATA LISTING AS FOLLOWS:

A) PLOT THE FOUR COORDINATES FROM THE ERROR LISTING (BASED UPON ZERO AZIMUTH ERROR) ON A TARGET PLOT, ORIGIN AT THE START OF THE ANALYSIS.
B) DESCRIBE ARCS OF +/- 10 DEGREES AND +/- 15 DEGREES (CENTRE AT THE ORIGIN) THROUGH THE INNER AND OUTER POINTS RESPECTIVELY.
C) CONNECT THE RESPECTIVE ARCS TOGETHER WITH STRAIGHT LINES TO GIVE THE TYPICAL AND MAXIMUM BOREHOLE POSITIONAL ERROR.

7. GIVEN BELOW IS A FULL DESCRIPTION OF THE PARAMETERS DISPLAYED ON THE ENSUING LISTING:

LOG DEPTH	THE DEPTH RECORDED ON THE FIELD LOGS FOR THE BOREHOLE.
TRUE DEPTH	THE TRUE VERTICAL DEPTH CORESPONDING TO THE ABOVE DEPTH. CORRECTED FROM THE START OF THE ANALYSIS.
HOLE TILT AND AZIMUTH	THE SAMPLED BOREHOLE ORIENTATION.
AXIAL COORDINATES	THE COORDINATES NORTH AND EAST FROM THE TARGET ORIGIN.
POLAR COORDINATES	THE POLAR, OR RADIAL COORDINATES OF THE BOREHOLE.
ERROR COORDINATES	THE POLAR COORDINATES CORRESPONDING TO THE TYPICAL AND MAXIMUM TILT ERROR.

N.B. THE REFERENCE POINT FOR ALL BEARING ANGLES ON THIS LISTING IS GIVEN AT THE TOP OF EACH SHEET.

ALL INTERPRETATIONS ARE OPINIONS BASED ON INFERENCES FROM ELECTRICAL OR OTHER MEASUREMENTS AND WE CANNOT, AND DO NOT, GUARANTEE THE ACCURACY OR CORRECTNESS OF ANY INTERPRETATIONS, AND WE SHALL NOT, EXCEPT IN THE CASE OF GROSS OR WILFUL NEGLIGENCE ON OUR PART, BE LIABLE OR RESPONSIBLE FOR ANY LOSS, COSTS, DAMAGES OR EXPENSES INCURRED OR SUSTAINED BY ANYONE RESULTING FROM ANY INTERPRETATION MADE BY ANY OF OUR OFFICERS, AGENTS OR EMPLOYEES. THESE INTERPRETATIONS ARE ALSO SUBJECT TO OUR GENERAL TERMS AND CONDITIONS AS SET OUT IN OUR CURRENT PRICE SCHEDULE.

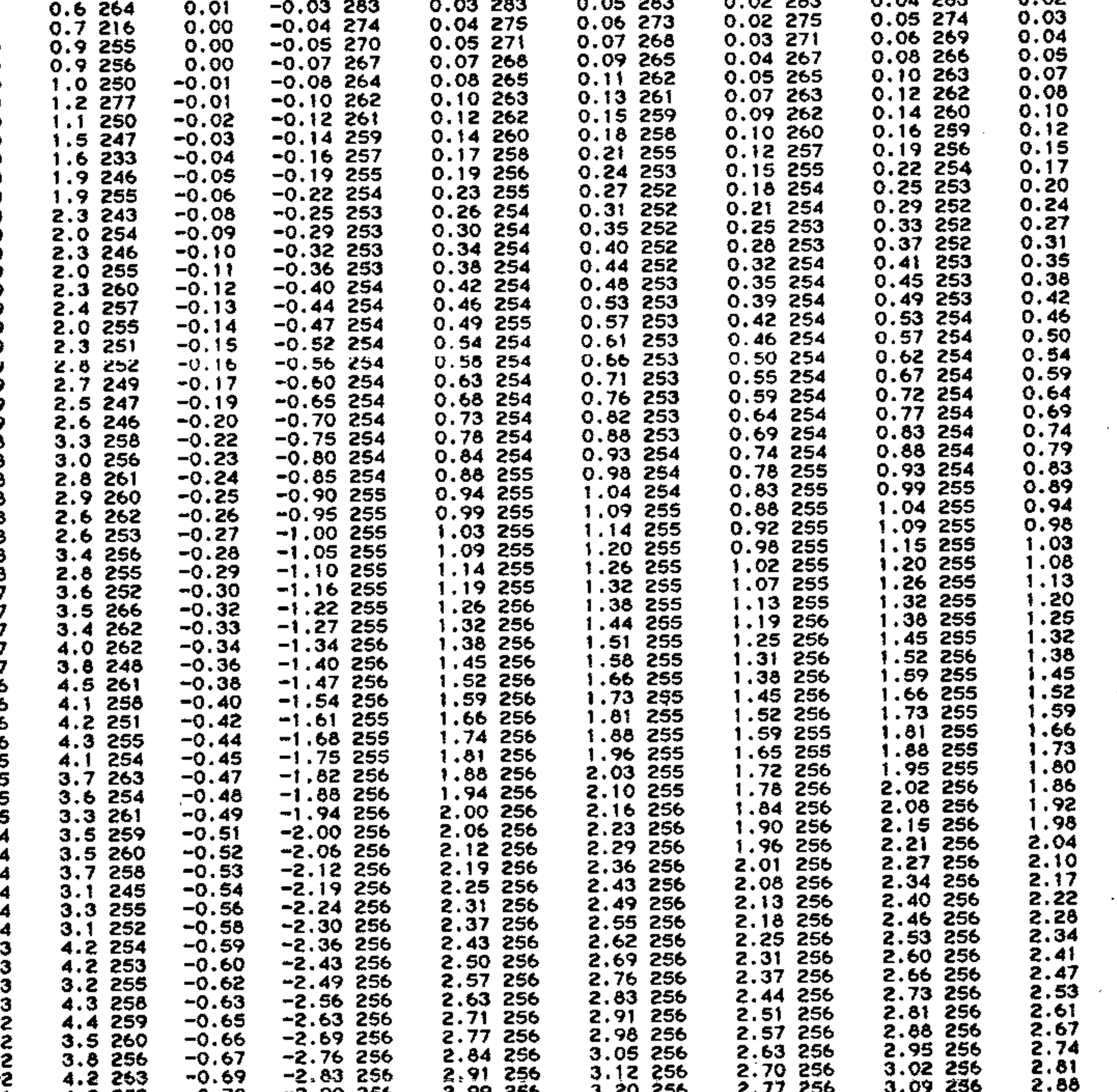
T92R-34
VERTICALITY DATA LISTING
ALL CO-ORDINATES WITH RESPECT TO TRUE NORTH
DATE PROCESSED: 2-OCT-1992
DATE LOGGED: 2-OCT-1992

DEPTHS		BOREHOLE		AXIAL CO-ORDS		POLAR		POLAR ERROR CO-ORDINATES (MAXIMUM & TYPICAL)							
LOG	TRUE	TILT	AZI	NORTH	EAST	BRG	RADIUS	BRG	RADIUS	BRG	RADIUS	BRG	RADIUS	BRD	RADIUS
10.00	10.00	0.5	267	0.00	0.00	267	0.00	267	0.00	267	0.00	267	0.00	267	0.00
11.00	11.00	0.2	109	0.00	0.00	74	0.01	74	0.01	73	0.00	74	0.01	73	0.00
12.00	12.00	0.2	221	0.00	0.01	77	0.01	76	0.01	79	0.00	77	0.01	78	0.00
13.00	13.00	0.2	263	0.00	0.01	81	0.01	81	0.01	80	0.00	82	0.01	81	0.00
14.00	14.00	0.4	188	0.00	0.01	103	0.01	108	0.01	92	0.00	106	0.01	99	0.01
15.00	15.00	0.5	254	0.00	0.00	127	0.01	133	0.01	111	0.00	131	0.01	120	0.01
16.00	16.00	0.2	124	0.00	0.00	132	0.00	139	0.01	113	0.00	136	0.01	125	0.00
17.00	17.00	0.3	70	0.00	0.00	117	0.00	126	0.00	96	0.00	122	0.00	109	0.00
18.00	18.00	0.3	275	0.00	0.00	37	0.00	41	0.00	32	0.00	39	0.00	35	0.00
19.00	19.00	0.8	315	0.01	0.00	323	0.01	325	0.01	321	0.01	324	0.01	322	0.01
20.00	20.00	0.2	312	0.01	-0.01	313	0.01	313	0.02	313	0.01	313	0.01	313	0.01
21.00	21.00	0.2	318	0.01	-0.01	319	0.01	320	0.02	314	0.01	320	0.02	317	0.01
22.00	22.00	0.2	138	0.01	-0.01	310	0.02	310	0.02	309	0.01	310	0.02	309	0.01
23.00	23.00	0.2	233	0.01	-0.02	300	0.02	299	0.03	304	0.01	300	0.03	302	0.01
24.00	24.00	0.3	251	0.01	-0.02	292	0.03	291	0.04	293	0.01	291	0.03	292	0.02
25.00	25.00	0.6	264	0.01	-0.03	283	0.03	283	0.05	283	0.02	283	0.04	283	0.02
26.00	26.00	0.7	216	0.00	-0.04	274	0.04	275	0.06	273	0.02	275	0.05	274	0.03
27.00	27.00	0.9	255	0.00	-0.05	270	0.05	271	0.07	268	0.03	271	0.06	269	0.04
28.00	28.00	0.9	256	0.00	-0.07	267	0.07	268	0.09	265	0.04	267	0.08	266	0.05
29.00	29.00	1.0	250	-0.01	-0.08	264	0.08	265	0.11	262	0.05	265	0.10	263	0.07
30.00	30.00	1.2	277	-0.01	-0.10	262	0.10	263	0.13	261	0.07	263	0.12	262	0.08
31.00	31.00	1.1	250	-0.02	-0.12	261	0.12	262	0.15	259	0.09	262	0.14	260	0.10
32.00	32.00	1.5	247	-0.03	-0.14	259	0.14	260	0.18	258	0.10	260	0.16	259	0.12
33.00	33.00	1.6	233	-0.04	-0.16	257	0.17	258	0.21	255	0.12	257	0.19	256	0.15
34.00	34.00	1.9	246	-0.05	-0.19	255	0.19	256	0.24	253	0.15	255	0.22	254	0.17
35.00	35.00	1.9	255	-0.06	-0.22	254	0.23	255	0.27	252	0.18	254	0.25	253	0.20
36.00	36.00	2.3	243	-0.08	-0.25	253	0.26	254	0.31	252	0.21	254	0.29	252	0.24
37.00	37.00	2.0	254	-0.09	-0.29	253	0.30	254	0.35	252	0.25	253	0.33	252	0.27
38.00	38.00	2.3	246	-0.10	-0.32	253	0.34	254	0.40	252	0.28	253	0.37	252	0.31
39.00	38.99	2.0	255	-0.11	-0.36	253	0.38	254	0.44	252	0.32	254	0.41	253	0.35
40.00	39.99	2.3	260	-0.12	-0.40	254	0.42	254	0.48	253	0.35	254	0.45	253	0.38
41.00	40.99	2.4	257	-0.13	-0.44	254	0.46	254	0.53	253	0.39	254	0.49	253	0.42
42.00	41.99	2.0	255	-0.14	-0.47	254	0.49	255	0.57	253	0.42	254	0.53	254	0.46
43.00	42.99	2.3	251	-0.15	-0.52	254	0.54	254	0.61	253	0.46	254	0.57	254	0.50
44.00	43.99	2.8	252	-0.16	-0.56	254	0.58	254	0.66	253	0.50	254	0.62	254	0.54
45.00	44.99	2.7	249	-0.17	-0.60	254	0.63	254	0.71	253	0.55	254	0.67	254	0.59
46.00	45.99	2.5	247	-0.19	-0.65	254	0.68	254	0.76	253	0.59	254	0.72	254	0.64
47.00	46.99	2.6	246	-0.20	-0.70	254	0.73	254	0.82	253	0.64	254	0.77	254	0.69
48.00	47.98	3.3	258	-0.22	-0.75	254	0.78	254	0.88	253	0.69	254	0.83	254	0.74
49.00	48.98	3.0	256	-0.23	-0.80	254	0.84	254	0.93	254	0.74	254	0.88	254	0.79
50.00	49.98	2.8	261	-0.24	-0.85	254	0.88	254	0.98	254	0.78	255	0.93	254	0.83
51.00	50.98	2.9	260	-0.25	-0.90	255	0.94	255	1.04	254	0.83	255	0.99	255	0.89
52.00	51.98	2.6	262	-0.26	-0.95	255	0.99	255	1.09	255	0.88	255	1.04	255	0.94
53.00	52.98	2.6	253	-0.27	-1.00	255	1.03	255	1.14	255	0.92	255	1.09	255	0.98
54.00	53.98	3.4	256	-0.28	-1.05	255	1.09	255	1.20	255	0.98	255	1.15	255	1.03
55.00	54.98	2.8	255	-0.29	-1.10	255	1.14	255	1.26	255	1.02	255	1.20	255	1.08
56.00	55.97	3.6	252	-0.30	-1.16	255	1.19	255	1.32	255	1.07	255	1.26	255	1.13
57.00	56.97	3.5	266	-0.32	-1.22	255	1.26	256	1.38	255	1.13	255	1.32	255	1.20
58.00	57.97	3.4	262	-0.33	-1.27	255	1.32	256	1.44	255	1.19	256	1.38	255	1.25
59.00	58.97	4.0	262	-0.34	-1.34	256	1.38	256	1.51	255	1.25	256	1.45	255	1.32
60.00	59.97	3.8	248	-0.36	-1.40	256	1.45	256	1.58	255	1.31	256	1.52	256	1.38
61.00	60.96	4.5	261	-0.38	-1.47	256	1.52	256	1.66	255	1.38	256	1.59	255	1.45
62.00	61.96	4.1	258	-0.40	-1.54	256	1.59	256	1.73	255	1.45	256	1.66	255	1.52
63.00	62.96	4.2	251	-0.42	-1.61	255	1.66	256	1.81	255	1.52	256	1.73	255	1.59
64.00	63.96	4.3	255	-0.44	-1.68	255	1.74	256	1.88	255	1.59	256	1.81	255	1.66
65.00	64.95	4.1	254	-0.45	-1.75	255	1.81	256	1.96	255	1.65	255	1.88	255	1.73
66.00	65.95	3.7	263	-0.47	-1.82	256	1.88	256	2.03	255	1.72	256	1.95	255	1.80
67.00	66.95	3.6	254	-0.48	-1.88	256	1.94	256	2.10	255	1.78	256	2.02	256	1.86
68.00	67.95	3.3	261	-0.49	-1.94	256	2.00	256	2.16	256	1.84	256	2.08	256	1.92
69.00	68.94	3.5	259	-0.51	-2.00	256	2.06	256	2.23	256	1.90	256	2.15	256	1.98
70.00	69.94	3.5	260	-0.52	-2.06	256	2.12	256	2.29	256	1.96	256	2.21	256	2.04
71.00	70.94	3.7	258	-0.53	-2.12	256	2.19	256	2.36	256	2.01	256	2.27	256	2.10
72.00	71.94	3.1	245	-0.54	-2.19	256	2.25	256	2.43	256	2.08	256	2.34	256	2.17
73.00	72.94	3.3	255	-0.56	-2.24	256	2.31	256	2.49	256	2.13	256	2.40	256	2.22
74.00	73.94	3.1	252	-0.58	-2.30	256	2.37	256	2.55	256	2.18	256	2.46	256	2.28
75.00	74.93	4.2	254	-0.59	-2.36	256	2.43	256	2.62	256	2.25	256	2.53	256	2.34
76.00	75.93	4.2	253	-0.60	-2.43	256	2.50	256	2.69	256	2.31	256	2.60	256	2.41
77.00	76.93	3.2	255	-0.62	-2.49	256	2.57	256	2.76	256	2.37	256	2.66	256	2.47
78.00	77.93	4.3	258	-0.63	-2.56	256	2.63	256	2.83	256	2.44	256	2.73	256	2.53
79.00	78.92	4.4	259	-0.65	-2.63	256	2.71	256	2.91	256	2.51	256	2.81	256	2.61
80.00	79.92	3.5	260	-0.66	-2.69	256	2.77	256	2.98	256	2.57	256	2.88	256	2.67
81.00	80.92	3.8	256	-0.67	-2.76	256	2.84	256	3.05	256	2.63	256	2.95	256	2.74
82.00	81.92	4.2	263	-0.69	-2.83	256	2.91	256	3.12	256	2.70	256	3.02	256	2.81
83.00	82.91	4.3	253	-0.70	-2.90	256	2.99	256	3.20	256	2.77	256	3.09	256	2.88
84.00	83.91	4.7	255	-0.72	-2.98	256	3.06	256	3.28	256	2.85	256	3.17	256	2.96
85.00	84.91	4.7	255	-0.75	-3.06	256	3.15	256	3.37	256	2.93	256	3.26	256	3.04
86.00	85.90	4.7	256	-0.76	-3.14	256	3.23	256	3.45	256	3.00	256	3.34	256	3.12
87.00	86.90	4.4	263	-0.78	-3.22	256	3.31	256	3.54	256	3.08	256	3.42	256	3.20
88.00	87.90	4.8	256	-0.80	-3.29	256	3.39	256	3.62	256	3.16	256	3.50	256	3.27
89.00	88.89	4.0	259	-0.81	-3.36	256	3.46	256	3.70	256	3.23	256	3.58	256	3.34
90.00	89.89	4.6	257	-0.83	-3.44	256	3.54	256	3.78	256	3.30	256	3.66	256	3.42
91.00	90.89	4.5	258	-0.85	-3.51	256	3.62	257	3.86	256	3.37	257	3.74	256	3.49
92.00	91.89	4.7	255	-0.87	-3.59	256	3.70	256	3.94	256	3.45	256	3.82	256	3.57
93.00	92.88	3.9	256	-0.88	-3.66	256	3.77	256	4.02	256	3.52	256	3.89	256	3.64
94.00	93.88	4.4	256	-0.90	-3.73	256	3.84	256	4.09	256	3.59	256	3.97	256	3.71
95.00	94.88	4.4	259	-0.91	-3.80	256	3.91	257	4.17	256	3.66	257	4.04	256	3.78
96.00	95.87	4.3	257	-0.93	-3.88	257	3.99	257	4.25	256	3.73	257	4.12	256	3.86
97.00	96.87	5.0	257	-0.95	-3.96	257	4.07	257	4.33	257	3.81	257	4.20	257	3.94
98.00	97.87	4.2	259	-0.96	-4.04	257	4.15	257	4.42	257	3.89	257	4.29	257	4.02
99.00	98.87	4.5	257	-0.98	-4.11	257	4.23	257	4.50	257	3.96	257	4.36	257	4.09
100.00	99.86	4.9	256	-0.99	-4.19	257	4.31	257	4.58	257	4.03	257	4.44	257	4.17
101.00	100.86	5.1	256	-1.01	-4.27	257	4.39	257	4.67	257	4.11	257	4.53	257	4.25
102.00	101.85	5.4	258	-1.03	-4.36	257	4.48	257	4.76	257	4.20	257	4.62	257	4.34
103.00	102.85	4.9	257	-1.05	-4.45	257	4.57	257	4.85	257	4.28	257	4.71	257	4.43
104.00	103.85	5.0	255	-1.07	-4.53	257	4.66	257	4.94	257	4.37	257	4.80	257	4.51
105.00	104.84	5.0	253	-1.10	-4.62	257	4.75	257	5.04	257	4.46	257	4.89	257	4.60
106.00	105.84	5.4	253	-1.12	-4.71	257	4.84	257	5.13	257	4.55	257	4.99	257	4.69
107.00	106.83	5.4	257	-1.14	-4.80	257	4.93	257	5.23	257	4.63	257	5.08	257	4.78
108.00	107.83	5.2	254	-1.16	-4.88	257	5.02	257	5.32	257	4.72	257	5.17	257	4.87
109.00	108.83	5.2	256	-1.19	-4.97	257	5.11	257	5.42	257	4.81	257	5.26	257	4.96
110.00	109.82	5.0	253	-1.21	-5.06	257	5.20	257	5.51	257	4.89	257	5.36	257	5.05
111.00	110.82	4.8	260	-1.22	-5.14	257	5.28	257	5.59	257	4.97	257	5.44	257	5.13
112.00	111.81	4.8	261	-1.24	-5.22	257	5.37	257	5.68	257	5.05	257	5.53	257	5.21
113.00	112.81	4.5	261	-1.26	-5.31	257	5.45	257	5.77	257	5.14	257	5.61	257	5.29
114.00	113.81	4.5	257	-1.27	-5.38	257	5.53	257	5.85	257	5.21	257	5.69	257	5.37
115.00	114.80	4.5	259	-1.29	-5.46	257	5.61	257	5.94	257	5.28	257	5.77	257	5.45
116.00	115.80	4.4	256	-1.30	-5.54	257	5.69	257	6.02	257	5.36	257	5.85	257	5.52
117.00	116.80	4.0	254	-1.32	-5.61	257	5.76	257	6.09	257	5.43	257	5.93	257	5.59
118.00	117.80	4.3	255	-1.34	-5.68	257	5.83	257	6.17	257	5.50	257	6.00	257	5.66
119.00	118.79	4.8	255	-1.35	-5.75	257	5.91	257	6.25	257	5.57	257	6.08	257	5.74
120.00	119.79	4.9	261	-1.37	-5.83	257	5.99	257	6.34	257	5.65	257	6.17	257	5.82
121.00	120.79	4.1	256	-1.39	-5.91	257	6.07	257	6.41	257	5.72	257	6.24	257	5.89
122.00	121.78	4.2	259	-1.40	-5.97	257	6.14	257	6.49	257	5.79	257	6.31	257	5.96
123.00	122.78	4.9	258	-1.42	-6.05	257	6.22	257	6.57	257	5.86	257	6.39	257	6.04
124.00	123.78	4.2	255	-1.43	-6.13	257	6.29	257	6.65	257	5.94	257	6.47	257	6.11
125.00	124.78	4.4	253	-1.45	-6.20	257	6.37	257	6.73	257	6.01	257	6.55	257	6.19
126.00	125.77	4.2	262	-1.46	-6.28	257	6.45	257	6.81	257	6.08	257	6.63	257	6.27
127.00	126.77	4.2	258	-1.48	-6.35	257	6.52	257	6.89	257	6.15	257	6.70	257	6.34
128.00	127.77	4.5	256	-1.49	-6.42	257	6.60	257	6.97	257	6.23	257	6.78	257	6.41
129.00	128.76	4.5	253	-1.51	-6.50	257	6.67	257	7.05	257	6.30	257	6.86	257	6.49
130.00	129.76	4.4	261	-1.53	-6.58	257	6.75	257	7.13	257	6.37	257	6.94	257	6.56
131.00	130.76	4.3	255	-1.55	-6.65	257	6.83	257	7.21	257	6.45	257	7.02	257	6.64
132.00	131.75	4.5	256	-1.56	-6.73	257	6.91	257	7.29	257	6.52	257	7.10	257	6.71
133.00	132.75	4.5	260	-1.58	-6.80	257	6.98	257	7.37	257	6.60	257	7.18	257	6.79
134.00	133.75	4.8	253	-1.60	-6.88	257	7.06	257	7.45	257	6.67	257	7.26	257	6.87
135.00	134.75	4.7	258	-1.62	-6.96	257	7.14	257	7.54	257	6.75	257	7.34	257	6.94
136.00	135.74	4.5	255	-1.64	-7.03	257	7.22	257	7.62	257	6.82	257	7.42	257	7.02
137.00	136.74	4.9	258	-1.66	-7.11	257	7.30	257	7.70	257	6.90	257	7.50	257	7.10
138.00	137.74	4.7	252	-1.69	-7.19	257	7.38	257	7.79	257	6.98	257	7.58	257	7.18
139.00	138.73	4.5	254	-1.70	-7.26	257	7.46	257	7.87	257	7.05	257	7.66	257	7.25
140.00	139.73	4.2	250	-1.73	-7.33	257	7.53	257	7.95	257	7.12	257	7.74	257	7.33
141.00	140.73	4.3	257	-1.74	-7.41	257	7.61	257	8.03	257	7.20	257	7.82	257	7.40
142.00	141.72	4.3	255	-1.76	-7.48	257	7.69	257	8.11	257	7.27	257	7.90	257	7.48
143.00	142.72	4.5	257	-1.78	-7.56	257	7.77	257	8.19	257	7.34	257	7.98	257	7.55
144.00	143.72	4.3	251	-1.80	-7.63	257	7.84	257	8.27	257	7.42	257	8.05	257	7.63
145.00	144.72	4.3	251	-1.82	-7.70	257	7.92	257	8.35	257	7.49	257	8.13	257	7.70
146.00	145.71	4.2	254	-1.84	-7.78	257	7.99	257	8.42	257	7.56	257	8.21	257	7.77
147.00	146.71	4.0	255	-1.86	-7.85	257	8.06	257	8.50	257	7.63	257	8.28	257	7.85
148.00	147.71	4.4	254	-1.88	-7.92	257	8.14	257	8.58	257	7.70	257	8.36	257	7.92
149.00	148.70	4.5	258	-1.89	-7.99	257	8.21	257	8.66	257	7.77	257	8.44	257	7.99
150.00	149.70	4.2	252	-1.91	-8.06	257	8.29	257	8.73	257	7.84	257	8.51	257	8.06
151.00	150.70	4.3	246	-1.94	-8.13	257	8.36	257	8.81	257	7.90	257	8.58	257	8.13
152.00	151.70	4.7	250	-1.97	-8.20	256	8.43	256	8.88	256	7.98	256	8.66	256	8.20
152.30	152.00	2.7	281	-1.97	-8.22	256	8.45	257	8.91	256	8.00	256	8.68	256	8.22

CROSS SECTION

ALL FIGURES IN LOG DEPTH MS
TARGET ORIGIN DEPTH.....9.80
LAST PLOTTED DEPTH.....152.30
DEPTH MARKERS ANNOTATED
IN MULTIPLES OF.....10
FIRST DEPTH MARKER AT....10
LAST DEPTH MARKER AT....150

PLOT WITH RESPECT TO TRUE NORTH
SCALE 200:1
DECLINATION 27.2 DEG.



BOREHOLE POSITIONAL ERROR
THE TWO BOXES SURROUNDING THE LAST PLOTTED DEPTH SHOW THE TYPICAL, AND MAXIMUM, POSITIONAL ERROR AT THAT DEPTH.

FINAL BOREHOLE POSITION
THE LAST PLOTTED DEPTH IS AT 1.97 MS SOUTH, 8.22 MS WEST IE. 8.45 MS FROM THE ORIGIN. 256 DEG FROM TRUE NORTH

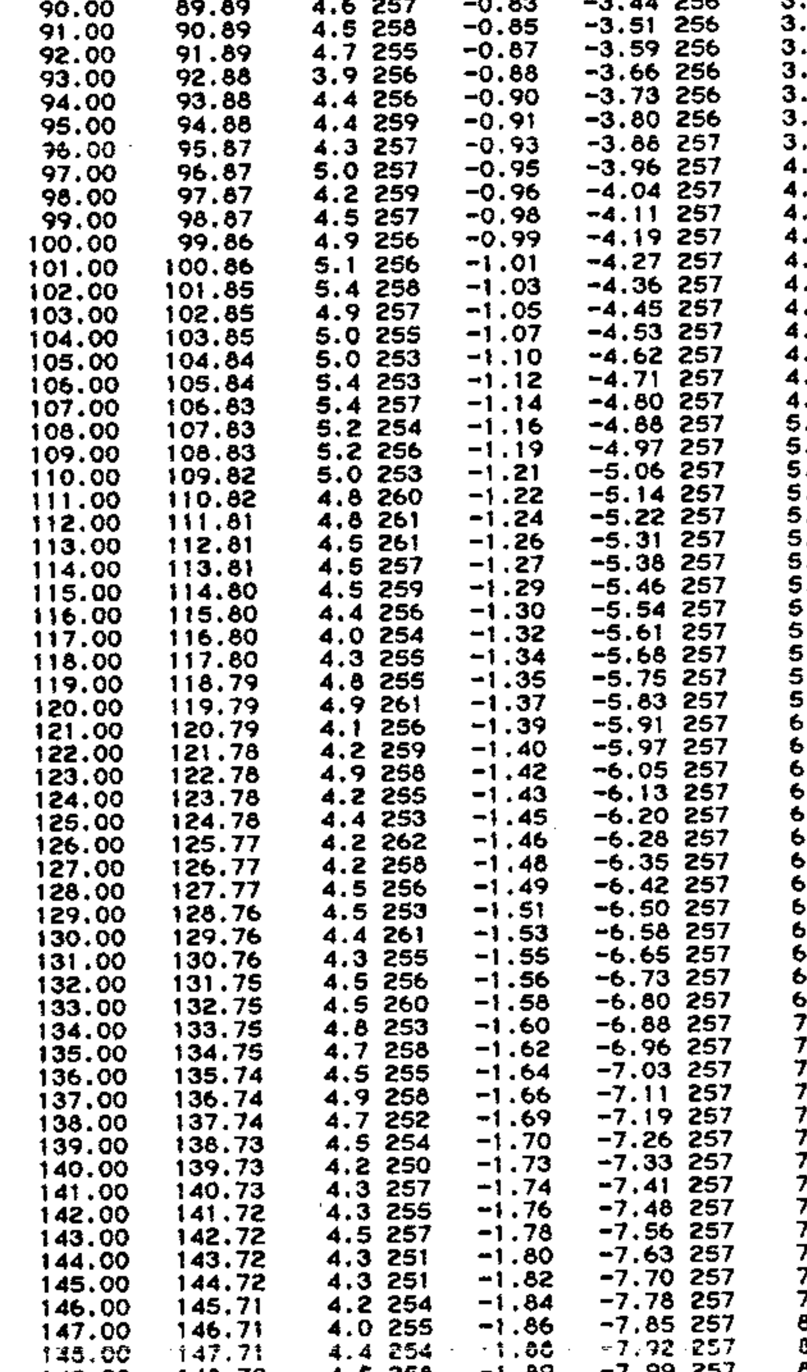
VERTICAL SECTIONS

(TRUE DEPTH VS DISPLACEMENT)

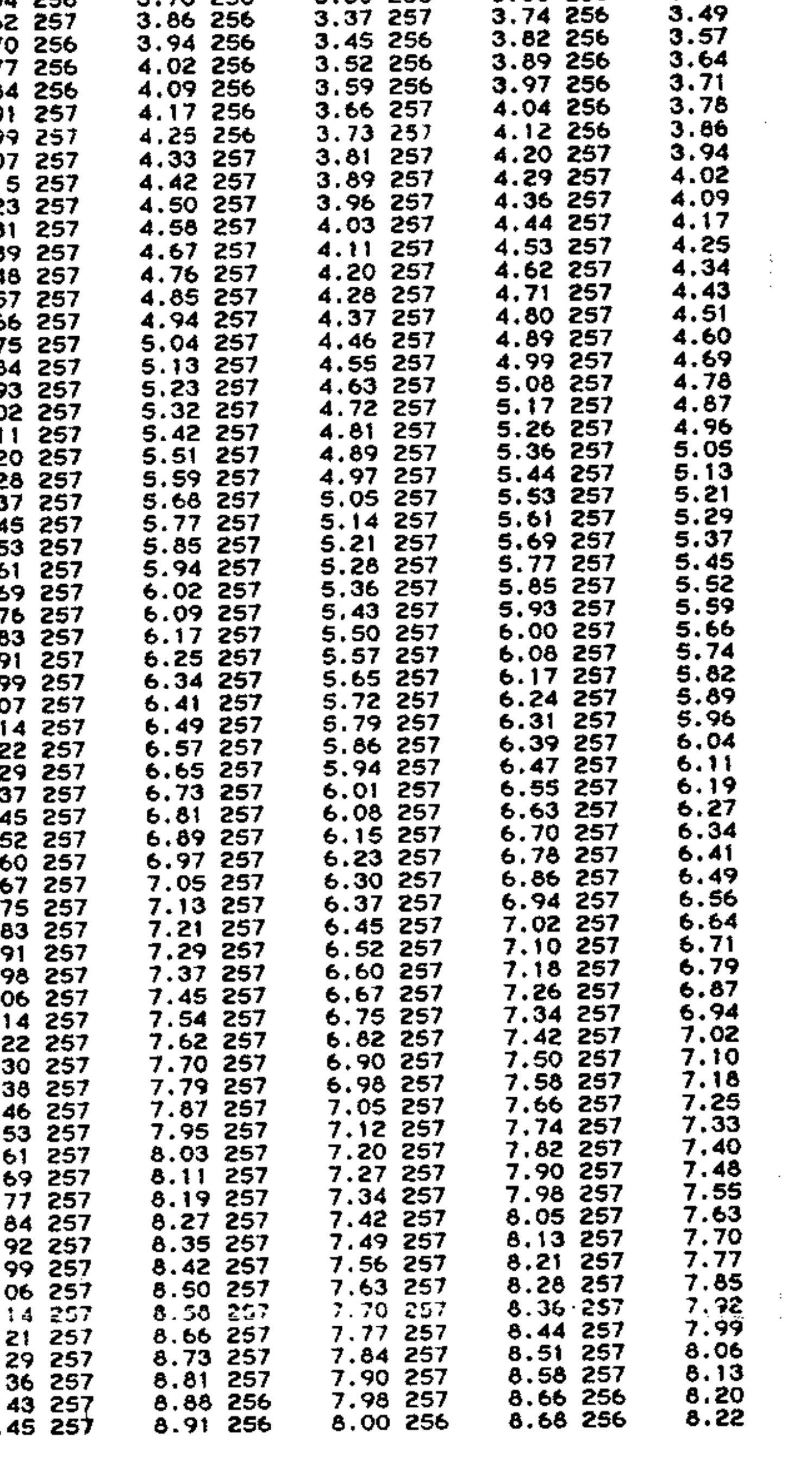
VERTICAL SCALE 1000:1
HORIZONTAL SCALE 500:1

MARKERS ANNOTATED AS ABOVE

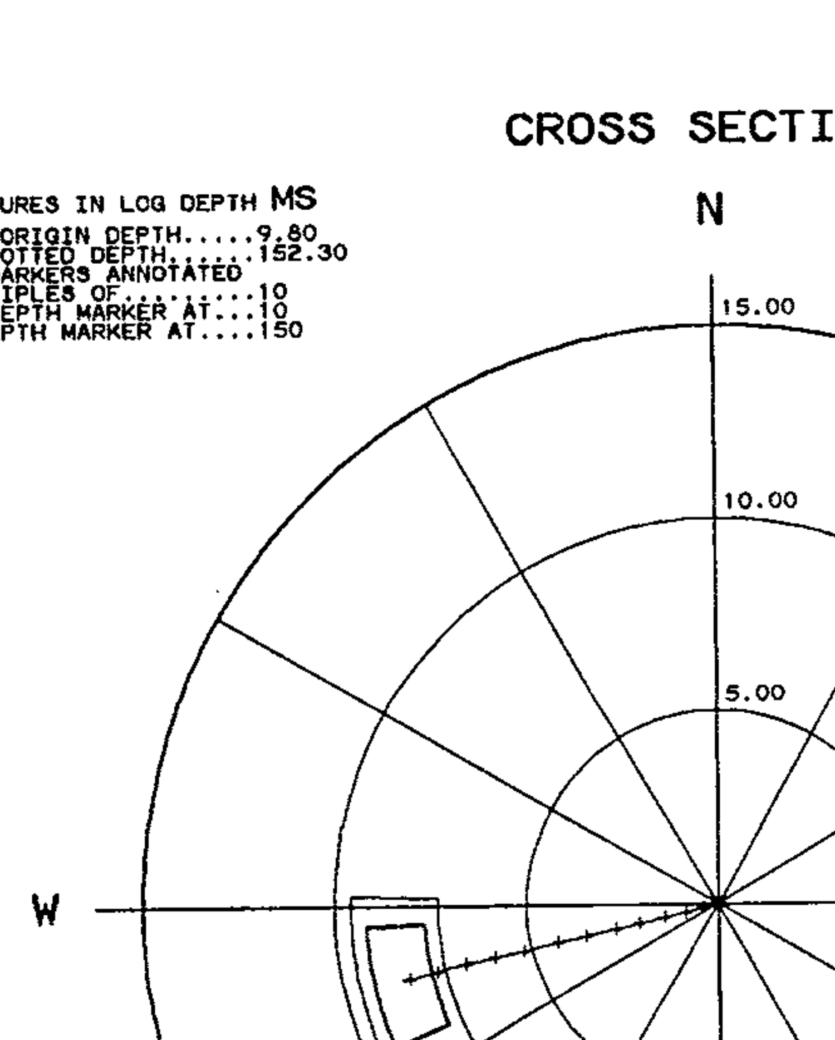
N-S SECTION



E-W SECTION



DEPTH CORRECTION ANALYSIS



DEPTHS: LOG	TRUE	DEPTHS: LOG	TRUE	DEPTHS: LOG	TRUE
10.00	10.00	80.00	79.92	150.00	149.70
11.00	11.00	81.00	80.92	151.00	150.70
12.00	12.00	82.00	81.92	152.00	151.70
13.00	13.00	83.00	82.91	152.30	152.00
14.00	14.00	84.00	83.91		
15.00	15.00	85.00	84.91		
16.00	16.00	86.00	85.90		
17.00	17.00	87.00	86.90		
18.00	18.00	88.00	87.90		
19.00	19.00	89.00	88.89		
20.00	20.00	90.00	89.89		
21.00	21.00	91.00	90.89		
22.00	22.00	92.00	91.89		
23.00	23.00	93.00	92.88		
24.00	24.00	94.00	93.88		
25.00	25.00	95.00	94.88		
26.00	26.00	96.00	95.87		
27.00	27.00	97.00	96.87		
28.00	28.00	98.00	97.87		
29.00	29.00	99.00	98.87		
30.00	30.00	100.00	99.86		
31.00	31.00	101.00	100.86		
32.00	32.00	102.00	101.85		
33.00	33.00	103.00	102.85		
34.00	34.00	104.00	103.85		
35.00	35.00	105.00	104.84		
36.00	36.00	106.00	105.84		
37.00	37.00	107.00	106.83		
38.00	38.00	108.00	107.83		
39.00	38.99	109.00	108.83		
40.00	39.99	110.00	109.82		
41.00	40.99	111.00	110.82		
42.00	41.99	112.00	111.81		
43.00	42.99	113.00	112.81		
44.00	43.99	114.00	113.81		
45.00	44.99	115.00	114.80		
46.00	45.99	116.00	115.80		
47.00	46.99	117.00	116.80		
48.00	47.98	118.00	117.80		
49.00	48.98	119.00	118.79		
50.00	49.98	120.00	119.79		
51.00	50.98	121.00	120.79		
52.00	51.98	122.00	121.78		
53.00	52.98	123.00	122.78		
54.00	53.98	124.00	123.78		
55.00	54.98	125.00	124.78		
56.00	55.97	126.00	125.77		
57.00	56.97	127.00	126.77		
58.00	57.97	128.00	127.77		
59.00	58.97	129.00	128.76		
60.00	59.97	130.00	129.76		
61.00	60.96	131.00	130.76		
62.00	61.96	132.00	131.75		
63.00	62.96	133.00	132.75		
64.00	63.96	134.00	133.75		
65.00	64.95	135.00	134.75		
66.00	65.95	136.00	135.74		
67.00	66.95	137.00	136.74		
68.00	67.95	138.00	137.74		
69.00	68.94	139.00	138.73		
70.00	69.94	140.00	139.73		
71.00	70.94	141.00	140.73		
72.00	71.94	142.00	141.72		
73.00	72.94	143.00	142.72		
74.00	73.94	144.00	143.72		
75.00	74.93	145.00	144.72		
76.00	75.93	146.00	145.71		
77.00	76.93	147.00	146.71		
78.00	77.93	148.00	147.71		
79.00	78.92	149.00	148.70		

COMPANY	MANALTA
WELL	T92R-34 35
FIELD	TELKWA
PROVINCE/COUNTY	BRITISH COLUMBIA
COUNTRY/STATE	CANADA

Borehole: T92R-34 35
Client: MANALTA
Field: TELKWA
Area: BRITISH COLUMBIA
Country: CANADA

COAL QUALITY LOG (20:1)
LONG SPACED DENSITY
GAMMA RAY, CALIPER

SLIMLINE GRAPHICS UNIT

Permanent Datum GROUND LEVEL, Elevation N/A
Log measured from 00m above permanent datum
Drilling measured from 00m above permanent datum

KB N/A
DF N/A
GL N/A

Location
TELKWA

Date	2-OCT-1992			LSD
Run Number	ONE			SEC
Depth-Driller	152.4m			TWP
Depth-Logger	152.4m			RGE
First Reading	152.4m			OTHER SERVICES
Last Reading	00m			VERT
Casing-Driller	12.8m			
Casing-Logger	12.8m			
Bit Size	155.0mm			
Hole Fluid Type	AIR/WATER			
Dens./Visc.	1.00	N/A		
PH/Fluid Loss	N/A			
Sample Source				
Rm @ Meas Temp				
Rmf @ Meas Temp	N/A			
Rmc @ Meas Temp	N/A			
Source: Rmf/Rmc	N/A	N/A		
Rm @ BHT	N/A			
Time Since Circ				
Max Rec Temp	N/A			
Equipment/Base	V222	RDR		
Recorded by	B PICHE			
Witnessed by	T. BRAZZONI			

RUN NUMBER	BOREHOLE RECORD BIT	FROM	TO	CASING RECORD SIZE	WEIGHT	FROM	TO
ONE	155.0mm	12.8m	TD	167.7mm	N/A	SURFACE	12.8m

EQUIPMENT	RUN 1	RUN 2	RUN 3	RUN 4
CCS	110			

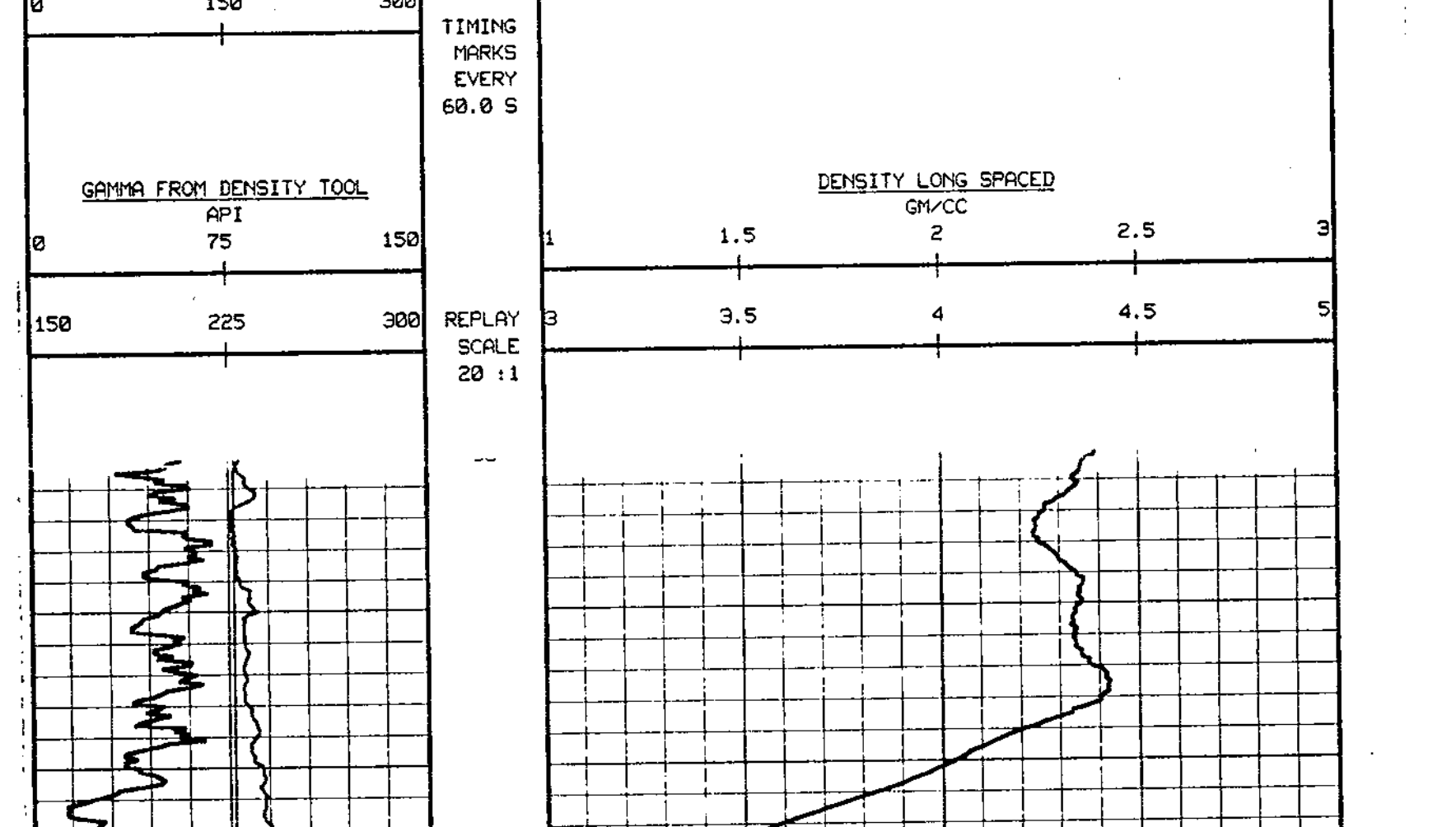
REMARKS:
COAL QUALITY LOG (20:1) LONG SPACED DENSITY GAMMA RAY, CALIPER

SYSTEM CONFIGURATION DATES: LOGGED 26-JUN-1992 PROCESSED PLOTTED 26-JUN-1992

↓ DETAIL SECTION ↓

DEPTH BASED DATA - MAXIMUM SAMPLING INCREMENT 1CM RECORDED ON 2-OCT-1992 14:12
FILENAME: DD3AR34C.CIB RUN ID: DETAIL SECTION PLOTTED ON 2-OCT-1992 AT 16:16

BIT SIZE MILLIMETRES 0 150 300
CALIPER FROM DENSITY MILLIMETRES 0 150 300
GAMMA FROM DENSITY TOOL API 0 75 150 / 150 225 300
DEPTH IN METRES
TIMING MARKS EVERY 60.0 S
REPLAY SCALE 20 :1
DENSITY LONG SPACED GM/CC 1 1.5 2 2.5 3 / 3 3.5 4 4.5 5



BIT SIZE MILLIMETRES 0 150 300
CALIPER FROM DENSITY MILLIMETRES 0 150 300
GAMMA FROM DENSITY TOOL API 0 75 150 / 150 225 300
DEPTH IN METRES
TIMING MARKS EVERY 60.0 S
REPLAY SCALE 20 :1
DENSITY LONG SPACED GM/CC 1 1.5 2 2.5 3 / 3 3.5 4 4.5 5

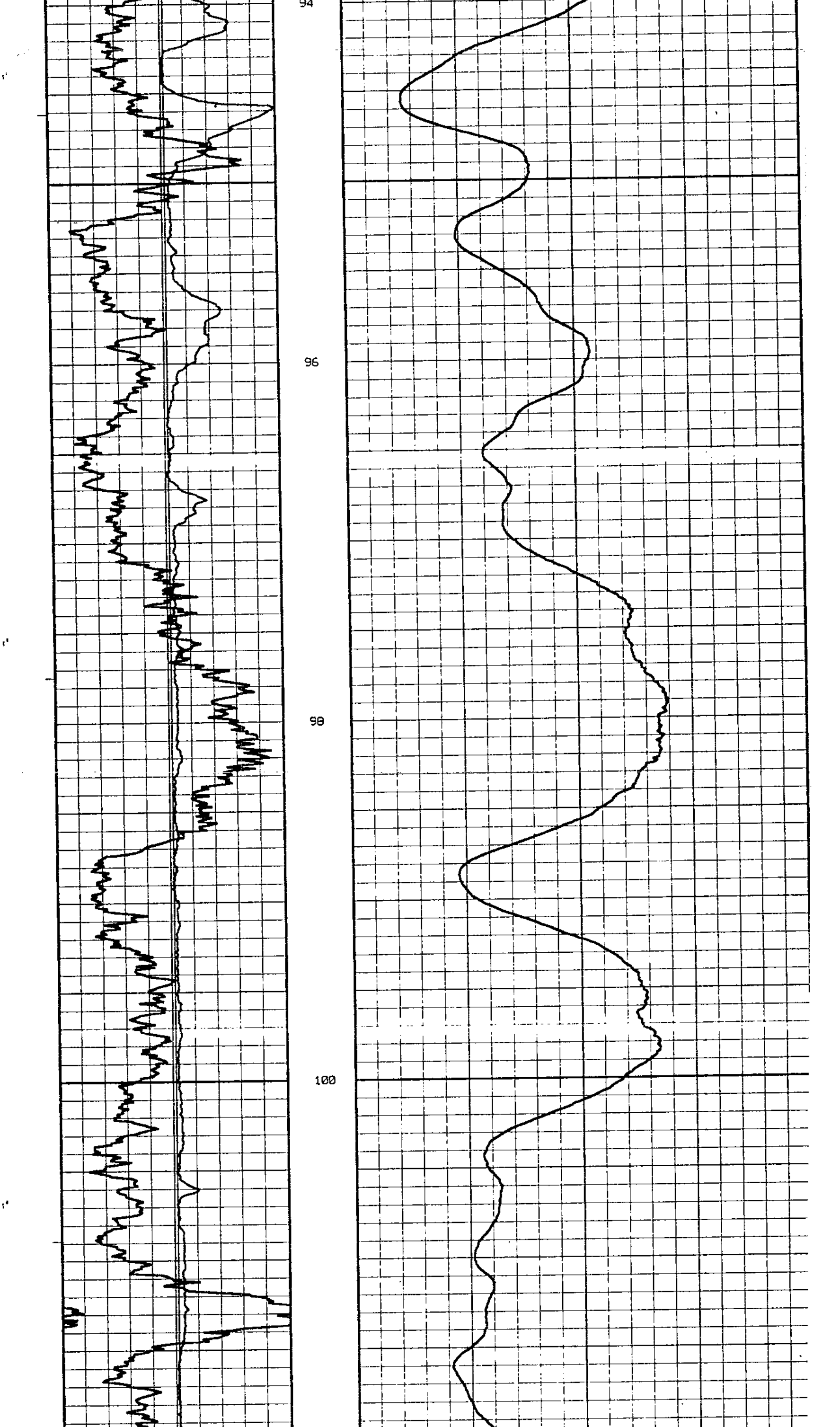
DEPTH BASED DATA - MAXIMUM SAMPLING INCREMENT 1CM RECORDED ON 2-OCT-1992 14:12
FILENAME: DD3AR34C.CIB RUN ID: DETAIL SECTION PLOTTED ON 2-OCT-1992 AT 16:15

↑ DETAIL SECTION ↑

↓ DETAIL SECTION ↓

DEPTH BASED DATA - MAXIMUM SAMPLING INCREMENT 1CM RECORDED ON 2-OCT-1992 14:12
FILENAME: DD3AR34B.CIB RUN ID: DETAIL SECTION PLOTTED ON 2-OCT-1992 AT 16:15

BIT SIZE MILLIMETRES 0 150 300
CALIPER FROM DENSITY MILLIMETRES 0 150 300
GAMMA FROM DENSITY TOOL API 0 75 150 / 150 225 300
DEPTH IN METRES
TIMING MARKS EVERY 60.0 S
REPLAY SCALE 20 :1
DENSITY LONG SPACED GM/CC 1 1.5 2 2.5 3 / 3 3.5 4 4.5 5



BIT SIZE MILLIMETRES 0 150 300
CALIPER FROM DENSITY MILLIMETRES 0 150 300
GAMMA FROM DENSITY TOOL API 0 75 150 / 150 225 300
DEPTH IN METRES
TIMING MARKS EVERY 60.0 S
REPLAY SCALE 20 :1
DENSITY LONG SPACED GM/CC 1 1.5 2 2.5 3 / 3 3.5 4 4.5 5

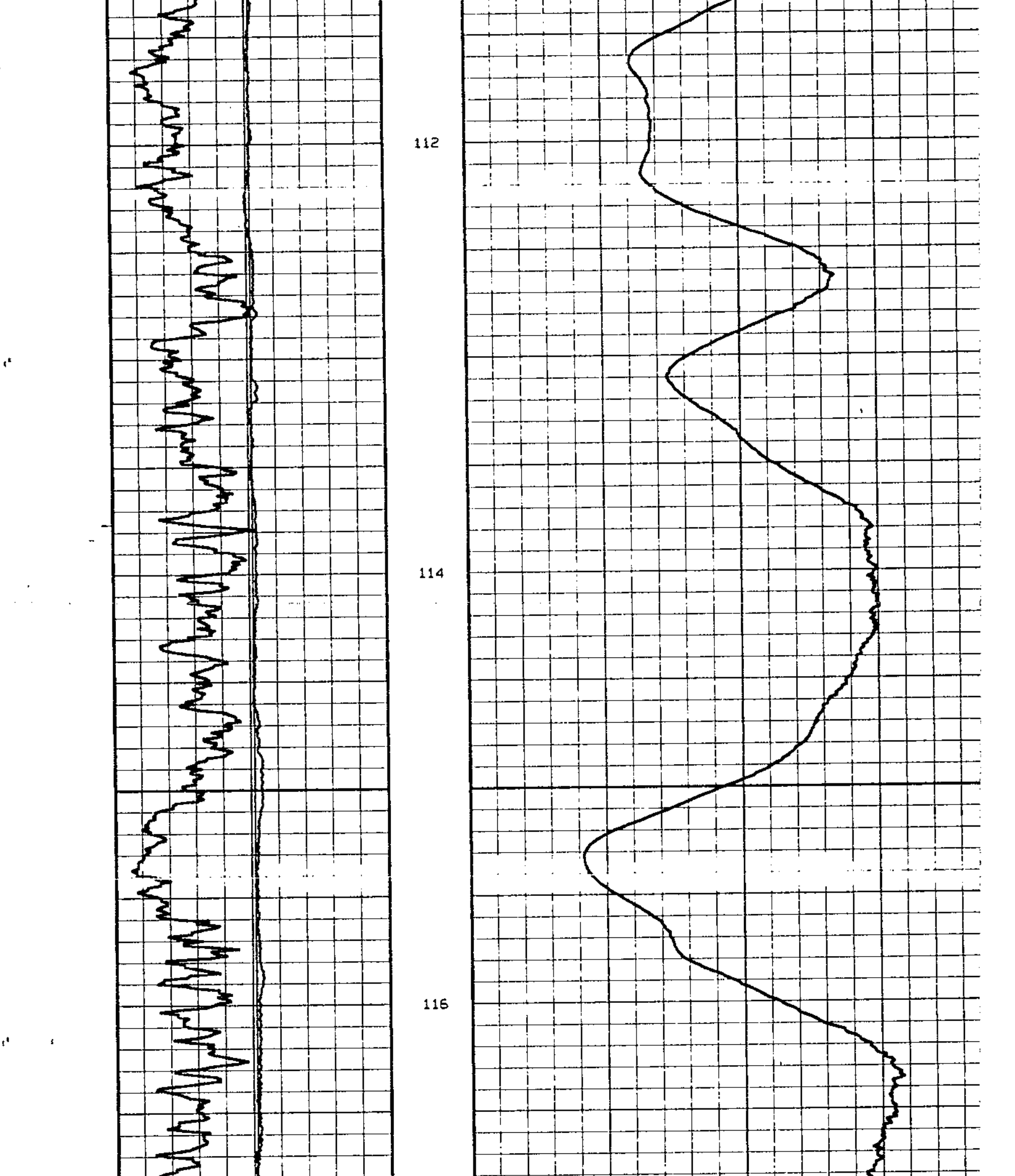
DEPTH BASED DATA - MAXIMUM SAMPLING INCREMENT 1CM RECORDED ON 2-OCT-1992 14:12
FILENAME: DD3AR34B.CIB RUN ID: DETAIL SECTION PLOTTED ON 2-OCT-1992 AT 16:13

↑ DETAIL SECTION ↑

↓ DETAIL SECTION ↓

DEPTH BASED DATA - MAXIMUM SAMPLING INCREMENT 1CM RECORDED ON 2-OCT-1992 14:12
FILENAME: DD3AR34A.CIB RUN ID: DETAIL SECTION PLOTTED ON 2-OCT-1992 AT 16:13

BIT SIZE MILLIMETRES 0 150 300
CALIPER FROM DENSITY MILLIMETRES 0 150 300
GAMMA FROM DENSITY TOOL API 0 75 150 / 150 225 300
DEPTH IN METRES
TIMING MARKS EVERY 60.0 S
REPLAY SCALE 20 :1
DENSITY LONG SPACED GM/CC 1 1.5 2 2.5 3 / 3 3.5 4 4.5 5



BIT SIZE MILLIMETRES 0 150 300
CALIPER FROM DENSITY MILLIMETRES 0 150 300
GAMMA FROM DENSITY TOOL API 0 75 150 / 150 225 300
DEPTH IN METRES
TIMING MARKS EVERY 60.0 S
REPLAY SCALE 20 :1
DENSITY LONG SPACED GM/CC 1 1.5 2 2.5 3 / 3 3.5 4 4.5 5

DEPTH BASED DATA - MAXIMUM SAMPLING INCREMENT 1CM RECORDED ON 2-OCT-1992 14:12
FILENAME: DD3AR34A.CIB RUN ID: DETAIL SECTION PLOTTED ON 2-OCT-1992 AT 16:13

↑ DETAIL SECTION

CLIENT	MANALTA
BOREHOLE	T92R-34
FIELD	TELKWA
AREA	BRITISH COLUMBIA
COUNTRY	CANADA

Borehole: T92R-34 #35
Client: MANALTA
Field: TELKWA
Area: BRITISH COLUMBIA
Country: CANADA

LONG SPACED DENSITY
GAMMA RAY
CALIPER

SLIMLINE GRAPHICS UNIT

Permanent Datum GROUND LEVEL, Elevation N/A
Log measured from 00m above permanent datum
Drilling measured from 00m above permanent datum

KB N/A
DF N/A
GL N/A

Location
TELKWA

Date	2-OCT-1992				
Run Number	ONE				
Depth-Driller	152.4m				
Depth-Logger	152.4m				
First Reading	152.4m				
Last Reading	00m				
Casing-Driller	12.8m				
Casing-Logger	12.8m				
Bit Size	155.0mm				
Hole Fluid Type	AIR/WATER				
Dens./Visc.	1.00	N/A			
PH/Fluid Loss	N/A				
Sample Source					
Rm @ Meas Temp					
Rmf @ Meas Temp	N/A				
Rmc @ Meas Temp	N/A				
Source: Rmf/Rmc	N/A	N/A			
Rm @ BHT	N/A				
Time Since Circ					
Max Rec Temp	N/A				
Equipment/Base	V222	RDR			
Recorded by	B PICHE				
Witnessed by	T. BRAZZONI				

LSD
SEC
TWP
RGE
OTHER SERVICES
VERT

RUN NUMBER	BOREHOLE RECORD BIT	FROM	TO	CASING RECORD SIZE	WEIGHT	FROM	TO
ONE	155.0mm	12.8m	TD	167.7mm	N/A	SURFACE	12.8m

EQUIPMENT	RUN 1	RUN 2	RUN 3	RUN 4
CCS	110			

REMARKS:
LONG SPACED DENSITY GAMMA RAY CALIPER

SYSTEM CONFIGURATION DATES: LOGGED 26-JUN-1992 PROCESSED PLOTTED 26-JUN-1992

↓ MAIN LOG ↓

DEPTH BASED DATA - MAXIMUM SAMPLING INCREMENT 10CM — RECORDED ON 2-OCT-1992 14:12
FILENAME: DD3AR34M.CIB — RUN ID: MAIN LOG — PLOTTED ON 2-OCT-1992 AT 14:45

BIT SIZE MILLIMETRES 0 150 300
CALIPER FROM DENSITY MILLIMETRES 0 150 300
GAMMA FROM DENSITY TOOL API 0 75 150 / 150 225 300
DEPTH IN METRES — TIMING MARKS EVERY 60.0 S — REPLAY SCALE 100:1
DENSITY LONG SPACED GM/CC 1 1.5 2 2.5 3 / 3 3.5 4 4.5 5

BIT SIZE MILLIMETRES 0 150 300
CALIPER FROM DENSITY MILLIMETRES 0 150 300
GAMMA FROM DENSITY TOOL API 0 75 150 / 150 225 300
DEPTH IN METRES — TIMING MARKS EVERY 60.0 S — REPLAY SCALE 100:1
DENSITY LONG SPACED GM/CC 1 1.5 2 2.5 3 / 3 3.5 4 4.5 5

DEPTH BASED DATA - MAXIMUM SAMPLING INCREMENT 10CM — RECORDED ON 2-OCT-1992 14:12
FILENAME: DD3AR34M.CIB — RUN ID: MAIN LOG — PLOTTED ON 2-OCT-1992 AT 14:13

↑ MAIN LOG ↑

CLIENT	MANALTA
BOREHOLE	T92R-34
FIELD	TELKWA
AREA	BRITISH COLUMBIA
COUNTRY	CANADA

Borehole: T92R-34 35
Client: MANALTA
Field: TELKWA
Area: BRITISH COLUMBIA
Country: CANADA

SEAM THICKNESS LOG (20:1)
SHORT SPACED DENSITY
GAMMA RAY, CALIPER

SLIMLINE GRAPHICS UNIT

Permanent Datum GROUND LEVEL, Elevation N/A
Log measured from 00m above permanent datum
Drilling measured from 00m above permanent datum
KB N/A
DF N/A
GL N/A
Location TELKWA

Date	2-OCT-1992			LSD
Run Number	ONE			SEC
Depth-Driller	152.4m			TWP
Depth-Logger	152.4m			RGE
First Reading	152.4m			OTHER SERVICES
Last Reading	00m			VERT
Casing-Driller	12.8m			
Casing-Logger	12.8m			
Bit Size	155.0mm			
Hole Fluid Type	AIR/WATER			
Dens./Visc.	1.00 N/A			
FH/Fluid Loss	N/A			
Sample Source				
Rm @ Meas Temp				
Rmf @ Meas Temp	N/A			
Rmc @ Meas Temp	N/A			
Source: Rmf/Rmc	N/A N/A			
Rm @ BHT	N/A			
Time Since Circ				
Max Rec Temp	N/A			
Equipment/Base	V222 RDR			
Recorded by	B PICHE			
Witnessed by	T. BRAZZONI			

RUN NUMBER	BOREHOLE RECORD BIT	FROM	TO	CASING RECORD SIZE	WEIGHT	FROM	TO
ONE	155.0mm	12.8m	TD	167.7mm	N/A	SURFACE	12.8m

EQUIPMENT	RUN 1	RUN 2	RUN 3	RUN 4
CCS	110			

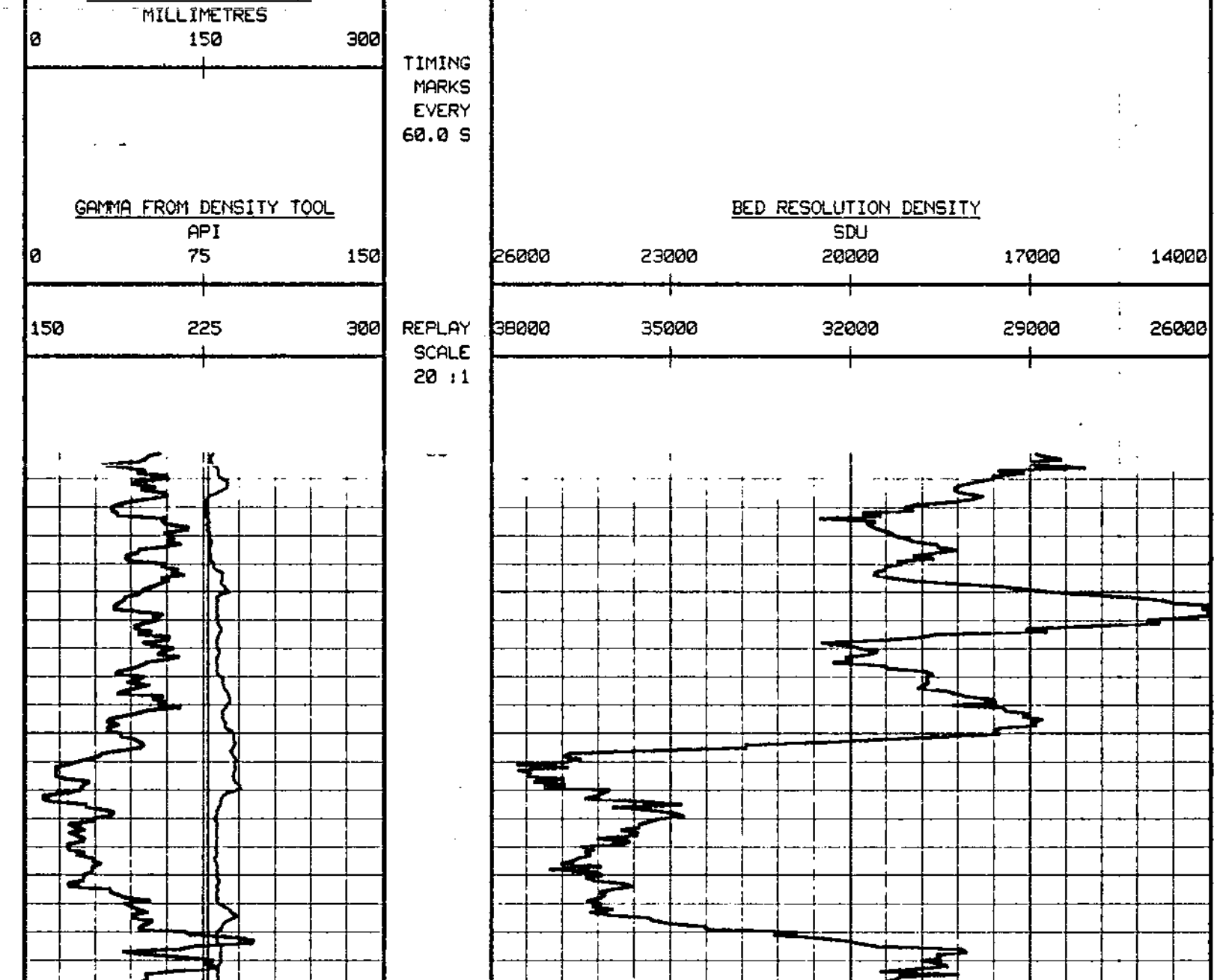
REMARKS:
SEAM THICKNESS LOG (20:1) SHORT SPACED DENSITY GAMMA RAY, CALIPER

SYSTEM CONFIGURATION DATES: LOGGED 26-JUN-1992 PROCESSED 26-JUN-1992 PLOTTED 26-JUN-1992

↓ DETAIL SECTION ↓

DEPTH BASED DATA - MAXIMUM SAMPLING INCREMENT 1CM RECORDED ON 2-OCT-1992 14:12
FILENAME: DD3AR34C.CIB RUN ID: DETAIL SECTION PLOTTED ON 2-OCT-1992 AT 16:24

BIT SIZE MILLIMETRES 0 150 300
CALIPER FROM DENSITY MILLIMETRES 0 150 300
GAMMA FROM DENSITY TOOL API 0 75 150
150 225 300
DEPTH IN METRES
TIMING MARKS EVERY 60.0 S
REPLAY SCALE 20 :1
BED RESOLUTION DENSITY SDU 26000 23000 20000 17000 14000
38000 35000 32000 29000 26000



BIT SIZE MILLIMETRES 0 150 300
CALIPER FROM DENSITY MILLIMETRES 0 150 300
GAMMA FROM DENSITY TOOL API 0 75 150
150 225 300
DEPTH IN METRES
TIMING MARKS EVERY 60.0 S
REPLAY SCALE 20 :1
BED RESOLUTION DENSITY SDU 26000 23000 20000 17000 14000
38000 35000 32000 29000 26000

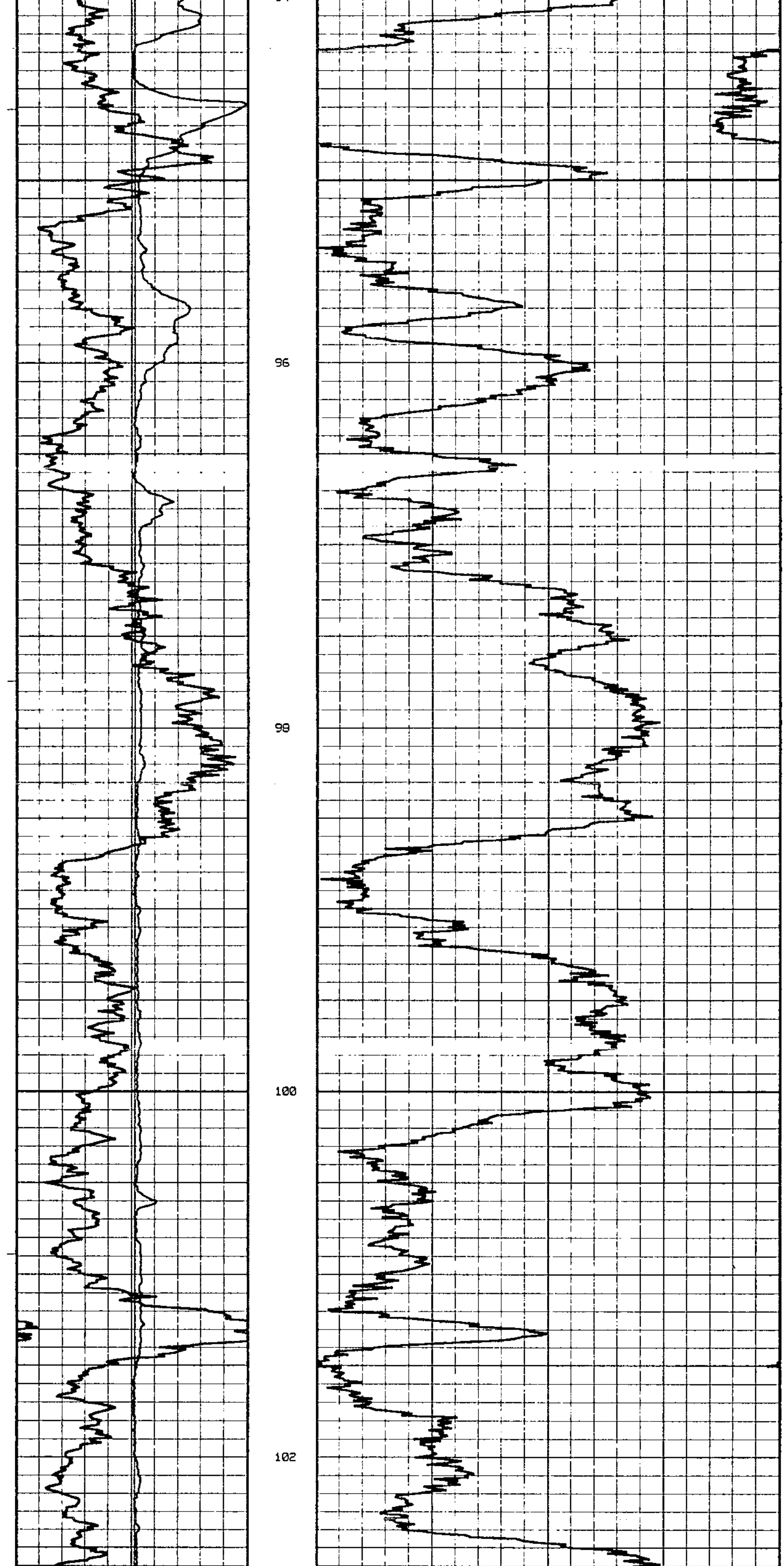
DEPTH BASED DATA - MAXIMUM SAMPLING INCREMENT 1CM RECORDED ON 2-OCT-1992 14:12
FILENAME: DD3AR34C.CIB RUN ID: DETAIL SECTION PLOTTED ON 2-OCT-1992 AT 16:23

↑ DETAIL SECTION ↑

↓ DETAIL SECTION ↓

DEPTH BASED DATA - MAXIMUM SAMPLING INCREMENT 1CM RECORDED ON 2-OCT-1992 14:12
FILENAME: DD3AR34B.CIB RUN ID: DETAIL SECTION PLOTTED ON 2-OCT-1992 AT 16:23

BIT SIZE MILLIMETRES 0 150 300
CALIPER FROM DENSITY MILLIMETRES 0 150 300
GAMMA FROM DENSITY TOOL API 0 75 150
150 225 300
DEPTH IN METRES
TIMING MARKS EVERY 60.0 S
REPLAY SCALE 20 :1
BED RESOLUTION DENSITY SDU 26000 23000 20000 17000 14000
38000 35000 32000 29000 26000



BIT SIZE MILLIMETRES 0 150 300
CALIPER FROM DENSITY MILLIMETRES 0 150 300
GAMMA FROM DENSITY TOOL API 0 75 150
150 225 300
DEPTH IN METRES
TIMING MARKS EVERY 60.0 S
REPLAY SCALE 20 :1
BED RESOLUTION DENSITY SDU 26000 23000 20000 17000 14000
38000 35000 32000 29000 26000

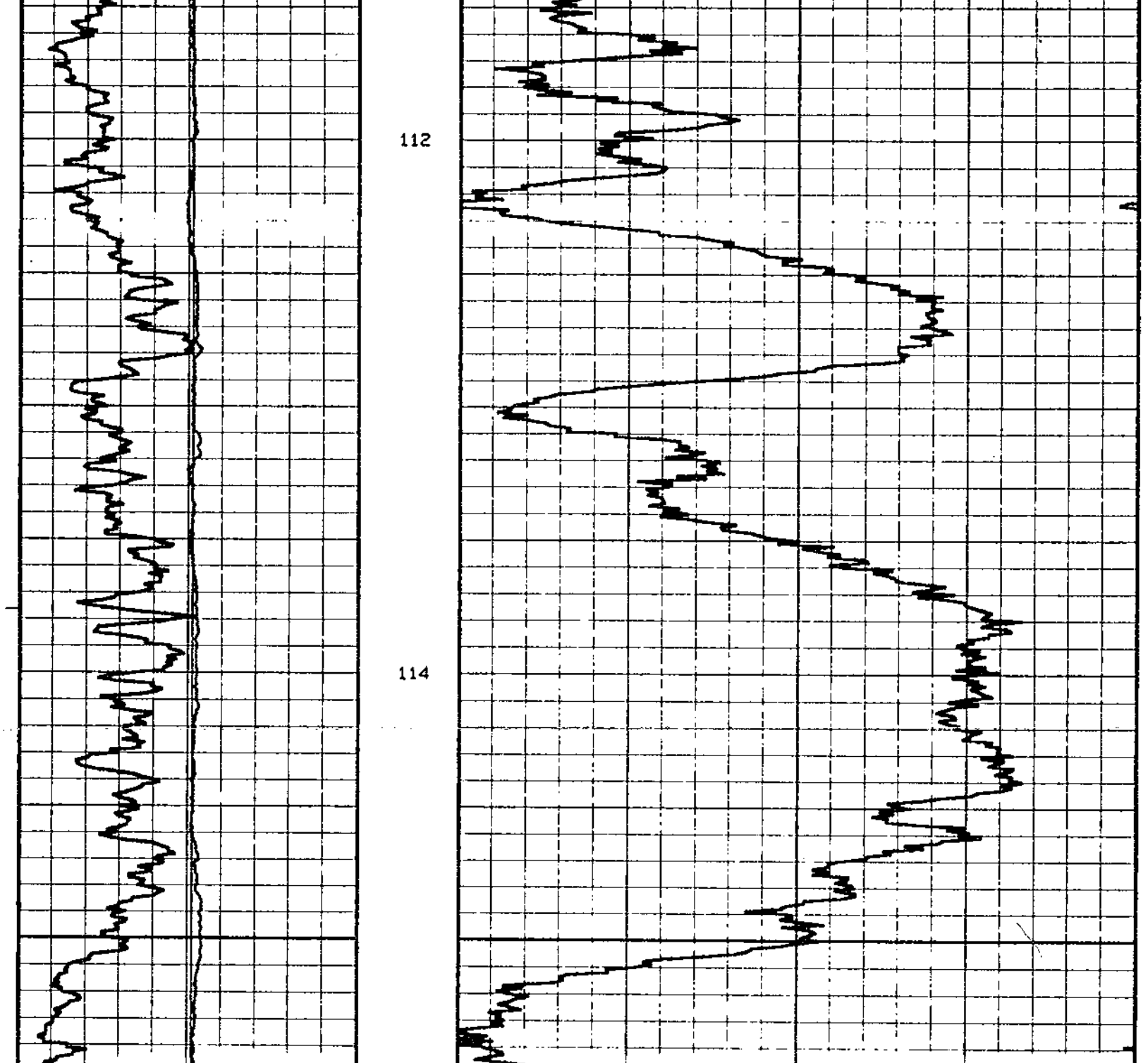
DEPTH BASED DATA - MAXIMUM SAMPLING INCREMENT 1CM RECORDED ON 2-OCT-1992 14:12
FILENAME: DD3AR34B.CIB RUN ID: DETAIL SECTION PLOTTED ON 2-OCT-1992 AT 16:21

↑ DETAIL SECTION ↑

↓ DETAIL SECTION ↓

DEPTH BASED DATA - MAXIMUM SAMPLING INCREMENT 1CM RECORDED ON 2-OCT-1992 14:12
FILENAME: DD3AR34A.CIB RUN ID: DETAIL SECTION PLOTTED ON 2-OCT-1992 AT 16:21

BIT SIZE MILLIMETRES 0 150 300
CALIPER FROM DENSITY MILLIMETRES 0 150 300
GAMMA FROM DENSITY TOOL API 0 75 150
150 225 300
DEPTH IN METRES
TIMING MARKS EVERY 60.0 S
REPLAY SCALE 20 :1
BED RESOLUTION DENSITY SDU 26000 23000 20000 17000 14000
38000 35000 32000 29000 26000



BIT SIZE MILLIMETRES 0 150 300
CALIPER FROM DENSITY MILLIMETRES 0 150 300
GAMMA FROM DENSITY TOOL API 0 75 150
150 225 300
DEPTH IN METRES
TIMING MARKS EVERY 60.0 S
REPLAY SCALE 20 :1
BED RESOLUTION DENSITY SDU 26000 23000 20000 17000 14000
38000 35000 32000 29000 26000

DEPTH BASED DATA - MAXIMUM SAMPLING INCREMENT 1CM RECORDED ON 2-OCT-1992 14:12
FILENAME: DD3AR34A.CIB RUN ID: DETAIL SECTION PLOTTED ON 2-OCT-1992 AT 16:20

↑ DETAIL SECTION ↑

CLIENT	MANALTA
BOREHOLE	T92R-34
FIELD	TELKWA
AREA	BRITISH COLUMBIA
COUNTRY	CANADA