

BULK SAMPLE ANALYSIS
ON
GT-A, GT-B AND GT-COMP
FOR
QUINETTE COAL LTD.



I. INTRODUCTION

II. SAMPLE PREPARATION

- a. Sample Preparation for GT-A and GT-B
- b. Sample Preparation for GT-COMP

III. METHOD OF ANALYSIS

IV. RESULTS

- a. GT-A
- b. GT-B
- c. GT-COMP

I. INTRODUCTION

Following a telephone conversation with Mr. Gordon Gormley, Chief Mine Geologist of Quintette Coal Ltd, approximately 9.6 tonnes of coal were received at Cyclone Engineering Sales Ltd. in Edmonton on August 15, 1986. The two samples, marked GT-A and GT-B, weighed 6.43 tonnes and 3.20 tonnes respectively.

The following analysis was requested:

- Proximate Analysis
- Ultimate Analysis
- Free Swelling Index
- Hardgrove Grindability Index
- Calorific Value
- Mineral Analysis of Ash
- Ash Fusibility

In addition, a third sample was to be created as a composite of GT-A and GT-B, and subjected to the same analysis.

Portions of the three samples were also to be sent for petrographic analysis. In a subsequent conversation, plasticity and dilation were requested for sample GT-A.

II. SAMPLE PREPARATION

A. SAMPLE PREPARATION FOR GT-A AND GT-B

Each of the samples, GT-A and GT-B, was prepared according to the following method (summarized in Fig. 1A).

1. The total sample was screened at 2"
2. A proportionate representative subsample was taken from each of the fractions using ASTM standard D346 (Cone & Quarter).
3. The +2" subsample was crushed to -2" size fraction.
4. The two subsamples from step 2 were individually crushed to - $\frac{1}{2}$ ".
5. Following ASTM standard D2013, the two were mixed together using a sample riffle, and further subsamples were removed for analysis.

B. SAMPLE PREPARATION FOR GT-COMP

After the size fractions for each of the two samples, GT-A and GT-B, had been crushed to - $\frac{1}{2}$ " and recombined, a proportionate subsample was taken from each and mixed to form the composite "GT-Comp". (See Fig. 1B)

FIG 1A

FLWSHEET FOR SAMPLE PREPARATION OF GT-A and GT-B

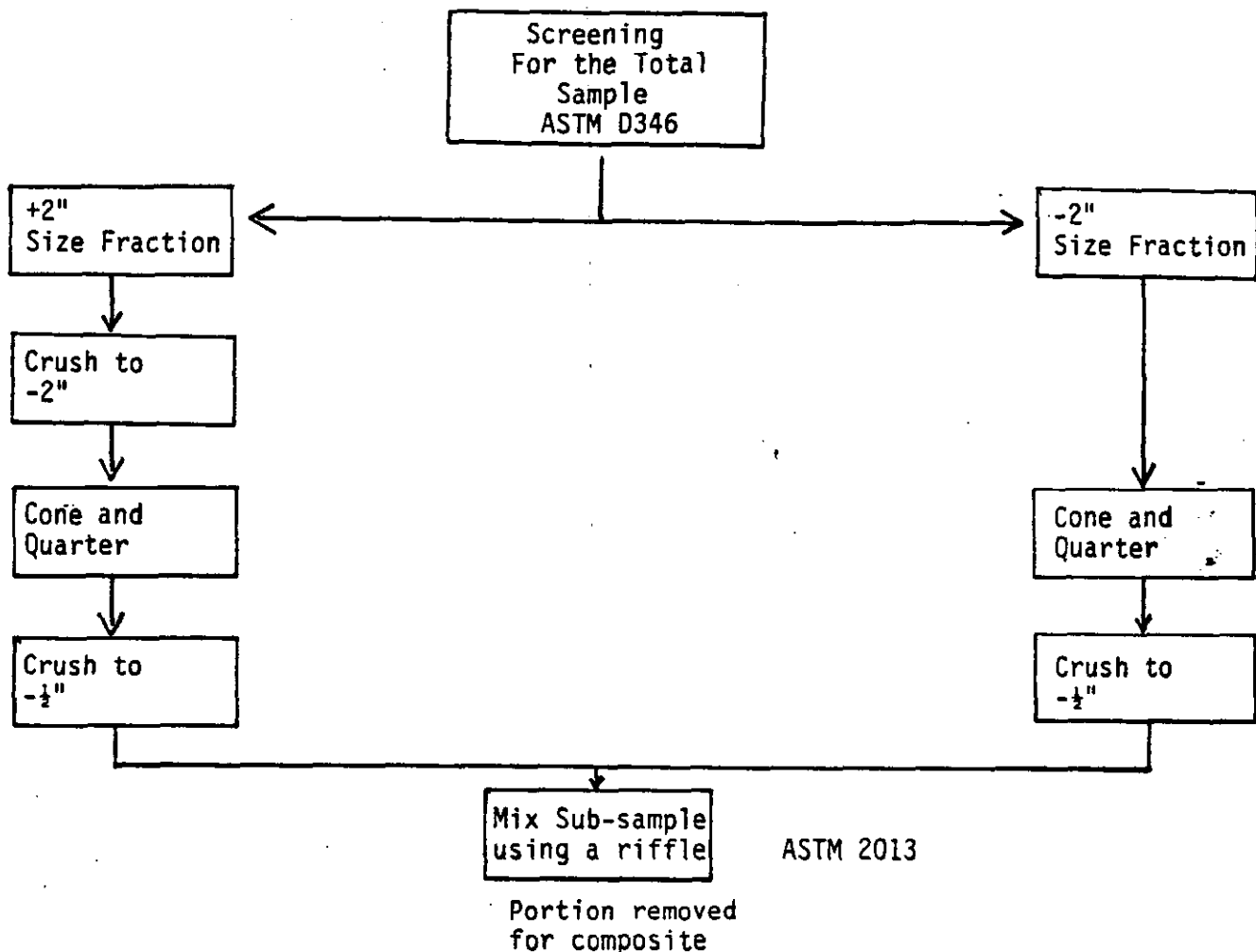
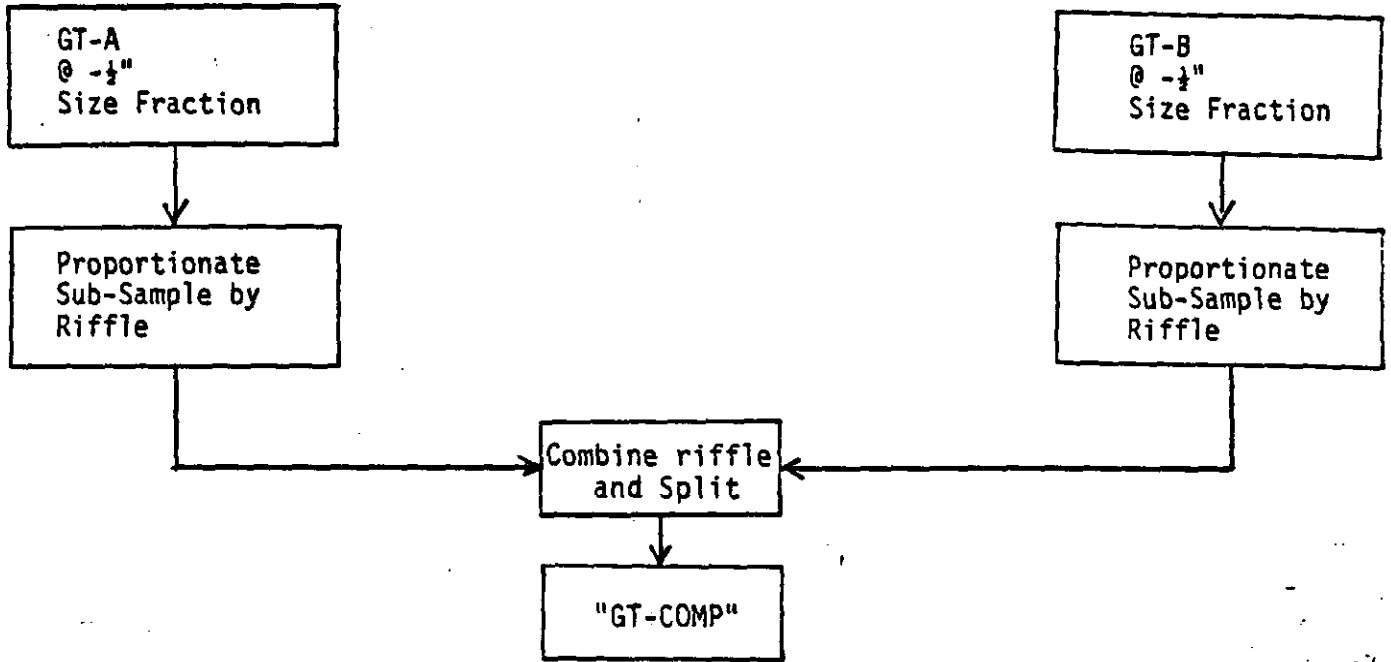


FIG 1B

FLWSHEET FOR SAMPLE PREPARATION GT-COMP



III. METHOD OF ANALYSIS

The following ASTM procedures were used for analysis

TEST		METHOD
Ash	(ASH %)	ASTM D3174
Volatile	(VM %)	ASTM D3175
Moisture	(RM %)	ASTM D3173
Sulphur	(S %)	ASTM D3177 (ESHKA)
Carbon/Hydrogen	(C/H)	ASTM D3178
Nitrogen	(N)	ASTM D3179
Calorific Value	(CV)	ASTM D2015
Free Swelling Index	(F.S.I.)	ASTM D 720
Hardgrove Grindability Index	(H.G.I.)	ASTM D 409
Ash Fusion	(AF)	ASTM D1857
Dilatation	(GT-A only)	ASTM D2014
Plasticity	(GT-A only)	ASTM D2639
Ash Analysis		ASTM D2795



CANADA
NEUTRON-NEUTRON

BOREHOLE QHD-86003
 CLIENT QUINTEPIE
 AREA GRIZZLY
 COUNTRY CANADA
 DATE LOGGED 96 07 05
 DEPTH SCALE 1:200
 2 OF 12 LOGS

PERMANENT DATA
 ELEVATION OF # D
 B P B
 MEASUREMENTS FROM 0.1m
 DEPTH REACHED 12.8m
 CASING SIZE 1 H2 TO 1D 2 TO
 B1 SIZES 3 3/4 TO 12.4m 2 TO
 CASING SIZES 1 3/4 TO 12.4m 2 TO

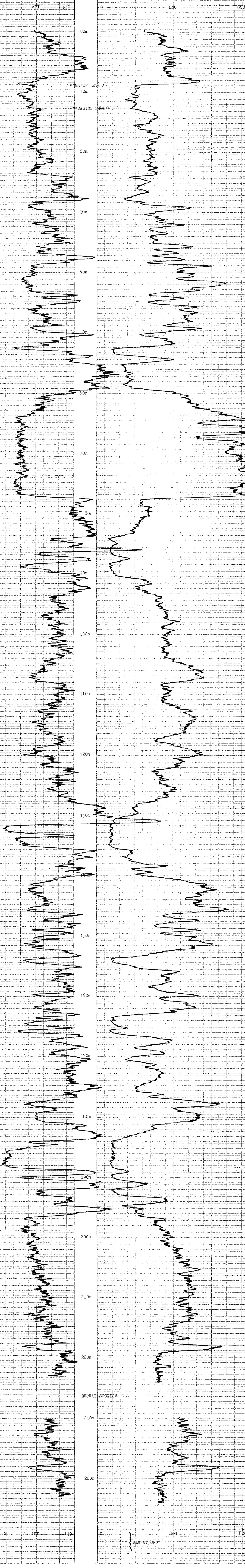
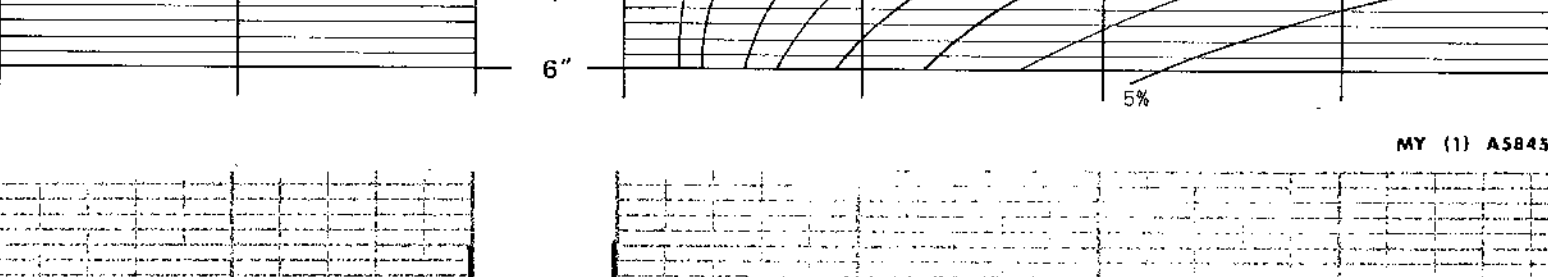
FLUID DATA
 NATURE FRESH TO INTERMEDIATE TO
 LEVEL
 VISCOSITY
 PH AT MEAS TEMP
 S H I

OPERATION DATA
 FIRST HEADING 2.2m
 LAST HEADING 0.0m
 INTERVAL LOGGED 2.2m
 UNIT - TRUCK NO V215
 ENGINEER A. LEBERSTON
 WITNESS

EQUIPMENT AND RECORDING DATA												
LOG	EQUIPMENT			TAPING		PANEL		CAL		DEPTHS		
	SONDE	SOURCE	CALIBRATOR	LOG TAPED	RECORD SPEED	DIRECTOR REPLAY	SPEED	T C SECS	NORM	FROM	TO	INTERVAL
GAMMA	118	-	251	Y	9/2	B	9	1	1.6	00	203	
N-N	215	7202	176	Y	9	D	9	1	11.4	22-	00	22-

ADDITIONAL SONDES RUN				REMARKS
SONDE	LOG	GENERAL SCALE LOG	DETAIL SCALE LOG	
118	CCS	1:200		
220	F.L.E.	1:200		
231	VBRT			

GAMMA RAY	DEPTH	NEUTRON-NEUTRON
0	API 150	0
	°C	800



GAMMA RAY	DEPTH	NEUTRON-NEUTRON
0	API 150	0
		800

BOREHOLE QHD-86003
 CLIENT QUINTEPIE
 AREA GRIZZLY
 COUNTRY CANADA





LOG SUITE
GAMMA RAY
S DENSITY
CALIPER

SONDE TYPE
COAL
COMBINATION
SONDE

COAL
LITHOLOGY
LOG

BOREHOLE QHD-3600
CLIENT QUINBYTS
AREA GRIZZLY
COUNTRY CANADA
DATE LOGGED 9/2/79

REMANENT DATA
ILLUMINATION OF P.D.
WATER RESISTANCE
DEPTH REACHED
CASING SIZE
BIT SIZES
CASING STOPS

LOG	EQUIPMENT	TAPING	PANEL	CAL COEFF	DEPTHS	SEAM LOG RUN							
SONDE	SOURCE	CALIBRATOR	LOG TAPED	RECORD SPEED	DIRECTOR REPLY	SPEED	T.C. SECS	NORM	FROM	TO	MIRVAL		
GAMMA RAY	118	251	Y	9/2	D	9/2	4/1	-	1.65	223	00	223	Y
S DENSITY	0026	399	Y	9/2	D	9/2	1/3	1.39	-	224	01	224	N
CALIPER	SIDEWALL POSITION	7"	2"	Y	9/2	D	9/2	4.3	1.0	224	01	224	Y

FROM	TO	INTERVAL	INTERVAL TOTAL
196m	169m	1.6m	90m
183m	162m	1.52m	85m
13m	6m	4m	8m
		4m	9m
		4m	4m

SONDE	LOG	GENERAL SCALE LOG	DETAIL SCALE LOG	REFER TO ADDITIONAL HEADINGS
215	N-N	1:200		
220	F.B.	1:200		
231	VERT			

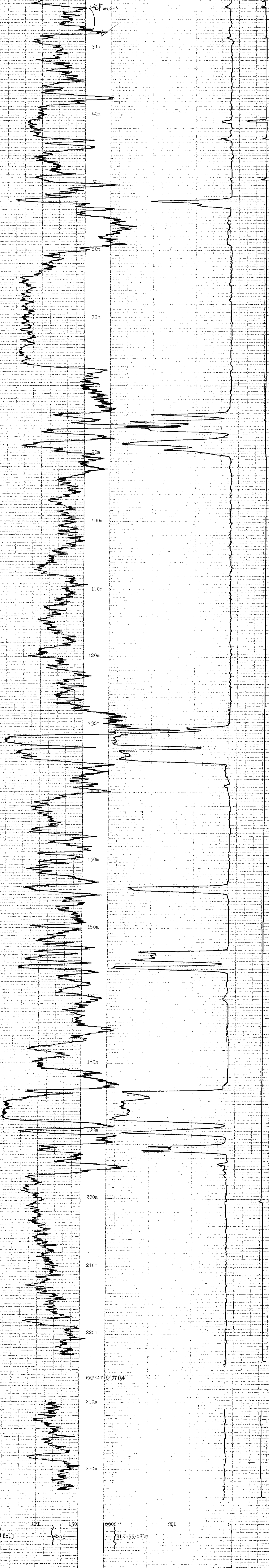
BPB COAL LITHOLOGY LOG

CALIBRATION DATA

JIG No 251	VALUE 37@1.5 DIAM	JIG CAL DATE 6/06/70	JIG VALUE 1.29	SDU @	g/cm ³	7" ms	716 cps
JIG MARK SHOWN AT ABOVE VALUE -X-3		SPAN 6000	NORM	SDU	g/cm ³	2" ms	632 cps

GAMMA RAY	DEPTH	BULK DENSITY	CALIPER
		g/cm ³	INCHES

HOLE SIZE CORRECTION DATA			
API	6000	SDU	INCHES

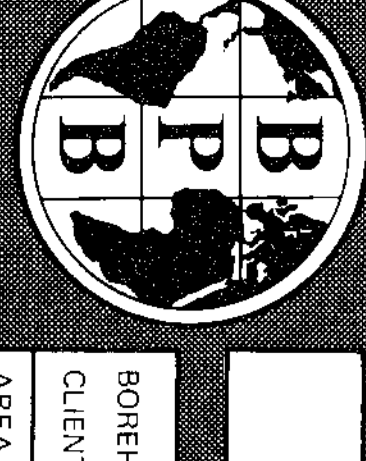


GAMMA RAY	DEPTH	BULK DENSITY	CALIPER
		g/cm ³	INCHES



BOREHOLE QHD-3600
CLIENT QUINBYTS
AREA GRIZZLY
COUNTRY CANADA

COAL LITHOLOGY LOG



CANADA, P.A.Y.
FOCUSSED ELECTRIC

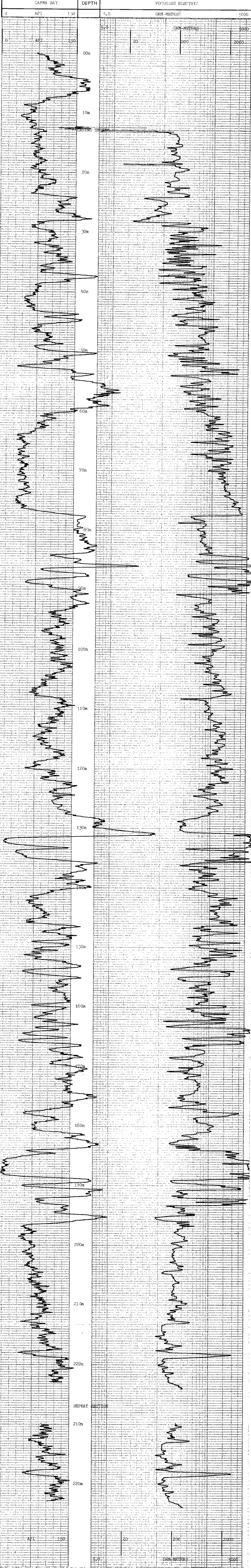
BOREHOLE	QHD-86003	DEPTH SCALE	1:200
CLIENT	QUINTETTE	AREA	GRIZZLY
COUNTRY	CANADA	DATE LOGGED	96 07 06
BOREHOLE DATA		LOGS	
PERMANENT DATUM	GROUND LEVEL		
ELEVATION OF # D			
MEASUREMENTS FROM	0.1m		
DEPTH REACHED	222.3m		
CASING SHOE	12.0m		
BIT SIZES	1 HQ TO TD 2 TO TO		
CASING SIZES	1 HW TO 12.0 2 TO TO		
FLUID DATA			
NATURE	REFERS TO LITHOLOG LOG.		
SG			
LEVEL			
VISCOSITY			
B.H.T.			
OPERATION DATA			
TEST READING	220m		
LAST READING	00m		
INTERVAL LOGGED	220m		
UNIT - TRUCK NO	V215		
ENGINEER	A. TEBBERTON		
WITNESS			

724

EQUIPMENT AND RECORDING DATA

LOG	EQUIPMENT			TAPING		RECORD		PANEL		CAL COEFF	DEPTHS		
	SONDE	SOURCE	CALIBRATOR	LOG TAPLO	RECORD SPEED	DIRECT REPLAY	SPEED	T.C SECS	NORM		FROM	TO	INTERVAL
GAMMA	118	--	251	Y	9/2	R	9	1	-	1.63	223	00	223
P.B.	220	--	Y	Y	9	D	9	3	-	1.0	224	12	212

ADDITIONAL SONDES RUN					REMARKS
SONDE	LOG	GENERAL SCALE LOG	DETAIL SCALE LOG		
118	CCS	1:200		REFER TO ADDITIONAL HEADINGS	
215	N-N	1:200			
231	VBRT				



GAMMA RAY	DEPTH	5.0	OHM-METERS	5000
0	API	150	0	2000

BOREHOLE	QHD-86003	AREA	GRIZZLY
CLIENT	QUINTETTE	COUNTRY	CANADA





BOREHOLE QHD-86005
CLIENT QUINTETTE

AREA TRANSFER
COUNTRY CANADA
DATE LOGGED 86 07 15/17
DEPTH SCALE 1:200
LOGS 1 of 4

COAL
LITHOLOGY
LOG

PREPARATION: GROUND LEVEL
ELEVATION OF P.D. 898
WAS SURVEYED: G.L.
DEPTH REACHED: 177.1m
CASING SHOE: 6.1m
BIT SIZES: 1 1/2" TO 1/8"

SONDE TYPE
COAL COMBINATION
SONDE

LOG SUITE
GAMMA RAY
L.S. DENSITY
CALIPER

FLUID DATA
NATURE: QUIET-GEL. & WATER
LEVEL: 1.01 @ 3m
VISCOSITY: N/A
TEMP. AT 100cm: 30.0
TEMP. AT 100cm: 30.0

OPERATION DATA
FIRST READING: 17.2m
LAST READING: 0.1m
INTERVAL LOGGED: 1.7m
UNIT TRUCK No: HELLI 121.5
ENGINEER: A. JARRETON

EQUIPMENT AND RECORDING DATA													
COAL COMBINATION SONDE													
LOG	EQUIPMENT			TAPING			PANEL		CAL COEFF		SEAM LOG RUN		
	SONDE	SOURCE	CALIBRATOR	LOG TAPED	RECORD SPEED	DIRECT REPLAY	SPEED	TC SECS	NORM	FROM	TO	IN/VAL	
GAMMA RAY	153		251	Y	9	D	9/2	1/2	-	1.59	175	01	174
L.S. DENSITY		0028	3995	Y	9	D	9/2	.3/1	7.4	-	176	02	174
CALIPER				Y	9	D	9/2	.3	-	-	176	02	174

COAL QUALITY/SEAM THICKNESS LOG INTERVALS (Refer to relevant log)					INTERVAL TOTAL
FROM	1.5m	12.3m	90m	20m	
TO	14.5m	11.5m	77m	12m	42m
INTERVAL	1.3m	8m	1.3m	8m	

ADDITIONAL SONDES RUN				REMARKS
SONDE	LOG	GENERAL SCALE LOG	DETAIL SCALE LOG	
221	F.E.	1:200		
215	N-N	1:200		

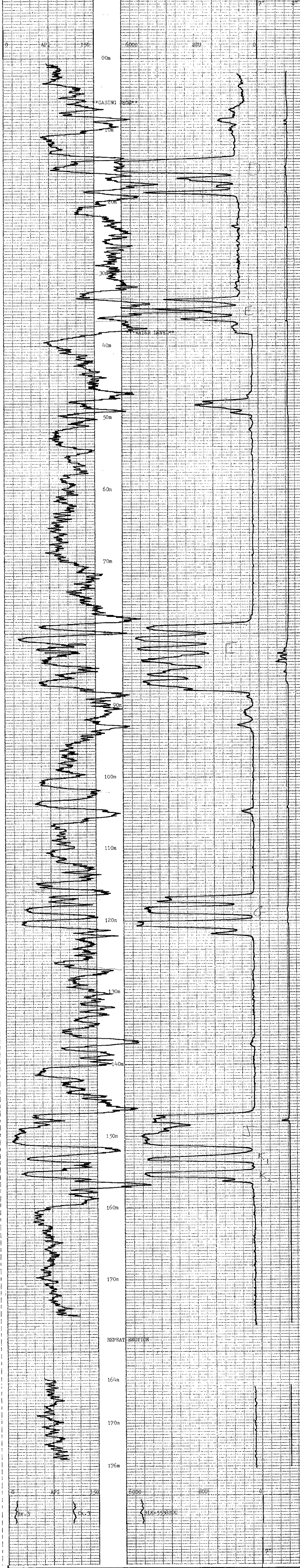
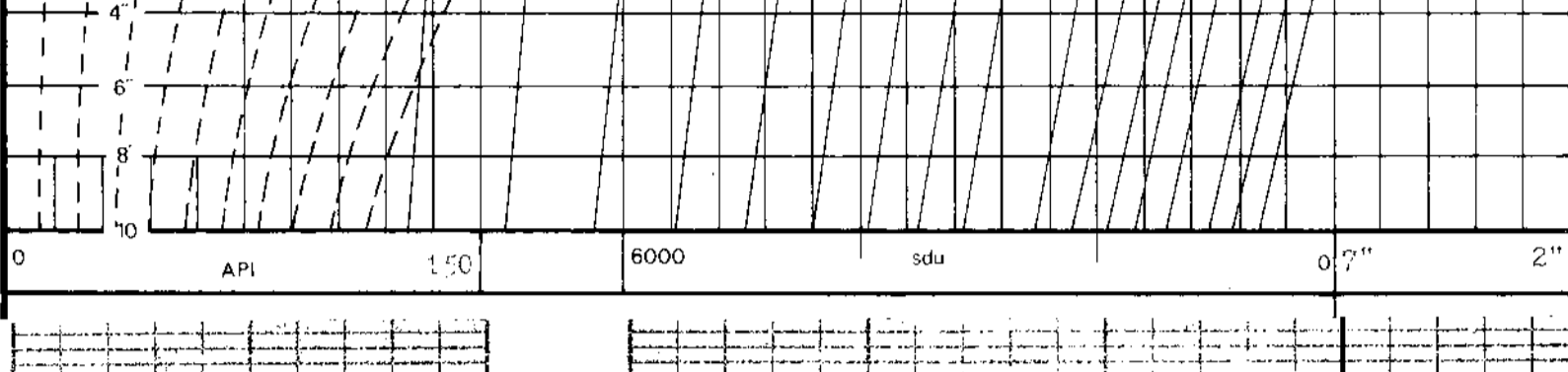
BPB COAL LITHOLOGY LOG

CALIBRATION DATA

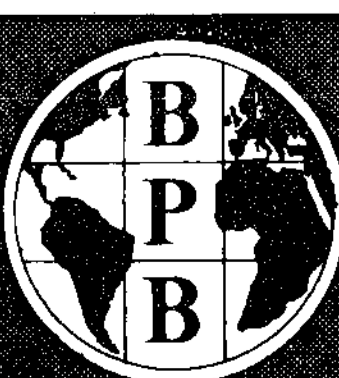
JIG No 251	VALUE 377 @ 5 DIAM	JIG CAL DATE 86 07 17	JIG VALUE 5538	SDU @ g/cm ³	7 ins 650 cps
JIG MARK SHOWN AT ABOVE VALUE - X.3		JIG No 3995	SPAN 6000	NORM SDU @ g/cm ³ 7.40	2 ins 240 cps

GAMMA RAY	DEPTH	BULK DENSITY g/cm ³	CALIPER INCHES
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HOLE SIZE CORRECTION DATA



GAMMA RAY	DEPTH	BULK DENSITY g/cm ³	CALIPER INCHES
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BOREHOLE QHD-86005 AREA TRANSFER
CLIENT QUINTETTE COUNTRY CANADA

COAL LITHOLOGY LOG



FOCUSSED ELECTRIC
GAMMA RAY

BOREHOLE QHD-86005
CLIENT QUINTESTE

AREA TRANSFER
COUNTRY CANADA

DEPTH SCALE
1:200

DATE LOGGED 07 15/17 2 OF 4 LOGS

BOREHOLE DATA

PERMANENT DATUM GROUND LEVEL
ELEVATION OF D. 8 P 8 DRILLER
MEASUREMENTS G.L. G.L.
DEPTH REACHED 177.1m 177.7m
CASING SHOE 6.1m 6.1m
BIT SIZES 1 HQ TO TD 2 TO
3 HW TO 6.1 2 TO

FLUID DATA

NATURE REFER TO LITHOLOGY LOG.
SG
TEMP.
LEVEL
VIScosity
Fm at these temp
B.H.T.

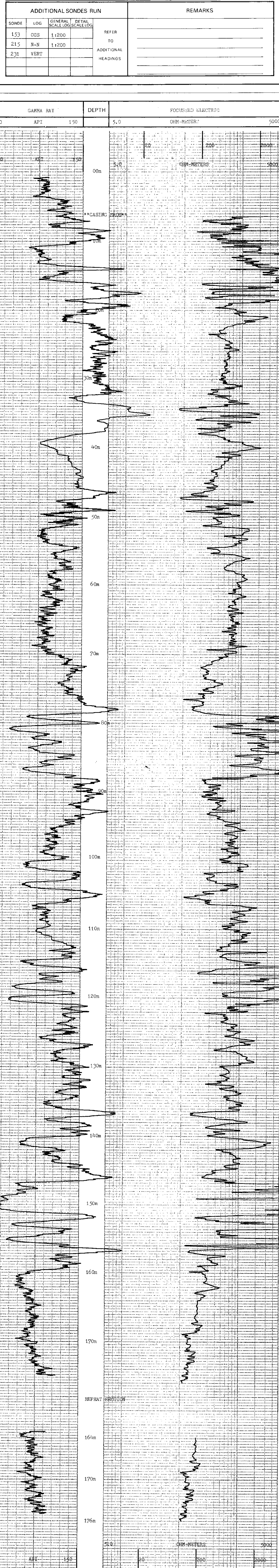
OPERATION DATA

FINISH READING 176m
LAST READING 00m
INTERVAL LOGGED 176m
UNIT - TRUCK NO. HELL 7215
ENGINEER A. JEBERTON
WITNESS

EQUIPMENT AND RECORDING DATA

LOG	EQUIPMENT			TAPING			PANEL			CAL COEFF	DEPTHS		
	SONDE	SOURCE	CALIBRATOR	LOG TAPED	RECORD SPEED	DIRECTOR REPEAT	SPEED	T.C. SECS	NORM		FROM	TO	INTERVAL
F.E.	221	--	Y	Y	9	D	9	.3	1.0	-	176	6	170
GAMMA	153	---	251	Y	9	R	9	1	-	1.5	175	01	174

ADDITIONAL SONDES RUN				REFER TO ADDITIONAL HEADINGS	REMARKS
SONDE	LOG	GENERAL SCALE LOG	DETAIL SCALE LOG		
153	CCS	1:200			
215	N-N	1:200			
231	VERT				



BOREHOLE QHD-86005
CLIENT QUINTESTE

AREA TRANSFER
COUNTRY CANADA



NEUTRON-NEUTRON
GAMMA RAY

BOREHOLE QHD-86005
CLIENT QUINTETTE

AREA TRANSFER
COUNTRY CANADA

DEPTH SCALE 1:200

DATE LOGGED 86 07 15/17

BOREHOLE DATA
PERMANENT LOG
ELEVATION OF P.D. 878
MEASUREMENTS FROM G.L.
DEPTH REACHED 177.7m
CASING SHOE 6.1m
BIT SIZES 1 HQ TO 2 TO
CASING SIZES 1 HW TO 6.1m 2 TO

FLUID DATA
NATURE REFER TO LITHOLOGY LOG.

OPERATION DATA
FIRST READING 176m
LAST READING 01m
INTERVAL LOGGED 17.5m
UNIT-TRUCK No. HELIX 7215
ENGINEER A. LEBRETON

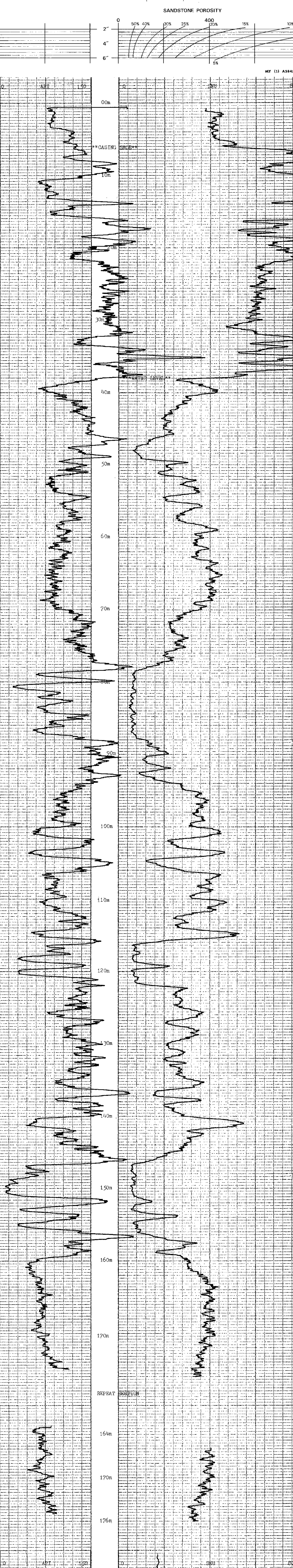
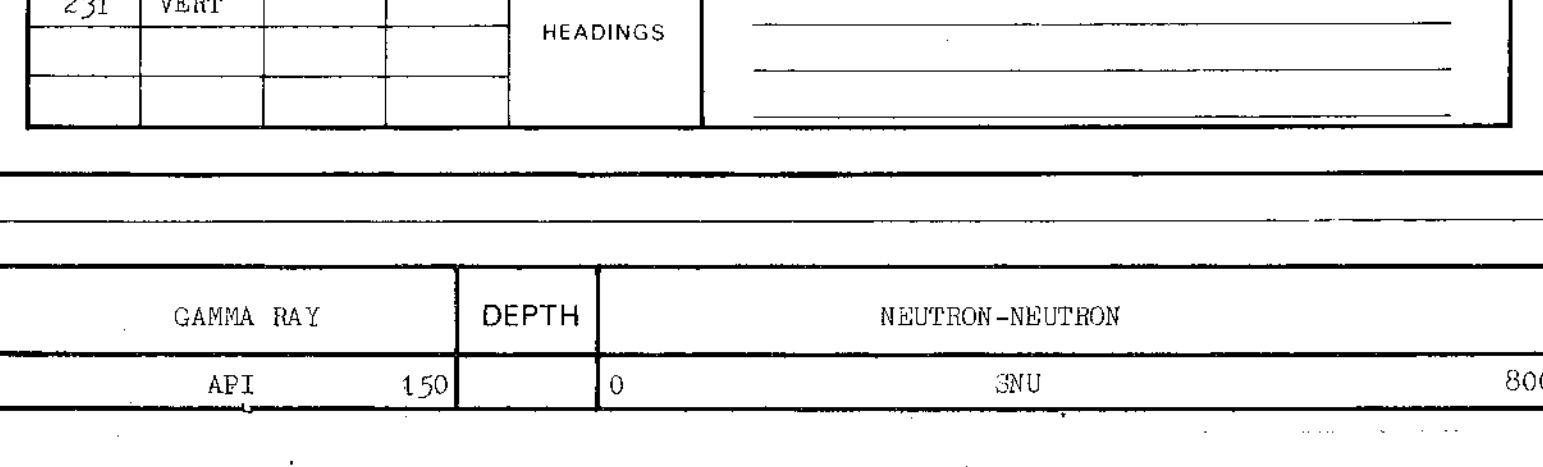
224

EQUIPMENT AND RECORDING DATA

LOG	EQUIPMENT			TAPING		PANEL		CAL COEFF	DEPTHS			
	SONDE	SOURCE	CALIBRATOR	LOG TAPED	RECORD SPEED	DIRECT REPLAY	SPEED		TO SECS	FROM	TO	INTERVAL
GAMMA	153	---	251	Y	9/2	R	9	1	1.59	175	01	174
N-N	215	7203	176	Y	9	D	9	1	9.84	176	01	175

ADDITIONAL SONDES RUN				REFER TO ADDITIONAL HEADINGS	REMARKS
SONDE	LOG	GENERAL SCALE LOG	DETAIL SCALE LOG		
153	CCS	1:200			
221	F.B.	1:200			
231	VERT				

GAMMA RAY	DEPTH	NEUTRON-NEUTRON
0 API 150	0	800 SNU



GAMMA RAY	DEPTH	NEUTRON-NEUTRON
0 API 150	0	800 SNU

BOREHOLE QHD-86005
CLIENT QUINTETTE

AREA TRANSFER
COUNTRY CANADA





COAL LITHOLOGY LOG

COAL

SONDE TYPE
COAL COMBINATION SONDE

LOG SUITE
GAMMA RAY
L S DENSITY
CALIPER

OPERATION DATA

FLUID DATA

DATE LOGGED 96-07-26

AREA TRANSFER

COUNTRY CANADA

DEPTH SCALE 1:200

CLIENT QUINTE

BOREHOLE QHD-86007

PERMANENT TAP JHDNDU 1.5321

ELEVATION OF P.D. B.P.P.

MEASUREMENTS FROM 1.2m

DEPTH REACHED 1.2m

CASING SIZE 1 1/4 TO 1 1/2

BIT SIZES 3 TO 4

CASING SIZES 1 1/2 TO 2 TO

NATURE QUIET-DEL & WATER

LEVEL 20m

VISCOMITY 1.71 #c

PHI N/A

TEMP AT REEL 14.0m-14.5m @ 13°C

FIRST READING 1.36

LAST READING 0.0m

UNIT - TRUCK NO 139M

ENGINEER A. JESSE

WITNESS

7224

EQUIPMENT AND RECORDING DATA

LOG	EQUIPMENT		TAPING			PANEL		CAL COEFF	DEPTHS			SEAM LOG RUN	
	SONDE	SOURCE	LOG TAPED	RECORD SPEED	DIRECTOR REPLAY	SPEED	TC SECS		NORM	FROM	TO		INTERVAL
GAMMA RAY	153	251	Y	9/2	D	9/2	2/1	-	1.2	1.36	0.0	1.36	Y
L S DENSITY	002B	799	Y	9/2	D	9/2	3/1	7.10	-	1.37	0.1	1.36	Y
CALIPER	7" 2"		Y	9/2	D	9/2	3/1	-	1.0	1.37	0.1	1.36	

FROM	TO	INTERVAL	TOTAL
11.2m	76m	5.1m	
97m	71m	4.1m	
16m	7m	10m	23m

SONDE	LOG	GENERAL SCALE LOG	DETAIL SCALE LOG	REFER TO ADDITIONAL HEADINGS
215	N-N	1:200		
232	F.B.	1:200		
231	VERT			

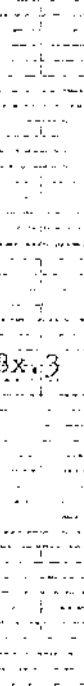
BPB COAL LITHOLOGY LOG

CALIBRATION DATA

JIG No 251	VALUE 37 @ 5 DIAM	JIG CAL DATE 26 07 17	JIG VALUE 5538	SDU @	g/cm ³	7 ins	644 cps
JIG MARK SHOWN AT ABOVE VALUE - X.3		JIG No 7995	SPAN 6000	NORM	SDU @	2 ins	241 cps

GAMMA RAY	DEPTH	BULK DENSITY	CALIPER
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HOLE SIZE CORRECTION DATA



GAMMA RAY	DEPTH	BULK DENSITY	CALIPER
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GAMMA RAY	DEPTH	BULK DENSITY	CALIPER
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COAL LITHOLOGY LOG

BOREHOLE QHD-86007

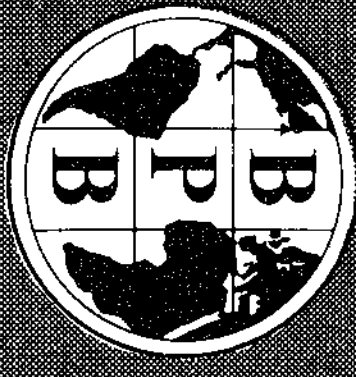
CLIENT QUINTE

AREA TRANSFER

COUNTRY CANADA

7224

MY (11)37483 B



NEUTRON-NEUTRON
GAMMA RAY

BOREHOLE QHD-86007
CLIENT QUI NTETTE

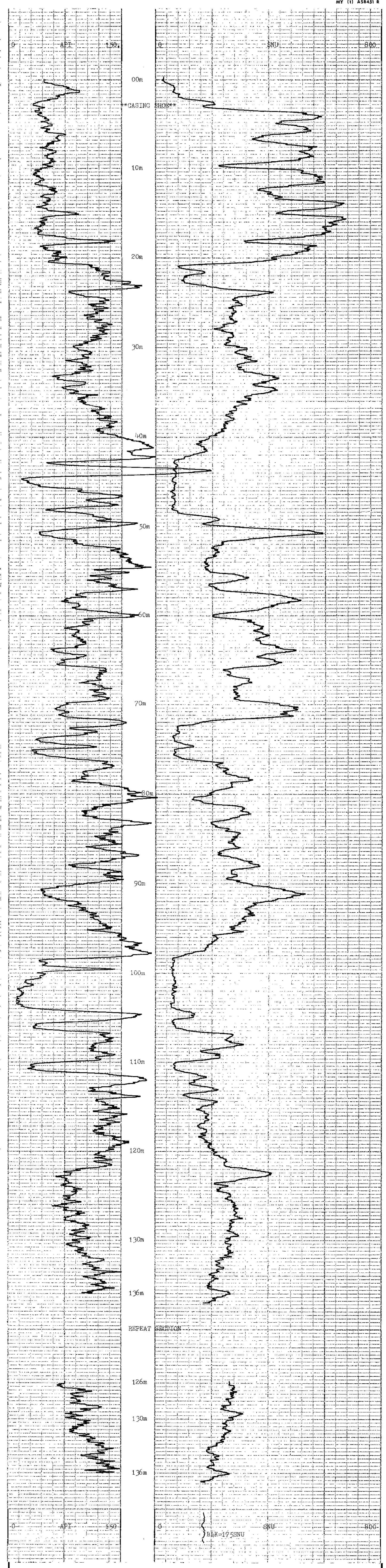
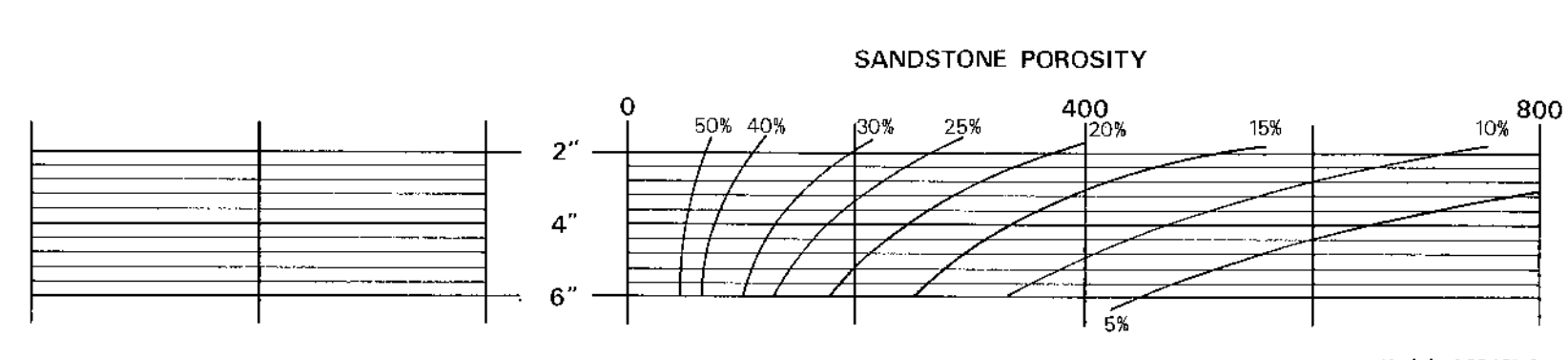
AREA TRANSFER
COUNTRY CANADA
DATE LOGGED 86 07 26

BOREHOLE DATA REFER TO LITHOLOGY LOG
OPERATION DATA REFER TO LITHOLOGY LOG

EQUIPMENT AND RECORDING DATA

LOG	TAPING	PANEL	DATE
N-N	Y	9	9 1 9 9
CANADA	Y	9/2	R 9 1 - . . 2
REMARKS			
724			

GAMMA RAY	DEPTH	NEUTRON-NEUTRON
0 API 150	0	0 SNU 800



GAMMA RAY	DEPTH	NEUTRON-NEUTRON
0 API 150	0	0 SNU 800



BOREHOLE QHD-86007
CLIENT QUI NTETTE
AREA TRANSFER
COUNTRY CANADA



FOCUSED ELECTRIC
GAMMA RAY

BOREHOLE QJD-86007

CLIENT QUINTETTE

AREA TRANSFER

COUNTRY CANADA

DATE LOGGED 86 07 26

DEPTH SCALE
1:200

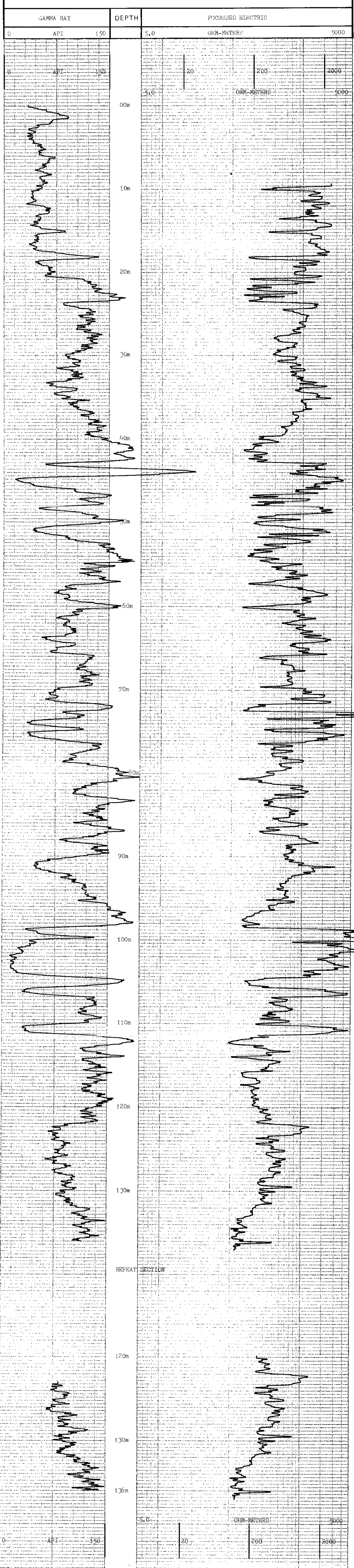
LOG LOSS
2 OF 4

BOREHOLE DATA REFER TO LITHOLOGY LOG

OPERATION DATA REFER TO LITHOLOGY LOG

EQUIPMENT AND RECORDING DATA

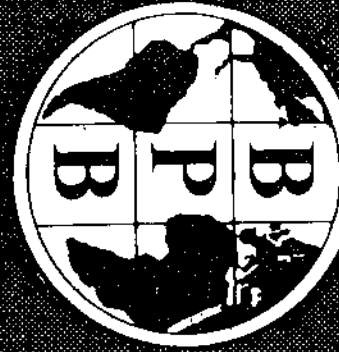
LOG	TAPPING	PANEL	CODE
LOG RECORDING SPEED	LOG REPLAY SPEED	T.C. NORM	
F.E. Y	D	9.3	1.0
GAMMA Y	H	9	1.52
REMARKS			
SOURCE 232			
724			



0	API	150	5.0	OHM-METERS	5000
GAMMA RAY			FOCUSED ELECTRIC		
DEPTH					



BOREHOLE QJD-86007
CLIENT QUINTETTE
AREA TRANSFER
COUNTRY CANADA



LOG SUITE
GAMMA RAY
L.S. DENSITY
CALIPER

SONDE TYPE
COAL COMBINATION
SONDE

COAL
LITHOLOGY
LOG

BOREHOLE QHD-86-008
CLIENT QUINETTE
AREA TRANSFER
COUNTRY CANADA
DATE LOGGED JULY 31/86
DEPTH SCALE 1:200
1 OF 4 LOGS

PERMANENT DATA
ELEVATION OF P.D. 0
MEASUREMENTS FROM C.L. 150.5m
DEPTH REACHED 167.0m
CASING SIZE 1 5.1/2 to 6.1m 2 HQ TO 7M
3 TO 10 TO 6.1m 4 TO TO
CASING SIZES 1 5" TO 6.1m 2 TO TO

BOREHOLE DATA
GROUND LEVEL

DRILLER
C.L.
167.0m
HQ TO 7M
TO TO
TO TO

FLUID DATA
WATER
NATURE
SG 1.00 GR/CC
LEVEL 0m FLOWING HOLE
VISCOSITY N/A
Rm @ 7m temp 17.0 DEGREES CELSIUS @ 16°C
BIT

OPERATION DATA
FIRST READING 159.0m
LAST READING 0.0m
INTERVAL LOGGED 149.0m
UNIT - FEET
ENGINEER B. PITCHER
WITNESS

EQUIPMENT AND RECORDING DATA														
COAL COMBINATION SONDE														
LOG	EQUIPMENT			TAPING		PANEL		CAL		DEPTHS		SEAM LOG RUN		
	SONDE	SOURCE	CALIBRATOR	LOG TAPED	RECORD SPEED	DIRECTOR RE-PLAY	SPEED	TC SECS	NORM	FROM	TO	INTERVAL		
GAMMA RAY	153		251	Y	9/2	D	9/2	2/1	-	1.61	149	0	149m	Y
L.S. DENSITY		0028	3993	Y	9/2	D	9/2	1/3	7.85	150	01	149m	Y	
CALIPER	SIDEWALL POSITION		7" 2"	Y	9/2	D	9/2			1.0				

COAL QUALITY/SEAM THICKNESS LOG INTERVALS (Refer to relevant log)

FROM	TO	INTERVAL	INTERVAL TOTAL
131	86	60	32
123	77	54	25
03m	09m	06m	07m
			30m

ADDITIONAL SONDES RUN

SONDE	LOG	GENERAL SCALE LOG	DETAIL SCALE LOG	REFER TO ADDITIONAL HEADINGS
232	F.E.	1:200		
215	N-N	1:200		
231	VBRT			

REMARKS
DRILL RODS STUCK AT 153m RODS PULLED
FREE LOGGED FROM 150m HOLE CAVING BELOW
153m

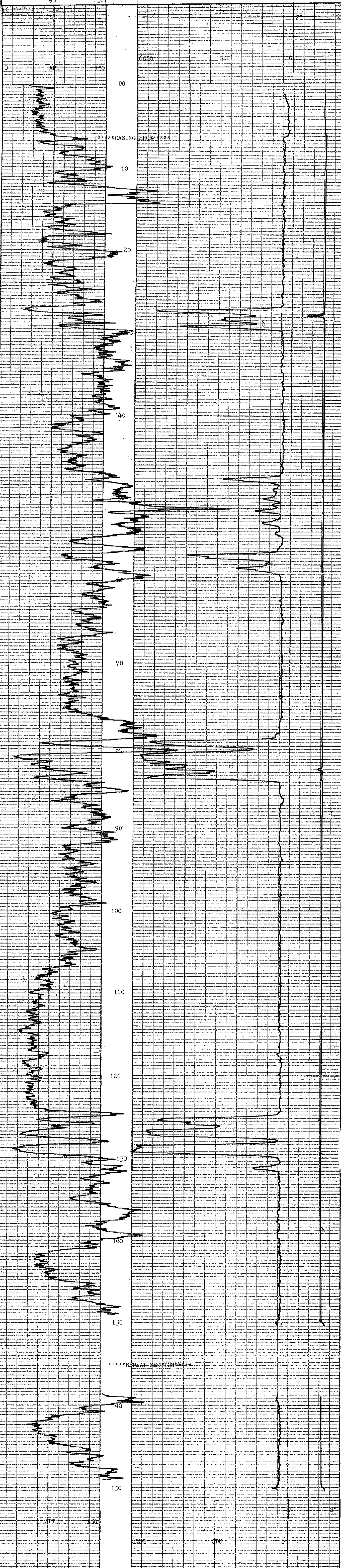
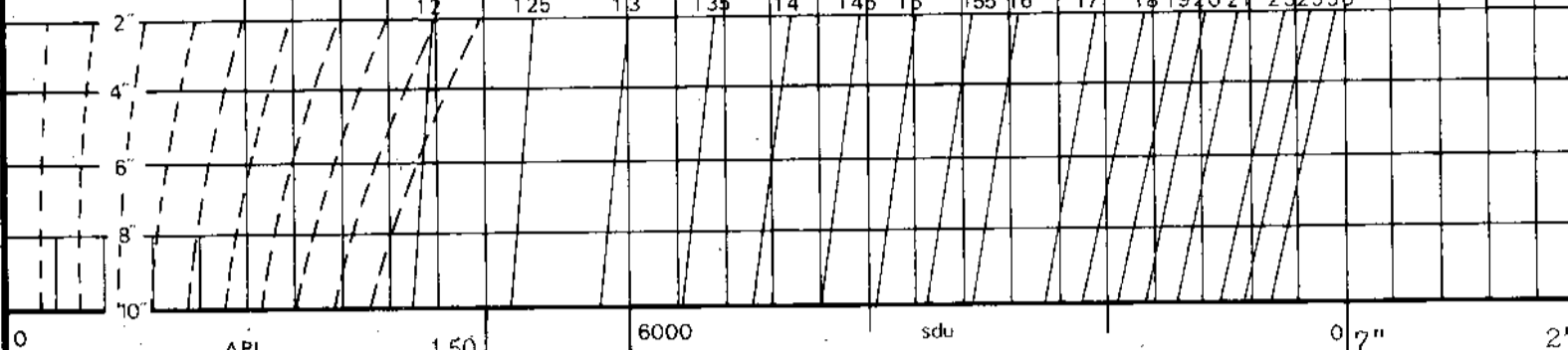
BPB COAL LITHOLOGY LOG

CALIBRATION DATA

JIG No 251 VALUE 337 @ 1.5" DIAM JIG CAL DATE 86/07/30 JIG VALUE 5930 SDU @ g/cm³ 7" ins 6.57 cps
JIG MARK SHOWN AT ABOVE VALUE - JIG No 3993 SPAN 6000 NORM SDU = 7.85 2" ins 24.0 cps

GAMMA RAY	DEPTH	BULK DENSITY g/cm ³	CALIPER INCHES
-----------	-------	--------------------------------	----------------

HOLE SIZE CORRECTION DATA



GAMMA RAY	DEPTH	BULK DENSITY g/cm ³	CALIPER INCHES
-----------	-------	--------------------------------	----------------



BOREHOLE QHD-86-008 AREA TRANSFER
CLIENT QUINETTE COUNTRY CANADA

COAL LITHOLOGY LOG



GAMMA RAY & NEUTRON-NEUTRON

BOREHOLE QHD-86008
CLIENT QUINTETTE

AREA TRANSFER
COUNTRY CANADA
DATE LOGGED JULY 31/86

DEPTH SCALE
1:200
2 OF 4 LOGS

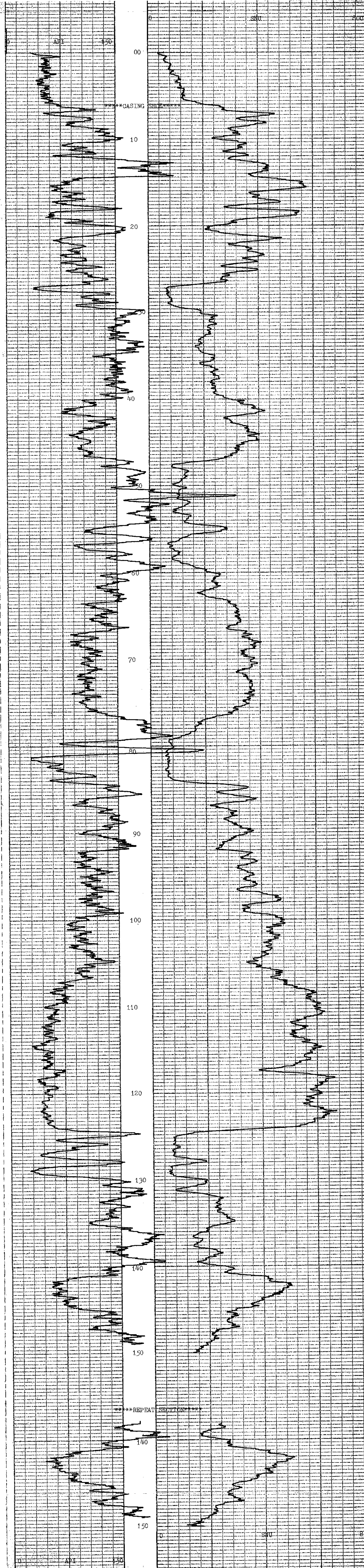
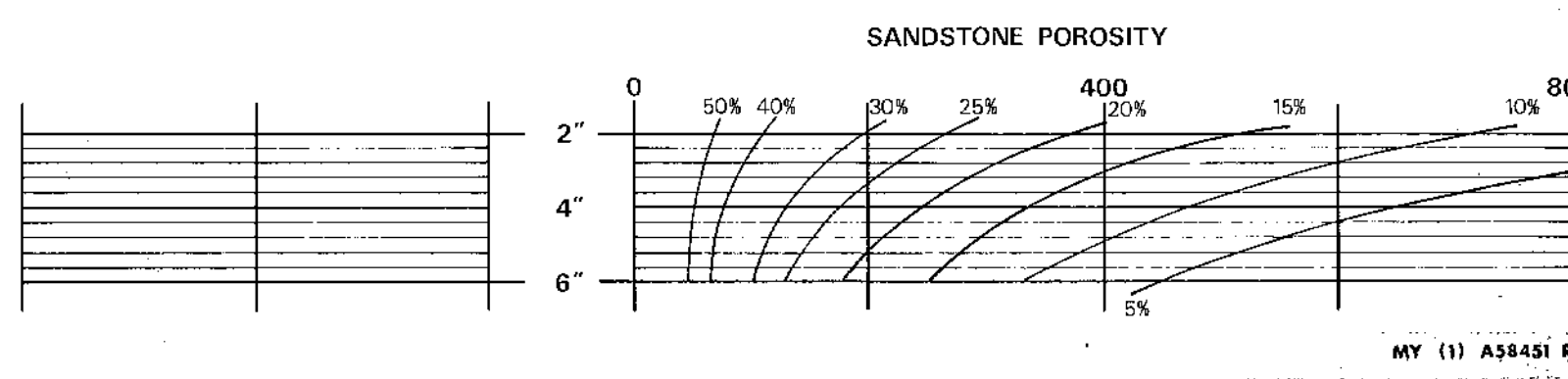
BOREHOLE DATA REFER TO LITHOLOGY LOG
OPERATION DATA REFER TO LITHOLOGY LOG

EQUIPMENT AND RECORDING DATA

LOG	TAPING	PANEL	CAL
GAMMA	LOG RECORDING SPEED SECS NORM		
Y	9	R	1
N-N	9	D	1
	153		9.90
	214		72202

REMARKS
724

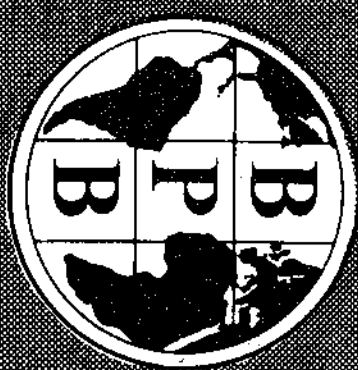
GAMMA RAY	DEPTH	NEUTRON-NEUTRON
0	API 150	0
		SNU 800



GAMMA RAY	DEPTH	NEUTRON-NEUTRON
0	API 150	0
		SNU 800



BOREHOLE QHD-86008
CLIENT QUINTETTE
AREA TRANSFER
COUNTRY CANADA



FOCUSSED ELECTRIC
GAMMA RAY

BOREHOLE QHD-86008
CLIENT QUINTETTE

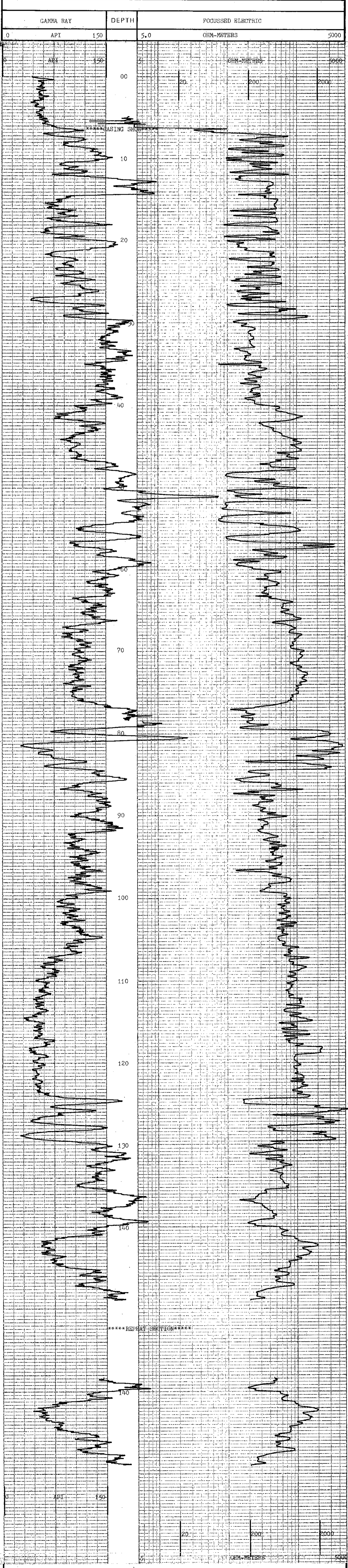
AREA TRANSFER
COUNTRY CANADA
DATE LOGGED JULY 31/86

DEPTH SCALE
1:200
3 OF 4 LOGS

BOREHOLE DATA REFER TO LITHOLOGY LOG
OPERATION DATA REFER TO LITHOLOGY LOG
EQUIPMENT AND RECORDING DATA

LOG	TAPPING	RECORDER DIRECT	T.C.	PANEL	DATE
		SPEED	FEED	SECS	NORM
F.E.	Y	9	D	9	.3
GAMMA	Y	9/2	R	9	1
					1.61
		3000	1.53		
		2.32			

REMARKS
724

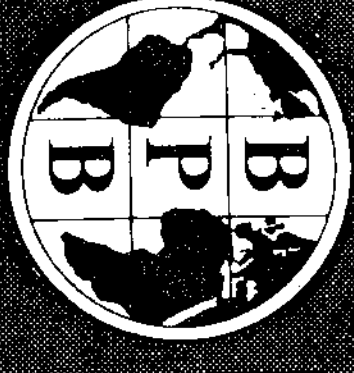


GAMMA RAY	DEPTH	FOCUSSED ELECTRIC
0 API 150	5.0	OHM-METERS 5000



BOREHOLE QHD-86008
CLIENT QUINTETTE

AREA TRANSFER
COUNTRY CANADA



SONDE TYPE
COAL COMBINATION
SONDE

LOG SUITE
GAMMA RAY
L.S. DENSITY
CALIPER

BOREHOLE GHD-R5001
CLIENT Quintette Coal
AREA BERMAR Mtn
COUNTRY Canada
DATE LOGGED 16/AUG/85
DEPTH SCALE 1:200
1 OF 2 LOGS

BOREHOLE DATA

REMANENT DILUTION	360000	LEVELS
ELEVATION OF P.O.	898	DRIER
WASSERMINSTERM	DILL FLOOR	JULY FLOOR
DEPTH REACHED	167.18m	172.27m
CASING SIZE	4.00m	4.50m
BIT SIZES	4.00m TO 4.5	2 H.C. TO 4.5
CASING SIZES	3 TO 4	4 TO 5

FLUID DATA

NATURE	Gulke-Gel
SIG	1.011 g/cm ³
LEVEL	27.0m
VISCOSITY	N/A
PH	N/A
BHT	N/A

OPERATION DATA

FIRST READING	15.5.0m
LAST READING	20.0m
INTERVAL LOGGED	15.5.0m
UNIT TRACK No.	Head Unit 1/27/85
ENGINEER	34444444
WITNESS	Flankers

EQUIPMENT AND RECORDING DATA

COAL COMBINATION SONDE #101														
LOG	SONDE	SOURCE	CALIBRATOR	LOG TAPED	RECORD SPEED	DIRECT REPLAY	PANEL SPEED	TC SECS	NORM	CAL COEFF	DEPTHS FROM	TO	INTERVAL	SEAM LOG RUN
GAMMA RAY	101	0.42	063	Y	9m/m	1	2m/m	1		1.1	15.5	20.0	4.5	Yes
L.S. DENSITY		0592	4340	Y	9m/m	1	2m/m	1.1		1.1	15.5	20.0	4.5	Yes
CALIPER	SIDEWALL POSITION		2" x 2"	Y	9m/m	1	2m/m	1.1		1.1	0.1	1.1	1.0	Yes

COAL QUALITY/SEAM THICKNESS LOG INTERVALS (Refer to relevant log)

FROM	15.5.0m	106.0m	72.0m	40.0m	22.0m	INTERVAL
TO	115.0m	72.0m	62.0m	42.0m	15.5m	TOTAL
INTERVAL	4.0m	10.0m	12.0m	8.0m	8.0m	

ADDITIONAL SONDES RUN

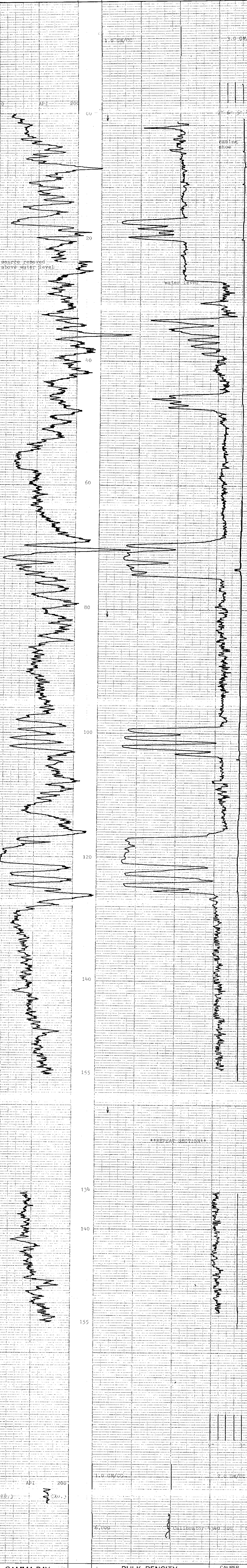
SONDE	LOG	GENERAL SCALE LOG	DETAIL SCALE LOG
18	N/A	1:200	
236	Yes	0.25m	

REMARKS
1. Lower than low water level
SOURCE REMOVED FOR GAMMA RAY SCALE
27.0m

BPB COAL LITHOLOGY LOG

CALIBRATION DATA

JIG No 242 VALUE 6.3 @ 5" DIAM JIG CAL DATE 02/03/85 JIG VALUE 1340SDU @ 2.0 g/cm³ 2" vs 2.31 cps
JIG MARK SHOWN AT ABOVE VALUE - X, 3 JIG No 0012 SPAN 6,000 NORM 2.3 3" vs 3.05 cps



****REPEAT SECTIONS****

GAMMA RAY	DEPTH	BULK DENSITY	CALIPER
		g/cm ³	INCHES



BOREHOLE GHD-R5001 AREA Bermar Mtn
CLIENT Quintette Coal COUNTRY Canada

COAL LITHOLOGY LOG



Neutron/Neutron & Gamma Ray Log

BOREHOLE 310-84001

CLIENT Quintette Coal

AREA Herman Mtn.

COUNTRY Canada

DATE LOGGED 16/AUG/85

DEPTH SCALE
1:200

3 or 4
10008

BOREHOLE DATA REFER TO Lithology LOG

OPERATION DATA REFER TO Lithology LOG

EQUIPMENT AND RECORDING DATA

LOG	TAPING	PANEL	CAL
LOG	RECORD DIRECTOR	SPEED	S/C
TAPING	RECORD	RECORD	RECORD
LOG	RECORD	RECORD	RECORD

M/N 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20

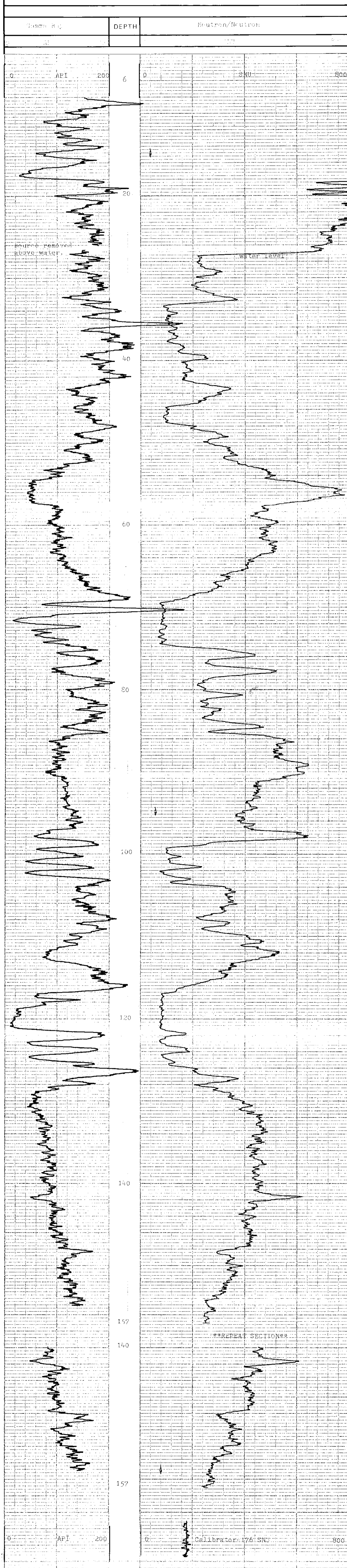
3/R 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20

REMARKS

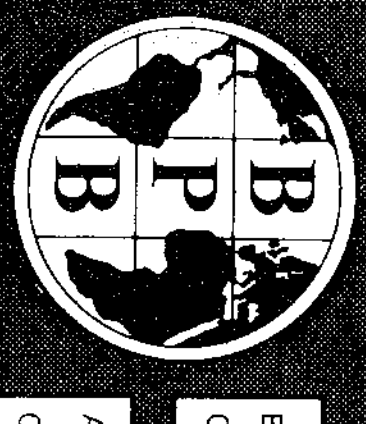
Neutron leveled to 12.0m due to log

Water level @ 27.0m

724



Gamma Ray	DEPTH	Neutron/Neutron
BOREHOLE <u>310-84001</u>	AREA <u>Herman Mtn.</u>	
CLIENT <u>Quintette Coal</u>	COUNTRY <u>Canada</u>	



COAL LITHOLOGY LOG

BOREHOLE DATA

PERMANENT DATA: Not available
ELEVATION OF P.D.: Not available
MEASUREMENTS FROM: Drill Floor, Drill Floor
DEPTH REACHED: 144.90m, 145.00m
CASING SHOE: 9.0m, 9.1m, 9.1m, 14.7
BIT SIZES: 1 1/4" TO 9.1", 2 1/2" TO 14.7
CASING SIZES: 1 1/4" TO 9.1", 2" TO 14.7

FLUID DATA

NATURE: Oil-sol/water
SG: 1.01 gm/cc
LEVEL: 4.0m
VISCOSITY: Not available
Rim or mass temp: Not available
BHT: Not available

OPERATION DATA

FIRST READING: 143.0m
LAST READING: 00.0m
INTERVAL LOGGED: 143.0m
UNIT-TRACK No: Fall-in-hill/W215
ENGINEER: Cayendish
WITNESS: Tainaka

SONDE TYPE: COAL COMBINATION SONDE

LOG SUITE: GAMMA RAY, L.S. DENSITY, CALIPER

BOREHOLE: QHD-85002
CLIENT: Quintette Coal Ltd.
AREA: Transfer Pit
COUNTRY: Canada
DATE LOGGED: 21/AUG/85
DEPTH SCALE: 1:200
LOGS: 1 of 4

EQUIPMENT AND RECORDING DATA

COAL COMBINATION SONDE #101

LOG	EQUIPMENT			TAPING		PANEL		CAL COEFF	DEPTHS			SEAM LOG RUN		
	SONDE	SOURCE	CALIBRATOR	LOG TAPED	RECORD SPEED	DIRECT REPLAY	SPEED		TC SECS	NORM	FROM		TO	INTERVAL
GAMMA RAY	101	0592		Y	9m/m	D	9	1	-	1.8	143	00	143	Yes
L.S. DENSITY			242	Y	9m/m	D	9	.3	7.14	-	143	10	133	Yes
CALIPER		SIDEWALL POSITION		Y	9m/m	D	9	.3	-	-	143	00	143	Yes

COAL QUALITY/SEAM THICKNESS LOG INTERVALS (Refer to relevant log)

FROM	TO	INTERVAL	INTERVAL TOTAL
127.0m	106.0m	58.0m	26.0m
117.0m	98.0m	51.0m	21.0m
10.0m	8.9m	7.0m	5.0m
			36.0m

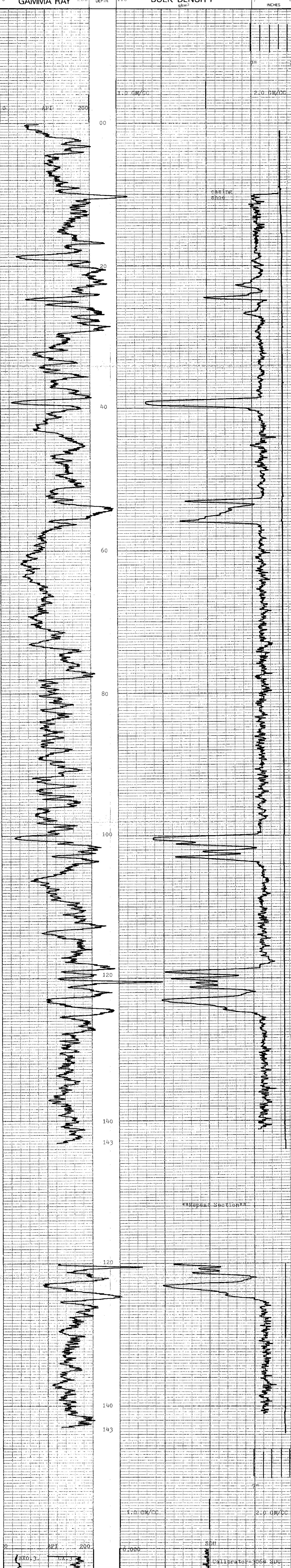
ADDITIONAL SONDES RUN

SONDE	LOG	GENERAL SCALE LOG	DETAIL SCALE LOG	REFER TO ADDITIONAL HEADINGS
18	N/N	1:200		
236	Vert.	CDS		

BPB COAL LITHOLOGY LOG

CALIBRATION DATA

JIG No 242 VALUE 46 @ 5 DIAM JIG CAL DATE 02/08/85 JIG VALUE 3064 SDU @ 2.0 g/cm³ 7"ins 733 cps
 JIG MARK SHOWN AT ABOVE VALUE X.3 JIG No 0042 SPAN 6,000 NORM SDU CPS 7.14 3"ins 511 cps



GAMMA RAY 200 DEPTH 1.0 BULK DENSITY g/cm³ 7" CALIPER 2" INCHES



BOREHOLE: QHD-85002 AREA: Transfer Pit
 CLIENT: Quintette Coal COUNTRY: Canada

COAL LITHOLOGY LOG



Gamma Ray & Neutron/Neutron
Log

BOREHOLE QHD-85002

CLIENT Quintette Coal Ltd.

AREA Transfer Pit

COUNTRY Canada

DATE LOGGED 21/Ave/85

DEPTH SCALE
1:200

2 OF 4 LOGS

BOREHOLE DATA REFER TO Lithology Log

OPERATION DATA REFER TO Lithology Log

EQUIPMENT AND RECORDING DATA

LOG TYPING PANEL CAL

LOG RECORDING SPEED SECS NORM

N/N X 9m/hr D 9 1 - .87

G/R X 9m/hr R 9 1 - 1.84

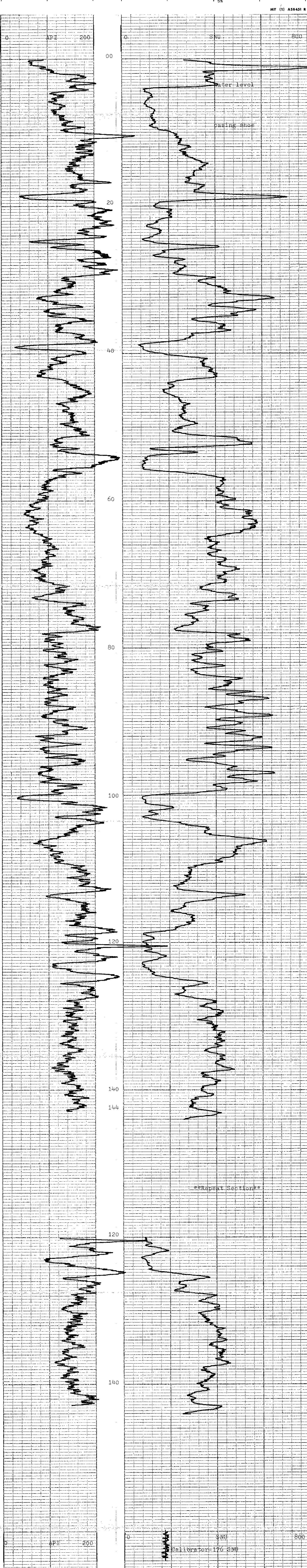
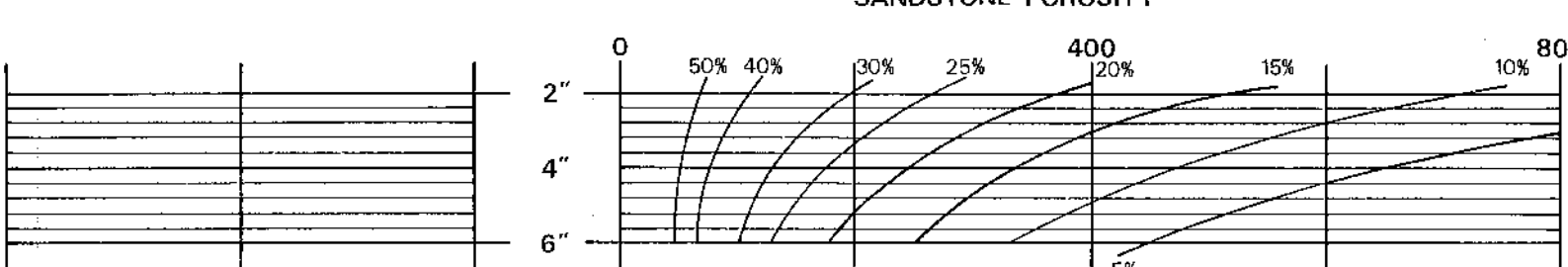
SCALE 18

REMARKS

724

Gamma Ray	DEPTH	Neutron/Neutron
0 API	200	0 SNU
		800

SANDSTONE POROSITY



Gamma Ray	DEPTH	Neutron/Neutron
0 API	200	0 SNU
		800



BOREHOLE QHD-85002 AREA Transfer Pit
 CLIENT Quintette Coal Ltd. COUNTRY Canada



BOREHOLE QHD-86003
CLIENT QUINTEITE

AREA GRIZZLY
COUNTRY CANADA
DATE LOGGED JUN 20/86

DEPTH SCALE
1:200
LOSS

COAL LITHOLOGY LOG

SONDE TYPE
COAL COMBINATION SONDE
LOG SUITE
GAMMA RAY
L S DENSITY
CALIPER

OPERATION DATA
FIRST BEARING 235.0m
LAST BEARING 235.0m
INTERVAL LOGGED 22.0m
UNIT TRACK No. 1213
ENGINEER P. FICHER

BOREHOLE DATA

PERMANENTIAL	GROUND LEVEL	CHALKER
ELEVATION OF P.D.	B.P.S.	C.L.L.
DEPTH FROM B.P.S.	226.5m	227.0m
DEPTH FROM C.L.L.	0.5m	0.5m
BIT SIZES	1 HQ TO 7 1/2	2 TO 10
CASING SIZES	1 HQ TO 2 1/2	2 TO 10

EQUIPMENT AND RECORDING DATA

LOG	EQUIPMENT	TAPING	PANEL	CAL	DEPTH	SEAM LOG RUN
SONDE	SOURCE	LOG TAPED	RECORD SPEED	TC SECS	FROM TO	INTERVAL
GAMMA RAY	118	Y	9/2	D	9/2 2/1	1.67 224 0 224m Y
L S DENSITY	0028	Y	9/2	D	9/2 1/3	7.40 225 01 224m Y
CALIPER	7" 2"	Y	9/2	D	9/2 1/3	1.0 225 01 224m Y

COAL QUALITY/SEAM THICKNESS LOG INTERVALS (Refer to relevant log)

FROM	TO	178	150	125	104	40	INTERVAL TOTAL
189	170	143	116	92	36		48m
INTERVAL	13m	08m	07m	09m	07m	04m	

ADDITIONAL SONDES RUN

SONDE	LOG	GENERAL SCALE	DETAIL SCALE LOG	REFER TO ADDITIONAL HEADINGS
215	N-N	1:200		
220	P.E.	1:200		
231	VERT			

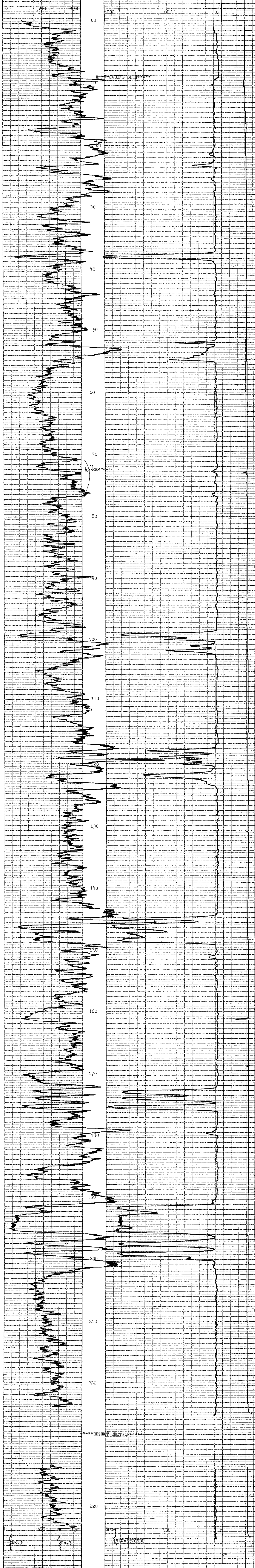
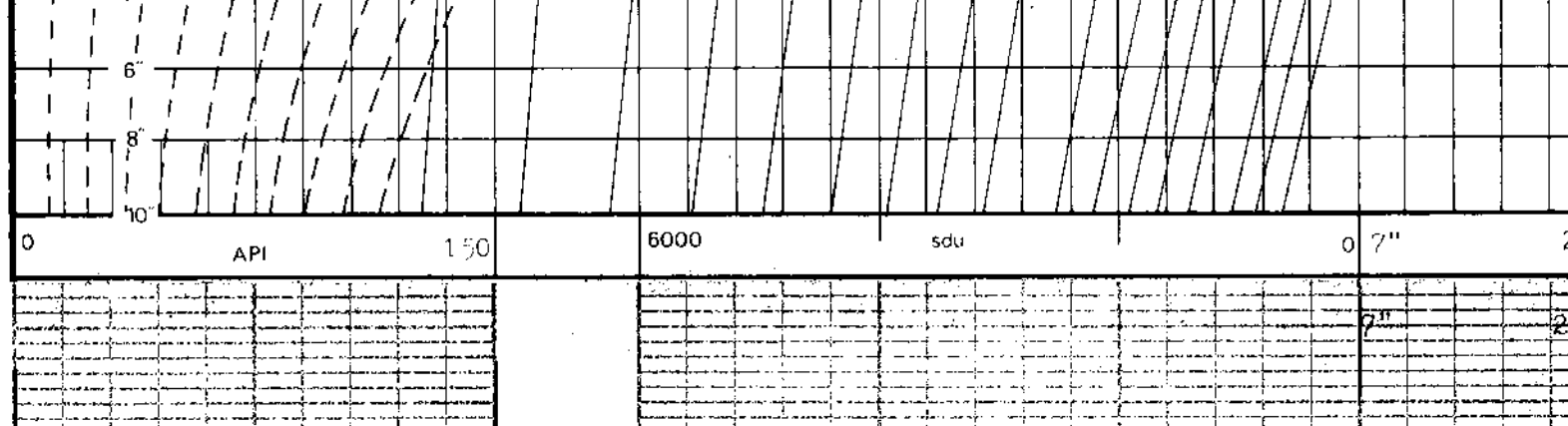
BPB COAL LITHOLOGY LOG

CALIBRATION DATA

JIG No 251	VALUE 3370	5" DIAM	JIG CAL DATE 86/06/20	JIG VALUE 5570	SDU @	g/cm ³	7" ins	216	cps
JIG MARK SHOWN AT ABOVE VALUE - x.3			JIG No 3995	SPAN 6000	NORM	SDU @ = 2.40	2" ins	432	cps

GAMMA RAY	DEPTH	BULK DENSITY	CALIPER
		g/cm ³	INCHES

HOLE SIZE CORRECTION DATA



GAMMA RAY	DEPTH	BULK DENSITY	CALIPER
		g/cm ³	INCHES





GAMMA RAY
&
NEUTRON-NEUTRON

BOREHOLE QHD-86003 85-02-B
CLIENT QUINTETTE
AREA GRIZZLY
COUNTRY CANADA
DATE LOGGED JUNE 20/86

DEPTH SCALE
1:200

BOREHOLE DATA

PERMANENT DIALUM CHOUND JEWEL
ELEVATION OF P.D. B.P.B. DRILLER
MEASUREMENTS FROM G.L. 226.5m
DEPTH REACHED 227.4m
CASING SIZE 9.5m
BIT SIZES 1 HQ TO TD 2 TO
CASING SIZES 3 HQ TO 2m 2 TO

NATURE REFER TO LITHOLOGY LOG

OPERATION DATA

FIRST READING 226.0m
LAST READING 0.0m
INTERVAL LOGGED 226.0m
UNIT-BLOCK NO. V215
ENGINEER B. TICHES
WITNESS

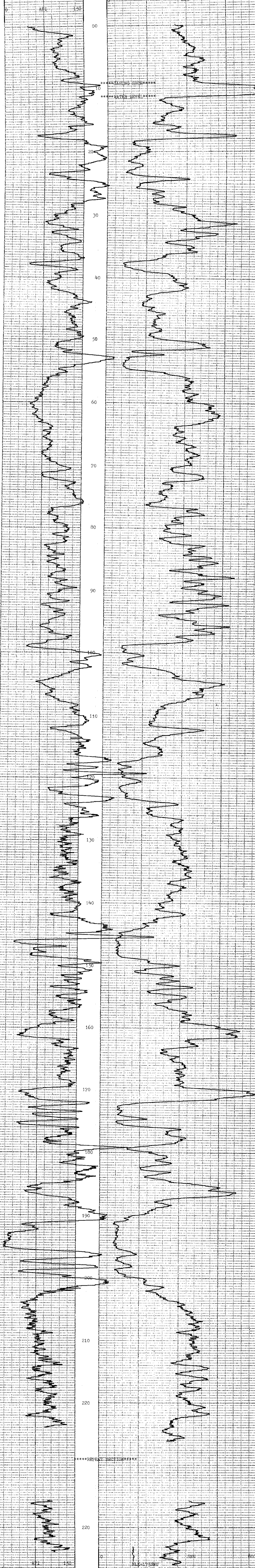
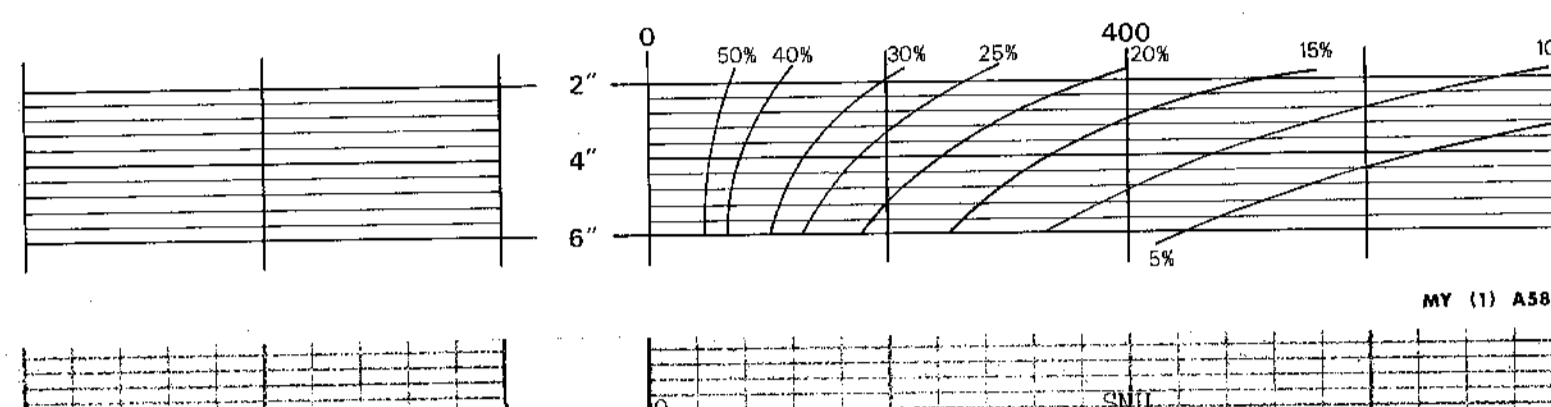
724

EQUIPMENT AND RECORDING DATA

LOG	EQUIPMENT			TAPING		PANEL		CAL COEFF	DEPTHS			
	SONDE	SOURCE	CALIBRATOR	LOG TAPED	RECORD SPEED	DIRECT or REPLAY	SPEED		IC SECS	NORM	FROM	TO
GAMMA	118	-	251	Y	9/2	R	9	1	1.63	224	0	224m
N-N	215	7202	176	Y	9	D	9	1	11.5	226	0	226m

ADDITIONAL SONDES RUN				REFER TO ADDITIONAL HEADINGS	REMARKS
SONDE	LOG	GENERAL SCALE LOG	DETAIL SCALE LOG		
118	CCS	1:200			
220	F.E.	1:200			
231	VBRP				

GAMMA RAY	DEPTH	NEUTRON-NEUTRON	
0	API 150	0	SNU 800



GAMMA RAY	DEPTH	NEUTRON-NEUTRON	
0	API 150	0	SNU 800

B.P.B.

BOREHOLE QHD-86003
CLIENT QUINTETTE
AREA GRIZZLY
COUNTRY CANADA



CANADA RAY
&
FOCUSSED ELECTRIC

BOREHOLE QHD-66003 @5002-B

CLIENT QUINTETTE

AREA GRIZZLY

COUNTRY CANADA

DATE LOGGED JUNE 30/86

3 of 4 LOGS

BOREHOLE DATA

PERMANENT LOG	GROUND LEVEL
ELEVATION OF P.D.	87.8
DRILLER	G.T.L.
MEASUREMENTS FROM	226.5m
DEPTH REACHED	227.4m
CASING SHOE	9.5m
BIT SIZES	1 1/4 TO 1/2
CASING SIZES	3 1/2 TO 2 1/2
NATURE	REFER TO LITHOLOGY LOG
LEVEL	
VISCOSITY	
TEMP. AT PRESS. TEMP.	
PH	

FIRST READING	22.5 Om
LAST READING	0 Om
INTERNAL LOGGED	22.5 Om
UNIT - TRACK No	N 231-5
ENGINEER	E. FICHER
WITNESSES	

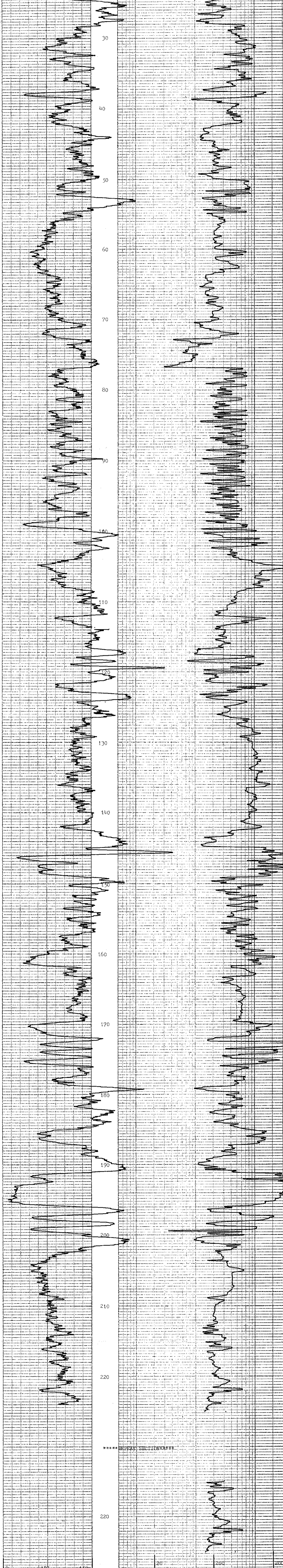
OPERATION DATA

724

EQUIPMENT AND RECORDING DATA

LOG	EQUIPMENT			TAPING			PANEL			CAL. COEFF.	DEPTHS		
	SONDE	SOURCE	CALIBRATOR	LOG TAPED	RECORD SPEED	DIRECT TO REFLEX	SPEED	T.C. SECS	NORM		FROM	TO	INTERVAL
GAMMA	118	-	251	Y	9/2	R	9	1		1.63	224	0	226.5
F.E.	220	-	Y	Y	9	D	9	.3		1.0	225	2.5	215m

ADDITIONAL SONDES RUN					REFER TO ADDITIONAL HEADINGS	REMARKS
SONDE	LOG	GENERAL SCALE LOG	DETAIL SCALE LOG			
118	CCS	1:200				
215	N-N	1:200				
231	VERT					



GAMMA RAY	DEPTH	FOCUSSED ELECTRIC
0	API 150	5
0	API 150	5

BOREHOLE QHD-66003 AREA GRIZZLY
 CLIENT QUINTETTE COUNTRY CANADA





COAL LITHOLOGY LOG

BOREHOLE QHD-86002	CLIENT QUINTETTE	AREA GRIZZLY	DEPTH SCALE 1:200
DATE LOGGED JUNE 26/86	1 OF 4 LOGS		

BOREHOLE DATA	
PERMANENT TUM	GROUND LEVEL
ELEVATION OF F.D.	
MEASUREMENT FROM	DEPTH
DEPTH REACHED	DEPTH
CASING SHAPE	DEPTH
BIT SIZES	TO
CASING SIZES	TO
FLUID DATA	
NATURE	QUITY-CHEM & WATER
S.G.	1.04 GM/CC
LEVEL	0.0m
VISCOSITY	14.4 CEN- METERS @ 16°C
PH	

OPERATION DATA	
FIRST READING	118.0m
LAST READING	0.0m
INTERVAL LOGGED	118.0m
UNIT-TRUCK No	V215
ENGINEER	B. EICHER
WITNESS	

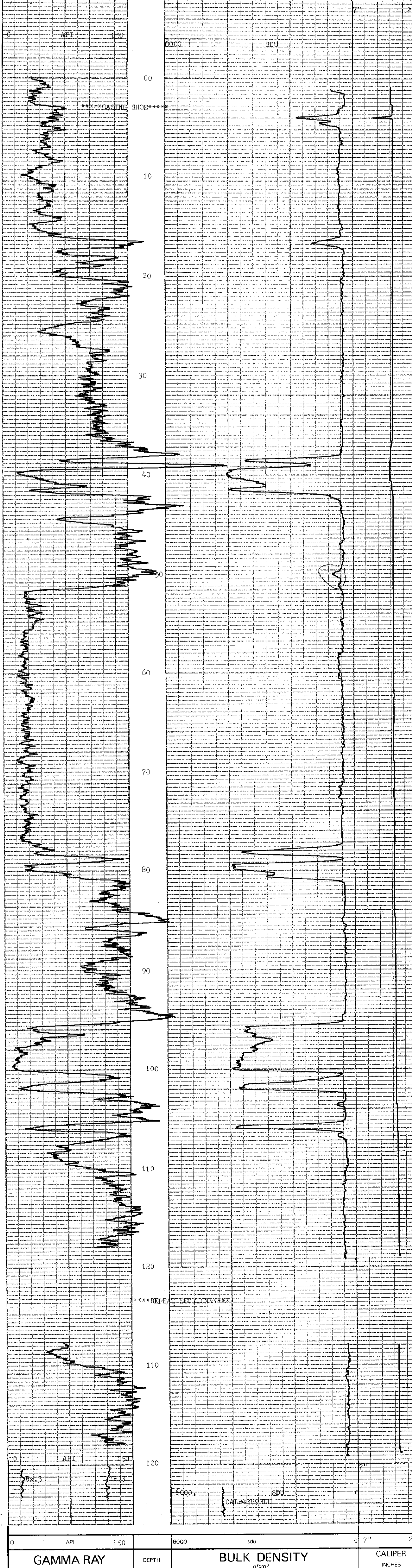
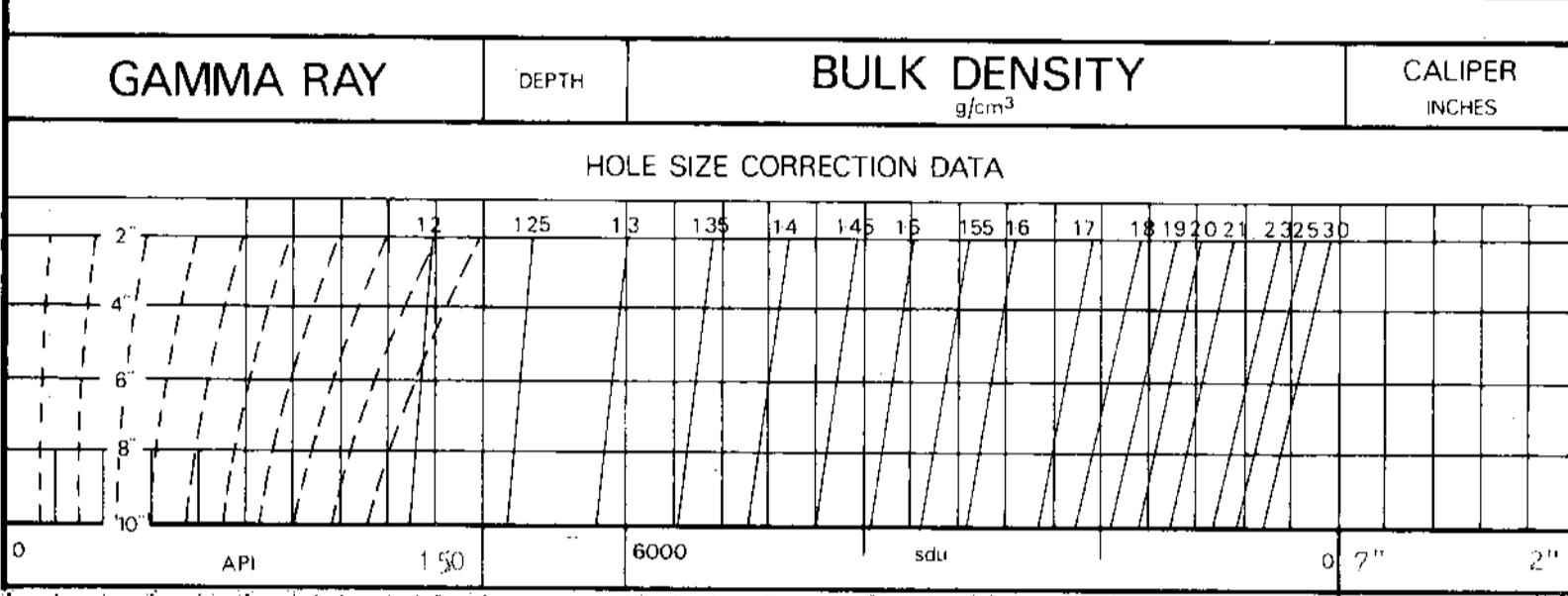
EQUIPMENT AND RECORDING DATA											
COAL COMBINATION SONDE											
LOG	EQUIPMENT	LOG TAPE	TAPING	PANEL	CAL COEFF	DEPTHS			SEAM LOG RUN		
SONDE	SOURCE	CAUBRATOR	RECORD SPEED	DIRECT or REPLAY	SPEED	TC SECS	NORM	FROM	TO	INTERVAL	
GAMMA RAY	184	251	9/2	D	9/2	2/1	1.50	118	0	118m	Y
LS DENSITY	0028	3995	9/2	D	9/2	1.1.3	7.81	119	01	118m	N
CALIPER	SIDEWALL POSITION	2" 2"	9/2	D	9/2	.3		119	01	118m	Y

COAL QUALITY/SEAM THICKNESS LOG INTERVALS (Refer to relevant log)			
FROM	TO	INTERVAL	INTERVAL TOTAL
108	83	43	
93	76	36	
1.5m	07m	07m	29m

ADDITIONAL SONDES RUN				REMARKS			
SONDE	LOG	GENERAL SCALE LOG	DETAIL SCALE LOG	REFER TO ADDITIONAL HEADINGS			
215	N-N	1:200					
221	F.B.	1:200					
231	VERT						

BPB COAL LITHOLOGY LOG

CALIBRATION DATA											
JIG No 251	VALUB 3710	5" DIAM	JIG CAL DATE 86/06/20	JIG VALUE 389	SDU @	g/cm ³	7" ins	738	cps		
JIG MARK SHOWN AT ABOVE VALUE - X.3			JIG No 3995	SPAN 6000	NORM	SDU = 7.81	2" ins	470	cps		



BOREHOLE QHD-86002	CLIENT QUINTETTE	AREA GRIZZLY	DEPTH SCALE 1:200
		COUNTRY CANADA	

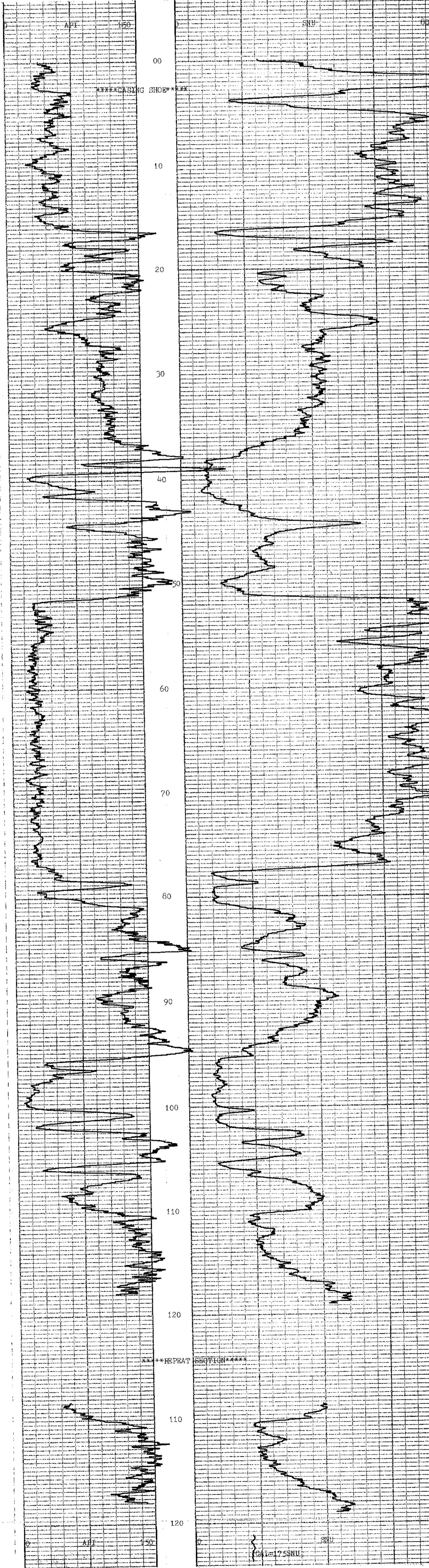
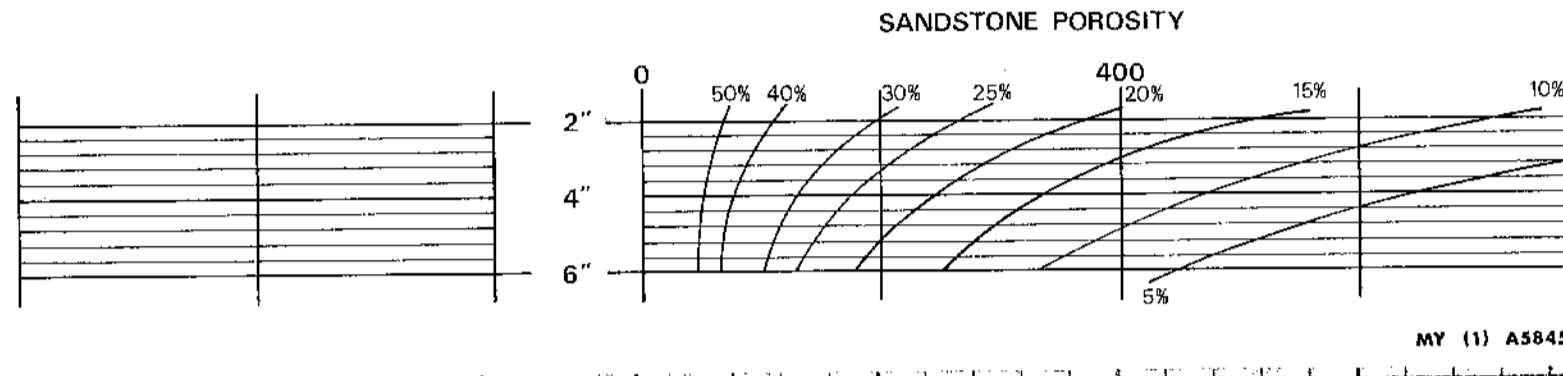


GAMMA RAY NEUTRON-NEUTRON	
BOREHOLE QHD-86002	DEPTH SCALE 1:200
CLIENT QUINTETTE	
AREA GRIZZLY	
COUNTRY CANADA	
DATE LOGGED JUNE 26/86	2 of 4 LOGS
BOREHOLE DATA	
PERMANENT DATUM GROUND LEVEL	
ELEVATION OF P.D.	B.P.B. DRILLER
MEASUREMENTS FROM G.L.	G.L.
DEPTH REACHED 119.6m	120.4m
CASING SHOE 3.0m	3.5m
BIT SIZES 1 HQ TO TD 2 TO TO	
CASING SIZES 3 HQ TO 3.0m 2 TO TO	
FLUID DATA	
NATURE REFER TO LITHOLOGY LOG	
S.G.	
LEVEL	
VISCOSITY	
Rim at meas. temp	
S.H.T.	
OPERATION DATA	
FIRST READING 119.0m	
LAST READING 0.0m	
INTERVAL LOGGED 119.0m	
UNIT-TRUCK No V212	
ENGINEER B. PITCHER	
WITNESS	

EQUIPMENT AND RECORDING DATA												
LOG	EQUIPMENT			TAPING			PANEL		CAL COEFF	DEPTHS		
	SONDE	SOURCE	CALIBRATOR	LOG TAPED	RECORD SPEED	DIRECT REPLAY	SPEED	I.C. SECS		FROM	TO	INTERVAL
GAMMA	184	-	251	Y	9/2	R	9	1	1.50	118	0	118m
N-N	215	7202	176	Y	9	D	9	1	11.5	119	0	119m

ADDITIONAL SONDES RUN				REFER TO ADDITIONAL HEADINGS	REMARKS
SONDE	LOG	GENERAL SCALE LOG	DETAIL SCALE LOG		
184	CCS	1:200			
221	F.E.	1:200			
231	VERT				

GAMMA RAY	DEPTH	NEUTRON-NEUTRON
0 API 150	0	0 SNU 800



GAMMA RAY	DEPTH	NEUTRON-NEUTRON
0 API 150	0	0 SNU 800



BOREHOLE QHD-86002	AREA GRIZZLY
CLIENT QUINTETTE	COUNTRY CANADA



GAMMA RAY
&
FOCUSSED ELECTRIC

BOREHOLE QHD-86002
CLIENT QUINTEITE

AREA GRIZZLY
COUNTRY CANADA

DATE LOGGED JUNE 26/86

BOREHOLE DATA

PERMANENT DATUM GROUND LEVEL
ELEVATION OF P.D. B.P.B. DRILLER C.L.
MEASUREMENTS FROM C.L. 119.6m 120.7m
DEPTH REACHED 3.0m 3.5m
CASING SHOE
BIT SIZES 1 HQ TO TD 2 TO
3 TO 4 TO
CASING SIZES 1 HQ TO 3.0m 2 TO

FLUID DATA

NATURE REFER TO LITHOLOGY LOG
SG LEVEL
VISCOSITY
Rm at meas. temp
B.H.T.

OPERATION DATA

FIRST READING 118.0m
LAST READING 0.0m
INTERVAL LOGGED 118.0m
UNIT - TRUCK NO. V215
ENGINEER 3 PITCHER
WITNESSES

724

EQUIPMENT AND RECORDING DATA

LOG	EQUIPMENT			TAPING			PANEL			CAL COEFF	DEPTHS		
	SONDE	SOURCE	CALIBRATOR	LOG TAPED	RECORD SPEED	DIRECT or REPLAY	SPEED	T.C SECS	NORM		FROM	TO	INTERVAL
GAMMA	184	-	251	Y	9/2	R	9	1		1.50	118	0	118m
F.E.	221	-	Y	Y	9	D	9	.3		1.0	118	03	115m

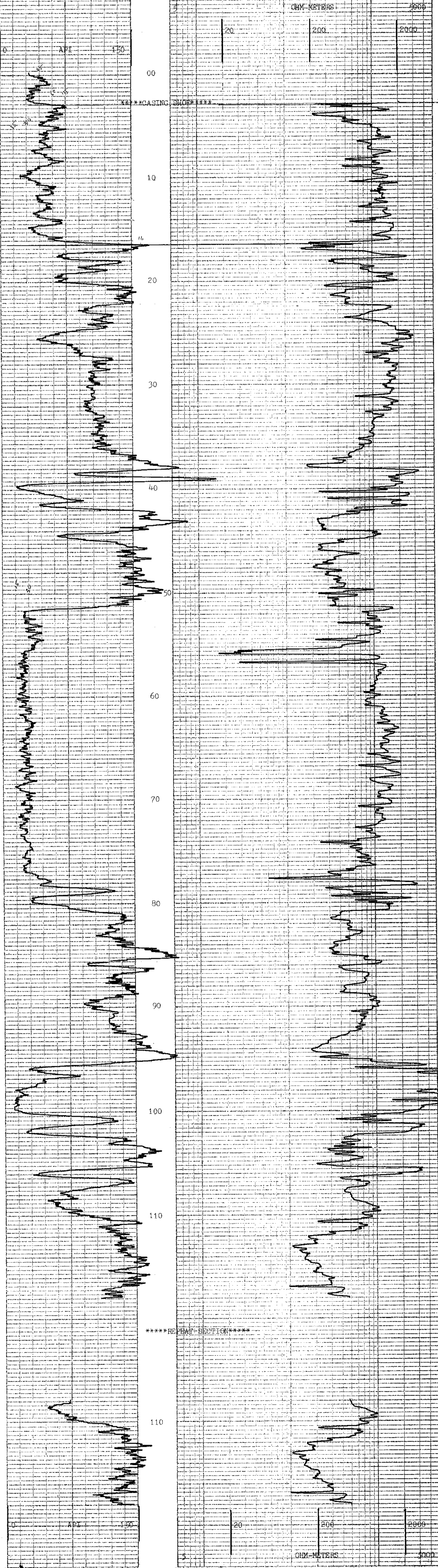
ADDITIONAL SONDES RUN

SONDE	LOG	GENERAL SCALE LOG	DETAIL SCALE LOG
184	CCS	1:200	
215	N-N	1:200	
231	VERT		

REMARKS

REFER TO ADDITIONAL HEADINGS

GAMMA RAY DEPTH FOCUSSED ELECTRIC



GAMMA RAY DEPTH FOCUSSED ELECTRIC



BOREHOLE QHD-86002
CLIENT QUINTEITE

AREA GRIZZLY
COUNTRY CANADA



COAL LITHOLOGY LOG

COAL COMBINATION SONDE
LOG SUITE
 GAMMA RAY
 L.S. DENSITY
 CALIPER

BOREHOLE QHD-86001	DEPTH SCALE 1:200
CLIENT QUINTETTE	DATE LOGGED JUNE 21/86
AREA GRIZZLY	COUNTRY CANADA
PERMANENT DATUM GROUND LEVEL	1 OF 5 LOSS
ELEVATION OF # D 898	
WASSERMARKS FROM 51.1	
DEPTH HEADCHD 147.1m	
CASING SHOE 8.0m	
BIT SIZES 1 HQ TO TD 2 TO TO	
CASING SIZES 3 HQ TO 3.0M 2 TO TO	
FLUID DATA	
NATURE QUIN-CLAY & WATER	
SG 1.03 (AV/CS)	
LEVEL 6.0m	
VISCOSITY	
PH IN MASS TEMP	
PH IN LIQ TEMP	
PH IN AIR TEMP	
PH IN WATER TEMP	
LOG SUITE	
FIRST READING 14.5 0.2m	
LAST READING 0 0.2m	
INTERVAL LOGGED 14.5 0.2m	
UNIT-TRUCK No V215	
ENGINEER B. PICHE	
WITNESS	

EQUIPMENT AND RECORDING DATA

LOG	EQUIPMENT			TAPING		PANEL		CAL COEFF	DEPTHS			SEAM LOG RUN	
	SONDE	SOURCE	CALIBRATOR	LOG TAPE	RECORD SPEED	DIRECTX REPLAY	SPEED		T.C SECS	FROM	TO		INTERVAL
GAMMA RAY	184		251	Y	9/2	D	9/2	1/2	1.50	145	0	14.5m	Y
DENSITY		0028	3995	Y	9/2	D	9/2	.3	2.81	146	01	14.5m	Y
CALIPER	SIDEWALL POSITION		7" 2"	Y	9/2	D	9/2	.3	1.0	146	01	14.5m	Y

COAL QUALITY/SEAM THICKNESS LOG INTERVALS (Refer to relevant log)

FROM	130	96	58	31	
TO	113	88	48	24	
INTERVAL	17m	8m	10m	62m	INTERVAL TOTAL 42m

ADDITIONAL SONDES RUN				REFER TO ADDITIONAL HEADINGS	REMARKS
SONDE	LOG	GENERAL SCALE LOG	DETAIL SCALE LOG		
215	N-N	1:200			
221	F.B.	1:200			
231	VERT				

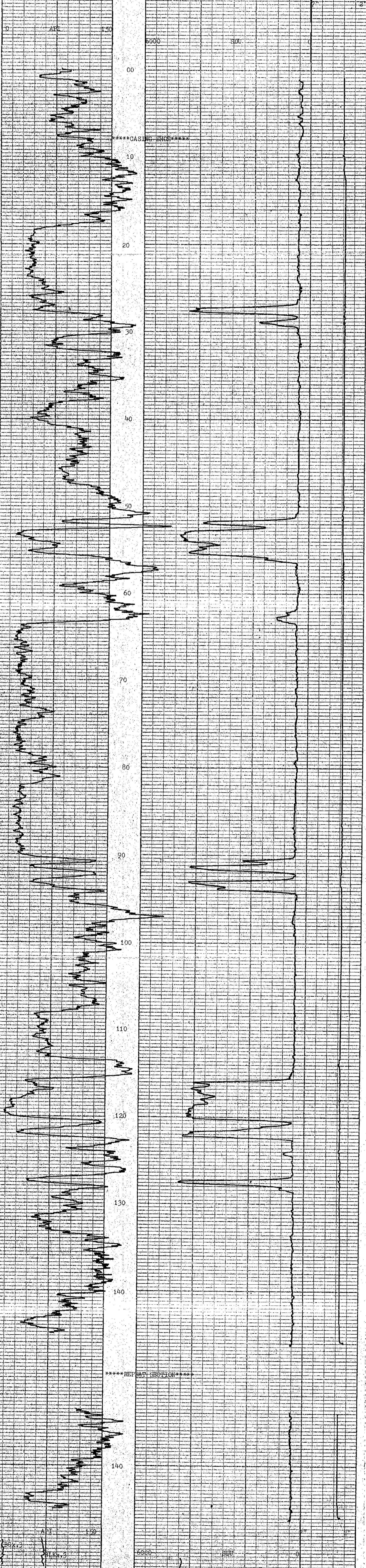
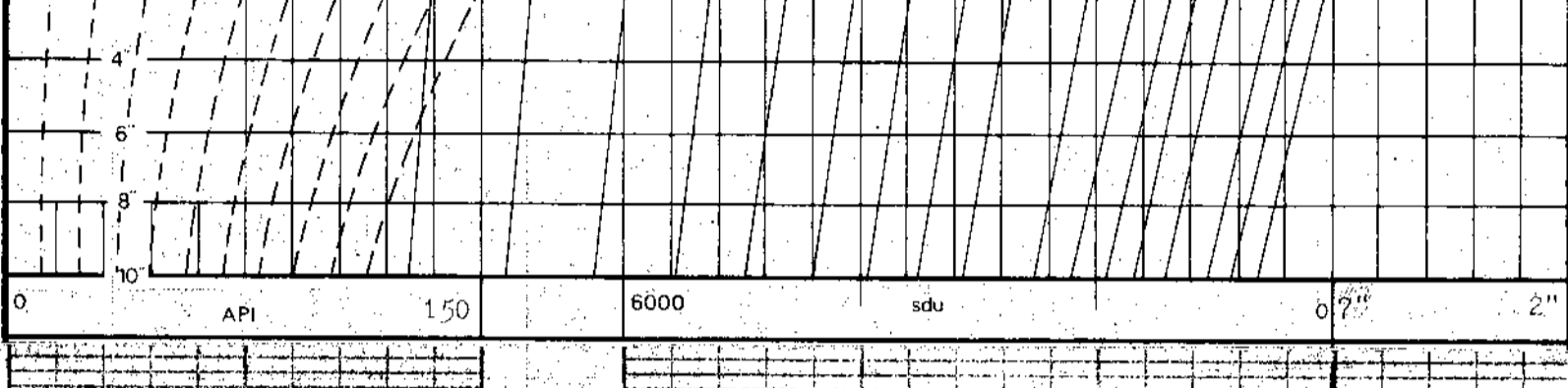
BPB COAL LITHOLOGY LOG

CALIBRATION DATA

JIG No 251	VALUE 337 @ 1.5 DIAM	JIG CAL DATE 6/06/20	JIG VALUE 4389	SDU @	g/cm ³	7" ins 738	cps
JIG MARK SHOWN AT ABOVE VALUE - X.3		JIG No 3995	SPAN 6000	NORM	SDU =	2" ins 470	cps

GAMMA RAY	DEPTH	BULK DENSITY g/cm ³	CALIPER INCHES
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HOLE SIZE CORRECTION DATA



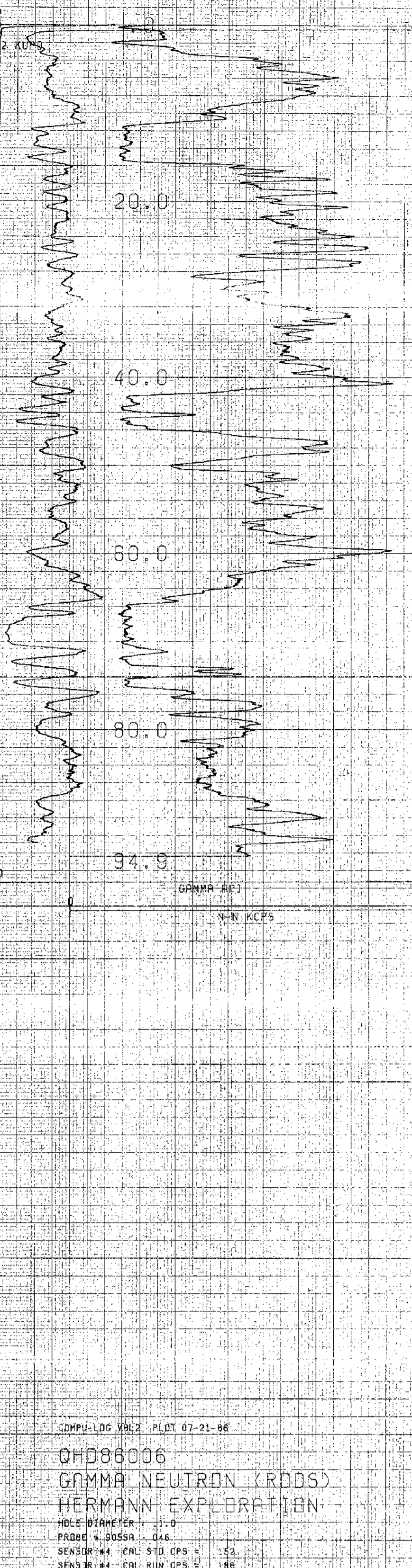
GAMMA RAY	DEPTH	BULK DENSITY g/cm ³	CALIPER INCHES
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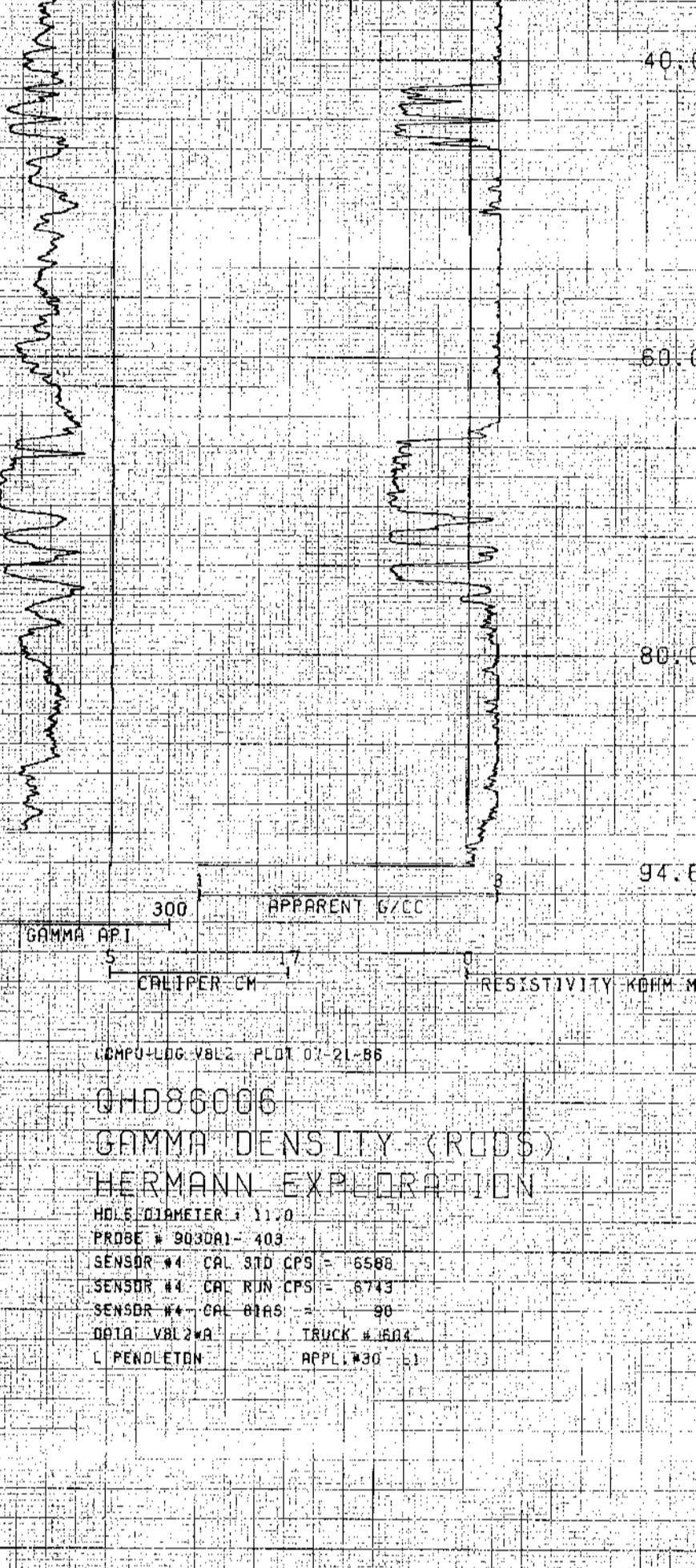
BOREHOLE QHD-86001 AREA GRIZZLY
 CLIENT QUINTETTE COUNTRY CANADA

COAL LITHOLOGY LOG

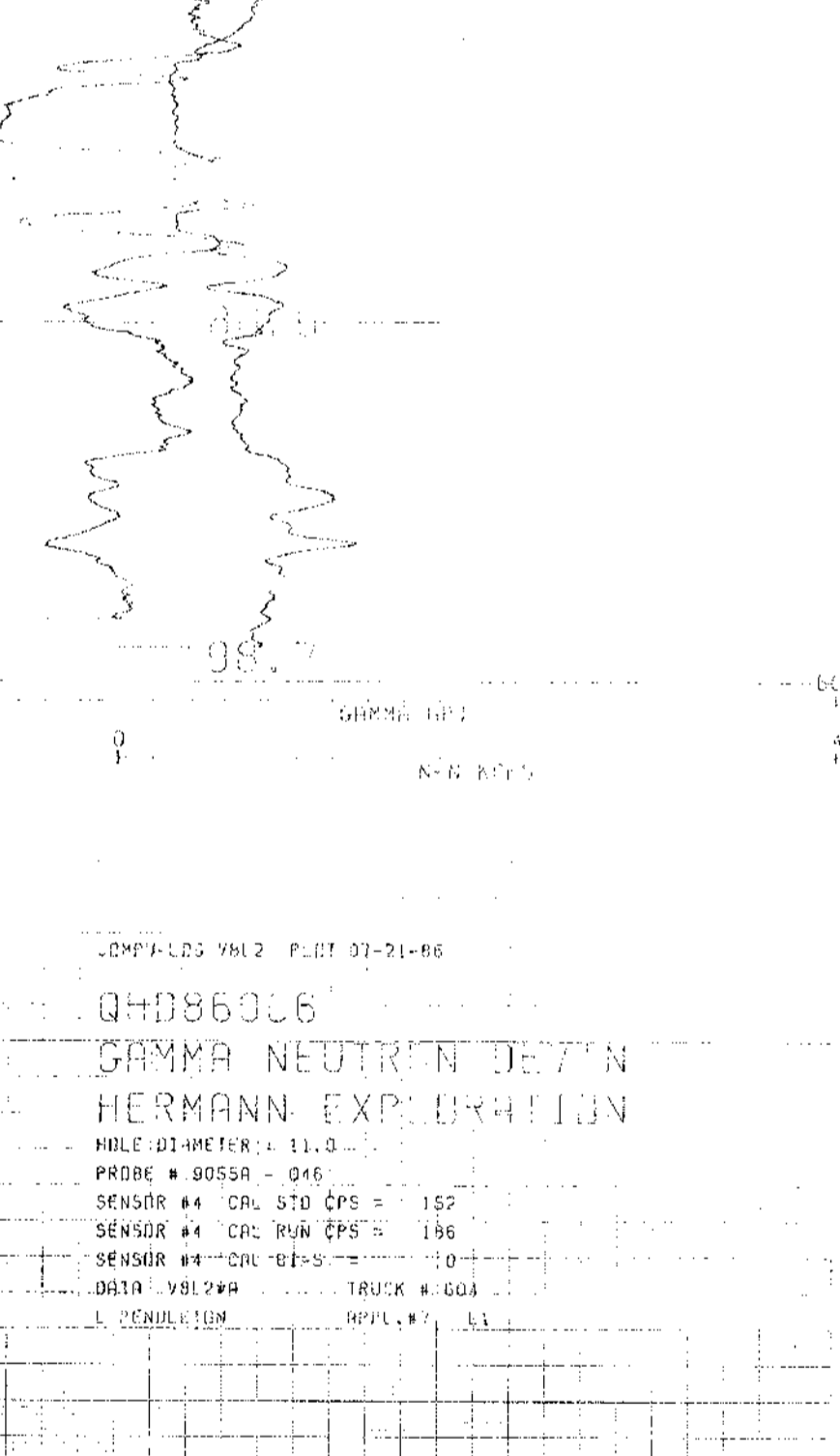
724



COMPU-LOG VBL2 PLOT 07-21-86
QHD86006
GAMMA NEUTRON (RDS)
HERMANN EXPLORATION
 HOLE DIAMETER : 11.0
 PROBE # 3055A - 046
 SENSOR #1 - CAL STD CPS = 152
 SENSOR #2 - CAL RUN CPS = 186
 SENSOR #4 - CAL BIAS = 0
 DATA - VBL2WA TRUCK # 604
 L PENDELTON APPL # 2 11



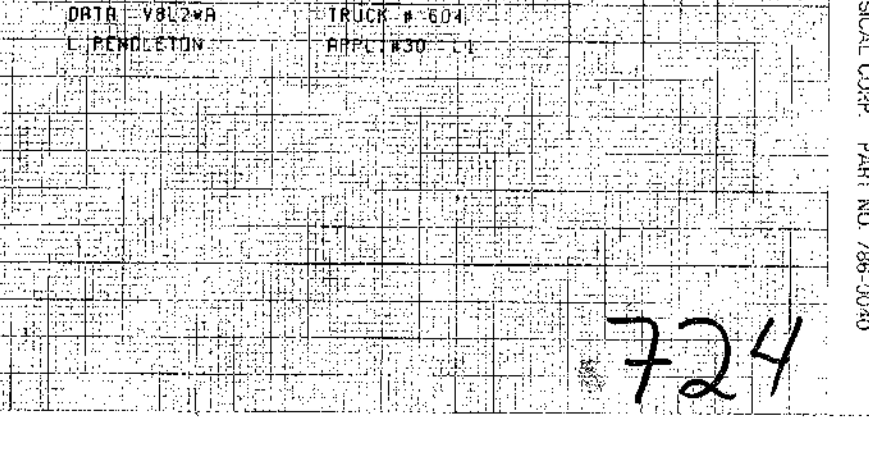
COMPU-LOG VBL2 PLOT 07-21-86
QHD86006
GAMMA DENSITY (RDS)
HERMANN EXPLORATION
 HOLE DIAMETER : 11.0
 PROBE # 3030A1 - 403
 SENSOR #1 - CAL STD CPS = 6588
 SENSOR #2 - CAL RUN CPS = 6743
 SENSOR #4 - CAL BIAS = 0
 DATA - VBL2WA TRUCK # 604
 L PENDELTON APPL # 30 11



COMPU-LOG VBL2 PLOT 07-21-86
QHD86006
GAMMA NEUTRON (RDS)
HERMANN EXPLORATION
 HOLE DIAMETER : 11.0
 PROBE # 3055A - 046
 SENSOR #1 - CAL STD CPS = 152
 SENSOR #2 - CAL RUN CPS = 186
 SENSOR #4 - CAL BIAS = 0
 DATA - VBL2WA TRUCK # 604
 L PENDELTON APPL # 2 11



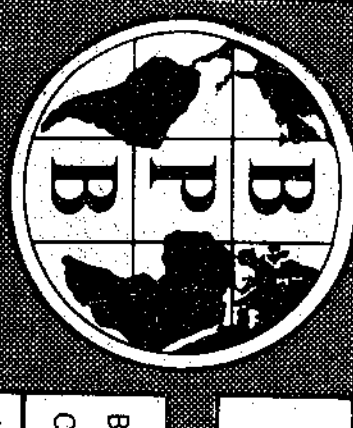
COMPU-LOG VBL1 DEVIATION DATA FROM 3. VBL2WA
VERTICAL DEVIATION
 CLIENT : GAMMA NEUTRON DEV W
 LOCATION : HERMANN EXPLORATION
 HOLE ID : QHD86006
 DATE OF LOG : 07-21-86
 PROBE : 3055A 0046
 SCALE : 2:50 H/DIV
 HOLE DEPTH : 24.5 M
 TRUE DEPTH : 25.4 M
 AZIMUTH : 221.4 M
 DISTANCE : 46.18 M
 1/2 5.0 M INCR
 1/2 10.0 M ZONE
 2/3 DEVIATION OF ZONE
 TRUE NORTH



COMPU-LOG VBL2 PLOT 07-21-86
QHD86006
GAMMA DENSITY CALIB
HERMANN EXPLORATION
 HOLE DIAMETER : 11.0
 PROBE # 3030A1 - 403
 SENSOR #1 - CAL STD CPS = 6588
 SENSOR #2 - CAL RUN CPS = 6743
 SENSOR #4 - CAL BIAS = 0
 DATA - VBL2WA TRUCK # 604
 L PENDELTON APPL # 30 11

724

724



GAMMA RAY
NEUTRON-NEUTRON

BOREHOLE QHD-86001
CLIENT QUINTETTE
AREA GRIZZLY
COUNTRY CANADA
DEPTH SCALE 1:200

DATE LOGGED JUNE 27/86
2 OF 5 LOGS

BOREHOLE DATA

PERMANENT DATA
ELEVATION OF F.D. GROUND LEVEL
MEASUREMENTS FROM B.P.B. DRILLER
DEPTH REACHED G.T.L. 147.1m
CASING SHOE 8.0m
BIT SIZES 1 HQ TO TD 2 TO TO
CASING SIZES 1 HQ TO 8.0m 2 TO TO

FLUID DATA

NATURE REFER TO LITHOLOGY LOG
S.G.
LEVEL
VISCOSITY
TEMP. AT MEAS. TEMP.
BH 1

OPERATION DATA

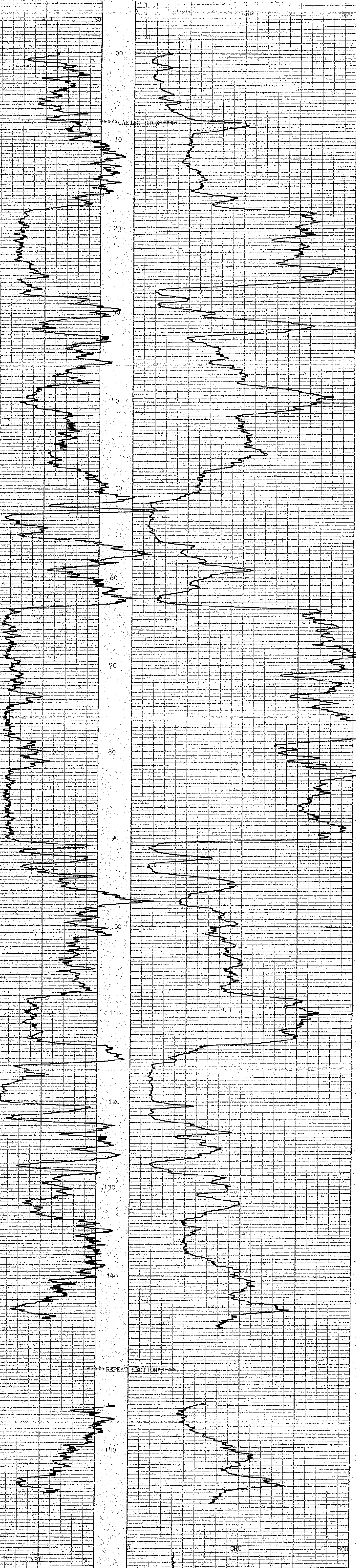
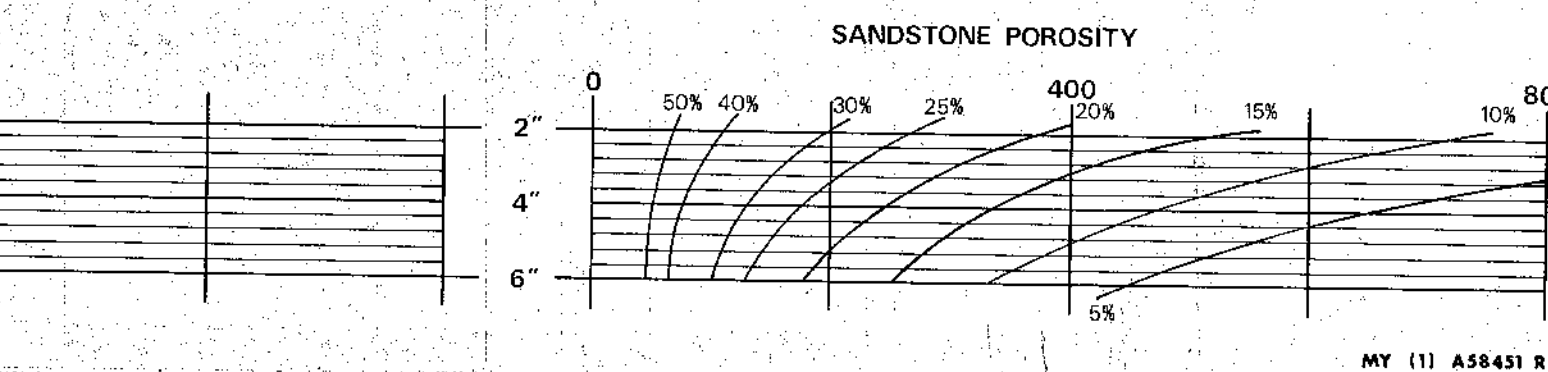
FIRST READING 146.0m
LAST READING 0.0m
INTERVAL LOGGED 146.0m
UNIT - TRUCK No. V215
ENGINEER B. FICHER
WITNESS

EQUIPMENT AND RECORDING DATA

LOG	EQUIPMENT			TAPING			PANEL		CAL COEFF	DEPTHS		
	SONDE	SOURCE	CALIBRATOR	LOG TAPE	RECORD SPEED	DIRECT REPLAY	SPEED	T.C. SECS		NORM	FROM	TO
GAMMA	184	-	251	Y	9	R	9	1	1.50	145	0	14.5m
N-N	215	7203	175	Y	9	D	9	1	11.0	146	0	14.6m

ADDITIONAL SONDES RUN				REFER TO ADDITIONAL HEADINGS	REMARKS
SONDE	LOG	GENERAL SCALE LOG	DETAIL SCALE LOG		
184	CCS	1:200			
221	F.E.	1:200			
231	VERT				

GAMMA RAY	DEPTH	NEUTRON-NEUTRON
0 API 150	0	SNU 800



GAMMA RAY	DEPTH	NEUTRON-NEUTRON
0 API 150	0	SNU 800



BOREHOLE QHD-86001
CLIENT QUINTETTE
AREA GRIZZLY
COUNTRY CANADA