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 ibm/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	Run 2	Run 3	Run 4
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		

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	OTHER SERVICES2
OS1: FMI GR	OS1:
OS2: PEX BHC GR SP	OS2:
OS3:	OS3:
OS4:	OS4:
OS5:	OS5:

REMARKS: RUN NUMBER 1	REMARKS: RUN NUMBER 2

RUN 1		RUN 2	
SERVICE ORDER #:		SERVICE ORDER #:	
PROGRAM VERSION:	9C1-303	PROGRAM VERSION:	
FLUID LEVEL:	0 ft	FLUID LEVEL:	

LOGGED INTERVAL	START	STOP	LOGGED INTERVAL	START	STOP

EQUIPMENT DESCRIPTION

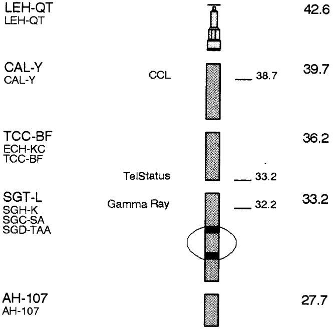
RUN 1

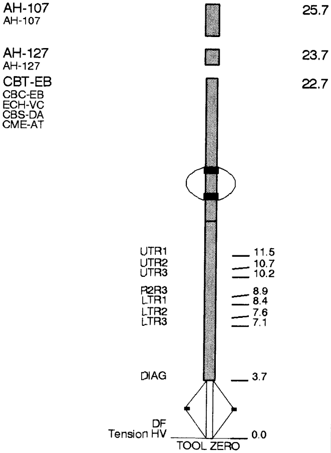
RUN 2

SURFACE EQUIPMENT

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

DOWNHOLE EQUIPMENT





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

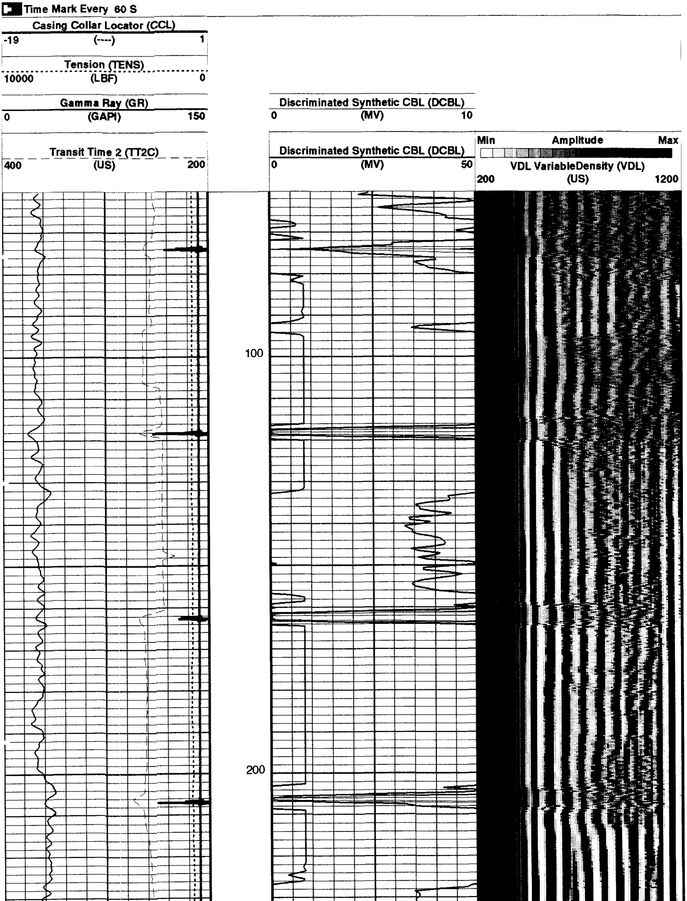
DEFAULT	CBTE .034	FN:30	PRODUCER	07-May-2000 12:52	1730.0 FT	60.0 FT

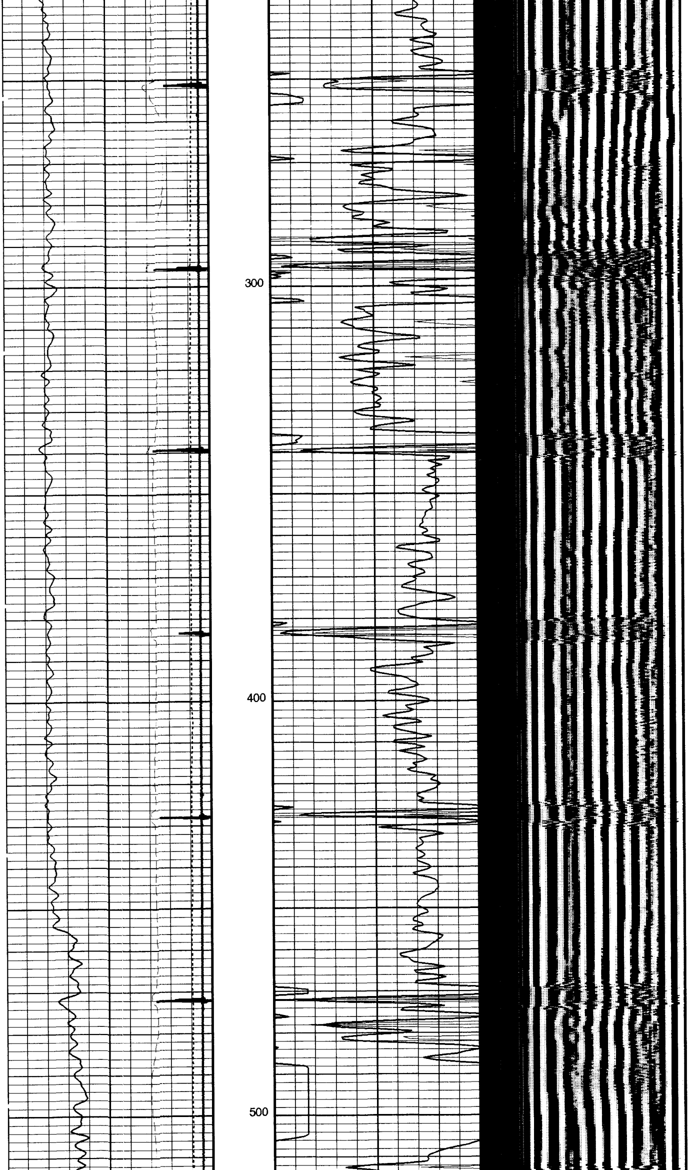
OP System Version: 9C1-303

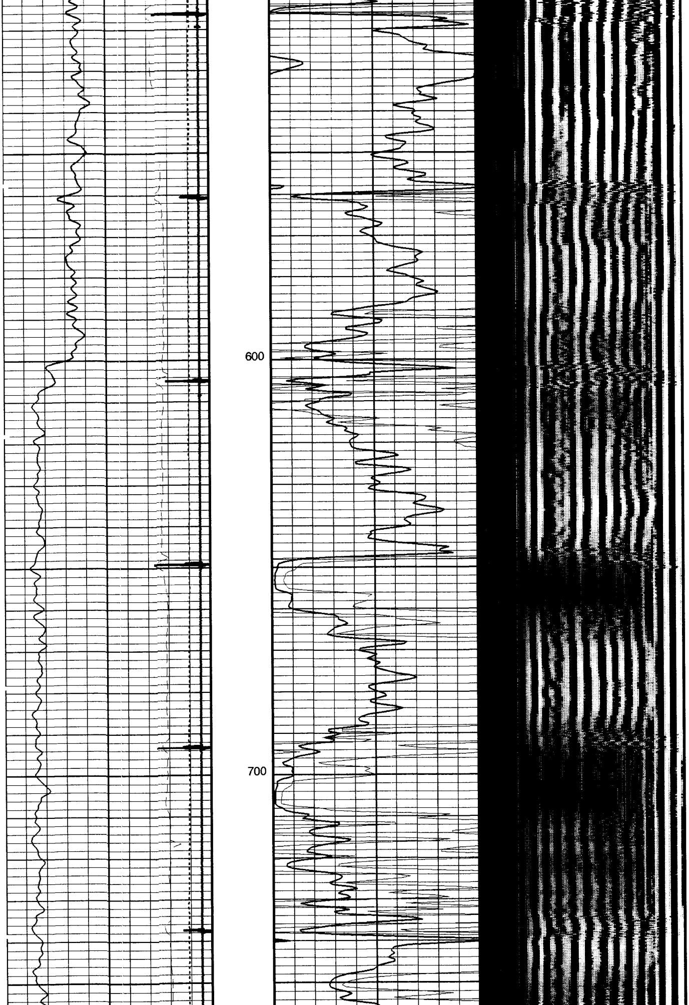
MCM

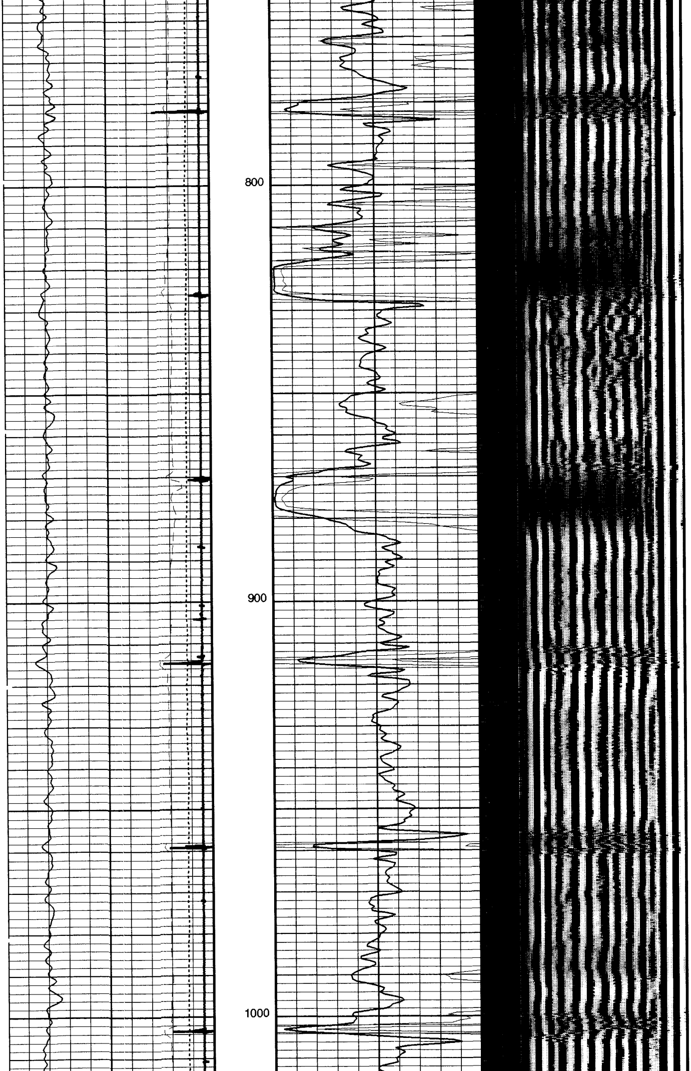
CBT-EB	OP91-KP1a	SGT-L	OP91-KP1a
TCC-BF	OP91-KP1a	CAL-Y	9C1-303

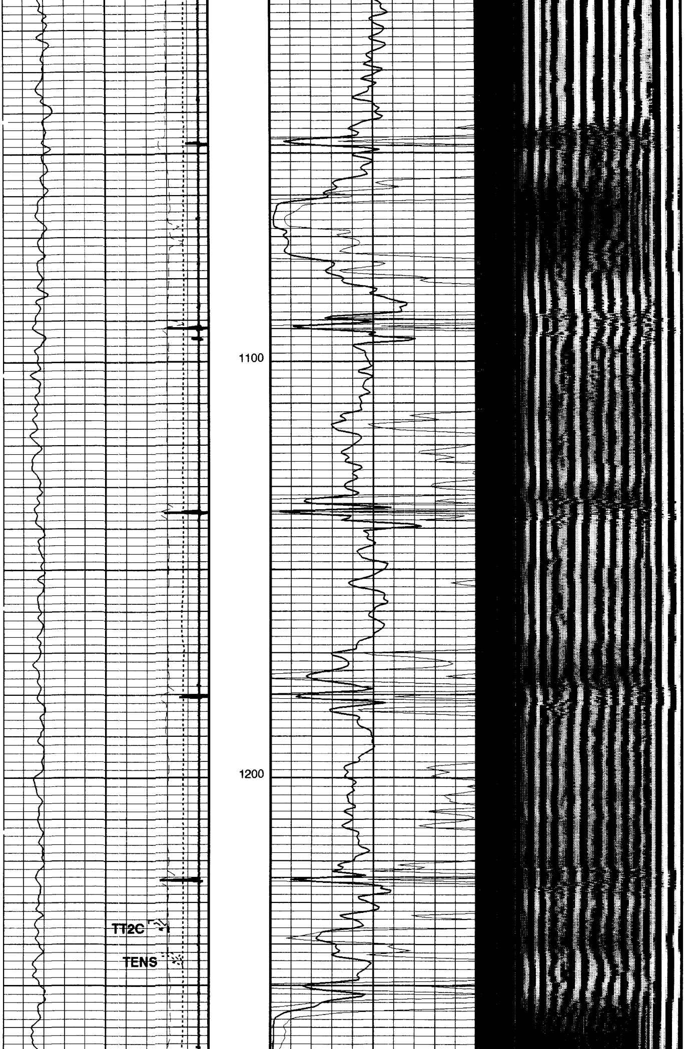
PIP SUMMARY

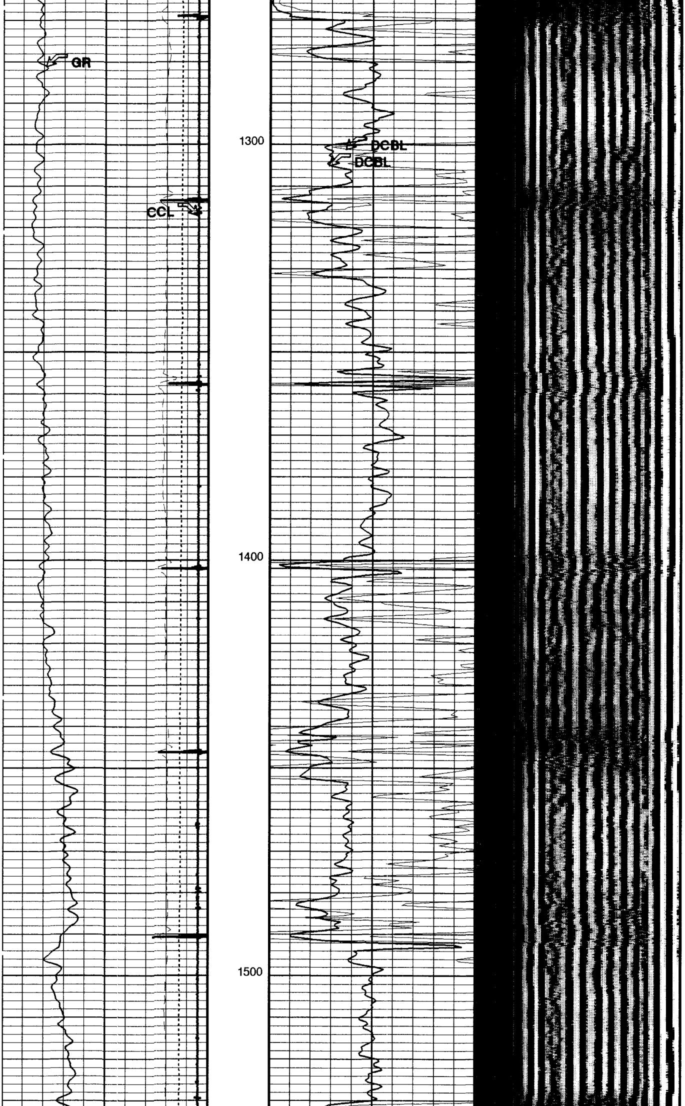


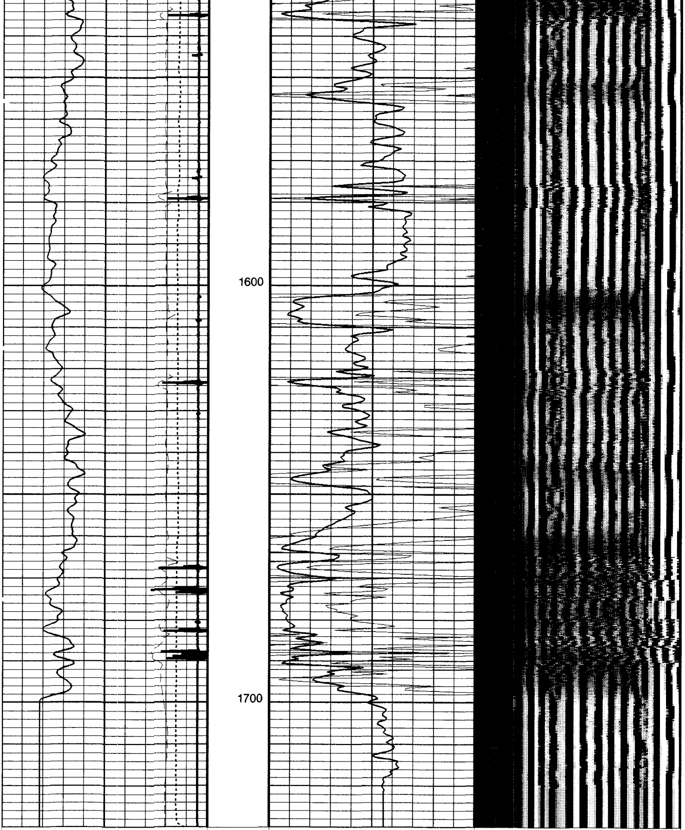












Transit Time 2 (TT2C)
400 (US) 200

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

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

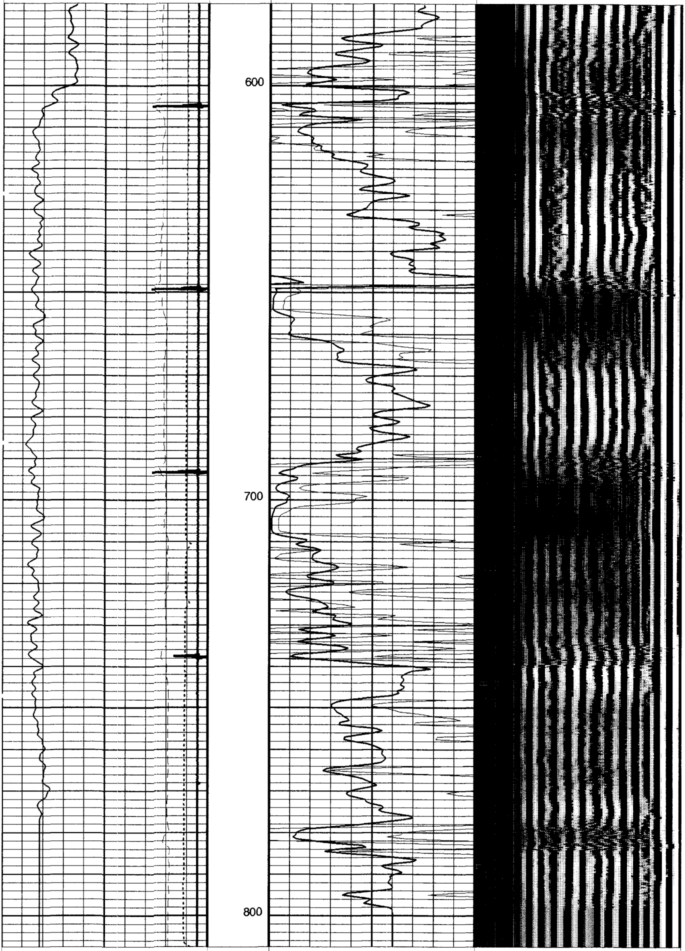
PIP SUMMARY

Time Mark Every 60 S

REPEAT SECTION

Curve	Left	Unit	Right
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
VDL VariableDensity (VDL)	200	(US)	1200

Min Amplitude Max



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'