COMPANY: NORTHWEST NATURAL GAS

WELL: OM 22-26-65 RD

FIELD: MIST

COUNTY: COLUMBIA **STATE:** OREGON

COUNTY: COLUMBIA
Field: MIST
Location: 1744.22' SOUTH, 2512.13' EAS
Well: OM 22-26-65 RD
Company: NORTHWEST NATURAL GAS

Schlumberger

PLATFORM EXPRESS
BHC SONIC /SP/GR
SCALE: 5" = 100'

LOCATION

1744.22' SOUTH, 2512.13' EAST FROM THE NW CORNER OF 26		Elev.:	K.B. 631 ft G.L. 621 ft D.F. 629 ft
Permanent Datum:	GROUND LEVEL	Elev.:	621 ft
Log Measured From:	K.B	10.0 ft	above Perm. Datum
Drilling Measured From:	K.B		

API Serial No.	SECTION	TOWNSHIP	RANGE
36-009-00330	26	6N	5W

SCANNED

Logging Date	21-MAY-2000			
Run Number	1			
Depth Driller	2151 ft			
Schlumberger Depth	2144 ft			
Bottom Log Interval	2136 ft			
Top Log Interval	487 ft			
Casing Driller Size @ Depth	7.000 in @ 487 ft		@	
Casing Schlumberger	487 ft			
Bit Size	6.250 in			
Type Fluid In Hole	DMA			
MUD Density | Viscosity	8.9 lbm/gal	45 s		
Fluid Loss | PH	6.6 cm3	9		
Source Of Sample	FLOWLINE			
RM @ Measured Temperature	1.185 ohm.m @ 76 degF		@	
RMF @ Measured Temperature	1.050 ohm.m @ 72 degF		@	
RMC @ Measured Temperature	0.930 ohm.m @ 76 degF		@	
Source RMF | RMC	PRESS	PRESS		
RM @ MRT | RMF @ MRT	0.954 @ 96	0.805 @ 96	@	@
Maximum Recorded Temperatures	96 degF	96 | 96		
Circulation Stopped | Time	21-MAY-2000	9:30		
Logger On Bottom | Time	21-MAY-2000	11:50		
Unit Number | Location	3152	SACRAMENTO		
Recorded By	M.KHAN			
Witnessed By	JACK MEYER			

	Run 1	Run 2	Run 3	Run 4
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				

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:	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

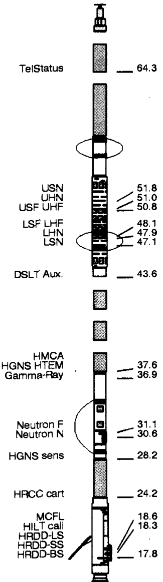
EQUIPMENT DESCRIPTION

RUN 1	RUN 2

SURFACE EQUIPMENT

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

DOWNHOLE EQUIPMENT



LEH-QT 70.2
LEH-QT 1808

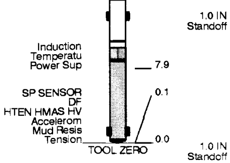
TCC-BF 67.3
ECH-KC
TCC-BF 590

DSLT-TCC 64.3
DSLC-B 3152
ECH-KH 2590
SLS-W 1464

AH-107 43.6
AH-107

AH-107 41.6
AH-107

HILTB-DTB 39.6
HTBCC
HMCA 756
HGNS-CAN-B
HGNS-H 828
NLS-KL
NSR-F
HACCZ
HCNT
HGR
HRCC-B 723
HRMS-B 723
HRGD 723
GLS-VJ 1924
MCFL Device
HILT Nucl. LS
HILT Nucl. SS
HILT Nucl. BS
AIT-H
AHIS-BA 112
AHRM-A
BOW-SPR
NPV-N



MAXIMUM STRING DIAMETER 5.88 IN
MEASUREMENTS RELATIVE TO TOOL ZERO
ALL LENGTHS IN FEET

Input DLIS Files

DEFAULT	HILTB .006	FN:5	PRODUCER	21-May-2000 12:08	2148.0 FT	0.0 FT

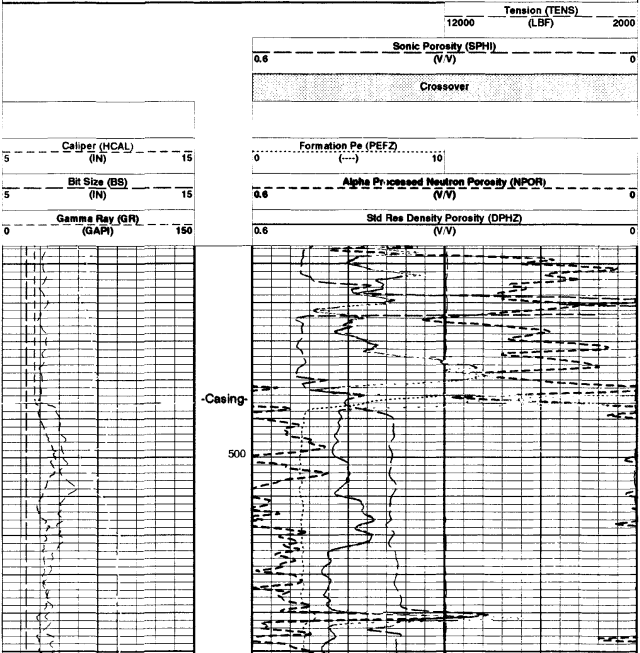
Output DLIS Files

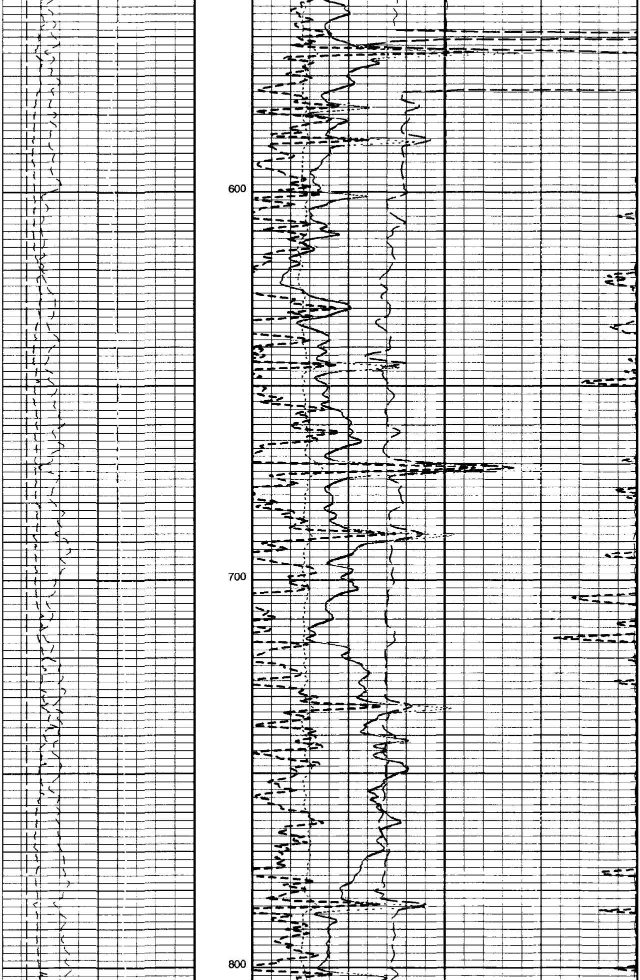
DEFAULT	HILTB .007	FN:6	PRODUCER	21-May-2000 13:30

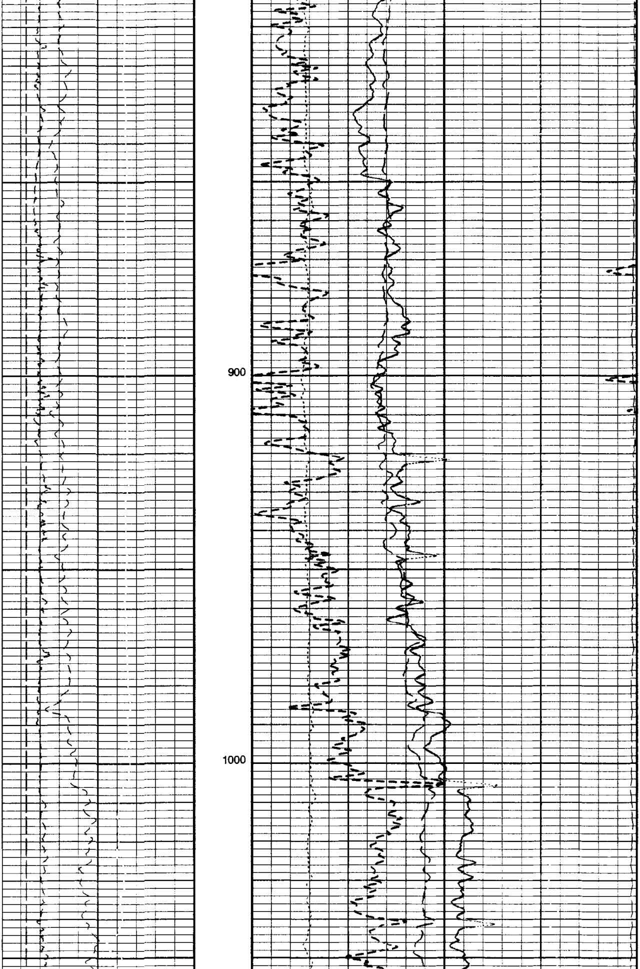
OP System Version: 9C1-303

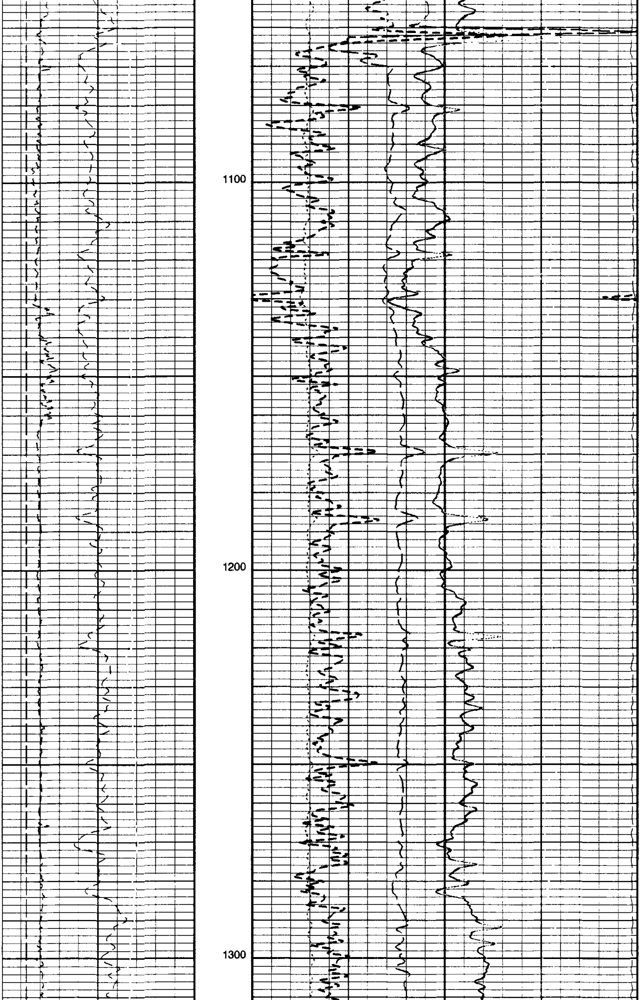
MCM

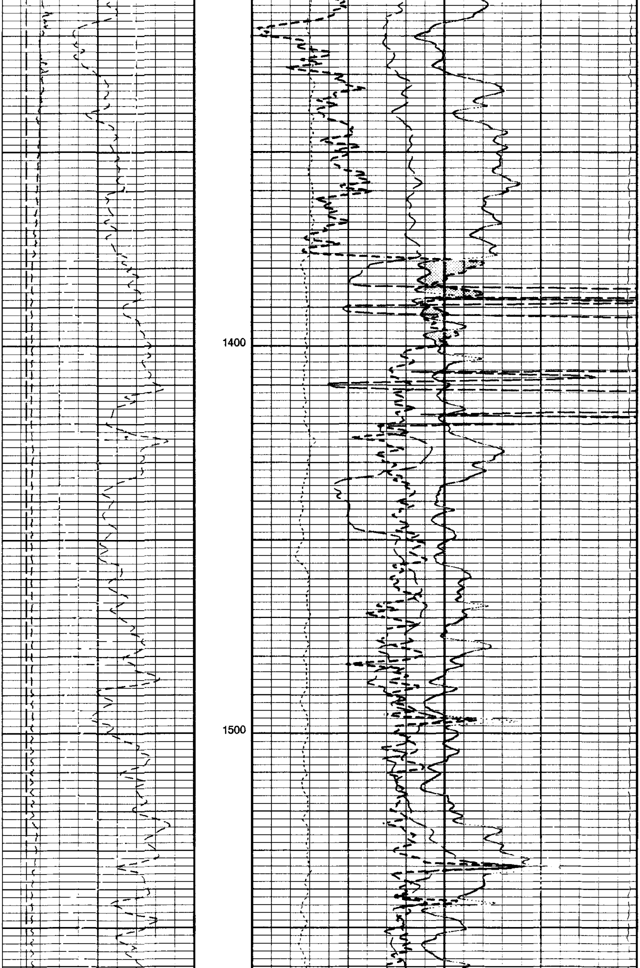
HILTB-DTB	OP91-KP1a	DSLT-TCC	OP91-KP1a
TCC-BF	OP91-KP1a		

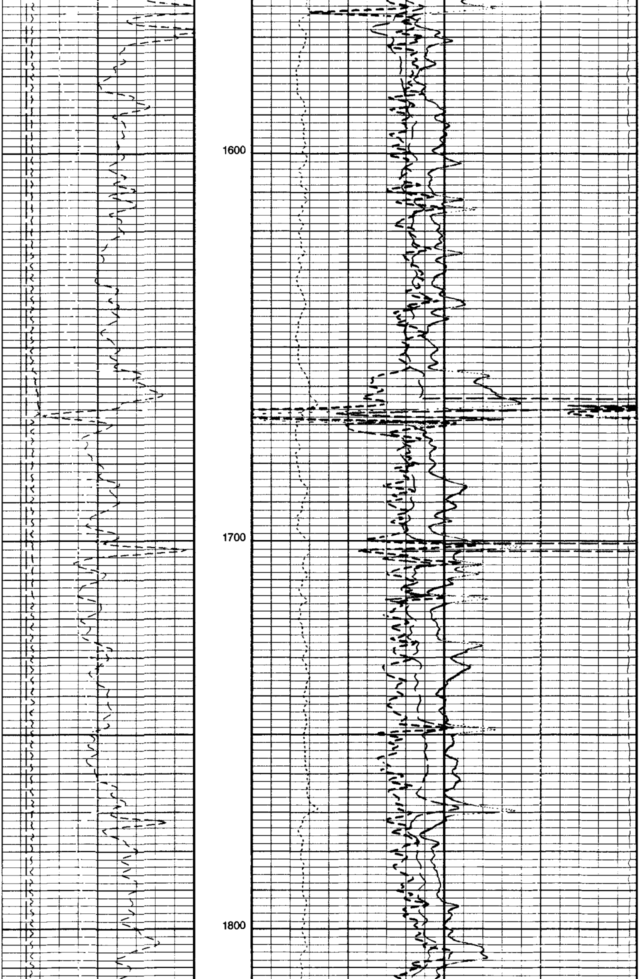


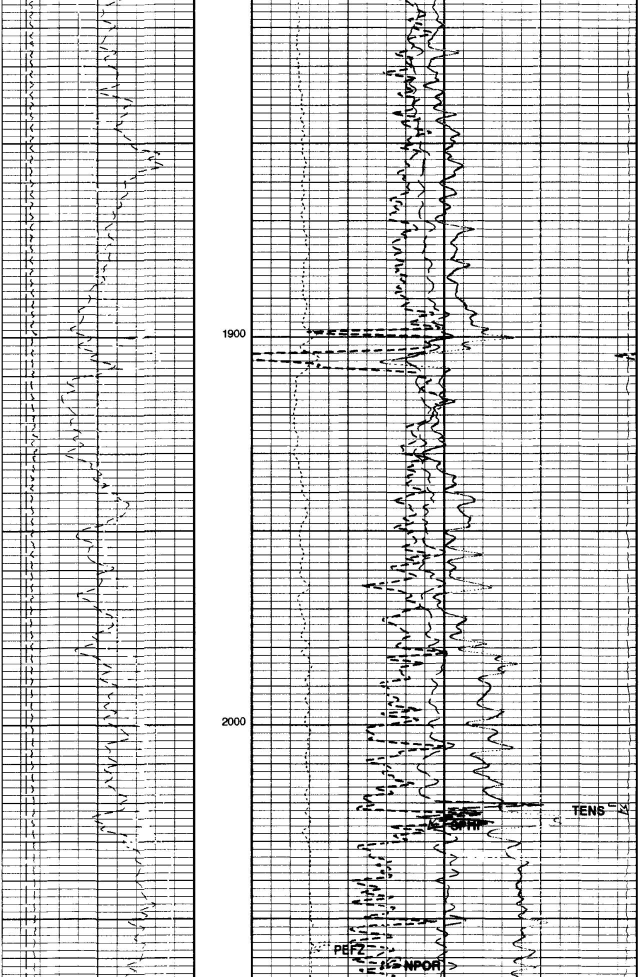


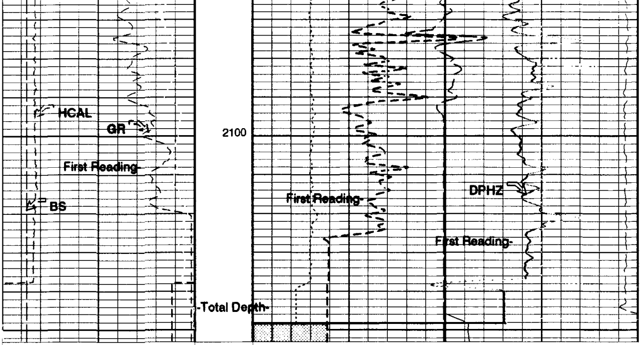












Gamma Ray (GR)
0 (GAPI) 150

Bit Size (BS)
5 (IN) 15

Caliper (HCAL)
5 (IN) 15

Std Res Density Porosity (DPHZ)
0.6 (V/V) 0

Alpha Processed Neutron Porosity (NPOR)
0.6 (V/V) 0

Formation Pe (PEFZ)
0 (----) 10

Crossover

Sonic Porosity (SPHI)
0.6 (V/V) 0

Tension (TENS)
12000 (LBF) 2000

AIT-H Answer Product Processing Summary. Data taken with Tool # 112 (AHTNO)

...Acquired data from HILT/HAIT

******* Borehole Correction *******

Effective Tool Standoff computed. Borehole diameter and mud res. taken as input (see GCSE and GRSE parameters)

Tool is run in ECCENTERED mode with a tool stand-off of 1.50 IN. Bit Size is 6.25 IN.

******* Input Selections to AIT-H Answer Product Processing *******

Caliper (GCSE): HCAL Mud Resistivity (GRSE): AHMF Temperature (GTSE): LINEAR_ESTIMATE Porosity (FPHI): DPHZ

******* Other Parameters used by AIT-H Answer Product Processing *******

Surface Hole Temperature (SHT)	68.000 DEGF	Bottom Temperature (BHT)	86.000 DEGF
Total Depth (TD)	2151.000 FT		
Form Factor Exponent (FEXP)	2.000	Form Factor Numerator (FNUM)	1.000
Mud Filtrate Sample Resistivity (RMFS)	1.050 OHMM	Mud Filtrate Sample Temperature (MFST)	72.000 DEGF
Resitivity Connate Water (RW)	1.000 OHMM		

******* AIT-H Answer Product Processing Control Parameters *******

Playback Mode: NORMAL

Parameters

DLIS Name	Description	Value	
BHFL	Borehole Fluid Type	WATER	
BHS	Borehole Status	OPEN	
BS	Bit Size	6.250	IN
BSAL	Borehole Salinity	2600.00	PPM
BSCO	Borehole Salinity Correction Option	NO	
CCCO	Casing & Cement Thickness Correction Option	NO	
CDTS	C-Delta-T Shale	100	US/F
CSIZ	Current Casing Size	7.000	IN
CWEI	Casing Weight	23.00	LB/F
DFD	Drilling Fluid Density	8.90	LB/G
DHC	Density Hole Correction	BS	
DO	Depth Offset for Logical Unit 1	5.0	FT
DORL	Depth Offset Repeat Analysis	5.0	FT
DTF	Delta-T Fluid	189	US/F
DTM	Delta-T Matrix	56	US/F

FD	Fluid Density	1	G/C3
FSAL	Formation Salinity	-50000	PPM
FSCO	Formation Salinity Correction Option	NO	
GCSE	Generalized Caliper Selection	HCAL	
GDEV	Average Angular Deviation of Borehole from Normal	12	DEG
GGRD	Geothermal Gradient	0.01	DF/F
HSCM	HILT Speed Correction Mode	NO_SC	
HSCO	Hole Size Correction Option	YES	
HSTI	STI Uses HILT Acceleration	YES	
MATR	Rock Matrix for Neutron Porosity Corrections	SANDSTONE	
MCCO	Mud Cake Correction Option	NO	
MCOR	Mud Correction	NATU	
MDEN	Matrix Density	2.65	G/C3
MST	Mud Sample Temperature	76.00	DEGF
MWCO	Mud Weight Correction Option	NO	
NAAC	HRDD APS Activation Correction	OFF	
NMT	HILT Nuclear Mud Type	NOBARITE	
NPRM	HRDD Processing Mode	StdRes	
NSAR	HRDD Depth Sampling Rate	1	IN
PP	Playback Processing	NORMAL	
PTCO	Pressure/Temperature Correction Option	NO	
RMFS	Resistivity of Mud Filtrate Sample	1.0500	OHMM
SDAT	Standoff Data Source	SOCN	
SHT	Surface Hole Temperature	68	DEGF
SOCN	Standoff Distance	0.125	IN
SOCO	Standoff Correction Option	NO	
SPFS	Sonic Porosity Formula	RAYMER_HUNT	
SPNV	SP Next Value	0	MV
SPSO	Sonic Porosity Source	DT	
TDL	Total Depth - Logger	2144.00	FT

Format: PORO **Vertical Scale: 5" per 100'** **Graphics File Created: 21-May-2000 13:30**

OP System Version: 9C1-303

MCM

HILTB-DTB	OP91-KP1a	DSLT-TCC	OP91-KP1a
TCC-BF	OP91-KP1a		

Input DLIS Files

DEFAULT	HILTB .006	FN:5	PRODUCER	21-May-2000 12:08	2148.0 FT	0.0 FT

Output DLIS Files

DEFAULT	HILTB .007	FN:6	PRODUCER	21-May-2000 13:30

Schlumberger

REPEAT SECTION

MAXIS 500 Field Log

Input DLIS Files

DEFAULT	HILTB .006	FN:5	PRODUCER	21-May-2000 12:08	2148.0 FT	0.0 FT
DEFAULT	HILTB .004	FN:3	PRODUCER	21-May-2000 11:50	2154.0 FT	1826.2 FT

Output DLIS Files

DEFAULT	HILTB .007	FN:6	PRODUCER	21-May-2000 13:30

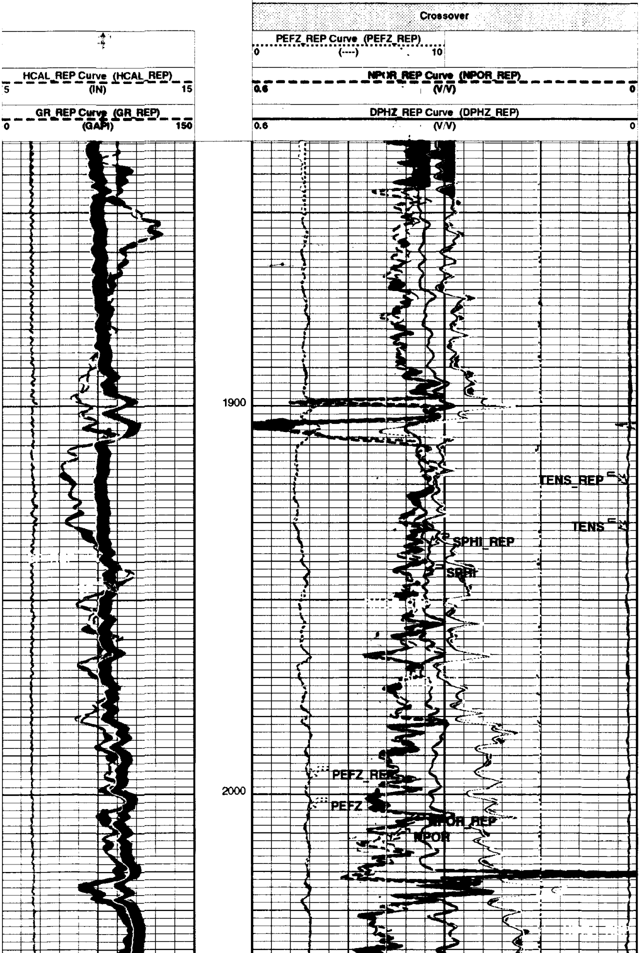
OP System Version: 9C1-303

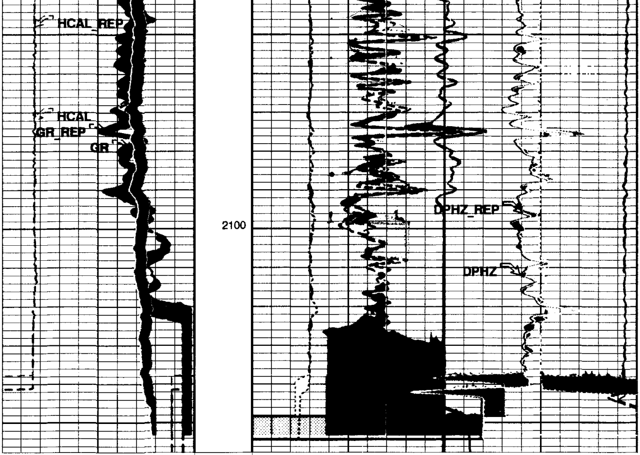
MCM

HILTB-DTB	OP91-KP1a	DSLT-TCC	OP91-KP1a
TCC-BF	OP91-KP1a		

TENS_REP Curve (TENS_REP)
12000 (LBF) 2000

SPHI_REP Curve (SPHI_REP)
0.6 (V/V) 0





GR_REP Curve (GR_REP)
0 (GAPI) 150

HCAL_REP Curve (HCAL_REP)
5 (IN) 15

DPHZ_REP Curve (DPHZ_REP)
0.6 (V/V) 0

NPOR_REP Curve (NPOR_REP)
0.6 (V/V) 0

PEFZ_REP Curve (PEFZ_REP)
0 (----) 10

Crossover

SPHI_REP Curve (SPHI_REP)
0.6 (V/V) 0

TENS_REP Curve (TENS_REP)
12000 (LBF) 2000

AIT-H Answer Product Processing Summary. Data taken with Tool # 112 (AHTNO)
...Acquired data from HILT/HAIT

***** Borehole Correction *****

Effective Tool Standoff computed. Borehole diameter and mud res. taken as input (see GCSE and GRSE parameters)
Tool is run in ECCENTERED mode with a tool stand-off of 1.50 IN. Bit Size is 6.25 IN.

***** Input Selections to AIT-H Answer Product Processing *****

Caliper (GCSE): HCAL Mud Resistivity (GRSE): AHMF Temperature (GTSE): LINEAR_ESTIMATE Porosity (FPHI): DPHZ

***** Other Parameters used by AIT-H Answer Product Processing *****

Surface Hole Temperature (SHT)	68.000 DEGF	Bottom Temperature (BHT)	86.000 DEGF
Total Depth (TD)	2151.000 FT		
Form Factor Exponent (FEXP)	2.000	Form Factor Numerator (FNUM)	1.000
Mud Filtrate Sample Resistivity (RMFS)	1.050 OHMM	Mud Filtrate Sample Temperature (MFST)	72.000 DEGF
Resitivity Connate Water (RW)	1.000 OHMM		

***** AIT-H Answer Product Processing Control Parameters *****

Playback Mode: NORMAL

Parameters

DLIS Name	Description	Value

BHFL	Borehole Fluid Type	WATER	
BHS	Borehole Status	OPEN	
BS	Bit Size	6.250	IN
BSAL	Borehole Salinity	2600.00	PPM
BSCO	Borehole Salinity Correction Option	NO	
CCCO	Casing & Cement Thickness Correction Option	NO	
CDTS	C-Delta-T Shale	100	US/F
CSIZ	Current Casing Size	7.000	IN
CWEI	Casing Weight	23.00	LB/F
DFD	Drilling Fluid Density	8.90	LB/G
DHC	Density Hole Correction	BS	
DO	Depth Offset for Logical Unit 1	5.0	FT
DORL	Depth Offset Repeat Analysis	5.0	FT
DTF	Delta-T Fluid	189	US/F
DTM	Delta-T Matrix	56	US/F
FD	Fluid Density	1	G/C3
FSAL	Formation Salinity	-50000	PPM
FSCO	Formation Salinity Correction Option	NO	
GCSE	Generalized Caliper Selection	HCAL	
GDEV	Average Angular Deviation of Borehole from Normal	12	DEG
GGRD	Geothermal Gradient	0.01	DF/F
HSCM	HILT Speed Correction Mode	NO_SC	
HSCO	Hole Size Correction Option	YES	
HSTI	STI Uses HILT Acceleration	YES	
MATR	Rock Matrix for Neutron Porosity Corrections	SANDSTONE	
MCCO	Mud Cake Correction Option	NO	
MCOR	Mud Correction	NATU	
MDEN	Matrix Density	2.65	G/C3
MST	Mud Sample Temperature	76.00	DEGF
MWCO	Mud Weight Correction Option	NO	
NAAC	HRDD APS Activation Correction	OFF	
NMT	HILT Nuclear Mud Type	NOBARITE	
NPRM	HRDD Processing Mode	StdRes	
NSAR	HRDD Depth Sampling Rate	1	IN
PP	Playback Processing	NORMAL	
PTCO	Pressure/Temperature Correction Option	NO	
RMFS	Resistivity of Mud Filtrate Sample	1.0500	OHMM
SDAT	Standoff Data Source	SOCN	
SHT	Surface Hole Temperature	68	DEGF
SOCN	Standoff Distance	0.125	IN
SOCO	Standoff Correction Option	NO	
SPFS	Sonic Porosity Formula	RAYMER_HUNT	
SPNV	SP Next Value	0	MV
SPSO	Sonic Porosity Source	DT	
TDL	Total Depth - Logger	2144.00	FT

Format: PORO_REP Vertical Scale: 5" per 100' Graphics File Created: 21-May-2000 13:31

OP System Version: 9C1-303

MCM

HILTB-DTB	OP91-KP1a	DSLT-TCC	OP91-KP1a
TCC-BF	OP91-KP1a		

Input DLIS Files

DEFAULT	HILTB .006	FN:5	PRODUCER	21-May-2000 12:08	2148.0 FT	0.0 FT
DEFAULT	HILTB .004	FN:3	PRODUCER	21-May-2000 11:50	2154.0 FT	1826.2 FT

Output DLIS Files

DEFAULT	HILTB .007	FN:6	PRODUCER	21-May-2000 13:30

Schlumberger

CALIBRATIONS

MAXIS [illegible]

Calibration and Check Summary

Measurement	Nominal	Master	Before	After	Change	Limit	Units
High resolution Integrated Logging Tool-CTS Wellsite Calibration - Electronics Calibration Check - Thru Cal Mag. & Phase							
Master: Calibration out of date 20-JAN-2000 11:39 Before: 21-MAY-2000 11:23							
Thru Cal Magnitude - 0	0	0.6214	0.6342	N/A	N/A	N/A	V
Thru Cal Magnitude - 1	0	1.274	1.300	N/A	N/A	N/A	V
Thru Cal Magnitude - 2	0	0.6329	0.6459	N/A	N/A	N/A	V
Thru Cal Magnitude - 3	0	0.7152	0.7301	N/A	N/A	N/A	V
Thru Cal Magnitude - 4	0	1.335	1.362	N/A	N/A	N/A	V
Thru Cal Magnitude - 5	0	1.943	1.983	N/A	N/A	N/A	V
Thru Cal Magnitude - 6	0	1.947	1.987	N/A	N/A	N/A	V
Thru Cal Magnitude - 7	0	1.371	1.401	N/A	N/A	N/A	V
Phase - 0	0	64.91	65.66	N/A	N/A	N/A	DEG
Phase - 1	0	63.80	64.55	N/A	N/A	N/A	DEG
Phase - 2	0	60.03	60.78	N/A	N/A	N/A	DEG
Phase - 3	0	59.25	60.01	N/A	N/A	N/A	DEG
Phase - 4	0	52.91	53.69	N/A	N/A	N/A	DEG
Phase - 5	0	50.96	51.75	N/A	N/A	N/A	DEG
Phase - 6	0	50.92	51.71	N/A	N/A	N/A	DEG
Phase - 7	0	47.08	47.97	N/A	N/A	N/A	DEG

High resolution Integrated Logging Tool-CTS Wellsite Calibration - Electronics Calibration Check - Auxilliary
Master: Calibration out of date 20-JAN-2000 11:39 Before: 21-MAY-2000 11:23

Array Induction SPA Plus	990.5	989.8	990.4	N/A	N/A	N/A	MV
Array Induction SPA Zero	0	0.1083	0.1083	N/A	N/A	N/A	MV
Array Induction Temperature Pl	0.9150	0.9169	0.9175	N/A	N/A	N/A	V
Array Induction Temperature Ze	0	0.0001095	0.0001059	N/A	N/A	N/A	V

High resolution Integrated Logging Tool-CTS Wellsite Calibration - Test Loop Gain Correction
Master: Calibration out of date 20-JAN-2000 11:39

Test Loop Gain Magnitude - 0	0	1.042	N/A	N/A	N/A	N/A	V
Test Loop Gain Magnitude - 1	0	1.011	N/A	N/A	N/A	N/A	V
Test Loop Gain Magnitude - 2	0	1.012	N/A	N/A	N/A	N/A	V
Test Loop Gain Magnitude - 3	0	1.010	N/A	N/A	N/A	N/A	V
Test Loop Gain Magnitude - 4	0	0.9940	N/A	N/A	N/A	N/A	V
Test Loop Gain Magnitude - 5	0	0.9835	N/A	N/A	N/A	N/A	V
Test Loop Gain Magnitude - 6	0	0.9934	N/A	N/A	N/A	N/A	V
Test Loop Gain Magnitude - 7	0	0.9945	N/A	N/A	N/A	N/A	V
Phase - 0	0	0.3672	N/A	N/A	N/A	N/A	DEG
Phase - 1	0	-0.6191	N/A	N/A	N/A	N/A	DEG
Phase - 2	0	-0.01578	N/A	N/A	N/A	N/A	DEG
Phase - 3	0	0.1871	N/A	N/A	N/A	N/A	DEG
Phase - 4	0	0.1325	N/A	N/A	N/A	N/A	DEG
Phase - 5	0	-0.1680	N/A	N/A	N/A	N/A	DEG
Phase - 6	0	0.2889	N/A	N/A	N/A	N/A	DEG
Phase - 7	0	-0.2642	N/A	N/A	N/A	N/A	DEG

High resolution Integrated Logging Tool-CTS Wellsite Calibration - Sonde Error Correction
Master: Calibration out of date 20-JAN-2000 11:39

R Sonde Error Correction - 0	0	-121.4	N/A	N/A	N/A	N/A	MM/M
R Sonde Error Correction - 1	0	149.7	N/A	N/A	N/A	N/A	MM/M
R Sonde Error Correction - 2	0	113.9	N/A	N/A	N/A	N/A	MM/M
R Sonde Error Correction - 3	0	58.40	N/A	N/A	N/A	N/A	MM/M
R Sonde Error Correction - 4	0	24.16	N/A	N/A	N/A	N/A	MM/M
R Sonde Error Correction - 5	0	11.87	N/A	N/A	N/A	N/A	MM/M
R Sonde Error Correction - 6	0	7.431	N/A	N/A	N/A	N/A	MM/M
R Sonde Error Correction - 7	0	-3.605	N/A	N/A	N/A	N/A	MM/M
X Sonde Error Correction - 0	0	34.14	N/A	N/A	N/A	N/A	MM/M
X Sonde Error Correction - 1	0	-240.4	N/A	N/A	N/A	N/A	MM/M
X Sonde Error Correction - 2	0	67.33	N/A	N/A	N/A	N/A	MM/M
X Sonde Error Correction - 3	0	81.72	N/A	N/A	N/A	N/A	MM/M
X Sonde Error Correction - 4	0	-1.172	N/A	N/A	N/A	N/A	MM/M
X Sonde Error Correction - 5	0	-10.09	N/A	N/A	N/A	N/A	MM/M
X Sonde Error Correction - 6	0	10.78	N/A	N/A	N/A	N/A	MM/M
X Sonde Error Correction - 7	0	0.3313	N/A	N/A	N/A	N/A	MM/M

High resolution Integrated Logging Tool-CTS Wellsite Calibration - Mud Gain Correction
Master: Calibration out of date 20-JAN-2000 11:39

Coarse - Mag, Real, Imag - 0	0	1.013	N/A	N/A	N/A	N/A	
Coarse - Mag, Real, Imag - 1	0	1.013	N/A	N/A	N/A	N/A	
Coarse - Mag, Real, Imag - 2	0	1.013	N/A	N/A	N/A	N/A	
Fine - Mag, Real, Imag - 0	0	1.011	N/A	N/A	N/A	N/A	
Fine - Mag, Real, Imag - 1	0	1.011	N/A	N/A	N/A	N/A	
Fine - Mag, Real, Imag - 2	0	1.011	N/A	N/A	N/A	N/A	

High resolution Integrated Logging Tool-CTS Wellsite Calibration - Stab Measurement Summary
Before: 7-MAY-2000 5:52

BS Window Ratio	1.033	N/A	1.022	N/A	N/A	N/A	
BS Window Sum	14310	N/A	14410	N/A	N/A	N/A	CPS
SS Window Ratio	0.5004	N/A	0.5048	N/A	N/A	N/A	
SS Window Sum	11490	N/A	11420	N/A	N/A	N/A	CPS
LS Window Ratio	0.2862	N/A	0.2864	N/A	N/A	N/A	
LS Window Sum	1163	N/A	1156	N/A	N/A	N/A	CPS

High resolution Integrated Logging Tool-CTS Wellsite Calibration - Photo-multiplier High Voltages Calibrations
Before: 7-MAY-2000 5:52

BS PM High Voltage (Command)	1614	N/A	1634	N/A	N/A	N/A	V
SS PM High Voltage (Command)	1916	N/A	1955	N/A	N/A	N/A	V
LS PM High Voltage (Command)	1966	N/A	1974	N/A	N/A	N/A	V

High resolution Integrated Logging Tool-CTS Wellsite Calibration - Crystal Quality Resolutions Calibration
Before: 7-MAY-2000 5:52

BS Crystal Resolution	12.26	N/A	12.52	N/A	N/A	N/A	%
SS Crystal Resolution	11.63	N/A	12.18	N/A	N/A	N/A	%
LS Crystal Resolution	10.59	N/A	10.66	N/A	N/A	N/A	%

High resolution Integrated Logging Tool-CTS Wellsite Calibration - MCFL Calibration
Before: 21-MAY-2000 11:23

Raw B0 Resistivity	3875	N/A	3845	N/A	N/A	N/A	OHMM
Raw B1 Resistivity	3830	N/A	3806	N/A	N/A	N/A	OHMM
Raw B2 Resistivity	3830	N/A	3815	N/A	N/A	N/A	OHMM

High resolution Integrated Logging Tool-CTS Wellsite Calibration - HILT Caliper Calibration
Before: 21-MAY-2000 11:17

HILT Caliper Zero Measurement	8.000	N/A	7.179	N/A	N/A	N/A	IN
HILT Caliper Plus Measurement	16.00	N/A	15.34	N/A	N/A	N/A	IN

High resolution Integrated Logging Tool-CTS Wellsite Calibration - Detector Calibration
Before: 7-MAY-2000 5:47

Gamma Ray Background	30.00	N/A	23.06	N/A	N/A	N/A	GAPI
Gamma Ray (Jig - Bkg)	193.6	N/A	193.6	N/A	N/A	17.60	GAPI
Gamma Ray (Calibrated)	165.0	N/A	173.7	N/A	N/A	15.00	GAPI

High resolution Integrated Logging Tool-CTS Wellsite Calibration - Zero Measurement
Master: 6-APR-2000 4:31 Before: 7-MAY-2000 5:49

CNTC Background	27.31	27.31	26.03	N/A	N/A	4.096	CPS
CFTC Background	28.31	28.31	30.62	N/A	N/A	4.247	CPS

High resolution Integrated Logging Tool-CTS Wellsite Calibration - Accelerometer Calibration
Before: Calibration not done

Z-Axis Acceleration	32.19	N/A	32.19	N/A	N/A	N/A	F/S2

The GLS-VJ source activity is acceptable.

The HGNS Neutron Master Calibration was done with the following parameters :

NCT-B Water Temperature	90.0	DEGF.
Thermal Housing Size	3.375	IN.

High resolution Integrated Logging Tool-CTS / Equipment Identification

Primary Equipment:

Array Induction Tool - H	AIT - H	
Rm/SP Bottom Nose	AHRM - A	
Array Induction Sonde	AHIS - BA	112
HILT high-Resolution Mechanical Sonde	HRMS - B	723
HILT Rxo Gamma-ray Device	HRGD -	723
HILT Nuclear Back-Scatter Detector	HILT -	
HILT Nuclear Short-Spacing Detector	HILT -	
HILT Nuclear Long-Spacing Detector	HILT -	

Auxiliary Equipment:

High resolution Integrated Logging Tool-CTS Wellsite Calibration

Electronics Calibration Check - Thru Cal Mag. & Phase

Idx	Phase	Value	Thru Cal Magnitude V	Nominal	Value	Phase DEG	Nominal
0	Master	0.6214		0.6050	64.91		71.00
	Before	0.6342			65.66		
1	Master	1.274		1.270	63.80		70.00
	Before	1.300			64.55		
2	Master	0.6329		0.6230	60.03		66.00
	Before	0.6459			60.78		
3	Master	0.7152		0.7040	59.25		65.00
	Before	0.7301			60.01		
4	Master	1.335		1.337	52.91		59.00
	Before	1.362			53.69		
5	Master	1.943		1.955	50.96		57.00
	Before	1.983			51.75		
6	Master	1.947		1.955	50.92		57.00
	Before	1.987			51.71		
7	Master	1.371		1.415	47.08		53.00
	Before	1.401			47.97		
			60.00 % (Minimum) (Nominal) 140.0 % (Maximum)			Nom -60.00 (Minimum) (Nominal) Nom + 60.00 (Maximum)	

Master: Calibration out of date 20-JAN-2000 11:39 Before: 21-MAY-2000 11:23

High resolution Integrated Logging Tool-CTS Wellsite Calibration

Electronics Calibration Check - Auxiliary

Phase	Array Induction SPA Plus MV	Value	Phase	Array Induction SPA Zero MV	Value
Master		989.8	Master		0.1083
Before		990.4	Before		0.1083
	941.0 (Minimum) 990.5 (Nominal) 1040 (Maximum)			-50.00 (Minimum) 0 (Nominal) 50.00 (Maximum)	
Phase	**Array Induction Temperature Plus V**	**Value**	**Phase**	**Array Induction Temperature Zero V**	**Value**
Master		0.9169	Master		0.0001095
Before		0.9175	Before		0.0001059
	0.8700 (Minimum) 0.9150 (Nominal) 0.9600 (Maximum)			-0.05000 (Minimum) 0 (Nominal) 0.05000 (Maximum)	

Master: Calibration out of date 20-JAN-2000 11:39 Before: 21-MAY-2000 11:23

High resolution Integrated Logging Tool-CTS Wellsite Calibration

Test Loop Gain Correction

Idx	Value	Test Loop Gain Magnitude V	Value	Phase DEG
0	1.042		0.3672	
		0.9500 (Minimum) 1.000 (Nominal) 1.050 (Maximum)		-3.000 (Minimum) 0 (Nominal) 3.000 (Maximum)
1	1.011		-0.6191	
		0.9500 (Minimum) 1.000 (Nominal) 1.050 (Maximum)		-3.000 (Minimum) 0 (Nominal) 3.000 (Maximum)
2	1.012		-0.01578	
		0.9500 (Minimum) 1.000 (Nominal) 1.050 (Maximum)		-3.000 (Minimum) 0 (Nominal) 3.000 (Maximum)
3	1.010		0.1871	
		0.9500 (Minimum) 1.000 (Nominal) 1.050 (Maximum)		-3.000 (Minimum) 0 (Nominal) 3.000 (Maximum)
4	0.9940		0.1325	
		0.9500 (Minimum) 1.000 (Nominal) 1.050 (Maximum)		-3.000 (Minimum) 0 (Nominal) 3.000 (Maximum)
5	0.9835		-0.1680	
		0.9500 (Minimum) 1.000 (Nominal) 1.050 (Maximum)		-3.000 (Minimum) 0 (Nominal) 3.000 (Maximum)
6	0.9934		0.2889	
		0.9500 (Minimum) 1.000 (Nominal) 1.050 (Maximum)		-3.000 (Minimum) 0 (Nominal) 3.000 (Maximum)
7	0.9945		-0.2642	
		0.9500 (Minimum) 1.000 (Nominal) 1.050 (Maximum)		-3.000 (Minimum) 0 (Nominal) 3.000 (Maximum)

Master: Calibration out of date 20-JAN-2000 11:39

High resolution Integrated Logging Tool-CTS Wellsite Calibration

Sonde Error Correction

Idx	Value	R Sonde Error Correction MM/M			Value	X Sonde Error Correction MM/M		
		(Minimum)	(Nominal)	(Maximum)		(Minimum)	(Nominal)	(Maximum)
0	-121.4	-231.0	-56.00	119.0	34.14	-2250	0	2250
1	149.7	114.0	159.0	204.0	-240.4	-625.0	0	625.0
2	113.9	66.00	111.0	156.0	67.33	-350.0	0	350.0
3	58.40	39.00	64.00	89.00	81.72	-250.0	0	250.0
4	24.16	15.00	25.00	35.00	-1.172	-63.00	0	63.00
5	11.67	4.000	14.00	24.00	-10.09	-50.00	0	50.00
6	7.431	5.000	10.00	15.00	10.78	-30.00	0	30.00
7	-3.605	-5.000	0	5.000	0.3313	-30.00	0	30.00

Master: Calibration out of date 20-JAN-2000 11:39

High resolution Integrated Logging Tool-CTS Wellsite Calibration

Mud Gain Correction

Idx	Value	Coarse - Mag, Real, Imag			Value	Fine - Mag, Real, Imag		
		(Minimum)	(Nominal)	(Maximum)		(Minimum)	(Nominal)	(Maximum)
0	1.013	0.8000	1.000	1.200	1.011	0.8000	1.000	1.200
1	1.013	0.8000	1.000	1.200	1.011	0.8000	1.000	1.200
2	1.013	0.8000	1.000	1.200	1.011	0.8000	1.000	1.200

Master: Calibration out of date 20-JAN-2000 11:39

High resolution Integrated Logging Tool-CTS Wellsite Calibration

Stab Measurement Summary

Phase	BS Window Ratio			Value	Phase	SS Window Ratio			Value	Phase	LS Window Ratio			Value
	(Minimum)	(Nominal)	(Maximum)			(Minimum)	(Nominal)	(Maximum)			(Minimum)	(Nominal)	(Maximum)	
Before	0.9818	1.033	1.085	1.022	Before	0.4754	0.5004	0.5255	0.5048	Before	0.2719	0.2862	0.3005	0.2864

Phase	BS Window Sum CPS			Value	Phase	SS Window Sum CPS			Value	Phase	LS Window Sum CPS			Value
	(Minimum)	(Nominal)	(Maximum)			(Minimum)	(Nominal)	(Maximum)			(Minimum)	(Nominal)	(Maximum)	
Before	13590	14310	15020	14410	Before	10920	11490	12070	11420	Before	1105	1163	1221	1156

Before: 7-MAY-2000 5:52

High resolution Integrated Logging Tool-CTS Wellsite Calibration

Photo-multiplier High Voltages Calibrations

Phase	BS PM High Voltage (Command) V			Value	Phase	SS PM High Voltage (Command) V			Value	Phase	LS PM High Voltage (Command) V			Value
	(Minimum)	(Nominal)	(Maximum)			(Minimum)	(Nominal)	(Maximum)			(Minimum)	(Nominal)	(Maximum)	
Before	1514	1614	1714	1634	Before	1816	1916	2016	1955	Before	1866	1966	2066	1974

Before: 7-MAY-2000 5:52

High resolution Integrated Logging Tool-CTS Wellsite Calibration

Crystal Quality Resolutions Calibration

Phase	BS Crystal Resolution %			Value	Phase	SS Crystal Resolution %			Value	Phase	LS Crystal Resolution %			Value
	(Minimum)	(Nominal)	(Maximum)			(Minimum)	(Nominal)	(Maximum)			(Minimum)	(Nominal)	(Maximum)	
Before	11.26	12.26	13.26	12.52	Before	10.63	11.63	12.63	12.18	Before	9.591	10.59	11.59	10.66

Before: 7-MAY-2000 5:52

High resolution Integrated Logging Tool-CTS Wellsite Calibration

MCFL Calibration

Phase	Raw B0 Resistivity OHMM			Value	Phase	Raw B1 Resistivity OHMM			Value	Phase	Raw B2 Resistivity OHMM			Value
	(Minimum)	(Nominal)	(Maximum)			(Minimum)	(Nominal)	(Maximum)			(Minimum)	(Nominal)	(Maximum)	
Before	3565	3875	4185	3845	Before	3524	3830	4136	3806	Before	3524	3830	4136	3815

Before: 21-MAY-2000 11:23

High resolution Integrated Logging Tool-CTS Wellsite Calibration

HILT Caliper Calibration

Phase	HILT Caliper Zero Measurement IN			Value	Phase	HILT Caliper Plus Measurement IN			Value
	(Minimum)	(Nominal)	(Maximum)			(Minimum)	(Nominal)	(Maximum)	
Before	6.000	8.000	10.00	7.179	Before	12.00	16.00	20.00	15.34

Before: 21-MAY-2000 11:17

High resolution Integrated Logging Tool-CTS Wellsite Calibration

Detector Calibration

Phase	Gamma Ray Background GAPI	Value	Phase	Gamma Ray (Jig - Bkg) GAPI	Value	Phase	Gamma Ray (Calibrated) GAPI	Value
Before		23.06	Before		193.6	Before		173.7
	0 (Minimum) 30.00 (Nominal) 120.0 (Maximum)			176.0 (Minimum) 193.6 (Nominal) 211.2 (Maximum)			150.0 (Minimum) 165.0 (Nominal) 180.0 (Maximum)	

Before: 7-MAY-2000 5:47

High resolution Integrated Logging Tool-CTS Wellsite Calibration

Zero Measurement

Phase	CNTC Background CPS	Value	Phase	CFTC Background CPS	Value
Master		27.31	Master		28.31
Before		26.03	Before		30.62
	5.000 (Minimum) 27.31 (Nominal) 40.00 (Maximum)			5.000 (Minimum) 28.31 (Nominal) 40.00 (Maximum)	

Master: 6-APR-2000 4:31 Before: 7-MAY-2000 5:49

High resolution Integrated Logging Tool-CTS Wellsite Calibration

Accelerometer Calibration

Phase	Z-Axis Acceleration F/S2	Value
Before		32.19
	31.53 (Minimum) 32.19 (Nominal) 32.84 (Maximum)	

Before: Calibration not done

COMPANY:	NORTHWEST NATURAL GAS	BOTTOM LOG INTERVAL	2136 ft
		SCHLUMBERGER DEPTH	2144 ft
WELL:	OM 22-26-65 RD	DEPTH DRILLER	2151 ft
FIELD:	MIST	KELLY BUSHING	631 ft
COUNTY:	COLUMBIA	DRILL FLOOR	629 ft
STATE:	OREGON	GROUND LEVEL	621 ft

Schlumberger

PLATFORM EXPRESS
BHC SONIC /SP/GR
SCALE: 5" = 100'