COMPANY: NORTHWEST NATURAL GAS

WELL: I.W. 24C-23-65

FIELD: CALVIN CREEK GAS STORAGE

COUNTY: COLUMBIA STATE: OREGON

COUNTY: COLUMBIA
Field: CALVIN CREEK GAS STORAGE
Location: 985.3' N & 1258.4' E FROM THE
Well: I.W. 24C-23-65
Company: NORTHWEST NATURAL GAS

Schlumberger

COMPENSATED BOND LOG
GR/CCL
SCALE: 5" = 100'

LOCATION
985.3' N & 1258.4' E FROM THE
FROM THE SW CORNER OF 23

Elev.: K.B. 917.5 ft
G.L. 905 ft
D.F. 917.3 ft

Permanent Datum:	GROUND LEVEL	Elev.:	905 ft
Log Measured From:	K.B		above Perm. Datum
Drilling Measured From:	K.B		

API Serial No.	SECTION	TOWNSHIP	RANGE
36-009-00350	23	6N	5W

Logging Date		7-MAY-2000			
Run Number		1			
Depth Driller		2591 ft			
Schlumberger Depth		2591 ft			
Bottom Log Interval		1720 ft			
Top Log Interval		60 ft			
Casing Fluid Type		DMA			
Salinity		1400 ppm			
Density		8.8 lbm/gal			
Fluid Level		0 ft			
BIT/CASING/TUBING STRING					
Bit Size		7.875 in			
From					
To					
Casing/Tubing Size		8.625 in			
Weight		34 lbm/ft			
Grade					
From		0 ft			
To		1724 ft			
Maximum Recorded Temperatures		92 degF	92	92	
Logger On Bottom	Time	7-MAY-2000		12:30	
Unit Number	Location	3152	SACRAMENTO		
Recorded By		M.KHAN			
Witnessed By		JACK MEYER			

		Run 1
PVT DATA	Oil Density	
	Water Salinity	1400 ppm
	Gas Gravity	
	Bo	
	Bw	
	1/Bg	
	Bubble Point Pressure	
	Bubble Point Temperature	
	Solution GOR	
	Maximum Deviation	
CEMENTING DATA		
	Primary/Squeeze	Primary
	Casing String No	
	Lead Cement Type	
	Volume	
	Density	
	Water Loss	
	Additives	
	Tail Cement Type	
	Volume	
	Density	
	Water Loss	
	Additives	
	Expected Cement Top	

Logging Date		
Run Number		
Depth Driller		
Schlumberger Depth		
Bottom Log Interval		
Top Log Interval		
Casing Fluid Type		
Salinity		
Density		
Fluid Level		
BIT/CASING/TUBING STRING		
Bit Size		
From		
To		
Casing/Tubing Size		
Weight		
Grade		
From		
To		
Maximum Recorded Temperatures		
Logger On Bottom	Time	
Unit Number	Location	
Recorded By		
Witnessed By		

Run 2

Run 3

Run 4

DISCLAIMER

THE USE OF AND RELIANCE UPON THIS RECORDED-DATA BY THE HEREIN NAMED COMPANY (AND ANY OF ITS AFFILIATES, PARTNERS, REPRESENTATIVES, AGENTS, CONSULTANTS AND EMPLOYEES) IS SUBJECT TO THE TERMS AND CONDITIONS AGREED UPON BETWEEN SCHLUMBERGER AND THE COMPANY, INCLUDING: (a) RESTRICTIONS ON USE OF THE RECORDED-DATA; (b) DISCLAIMERS AND WAIVERS OF WARRANTIES AND REPRESENTATIONS REGARDING COMPANY'S USE OF AND RELIANCE UPON THE RECORDED-DATA; AND (c) CUSTOMER'S FULL AND SOLE RESPONSIBILITY FOR ANY INFERENCE DRAWN OR DECISION MADE IN CONNECTION WITH THE USE OF THIS RECORDED-DATA.

OTHER SERVICES1
OS1: FMI GR
OS2: PEX BHC GR SP
OS3:
OS4:
OS5:

OTHER SERVICES2
OS1:
OS2:
OS3:
OS4:
OS5:

REMARKS: RUN NUMBER 1

REMARKS: RUN NUMBER 2

RUN 1

SERVICE ORDER #:
PROGRAM VERSION: 9C1-303
FLUID LEVEL: 0 ft

LOGGED INTERVAL	START	STOP

RUN 2

SERVICE ORDER #:
PROGRAM VERSION:
FLUID LEVEL:

LOGGED INTERVAL	START	STOP

EQUIPMENT DESCRIPTION

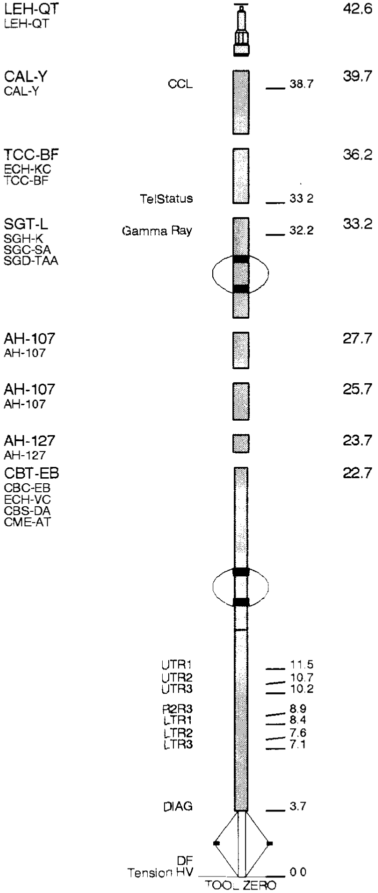
RUN 1

SURFACE EQUIPMENT

WDM-AB
STM-C
GSR-U/Y
WITM (CTS)-A

DOWNHOLE EQUIPMENT

RUN 2



MAXIMUM STRING DIAMETER 7.50 IN
MEASUREMENTS RELATIVE TO TOOL ZERO
ALL LENGTHS IN FEET

Input DLIS Files

DEFAULT	CBTE .031	FN:27	PRODUCER	07-May-2000 12:09	1726.0 FT	55.6 FT

Output DLIS Files

DEFAULT	CBTE .034	FN:30	PRODUCER	07-May-2000 12:52	1730.0 FT	60.0 FT

OP System Version: 9C1-303

MCM

CBT-EB	OP91-KP1a	SGT-L	OP91-KP1a
TCC-BF	OP91-KP1a	CAL-Y	9C1-303

PIP SUMMARY

■ Time Mark Every 60 S

Casing Collar Locator (CCL)
-19 (----) 1

Tension (TENS)
10000 (LBF) 0

Gamma Ray (GR)
0 (GAPI) 150

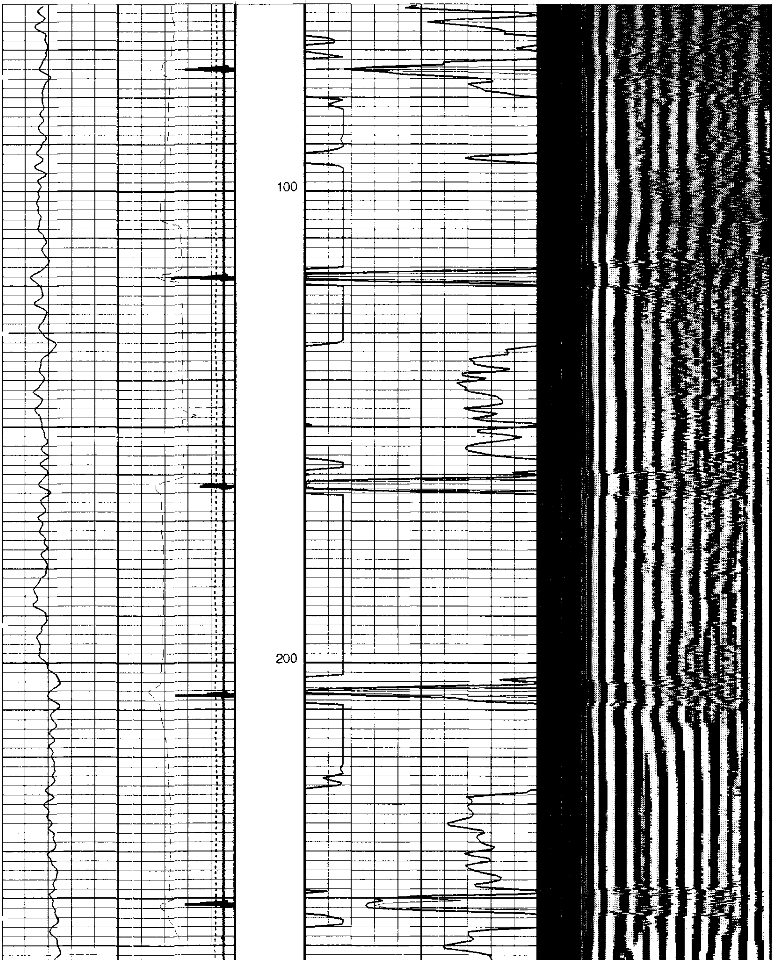
Transit Time 2 (TT2C)
400 (US) 200

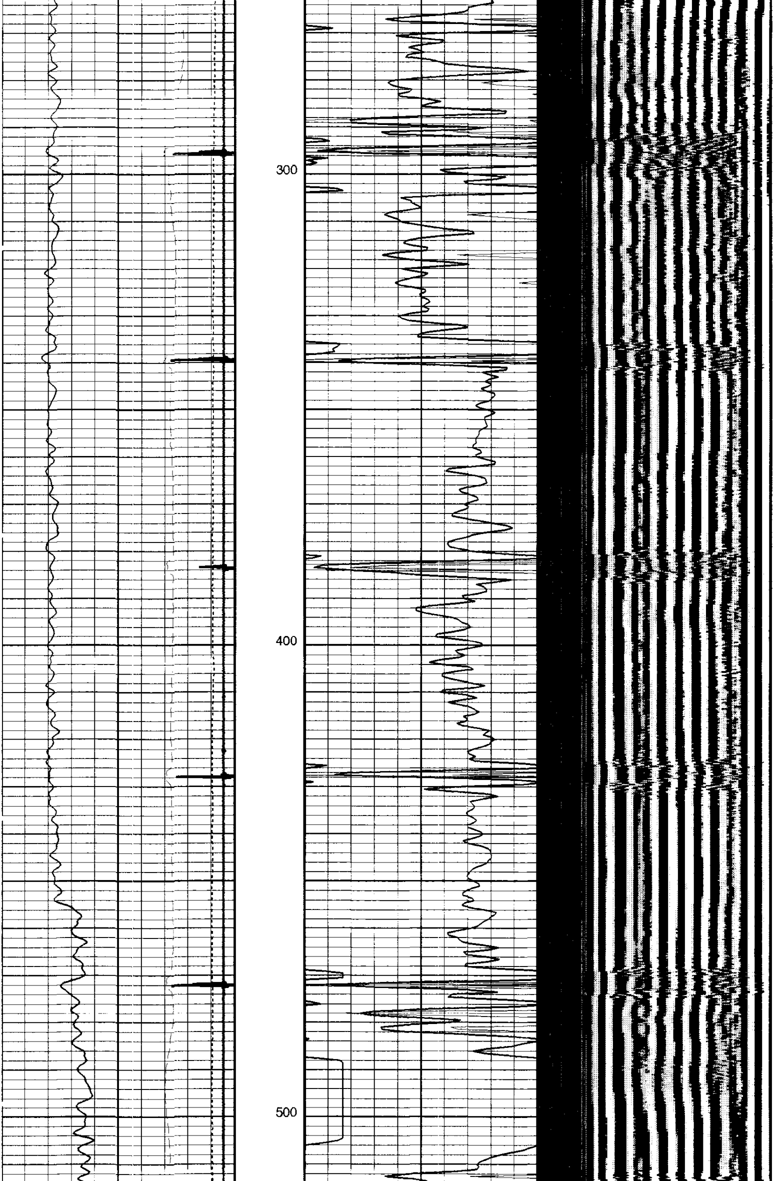
Discriminated Synthetic CBL (DCBL)
0 (MV) 10

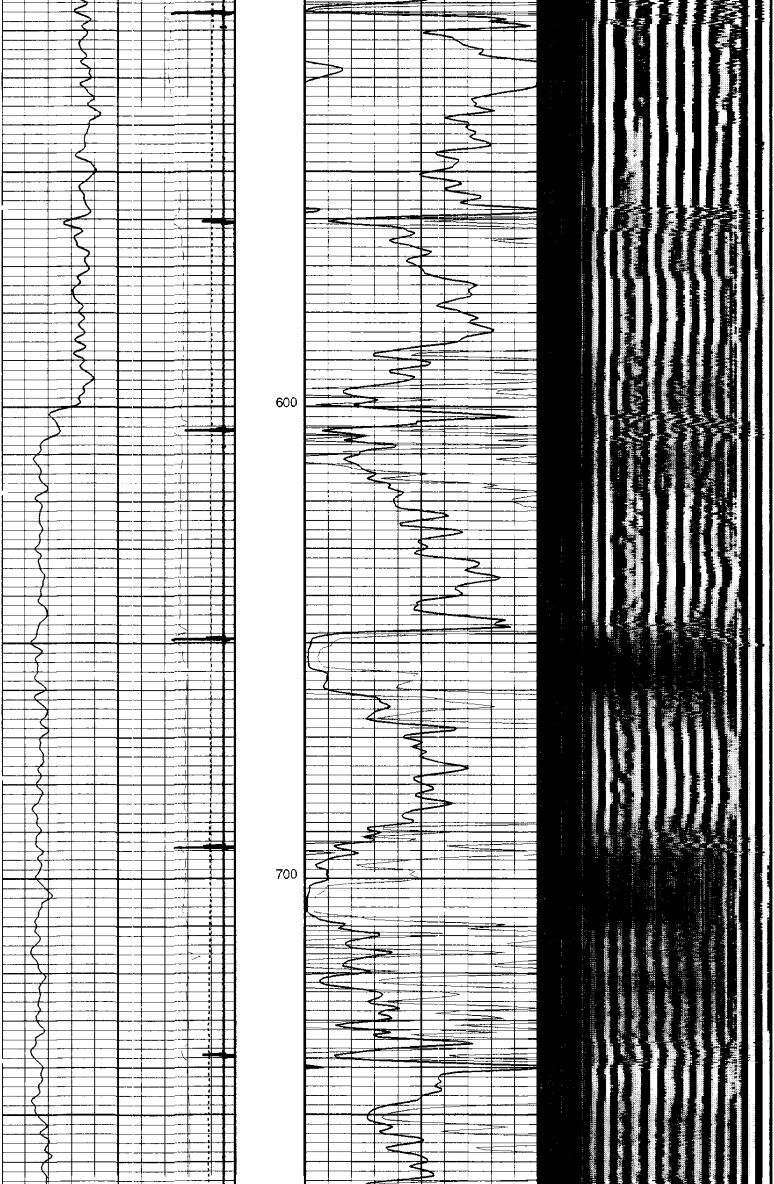
Discriminated Synthetic CBL (DCBL)
0 (MV) 50

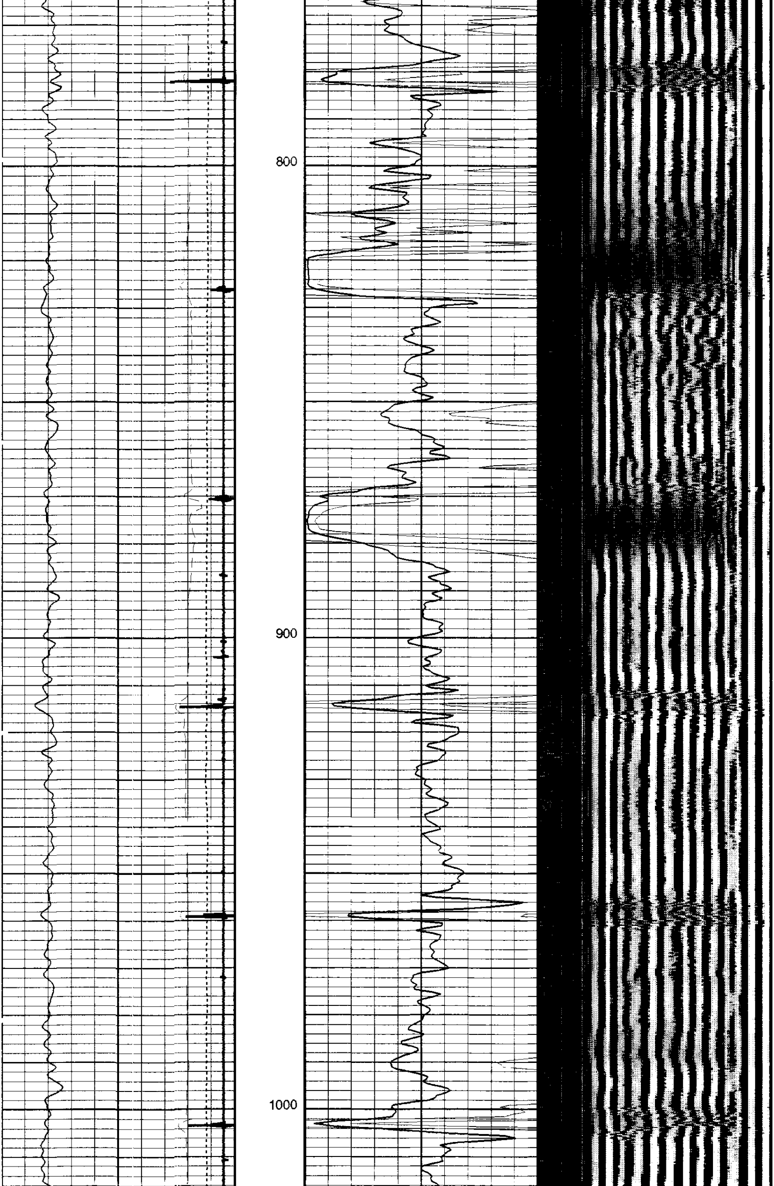
Min Amplitude Max

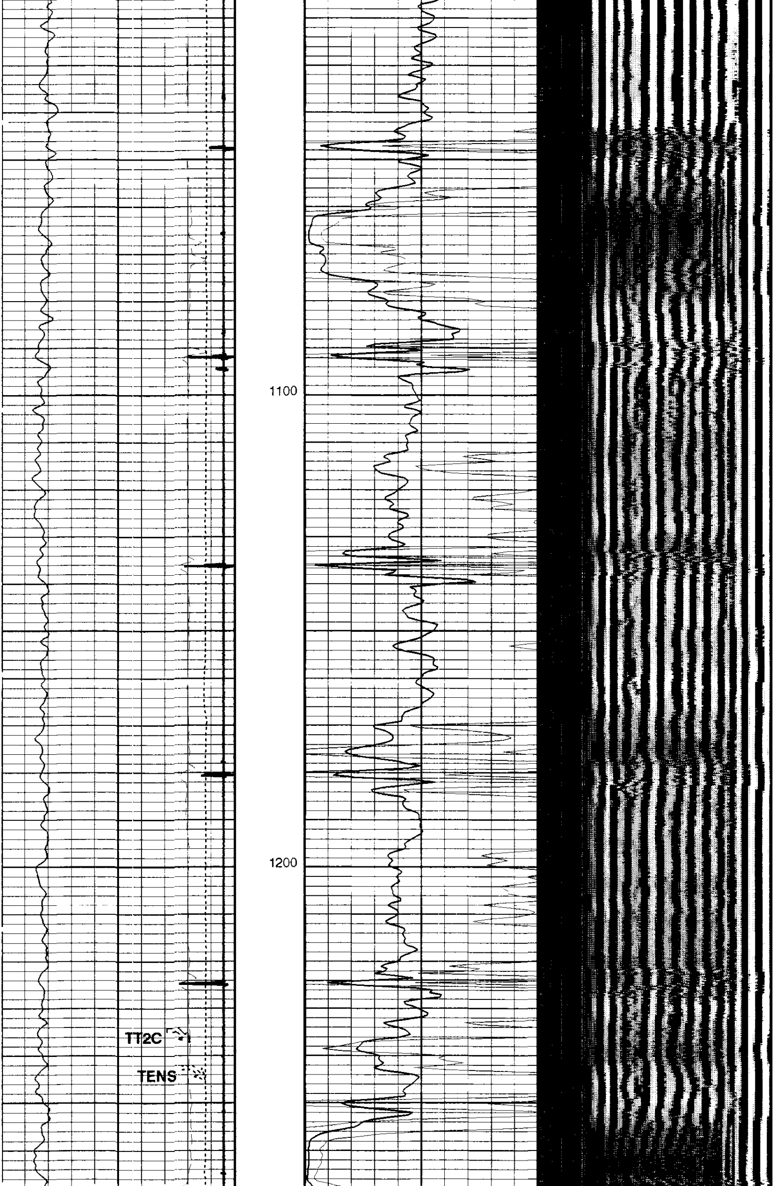
VDL VariableDensity (VDL)
200 (US) 1200

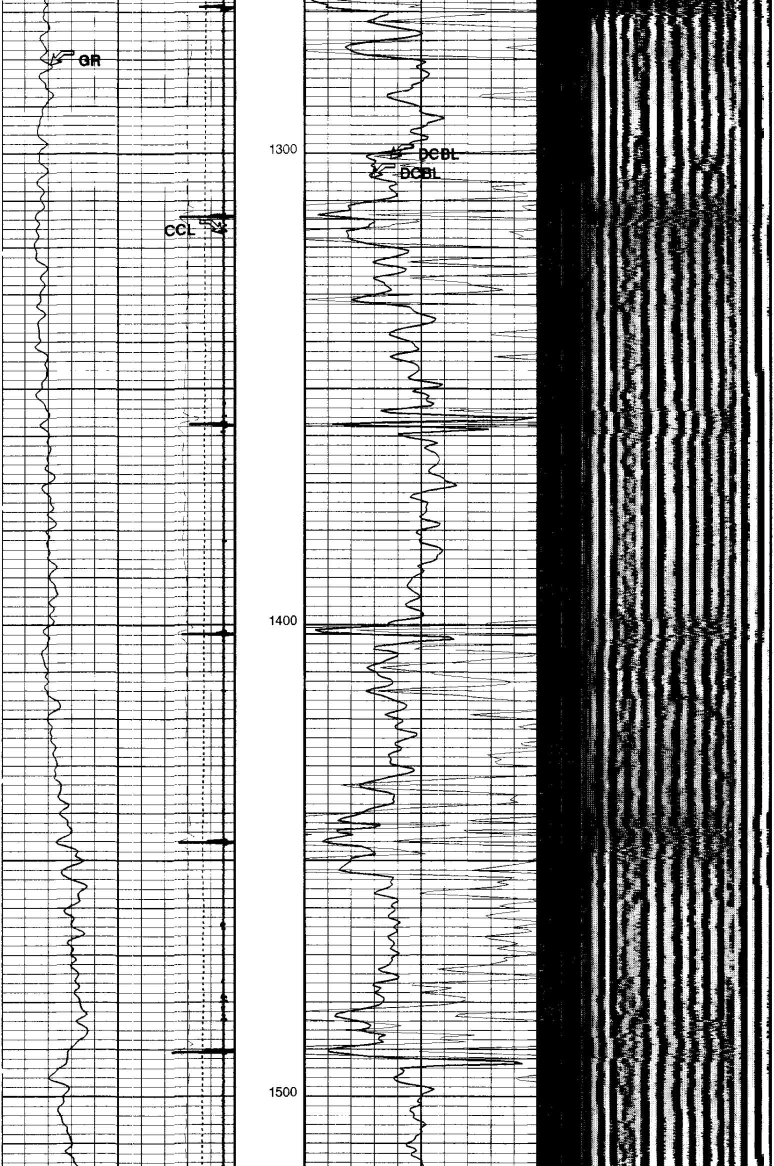


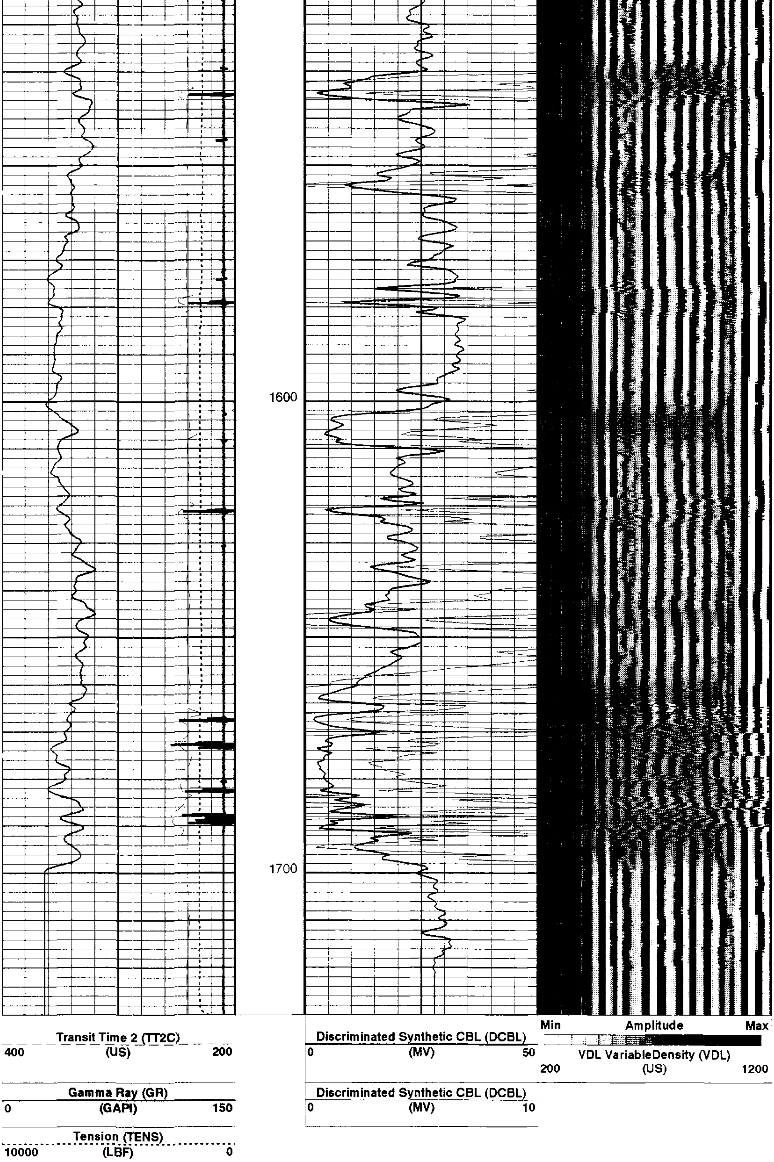












Casing Collar Locator (CCL)		
-19	(----)	1

PIP SUMMARY

■ Time Mark Every 60 S

Parameters

DLIS Name	Description	Value	
CCLD	CCL reset delay	12	IN
CCLT	CCL Detection Level	0.3	V
CMPM	Computation Mode	ALL	
DO	Depth Offset for Logical Unit 1	4.0	FT
MATT	Maximum Attenuation	15	DB F
MODE	Firing Mode	ALL	
PP	Playback Processing	NORMAL	
VDLM	VDL Firing Mode	LTR1	

Format: CbteCBL **Vertical Scale: 5" per 100'** **Graphics File Created: 07-May-2000 12:52**

OP System Version: 9C1-303

MCM

CBT-EB	OP91-KP1a	SGT-L	OP91-KP1a
TCC-BF	OP91-KP1a	CAL-Y	9C1-303

Input DLIS Files

DEFAULT	CBTE .031	FN:27	PRODUCER	07-May-2000 12:09	1726.0 FT	55.6 FT

Output DLIS Files

DEFAULT	CBTE .034	FN:30	PRODUCER	07-May-2000 12:52

Schlumberger

REPEAT SECTION

MAXIS 500 Field Log

Input DLIS Files

DEFAULT	CBTE .032	FN:28	PRODUCER	07-May-2000 12:41	803.5 FT	576.0 FT

Output DLIS Files

DEFAULT	CBTE .033	FN:29	PRODUCER	07-May-2000 12:51	807.5 FT	580.0 FT

OP System Version: 9C1-303

MCM

CBT-EB	OP91-KP1a	SGT-L	OP91-KP1a
TCC-BF	OP91-KP1a	CAL-Y	9C1-303

PIP SUMMARY

■ Time Mark Every 60 S

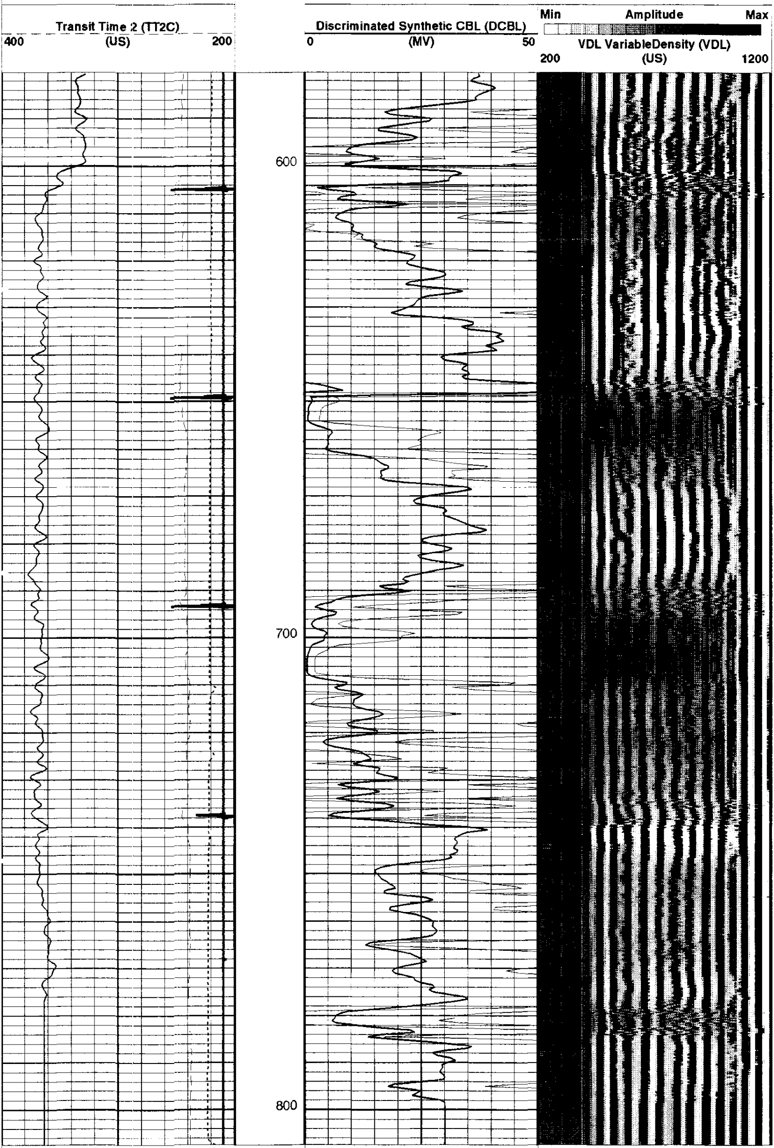
Casing Collar Locator (CCL)		
-19	(----)	1

REPEAT SECTION

Tension (TENS)		
10000	(LBF)	0

Gamma Ray (GR)		
0	(GAPI)	150

Discriminated Synthetic CBL (DCBL)		
0	(MV)	10



Transit Time 2 (TT2C)		
400	(US)	200
Gamma Ray (GR)		
0	(GAPI)	150
Tension (TENS)		
10000	(LBF)	0
Casing Collar Locator (CCL)		
-19	(----)	1

Discriminated Synthetic CBL (DCBL)		
0	(MV)	50
Discriminated Synthetic CBL (DCBL)		
0	(MV)	10

Min	Amplitude	Max
VDL VariableDensity (VDL)		
200	(US)	1200

REPEAT SECTION

PIP SUMMARY

▪ Time Mark Every 60 S

Parameters

DLIS Name	Description	Value	
CCLD	CCL reset delay	12	IN
CCLT	CCL Detection Level	0.3	V
CMPM	Computation Mode	ALL	
DO	Depth Offset for Logical Unit 1	4.0	FT
MATT	Maximum Attenuation	15	DB F
MODE	Firing Mode	ALL	
PP	Playback Processing	NORMAL	
VDLM	VDL Firing Mode	LTR1	

Format: CbteCBL   Vertical Scale: 5" per 100'   Graphics File Created: 07-May-2000 12:51

OP System Version: 9C1-303

MCM

CBT-EB	OP91-KP1a	SGT-L	OP91-KP1a
TCC-BF	OP91-KP1a	CAL-Y	9C1-303

Input DLIS Files

DEFAULT	CBTE .032	FN:28	PRODUCER	07-May-2000 12:41	803.5 FT	576.0 FT

Output DLIS Files

DEFAULT	CBTE .033	FN:29	PRODUCER	07-May-2000 12:51

COMPANY:	NORTHWEST NATURAL GAS	BOTTOM LOG INTERVAL	1720 ft
		SCHLUMBERGER DEPTH	2591 ft
WELL:	I.W. 24C-23-65	DEPTH DRILLER	2591 ft
FIELD:	CALVIN CREEK GAS STORAGE	KELLY BUSHING	917.5 ft
COUNTY:	COLUMBIA	DRILL FLOOR	917.3 ft
STATE:	OREGON	GROUND LEVEL	905 ft

Schlumberger

COMPENSATED BOND LOG
GR/CCL
SCALE: 5" = 100'