COMPANY: **NORTHWEST NATURAL GAS**

WELL: **IW 14dH-23-65**

FIELD: **CALVIN CREEK-REICHHOLD POOL**

COUNTY: **COLUMBIA** STATE: **OREGON**

COUNTY: COLUMBIA
Field: CALVIN CREEK-REICHHOLD P
Location: SHL: 976.5' NORTH & 1256.3 '
Well: IW 14dH-23-65
Company: NORTHWEST NATURAL GAS C

Schlumberger

ARRAY INDUCTION / SP
BHC SONIC / GR
SCALE: 5"=100' COMPOSIT

LOCATION

SHL: 976.5' NORTH & 1256.3 ' EAST
FROM THE SW CORNER
OF SECTION 23

Elev.: K.B. 923 ft
G.L. 905 ft
D.F. 921.5 ft

Permanent Datum: GROUND LEVEL — Elev.: 905 ft
Log Measured From: K.B. — 18.0 ft above Perm. Datum
Drilling Measured From: K.B.

API Serial No.	SECTION	TOWNSHIP	RANGE
36-009-00353	23	6N	5W

Logging Date		21-Oct-2001		27-Oct-2001	
Run Number		1		TWO	
Depth Driller		2168 ft		3033 ft	
Schlumberger Depth		2152 ft		3020 ft	
Bottom Log Interval		2142 ft		3012 ft	
Top Log Interval		411 ft		2144 ft	
Casing Driller Size @ Depth		13.375 in	@ 411 ft	8.625 in	@ 2144 ft
Casing Schlumberger		411 ft		2144 ft	
Bit Size		12.250 in		7.875 in	
Type Fluid In Hole		GEL-WATER		WATER BASED	
MUD Density	Viscosity	9.6 lbm/gal	61 s	8.9 lbm/gal	61 s
Fluid Loss	PH	5.2 cm3	8.5	5.2 cm3	8.5
Source Of Sample		FLOWLINE		MUD TANK	
RM @ Measured Temperature		3.190 ohm.m	@ 55 degF	3.190 ohm.m	@ 55 degF
RMF @ Measured Temperature		2.987 ohm.m	@ 56 degF	2.987 ohm.m	@ 56 degF
RMC @ Measured Temperature		3.568 ohm.m	@ 55 degF	3.568 ohm.m	@ 55 degF
Source RMF	RMC	PRESS	PRESS	MUD PRESS	MUD PRESS
RM @ MRT	RMF @ MRT	2.036 @ 90	1.938 @ 90	2.352 @ 77	2.238 @ 77
Maximum Recorded Temperatures		90 degF	90 / 90	77 degF	
Circulation Stopped	Time	21-Oct-2001	4:00	26-Oct-2001	4:00
Logger On Bottom	Time	21-Oct-2001	14:30	27-Oct-2001	23:30
Unit Number	Location	3152	SACRAMENTO	3152	SACRAMENTO
Recorded By		M. KHAN		Z.AHMED	
Witnessed By		JACK MEYER		ED VADER	

	Run 1	Run 2	Ru
Logging Date			
Run Number			
Depth Driller			
Schlumberger Depth			
Bottom Log Interval			
Top Log Interval			
Casing Driller Size @ Depth		@	
Casing Schlumberger			
Bit Size			
Type Fluid In Hole			
MUD Density / Viscosity			
Fluid Loss / PH			
Source Of Sample			
RM @ Measured Temperature		@	
RMF @ Measured Temperature		@	
RMC @ Measured Temperature		@	
Source RMF / RMC			
RM @ MRT / RMF @ MRT	@	@	
Maximum Recorded Temperatures			
Circulation Stopped / Time			
Logger On Bottom / Time			
Unit Number / Location			
Recorded By			
Witnessed By			

n 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	OTHER SERVICES2
OS1: FMI-GR	OS1: USIT
OS2:	OS2: NEUTRON
OS3:	OS3: PEX/FMI/SONIC ON
OS4:	OS4: TLC
OS5:	OS5:
REMARKS: RUN NUMBER 1	REMARKS: RUN NUMBER 2
BHL: 1' NORTH & 1176' EAST OF THE SOUTHWEST CORNER OF SECTI	CORRELATED TO LOG RAN BY SCHLUMBERGER ON 21-OCT-2001
RUN 1 , FROM 1658 TO 400 FT RECORDED WITH WIRELINE;	RAN ON TLC
RUN 2 , FROM TD 2152 TO 1500 FT RECORDED WITH TLC EQUIPMENT.	USED FOUR KNUCKLE JOINTS AND THREE GEMCOS
MAXIMUM HOLE DEVIATION: 73.8 DEG AT 1776 FT.	
	RESISTIVITY SCALE CHANGES MADE AS PER CLIENT REQUEST
	MAX TEMP REORDED AT BOTTOM: 75DEGF
	SP FISH MOVED SEVERAL TIMES
	SPLICEPERFORMED AT 2850FT AS SHOWN ON LOGS
	BHC REMOVED IN CONSULTATION WITH GEOLOGIST DUE TO POSSI
	ECCENRALIZATION
	CREW:ROCKY BECK, BRAD TOMM

RUN 1		RUN 2	
SERVICE ORDER #:		SERVICE ORDER #:	
PROGRAM VERSION:	9C2-303	PROGRAM VERSION:	9C2-303
FLUID LEVEL:	0 ft	FLUID LEVEL:	

LOGGED INTERVAL	START	STOP	LOGGED INTERVAL	START	STOP

EQUIPMENT DESCRIPTION

RUN 1

SURFACE EQUIPMENT

GSR-U/Y WITM (CTS)-A
NCT-B
CNB-AB
NCS-VB

DOWNHOLE EQUIPMENT

AH-CSES AH-CSES	91.2
AH-X-OVER	87.2
DWCH-A DWCH-A	86.2
AH-107	78.2
SAH-F SAH-F	76.2

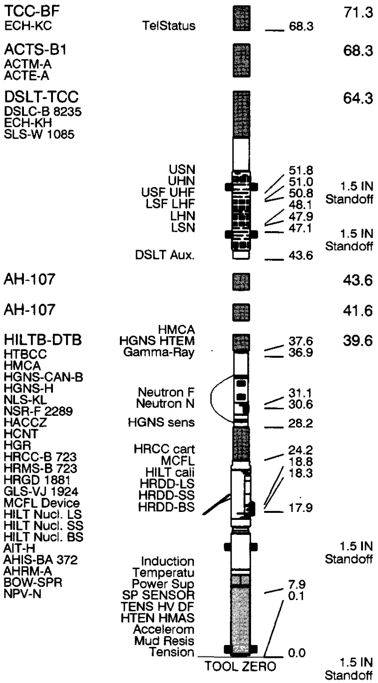
RUN 2

SURFACE EQUIPMENT

GSR-U/Y WITM (CTS)-A
NCT-B
CNB-AB
NCS-VB

DOWNHOLE EQUIPMENT

AH-CSES AH-CSES	93.2
AH-X-OVER	89.2
DWCH-A DWCH-A	88.2
AH-107	80.2
SAH-F SAH-F	78.2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ECH-KC
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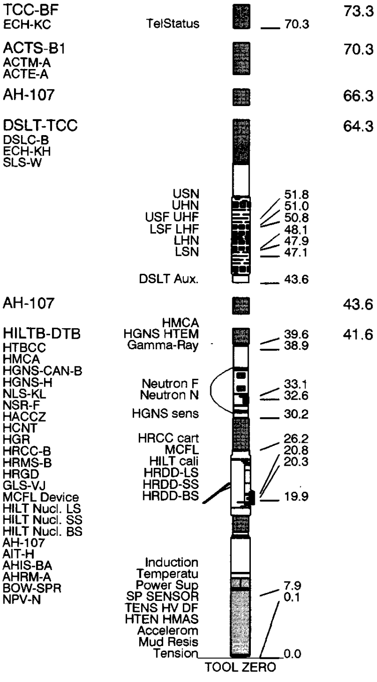
68.3
71.3
ACTS-B1
ACTM-A
ACTE-A
68.3
DSLT-TCC
DSLC-B 8235
ECH-KH
SLS-W 1085
64.3
USN
UHN
USF UHF
LSF LHF
LHN
LSN
51.8
51.0
50.8
48.1
47.9
47.1
1.5 IN Standoff
1.5 IN Standoff
DSLT Aux.
43.6
AH-107
43.6
AH-107
41.6
HILTB-DTB
HTBCC
HMCA
HGNS-CAN-B
HGNS-H
NLS-KL
NSR-F 2289
HACCZ
HCNT
HGR
HRCC-B 723
HRMS-B 723
HRGD 1881
GLS-VJ 1924
MCFL Device
HILT Nucl. LS
HILT Nucl. SS
HILT Nucl. BS
AIT-H
AHIS-BA 372
AHRM-A
BOW-SPR
NPV-N
39.6
HMCA
HGNS HTEM
Gamma-Ray
37.6
36.9
Neutron F
Neutron N
31.1
30.6
HGNS sens
28.2
HRCC cart
MCFL
HILT cali
HRDD-LS
HRDD-SS
HRDD-BS
24.2
18.8
18.3
17.9
1.5 IN Standoff
Induction
Temperatu
Power Sup
SP SENSOR
TENS HV DF
HTEN HMAS
Accelerom
Mud Resis
Tension
7.9
0.1
0.0
TOOL ZERO
1.5 IN Standoff

MAXIMUM STRING DIAMETER 6.88 IN
MEASUREMENTS RELATIVE TO TOOL ZERO
ALL LENGTHS IN FEET


TCC-BF
ECH-KC
TelStatus
70.3
73.3
ACTS-B1
ACTM-A
ACTE-A
70.3
AH-107
66.3
DSLT-TCC
DSLC-B
ECH-KH
SLS-W
64.3
USN
UHN
USF UHF
LSF LHF
LHN
LSN
51.8
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HTBCC
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HGNS-CAN-B
HGNS-H
NLS-KL
NSR-F
HACCZ
HCNT
HGR
HRCC-B
HRMS-B
HRGD
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AHIS-BA
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HGNS sens
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HRDD-SS
HRDD-BS
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Power Sup
SP SENSOR
TENS HV DF
HTEN HMAS
Accelerom
Mud Resis
Tension
7.9
0.1
0.0
TOOL ZERO

MAXIMUM STRING DIAMETER 5.00 IN
MEASUREMENTS RELATIVE TO TOOL ZERO
ALL LENGTHS IN FEET

Input DLIS Files

DEFAULT	Splice_AIT_TLD_MCFL_003CUP	FN:1	PRODUCER	16-Nov-2001 12:01	3024.0 FT	293.5 FT

Integrated Hole/Cement Volume Summary

Hole Volume = 306.40 ft3

Cement Volume = 161.79 ft3 (assuming 5.50 in casing O.D.)

Computed from 3020.0 ft to 2144.0 ft

OP System Version: 9C2-303

MCM

HILTB	SRPC-2078-HILT	DSLT-BA	OP92-KP1
ACTS1	9C2-303	TCCBF	9C2-303

PIP SUMMARY

⊢ Integrated Hole Volume Minor Pip Every 10 F3
⊢ Integrated Hole Volume Major Pip Every 100 F3
⊣ Integrated Cement Volume Minor Pip Every 10 F3
⊣ Integrated Cement Volume Major Pip Every 100 F3

▶ Time Mark Every 60 S

AIT-H 90 Inch Investigation Conductivity (AHTCO90)
1000 (MM/M) 0

AIT-H 60 Inch Investigation (AHT60)
0.2 (OHMM) 200

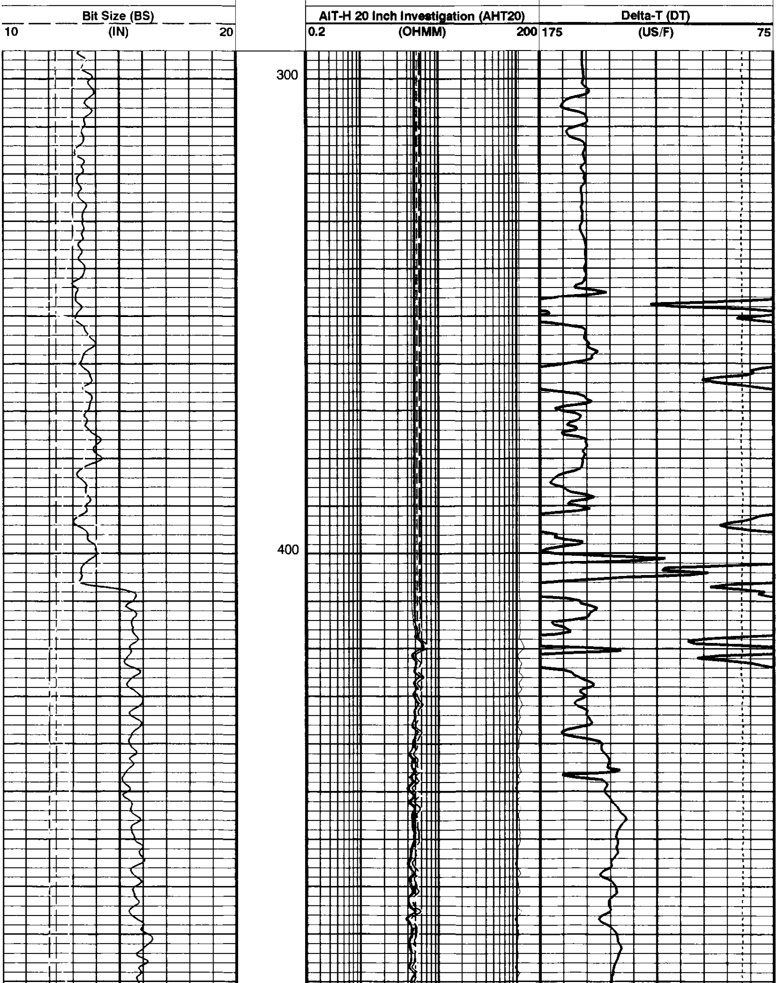
AIT-H 30 Inch Investigation (AHT30)
0.2 (OHMM) 200

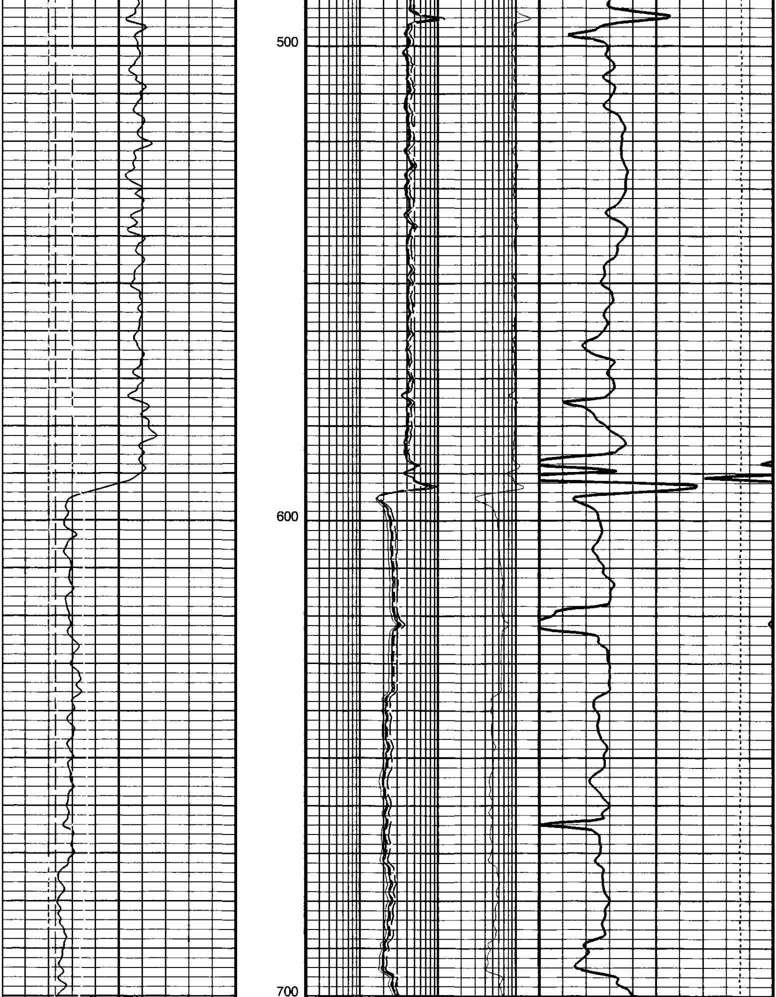
Gamma Ray (GR)
150 (GAPI) 300

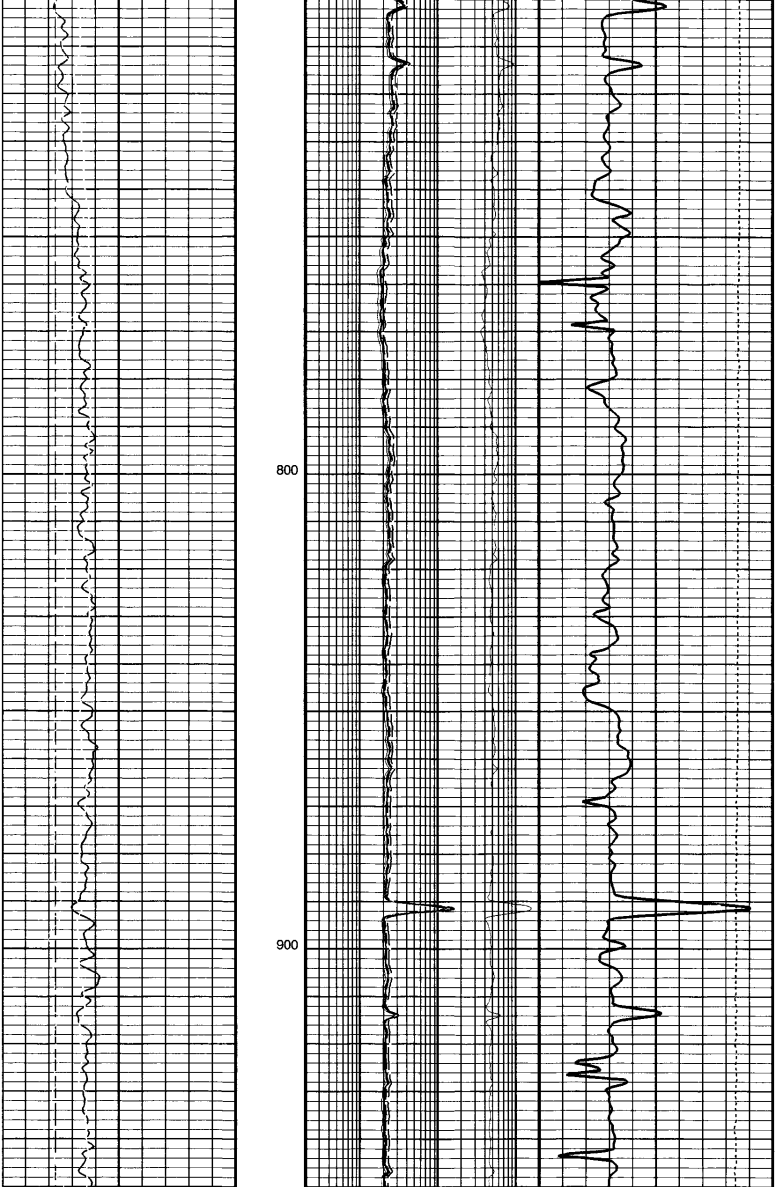
AIT-H 10 Inch Investigation (AHT10)
0.2 (OHMM) 200

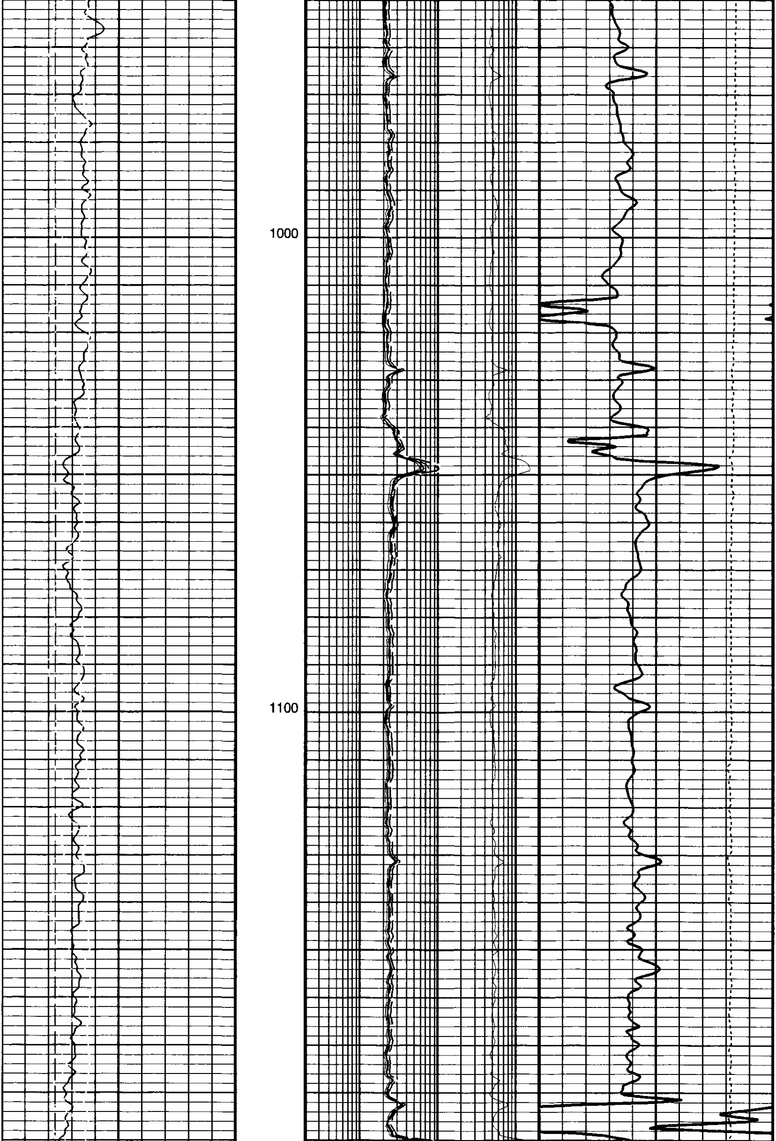
Gamma Ray (GR)
0 (GAPI) 150

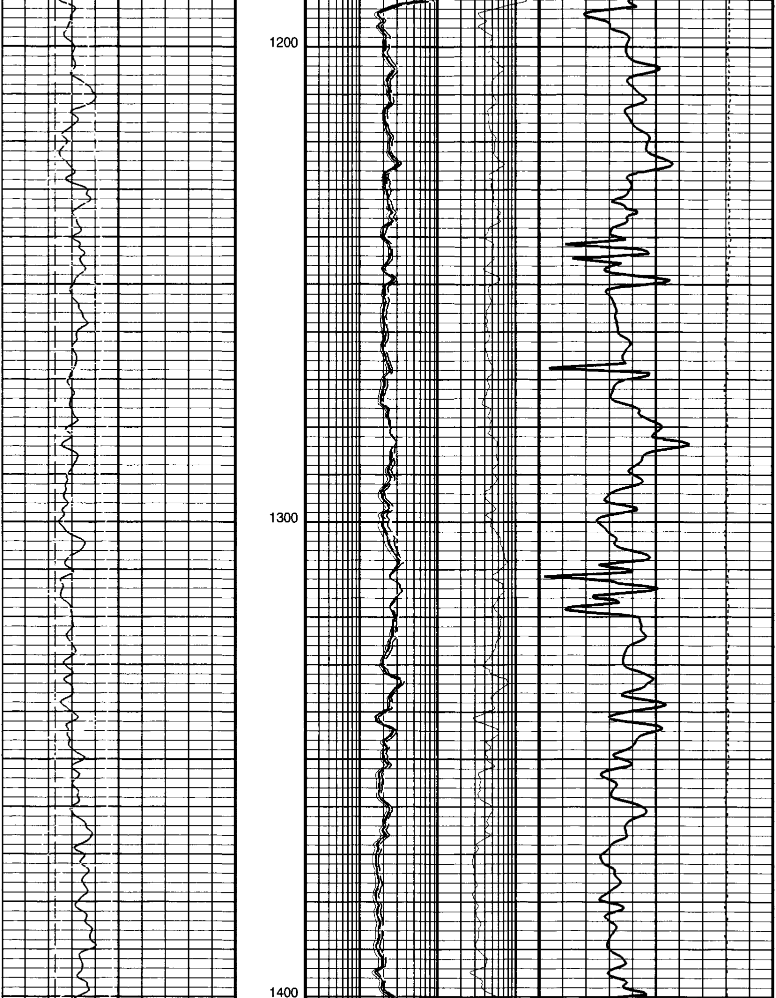
Tension (TENS)
10000 (LBF) 0

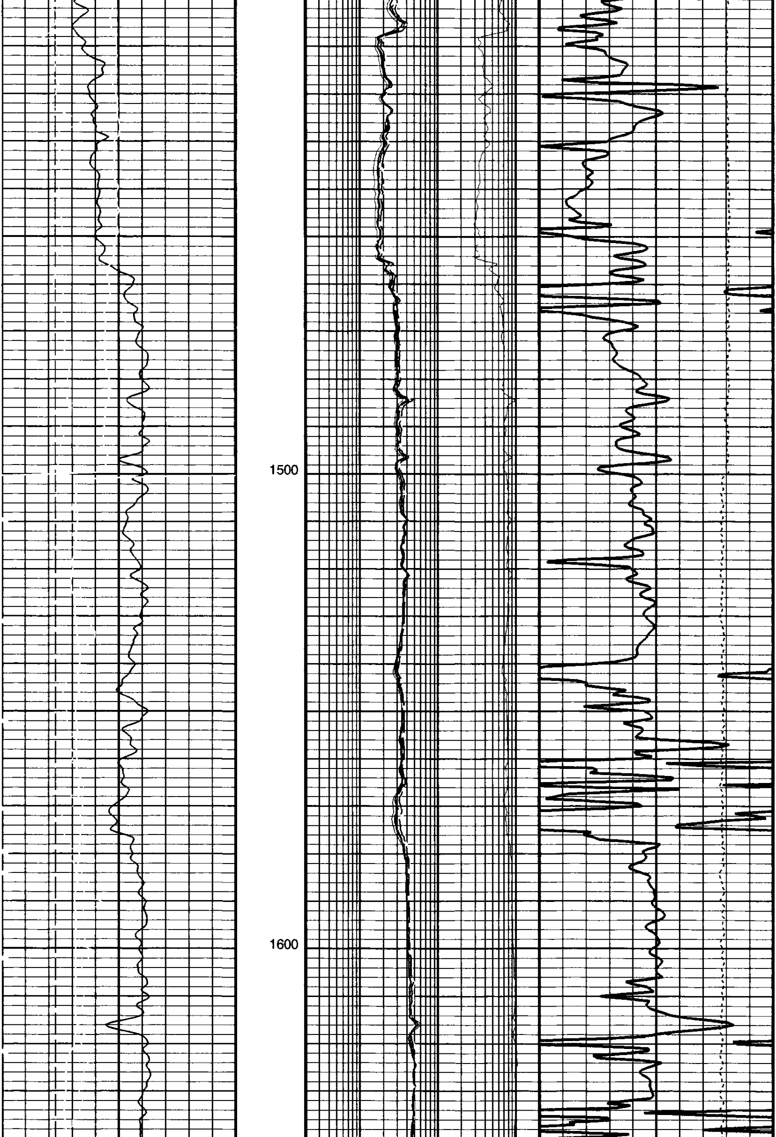


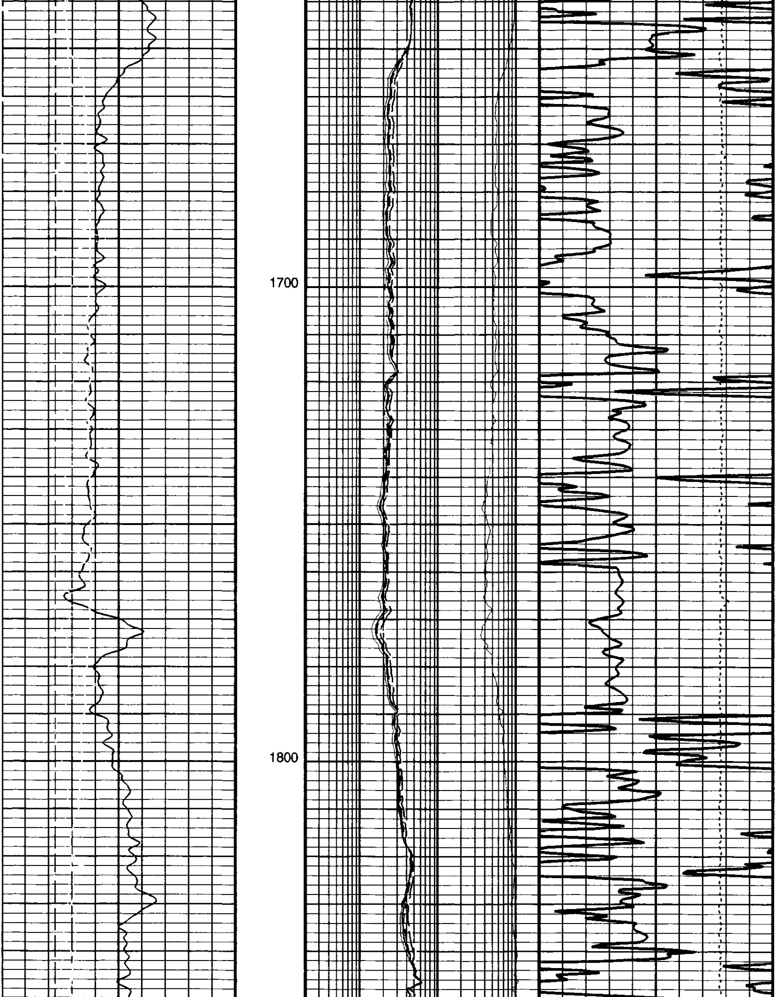


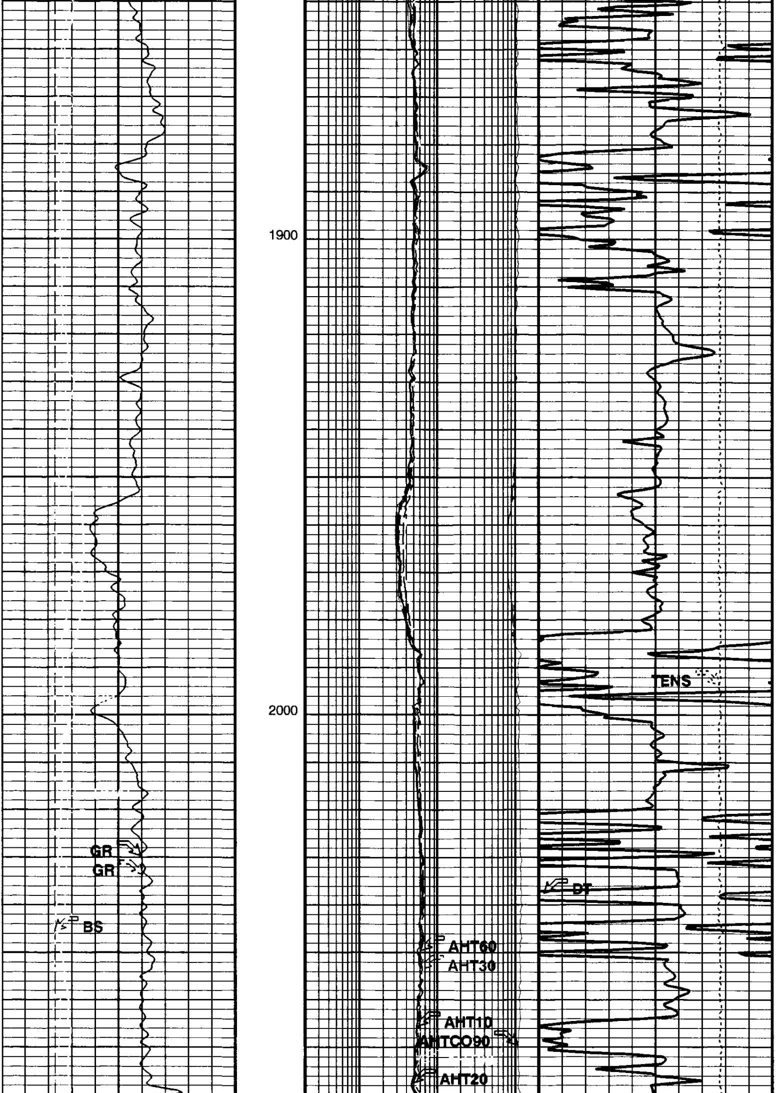


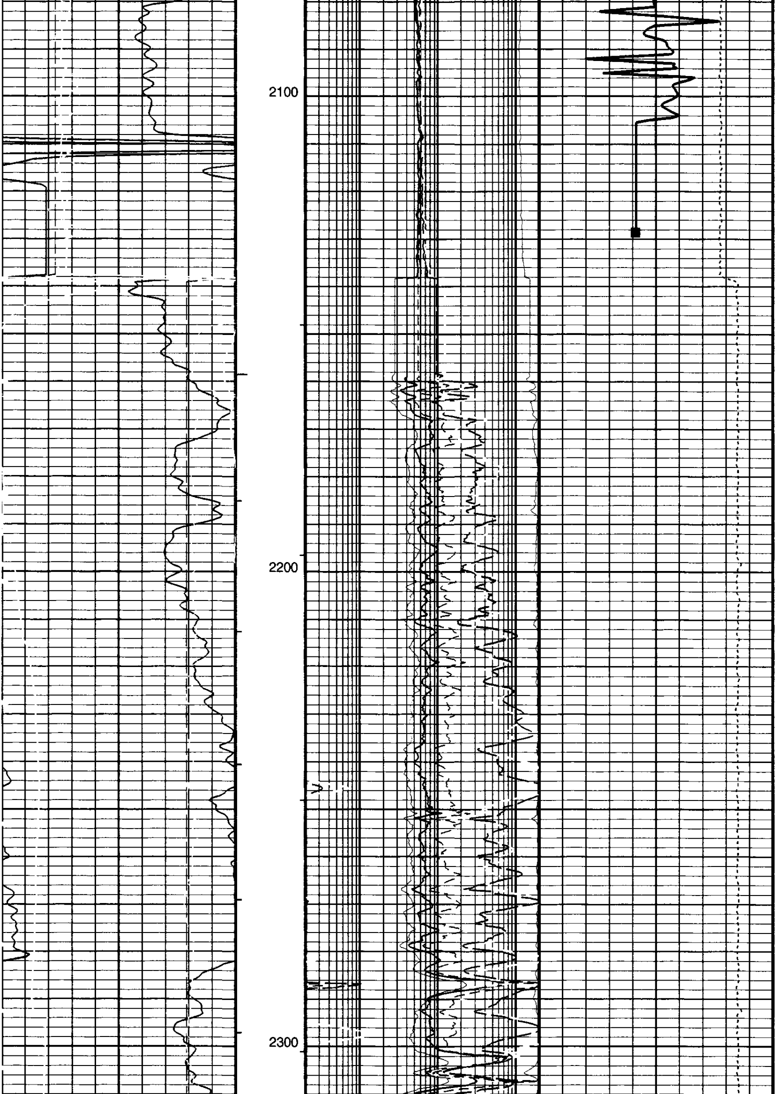


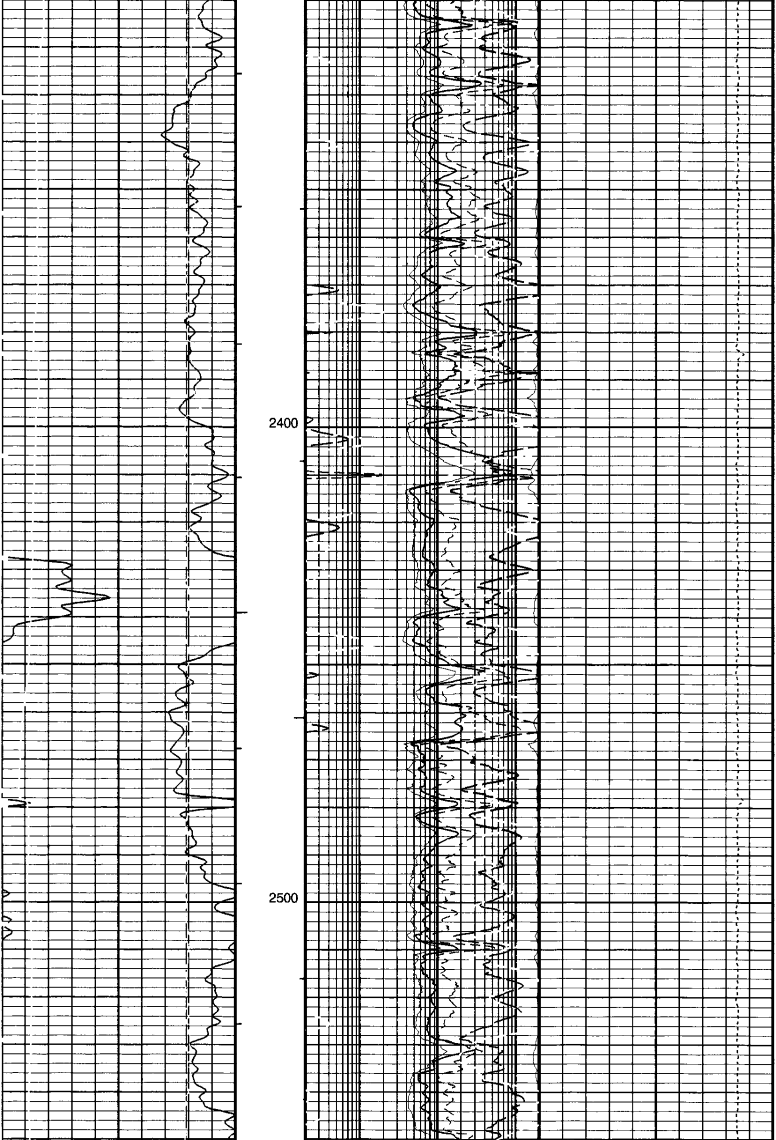


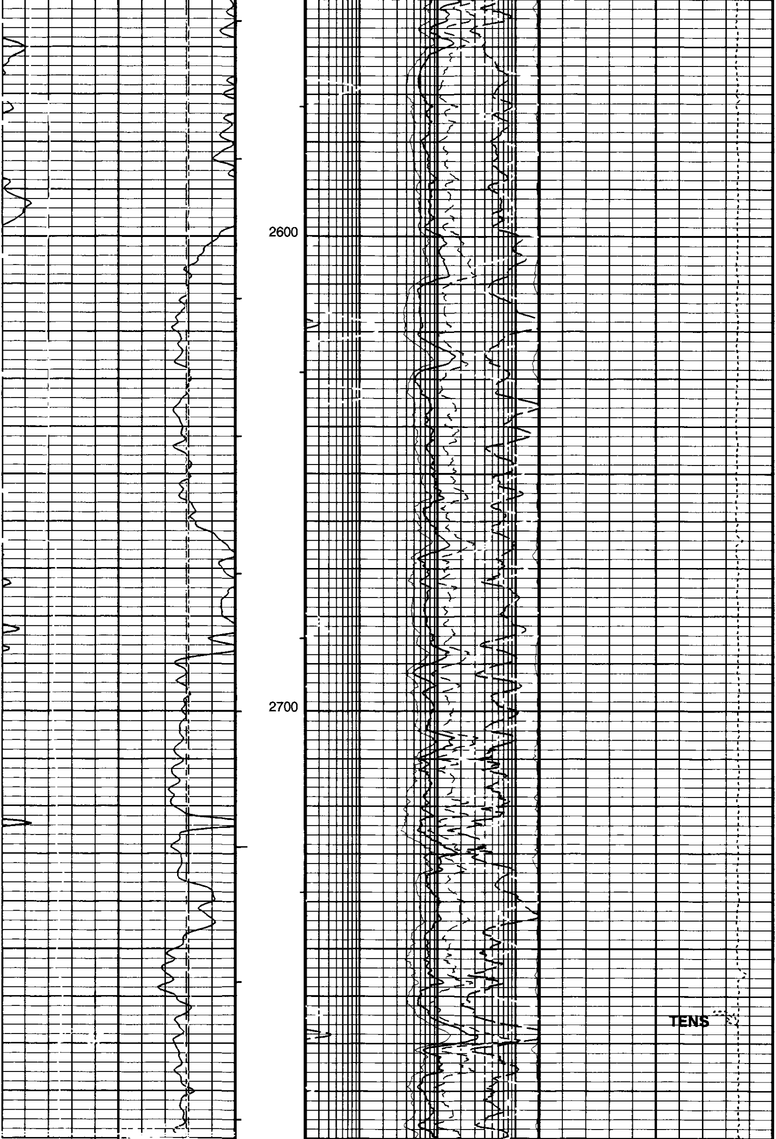


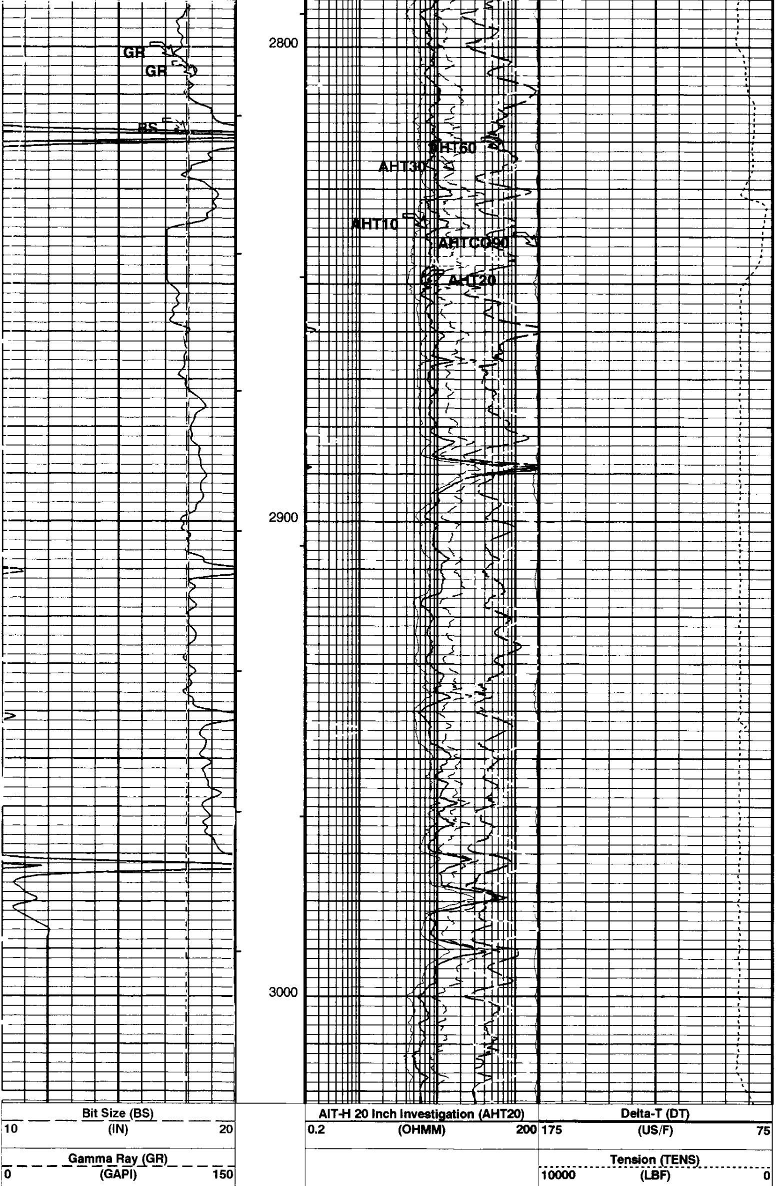












Gamma Ray (GR)
150 (GAPI) 300

AIT-H 10 Inch Investigation (AHT10)
0.2 (OHMM) 200

AIT-H 30 Inch Investigation (AHT30)
0.2 (OHMM) 200

AIT-H 60 Inch Investigation (AHT60)
0.2 (OHMM) 200

AIT-H 90 Inch Investigation Conductivity (AHTCO90)
1000 (MM/M) 0

PIP SUMMARY

⊢ Integrated Hole Volume Minor Pip Every 10 F3
⊢ Integrated Hole Volume Major Pip Every 100 F3
⊣ Integrated Cement Volume Minor Pip Every 10 F3
⊣ Integrated Cement Volume Major Pip Every 100 F3

Time Mark Every 60 S

Parameters

DLIS Name	Description	Value	
AHBHM	Array Induction Borehole Correction Mode	2_COMPUTESTANDOFF	
AHBHV	Array Induction Borehole Correction Code Version Number	880	
AHBLM	Array Induction Basic Logs Mode	6_ONE_TWO_AND_FOUR	
AHBLV	Array Induction Basic Logs Code Version Number	108	
AHCDE	Array Induction Casing Detection Enable	YES	
AHCEN	Array Induction Tool Centering Flag (in Borehole)	ECCENTERED	
AHFRSV	Array Induction Response Set Version for Four ft Resolution	40.70.24.21	
AHMRF	Array Induction Mud Resistivity Factor	1.000	
AHORSV	Array Induction Response Set Version for One ft Resolution	40.70.24.21	
AHRFV	Array Induction Radial Profiling Code Version Number	700	
AHRPV	Array Induction Radial Parametrization Code Version Number	223	
AHSAP	Array Induction Suspend Answer Product Processing	0_NOSUSPENSION	
AHSTA	Array Induction Tool Standoff	0.500	in
AHTRSV	Array Induction Response Set Version for Two ft Resolution	40.70.24.21	
BHT	Bottom Hole Temperature (used in calculations)	77.000	degF
BS	Bit Size	7.875	in
DDEL	Digitizer Delay	0	us
DFAD_TYPE	DFAD type	DFAD2	
DFD	Drilling Fluid Density	8.900	lbm/gal
DIVL	DSLT Depth Sampling Interval	20	
DRCS	DSLT DLIS Recording Size	100	
DSIN	Digitizer Sample Interval	10	
DTFS	DSLC Telemetry Frame Size	190	
DWCO	Digitizer Word Count	80	
FEXP	Form Factor Exponent	2.000	
FNUM	Form Factor Numerator	1.000	
GAI	Manual Gain	100	
GCSE	Generalized Caliper Selection	HCAL	
GDEV	Average Angular Deviation of Borehole from Normal	0.000	deg
GGRD	Geothermal Gradient	0.010	degF/ft
GRSE	Generalized Mud Resistivity Selection	AHMF	
GTSE	Generalized Temperature Selection	TEMP	
MAHTR	Manual High Threshold Reference	120	
MGAI	Maximum Gain	200	
MNHTR	Minimum High Threshold Reference	100	
MST	Mud Sample Temperature	55.000	degF
NMSG	Near Minimum Sliding Gate	275	us
NMXG	Near Maximum Sliding Gate	600	us
RATE	Firing Rate	R7	
SFAF	Sonic Formation Attenuation Factor	0	dB/ft
SGCL	Sliding Gate Closing Delta-T	250	us/ft
SGDT	Sliding Gate Delta-T	50	us/ft
SGW	Sliding Gate Width	80	us
SHT	Surface Hole Temperature	68.000	degF
SLEV	Signal Level for AGC	5000	
SPDR	SP Drift	0.000	mV/ft
SPNV	SP Next Value	0.000	mV
SPVD	TVD of Starting Point	0.000	ft
TD	Total Depth	3020.0	ft
TIMD	Along-hole depth of Tie-in Point	0.000	ft
TIVD	TVD of Tie-in Point	0.000	ft
WMOD	Waveform Firing Mode	FULL	

Format: 5INCH Vertical Scale: 5" per 100' Graphics File Created: 18-Nov-2001 08:52

OP System Version: 9C2-303

MCM

HILTB	SRPC-2078-HILT	DSLT-BA	OP92-KP1
ACTS1	9C2-303	TCCBF	9C2-303

Input DLIS Files

DEFAULT	**Splice_AIT_TLD_MCFL_003CUP**	**FN:1**	**PRODUCER**	**16-Nov-2001 12:01**	**3024.0 FT**	**293.5 FT**

COMPANY: **NORTHWEST NATURAL GAS COMPANY**

WELL: **IW 14dH-23-65**
FIELD: **CALVIN CREEK-REICHHOLD POOL**
COUNTY: **COLUMBIA**
STATE: **OREGON**

BOTTOM LOG INTERVAL	2142 ft
SCHLUMBERGER DEPTH	2152 ft
DEPTH DRILLER	2168 ft
KELLY BUSHING	923 ft
DRILL FLOOR	921.5 ft
GROUND LEVEL	905 ft

Schlumberger

ARRAY INDUCTION / SP
BHC SONIC / GR
SCALE: 5"=100'