Schlumberger

Company: **JOGMEC**

Well: **AURORA/JOGMEC/NRCAN MALLIK 2L−38**
Field: **MALLIK**
Province: **NWT**

CEMENT VOLUME LOG

Province: NWT
Field: MALLIK
Location: GRID: 69−30−134−3(
Well: AURORA/JOGMEC/NRCAN MALLIK 2L−38
Company: JOGMEC

LOCATION

GRID: 69−30−134−3(
UWID: 302 L38 69−30−134−301

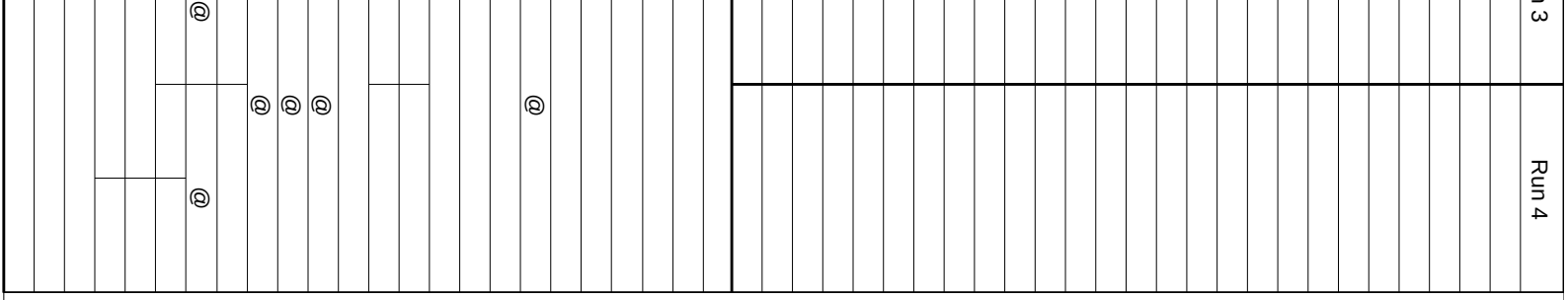
Elev.: K.B. 10.55 m
G.L. 1 m
D.F. 10.25 m

Permanent Datum: GROUND LEVEL — Elev.: 1 m
Log Measured From: KELLY BUSHING — 9.6 m above Perm. Datum
Drilling Measured From: KELLY BUSHING

API Serial No.
1163

	Run 1	Run 2	Run
Logging Date	3−Mar−2007		
Run Number	ONE		
Depth Driller	1147 m		
Schlumberger Depth	1133 m		
Bottom Log Interval	1114.5 m		
Top Log Interval	677 m		
Casing Driller Size @ Depth	339.700 mm @ 677 m	@	@
Casing Schlumberger	678 m		
Bit Size	361.950 mm		
Type Fluid In Hole	KCL POLYMER		
MUD Density / Viscosity	1120 kg/m3 / 63 s		
MUD Fluid Loss / PH	5 cm3 / 8.9		
MUD Source Of Sample	FLOWLINE		
RM @ Measured Temperature	0.113 ohm.m @ 21 degC	@	@
RMF @ Measured Temperature	0.150 ohm.m @ 22 degC	@	@
RMC @ Measured Temperature	0.158 ohm.m @ 21 degC	@	@
Source RMF / RMC	PRESS / PRESS		
RM @ MRT / RMF @ MRT	0.154 @ 9 / 0.210 @ 9	@ / @	@ / @
Maximum Recorded Temperatures	9 degC		
Circulation Stopped / Time	2−Mar−2007 / 19:00		
Logger On Bottom / Time	3−Mar−2007 / 08:30		
Unit Number / Location	1803 / NISKU, AB		
Recorded By	LANNY LAROCHE		
Witnessed By	TOKUJIRO TAKAYAMA		

	Run 1	Run 2	Run
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			
MUD Fluid Loss / PH			
MUD 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			



DEPTH SUMMARY LISTING

Date Created: 3−MAR−2007 9:28:42

Depth System Equipment

Depth Measuring Device		Tension Device		Logging Cable	
Type:	IDW−B	Type:	CMTD−B/A	Type:	7−46P−XS
Serial Number:	6423	Serial Number:	2565	Serial Number:	−999
Calibration Date:	09−JAN−2007	Calibration Date:	06−FEB−2007	Length:	6399.89 M
Calibrator Serial Number:	4	Calibrator Serial Number:	1111		
Calibration Cable Type:	7−46P−XS	Calibration Gain:	0.84	Conveyance Method:	Wireline
Wheel Correction 1:	−6	Calibration Offset:	−14.00	Rig Type:	LAND
Wheel Correction 2:	−7				

Depth Control Parameters

Log Sequence: First Log In the Well

Stretch Correction: 0.40 M
Tool Zero Check At Surface: 0.20 M

Depth Control Remarks

1. SPEED CORRECTION NOT APPLIED ON WELLSITE
2. UPLOG CORRELATED TO DOWNLOG
3.
4.
5.
6.

OTHER SERVICES1	OTHER SERVICES2
OS1: AIT−TLD−HGNS−CMR−EMS	OS1:
OS2:	OS2:
OS3:	OS3:
OS4:	OS4:
OS5:	OS5:

REMARKS: RUN NUMBER 1	REMARKS: RUN NUMBER 2
AIT LOGGED WITH 2.5in STANDOFF AND ECCENTERED WITH NON−CONDUCTIVE BOWSPRING	
TLD HAS LARGE HOLE KIT CALIPER INSTALLED	
HGNS HAS LARGE HOLE KIT INSTALLED	
CMR ECCENTERED WITH LARGE HOLE ECCENTRALIZER	
EMS HAS LARGE HOLE KIT INSTALLED	
BS = 12.25" FROM SC−900M	

BS = 14.25" FROM 900−1133M

BS = 9.875" FROM 1133−1147M

SLB ONLY LOGGED DOWN TO 1133M

REPEAT PERFORMED OVER 950−1050M

RIG: AKITA 62

CREW: JAMES MACDONALD / MARK KIMBALL / MIKE KLOC

RUN 1		RUN 2	
SERVICE ORDER #:	11709032	SERVICE ORDER #:	
PROGRAM VERSION:	14C0−302	PROGRAM VERSION:	
FLUID LEVEL:		FLUID LEVEL:	

LOGGED INTERVAL	START	STOP	LOGGED INTERVAL	START	STOP

EQUIPMENT DESCRIPTION

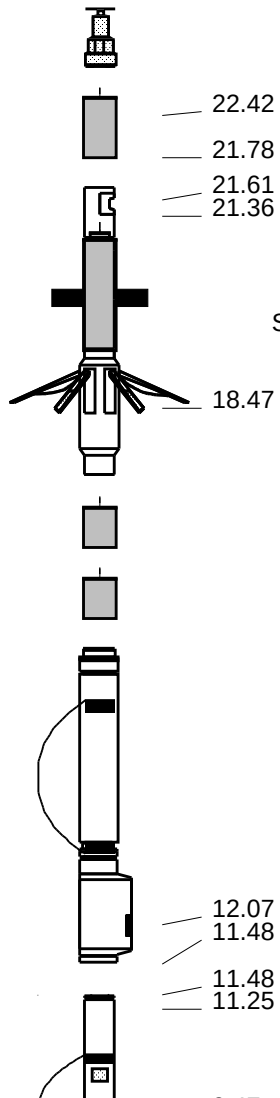
RUN 1 RUN 2

SURFACE EQUIPMENT

GSR−U/Y 6710
NCT−B
CNB−AB
NCS−VB

WITM (DTS)−A

DOWNHOLE EQUIPMENT



LEH−QT
LEH−QT — 23.59

DTC−H
ECH−KC
DTCH0−A
CTEM — 22.42
TelStatus
ToolStatu — 21.78
22.70

EMS−B
EMA−B
RES
EMC−B
ECH−KH
EMM−B
LONG_CAL_EXT
Mud Resis — 21.61
Mud Tempe — 21.36
21.78

82 MM Standoff

Calipers — 18.47

AH−224
AH−224 — 17.45

AH−224
AH−224 — 16.84

CMRT−B
CMRC−BA 202
CMRS−BA 182
EME−F
16.23

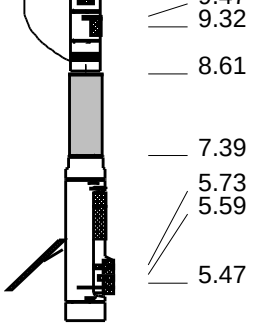
CMR−B Raw
CMR−B Sen — 12.07
CMR−B Dia — 11.48
HGNS HTEM
HMCA — 11.48
Gamma−Ray — 11.25

HILTH−FTB
HGNSD−H 4730
HMCA−H
HGNH
NLS−KL
11.48

Neutron E — 9.47

NSR−F 5196
HACCZ−H
HCNT−H
HGR
HRCC−H 4721
HRMS−H 4707
HRGD−H 4761
GLS−VJ 1904
MCFL Device−H
HILT Nucl. LS−H
HILT Nucl. SS−H
HILT Nucl. BS−H
BOW−SPR
NPV−N

Neutron N — 9.32
HGNS sens — 8.61
HRCC cart — 7.39
MCFL — 5.73
HILT cali — 5.59
HRDD−LS
HRDD−SS
HRDD−BS — 5.47



AIT−M
AMIS−A 175
AMRM−A

4.88
64 MM Standoff

Induction — 2.41
Temperatu
Power Sup
SP SENSOR — 0.03
DF
Cartridge HV
HTEN HMAS
Accelerom
Mud Resis
Tension — 0.00

TOOL ZERO

64 MM Standoff

MAXIMUM STRING DIAMETER 250 MM
MEASUREMENTS RELATIVE TO TOOL ZERO
ALL LENGTHS IN METERS

Schlumberger

CEMENT VOLUME LOG

MAXIS Field Log

Input DLIS Files

DEFAULT	SPLICE_AIT_TLD_MCFL_089	FN:1	PRODUCER	03−Mar−2007 11:47	1134.3 M	622.9 M

Output DLIS Files

DEFAULT	AIT_TLD_MCFL_CNL_091PUP	FN:110	PRODUCER	03−Mar−2007 11:51	1134.3 M	624.7 M
CUST	AIT_TLD_MCFL_CNL_091PUP	FN:111	PRODUCER	03−Mar−2007 11:51	1134.3 M	624.7 M

Integrated Hole/Cement Volume Summary

Hole Volume = 63.80 M3

Cement Volume = 42.33 M3 (assuming 244.50 MM casing O.D.)

Computed from 1134.3 M to 677.1 M using data channel(s) RD1 RD2 RD3 RD4 RD5 RD6

OP System Version: 14C0−302

MCM

AIT−M	14C0−302	HILTH−FTB	14C0−302
EMS−B	14C0−302	DTC−H	14C0−302

PIP SUMMARY

- **Integrated Hole Volume Minor Pip Every 0.1 M3**
- **Integrated Hole Volume Major Pip Every 1 M3**
- **Integrated Cement Volume Minor Pip Every 0.1 M3**

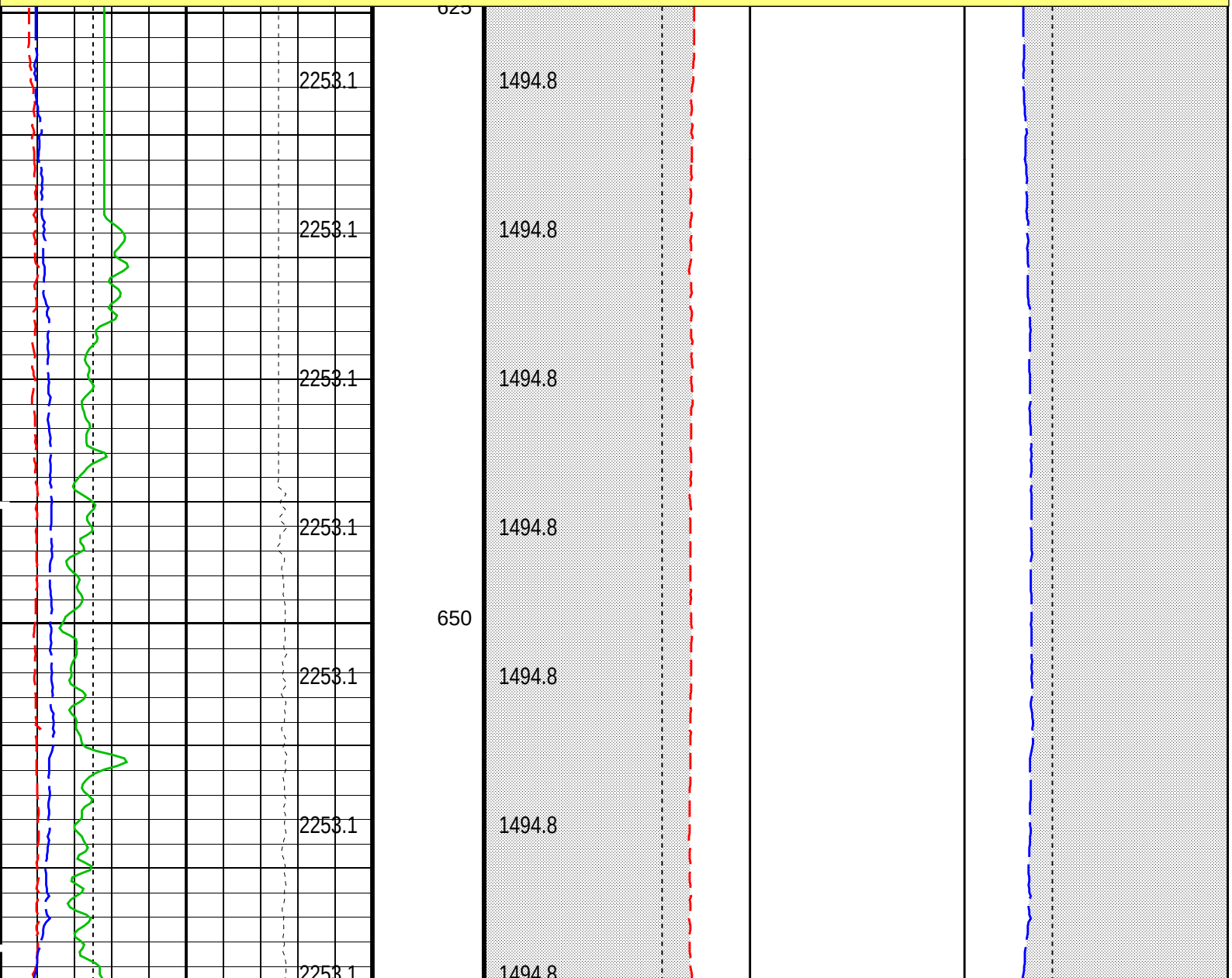
Integrated Cement Volume Major Dip Every 1 M3

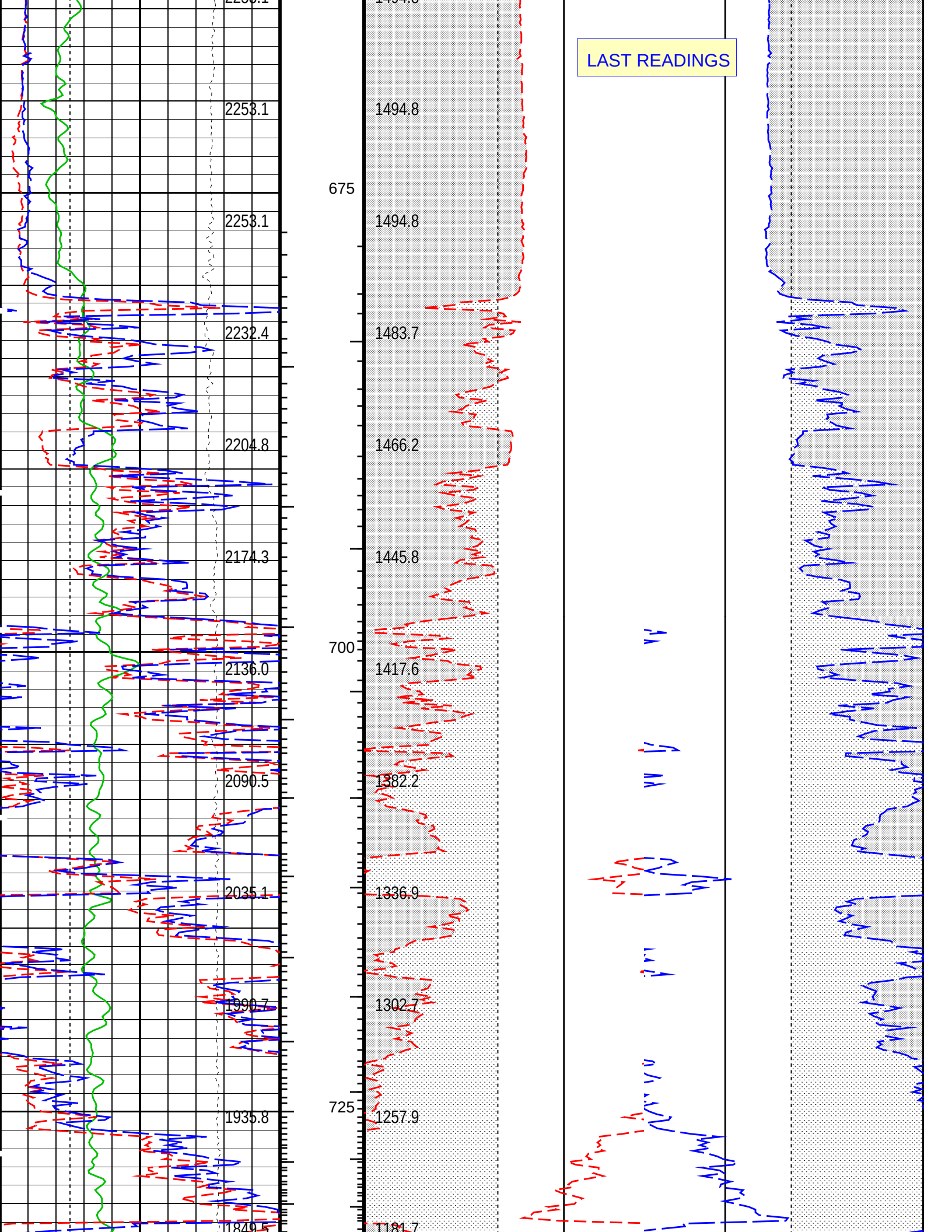
Time Mark Every 60 S

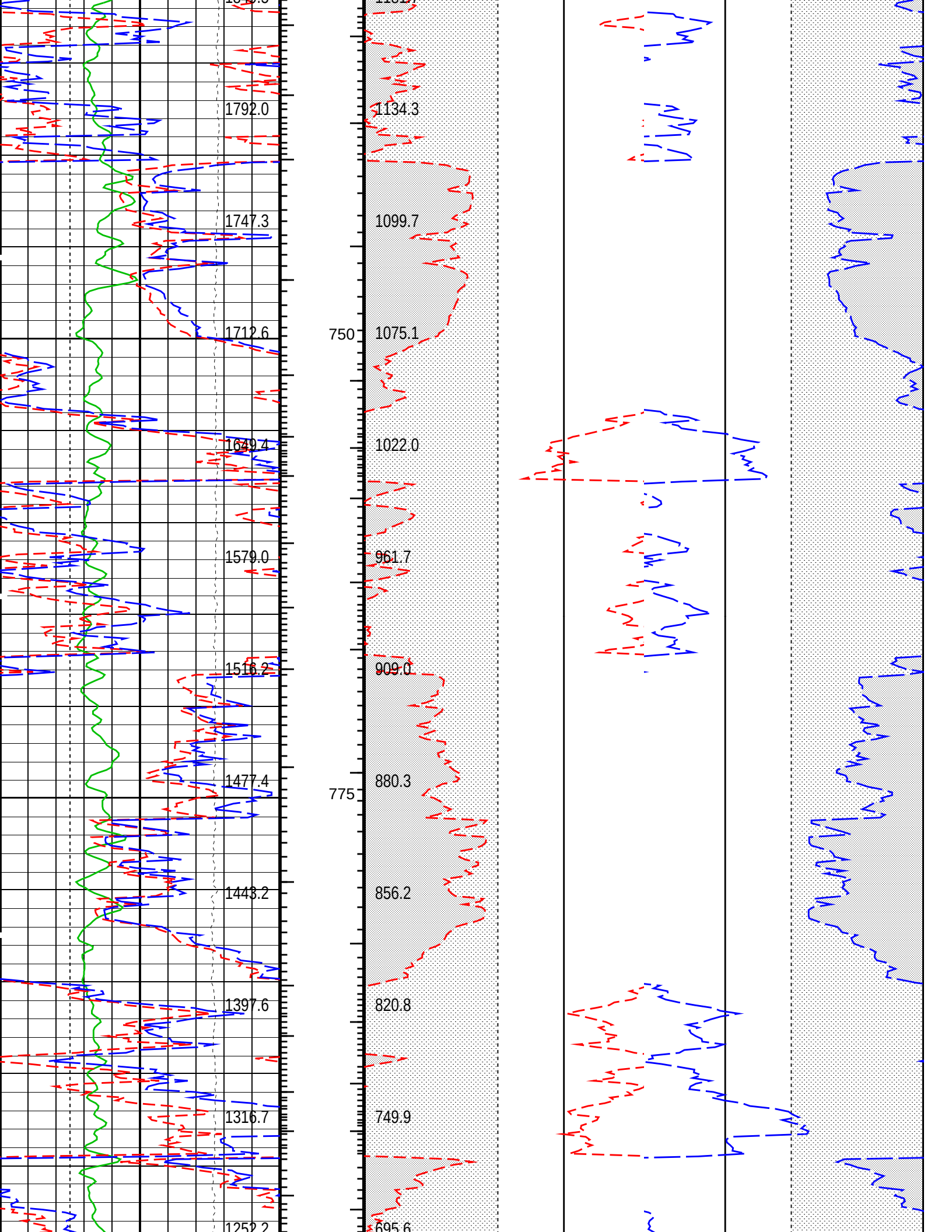
	Formation Between LHT2 and HDMI_1	Formation Between HDMX_1 and RHT3
	Washout From HDMI_1 to BS2	Washout From BS3 to HDMX_1
	Tight Spot From BS2 to HDMI_1	Tight Spot From HDMX_1 to BS3
	Annulus From BS2 to FCD2	Annulus From FCD3 to BS3
		Future Casing

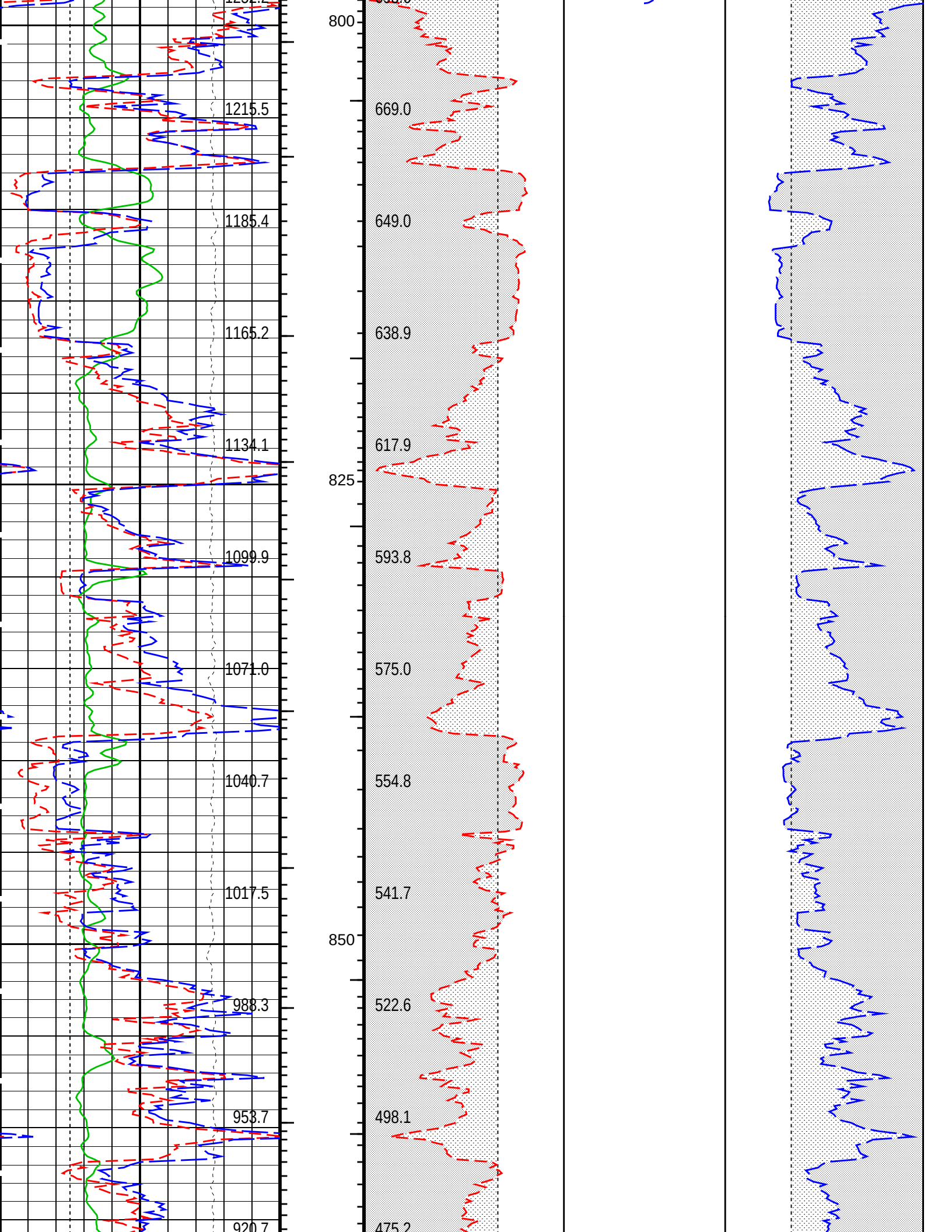
Tension (TENS) 25000 (N) 0		
Hole Diameter Maximum (HDMX) 300 (MM) 550		
Hole Diameter Minimum (HDMI) 300 (MM) 550	Hole Diameter Minimum (HDMI) 600 (MM) 100	Hole Diameter Maximum (HDMX) 100 (MM) 600
Gamma Ray (GR) 0 (GAPI) 150	FCD2 (FCD) 600 (MM) 100	FCD3 (FCD) 100 (MM) 600
Bit Size (BS) 300 (MM) 550	Bit Size (BS) 600 (MM) 100	Bit Size (BS) 100 (MM) 600

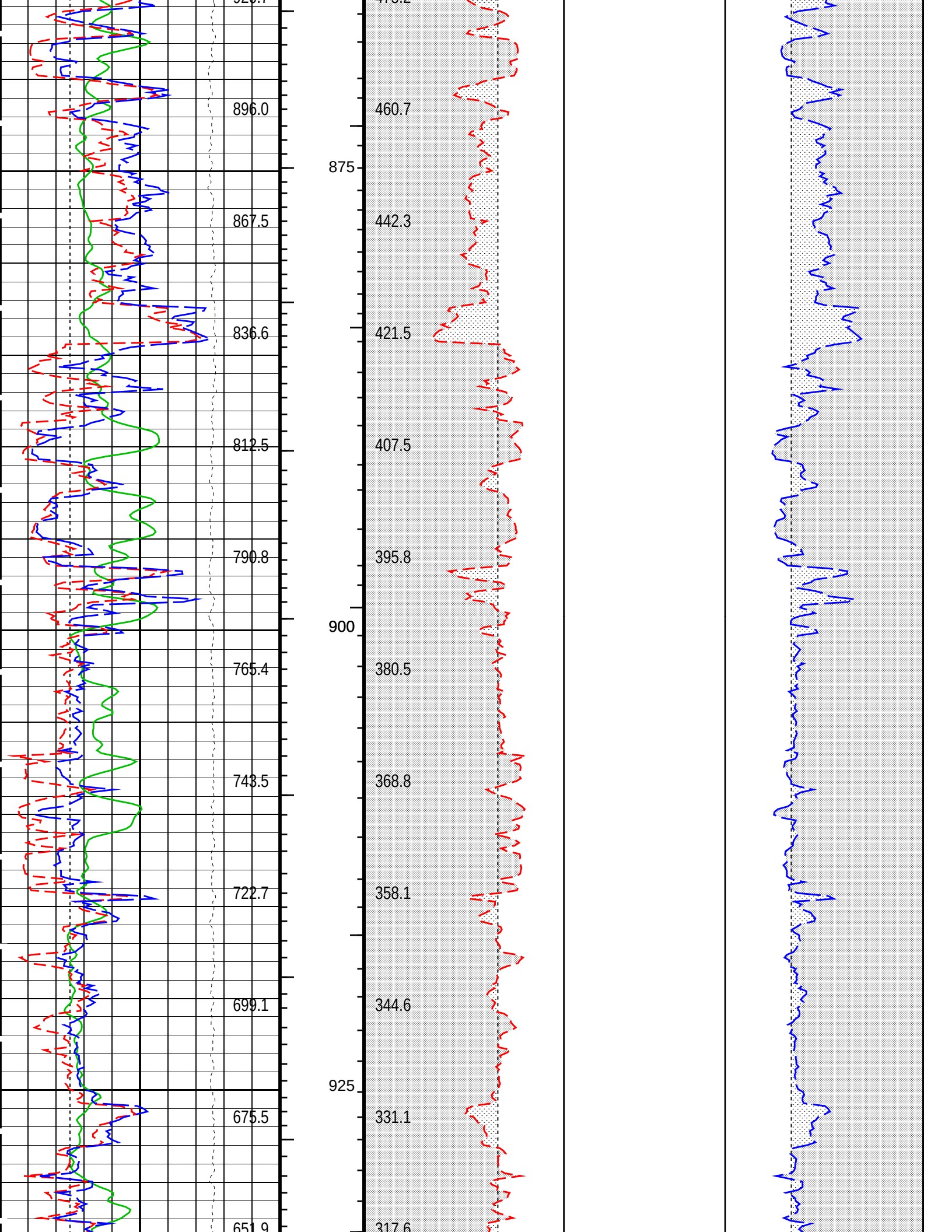
*** CEMENT VOLUME LOG ***

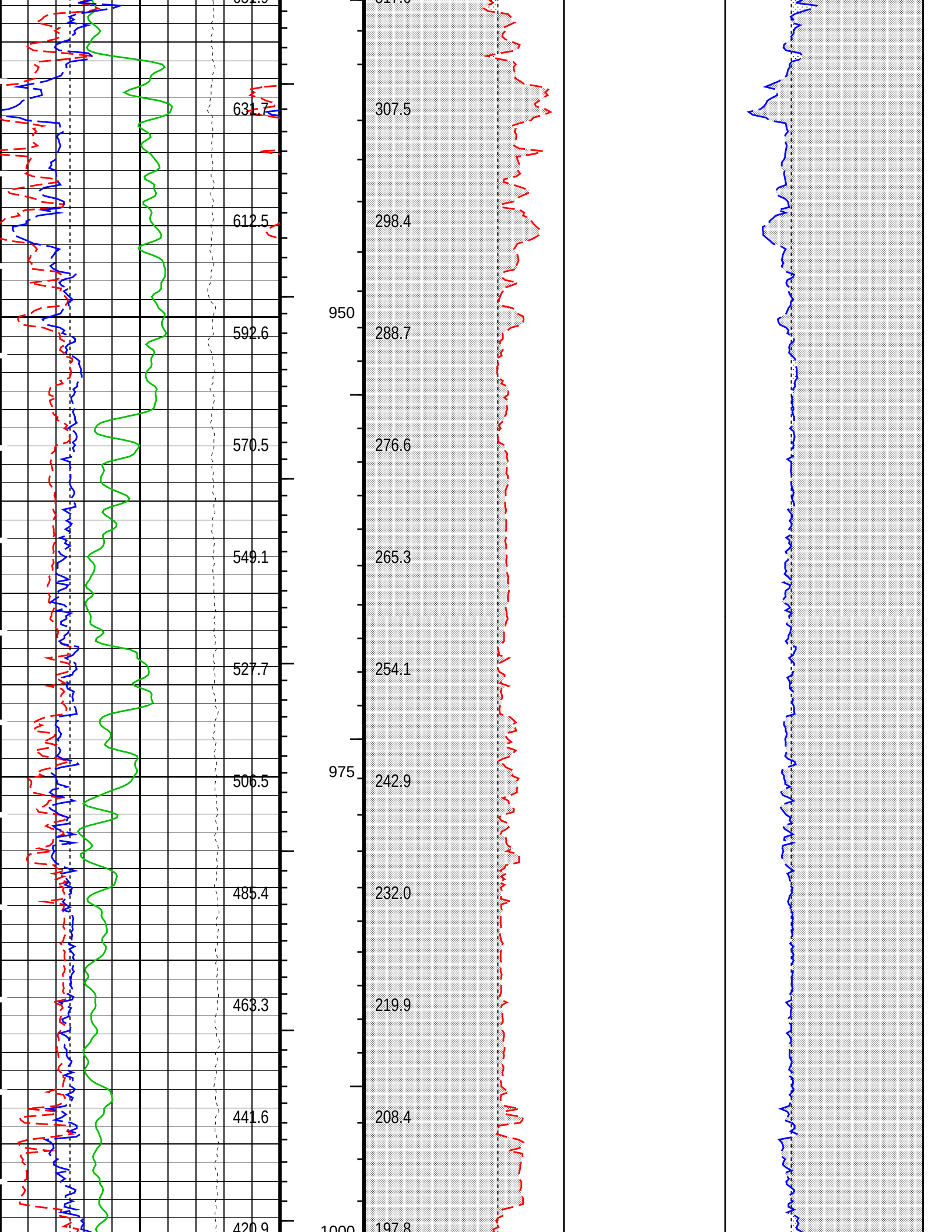


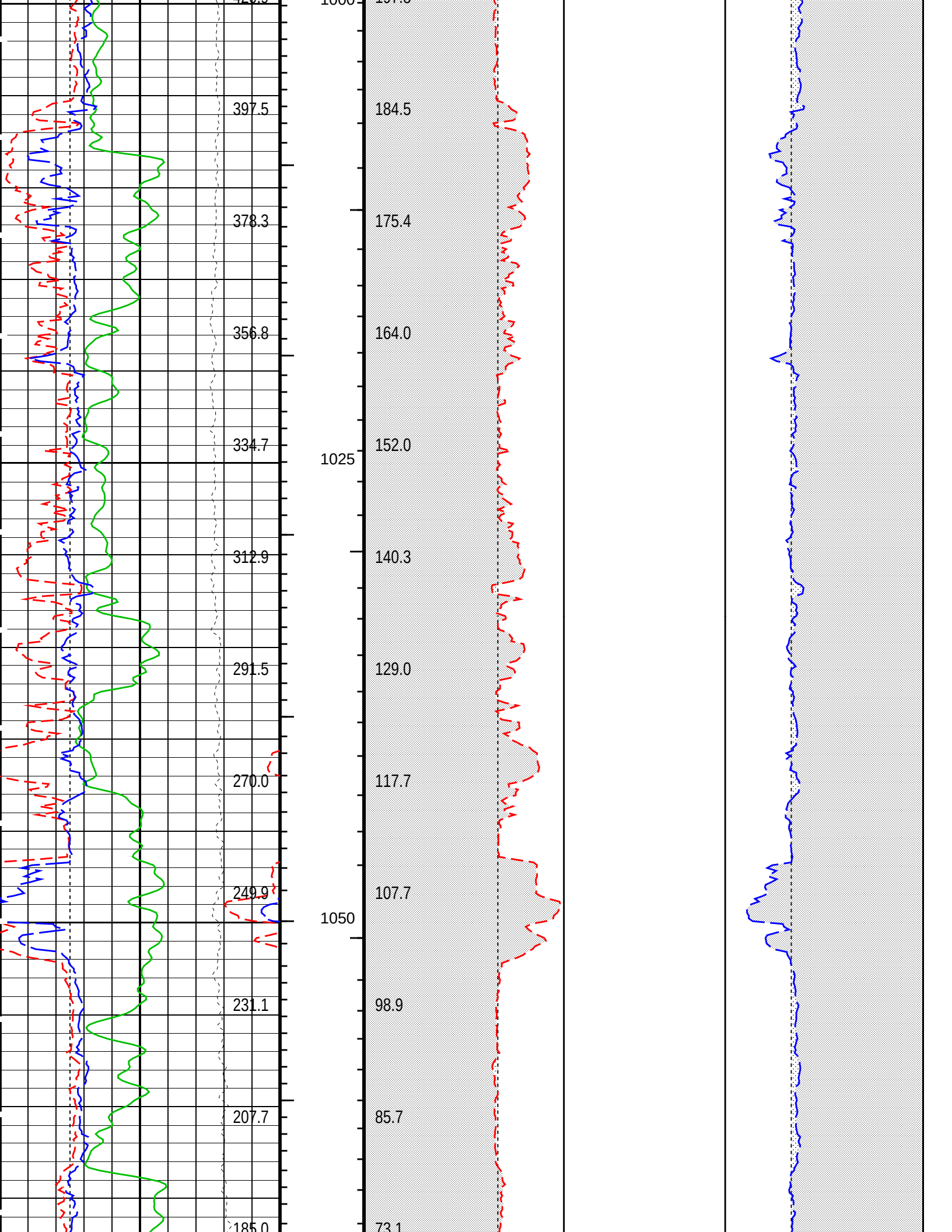

LAST READINGS
2253.1
2253.1
2232.4
2204.8
2174.3
2136.0
2090.5
2035.1
1990.7
1935.8
1840.5
675
700
725
1494.8
1494.8
1483.7
1466.2
1445.8
1417.6
1382.2
1336.9
1302.7
1257.9
1181.7

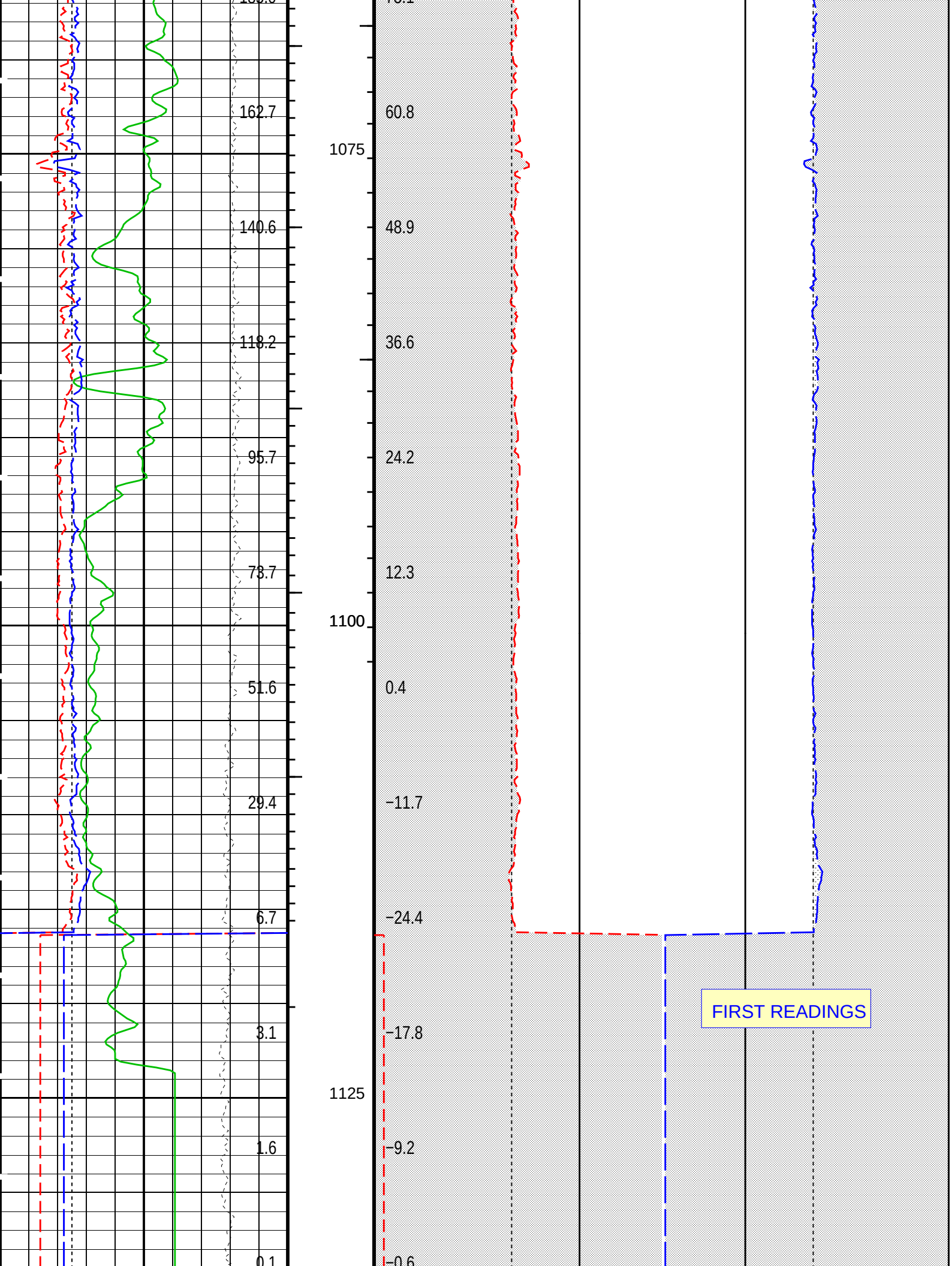

1792.0
1747.3
1712.6
1649.4
1579.0
1516.2
1477.4
1448.2
1397.6
1316.7
1252.2
1134.3
1099.7
750
1075.1
1022.0
961.7
909.0
775
880.3
856.2
820.8
749.9
695.6


1215.5
1185.4
1165.2
1134.1
1099.9
1071.0
1040.7
1017.5
988.3
953.7
920.7
800
669.0
649.0
638.9
617.9
825
593.8
575.0
554.8
541.7
850
522.6
498.1
475.2


896.0
867.5
836.6
812.5
790.8
765.4
743.5
722.7
699.1
675.5
651.9
875
900
925
460.7
442.3
421.5
407.5
395.8
380.5
368.8
358.1
344.6
331.1
317.6


631.7
612.5
592.6
570.5
549.1
527.7
506.5
485.4
463.3
441.6
420.9
307.5
298.4
950
288.7
276.6
265.3
254.1
975
242.9
232.0
219.9
208.4
1000
197.8


397.5
378.3
356.8
334.7
312.9
291.5
270.0
249.9
231.1
207.7
185.0
1000
184.5
175.4
164.0
152.0
1025
140.3
129.0
117.7
107.7
1050
98.9
85.7
73.1


162.7
140.6
118.2
95.7
73.7
51.6
29.4
6.7
3.1
1.6
0.1
1075
60.8
48.9
36.6
24.2
12.3
1100
0.4
−11.7
−24.4
−17.8
1125
−9.2
−0.6
FIRST READINGS

*** CEMENT VOLUME LOG ***

Bit Size (BS)	Bit Size (BS)	Bit Size (BS)
300 (MM) 550	600 (MM) 100	100 (MM) 600
Gamma Ray (GR)	FCD2 (FCD)	FCD3 (FCD)
0 (GAPI) 150	600 (MM) 100	100 (MM) 600
Hole Diameter Minimum (HDMI)	Hole Diameter Minimum (HDMI)	Hole Diameter Maximum (HDMX)
300 (MM) 550	600 (MM) 100	100 (MM) 600
Hole Diameter Maximum (HDMX)	Future Casing	
300 (MM) 550		
Tension (TENS)	Annulus From BS2 to FCD2	Annulus From FCD3 to BS3
25000 (N) 0	Tight Spot From BS2 to HDMI_1	Tight Spot From HDMX_1 to BS3
	Washout From HDMI_1 to BS2	Washout From BS3 to HDMX_1
	Formation Between LHT2 and HDMI_1	Formation Between HDMX_1 and RHT3

PIP SUMMARY

- Integrated Hole Volume Minor Pip Every 0.1 M3
- Integrated Hole Volume Major Pip Every 1 M3
- Integrated Cement Volume Minor Pip Every 0.1 M3
- Integrated Cement Volume Major Pip Every 1 M3

Time Mark Every 60 S

Parameters

DLIS Name	Description	Value	
	EMS−B: Environment Measurement Sonde		
ECOF	EMS Caliper Offset	50.8	MM
EFC	EMS Fixed Caliper Operation	OFF	
FCD	Future Casing (Outer) Diameter	244.5	MM
HVCS	Integrated Hole Volume Caliper Selection	EMS_Calipers	
	HOLEV: Integrated Hole/Cement Volume		
FCD	Future Casing (Outer) Diameter	244.5	MM
HVCS	Integrated Hole Volume Caliper Selection	EMS_Calipers	
	System and Miscellaneous		
BS	Bit Size	361.950	MM
DO	Depth Offset for Playback	0.0	M
DORL	Depth Offset for Repeat Analysis	0.0	M
PP	Playback Processing	RECOMPUTE	
TD	Total Depth	1147	M

Format: CVL Vertical Scale: 1:240 Graphics File Created: 03−Mar−2007 11:51

OP System Version: 14C0−302

MCM

AIT−M	14C0−302	HILTH−FTB	14C0−302
EMS−B	14C0−302	DTC−H	14C0−302

Input DLIS Files

DEFAULT	SPLICE_AIT_TLD_MCFL_089	FN:1	PRODUCER	03−Mar−2007 11:47	1134.3 M	622.9 M

Output DLIS Files

DEFAULT	AIT_TLD_MCFL_CNL_091PUP	FN:110	PRODUCER	03−Mar−2007 11:51
CUST	AIT_TLD_MCFL_CNL_091PUP	FN:111	PRODUCER	03−Mar−2007 11:51

Schlumberger

CALIBRATIONS

MAXIS Field Log

Calibration and Check Summary

Measurement	Nominal	Master	Before	After	Change	Limit	Units
Array Induction Tool − M Wellsite Calibration − Electronics Calibration Check − Thru Cal Mag. & Phase							
Master: 9−Jan−2007 16:33 Before: 2−Mar−2007 21:07							
Thru Cal Magnitude − 0	0	0.6106	0.6119	N/A	N/A	N/A	V
Thru Cal Magnitude − 1	0	1.251	1.254	N/A	N/A	N/A	V
Thru Cal Magnitude − 2	0	0.6204	0.6215	N/A	N/A	N/A	V
Thru Cal Magnitude − 3	0	0.6999	0.7012	N/A	N/A	N/A	V
Thru Cal Magnitude − 4	0	1.310	1.313	N/A	N/A	N/A	V
Thru Cal Magnitude − 5	0	1.909	1.912	N/A	N/A	N/A	V
Thru Cal Magnitude − 6	0	1.905	1.909	N/A	N/A	N/A	V
Thru Cal Magnitude − 7	0	1.370	1.372	N/A	N/A	N/A	V
Thru Cal Phase − 0	0	194.5	192.9	N/A	N/A	N/A	DEG
Thru Cal Phase − 1	0	193.4	191.8	N/A	N/A	N/A	DEG
Thru Cal Phase − 2	0	189.7	188.2	N/A	N/A	N/A	DEG
Thru Cal Phase − 3	0	189.0	187.4	N/A	N/A	N/A	DEG
Thru Cal Phase − 4	0	182.7	181.1	N/A	N/A	N/A	DEG
Thru Cal Phase − 5	0	181.0	179.4	N/A	N/A	N/A	DEG
Thru Cal Phase − 6	0	181.1	179.5	N/A	N/A	N/A	DEG
Thru Cal Phase − 7	0	180.5	178.8	N/A	N/A	N/A	DEG
Array Induction Tool − M Wellsite Calibration − Electronics Calibration Check − Auxiliary							
Master: 9−Jan−2007 16:33 Before: 2−Mar−2007 21:07							
Array Induction SPA Plus	991.0	992.5	992.9	N/A	N/A	N/A	MV
Array Induction SPA Zero	0	−0.1065	−0.06589	N/A	N/A	N/A	MV
Array Induction Temperature Pl	0.9170	0.9193	0.9197	N/A	N/A	N/A	V
Array Induction Temperature Ze	0	−0.0001016	−0.00007390	N/A	N/A	N/A	V
Array Induction Tool − M Wellsite Calibration − Test Loop Gain Correction							
Master: 9−Jan−2007 16:33							
Test Loop Gain Correctio − 0	0	1.044	N/A	N/A	N/A	N/A	V
Test Loop Gain Correctio − 1	0	1.044	N/A	N/A	N/A	N/A	V
Test Loop Gain Correctio − 2	0	1.026	N/A	N/A	N/A	N/A	V
Test Loop Gain Correctio − 3	0	1.018	N/A	N/A	N/A	N/A	V
Test Loop Gain Correctio − 4	0	1.005	N/A	N/A	N/A	N/A	V
Test Loop Gain Correctio − 5	0	1.004	N/A	N/A	N/A	N/A	V
Test Loop Gain Correctio − 6	0	1.013	N/A	N/A	N/A	N/A	V
Test Loop Gain Correctio − 7	0	1.025	N/A	N/A	N/A	N/A	V
Test Loop Gain Correctio − 0	0	0.7534	N/A	N/A	N/A	N/A	DEG
Test Loop Gain Correctio − 1	0	0.6562	N/A	N/A	N/A	N/A	DEG
Test Loop Gain Correctio − 2	0	0.06160	N/A	N/A	N/A	N/A	DEG
Test Loop Gain Correctio − 3	0	0.1409	N/A	N/A	N/A	N/A	DEG
Test Loop Gain Correctio − 4	0	0.1225	N/A	N/A	N/A	N/A	DEG
Test Loop Gain Correctio − 5	0	0.05437	N/A	N/A	N/A	N/A	DEG
Test Loop Gain Correctio − 6	0	0.4129	N/A	N/A	N/A	N/A	DEG
Test Loop Gain Correctio − 7	0	0.09432	N/A	N/A	N/A	N/A	DEG
Array Induction Tool − M Wellsite Calibration − Sonde Error Correction							
Master: 9−Jan−2007 16:33							
R Sonde Error Correction − 0	0	−18.53	N/A	N/A	N/A	N/A	MM/M
R Sonde Error Correction − 1	0	176.7	N/A	N/A	N/A	N/A	MM/M
R Sonde Error Correction − 2	0	101.8	N/A	N/A	N/A	N/A	MM/M
R Sonde Error Correction − 3	0	56.95	N/A	N/A	N/A	N/A	MM/M
R Sonde Error Correction − 4	0	23.72	N/A	N/A	N/A	N/A	MM/M
R Sonde Error Correction − 5	0	11.78	N/A	N/A	N/A	N/A	MM/M
R Sonde Error Correction − 6	0	9.211	N/A	N/A	N/A	N/A	MM/M
R Sonde Error Correction − 7	0	−2.205	N/A	N/A	N/A	N/A	MM/M
X Sonde Error Correction − 0	0	186.1	N/A	N/A	N/A	N/A	MM/M
X Sonde Error Correction − 1	0	−10.08	N/A	N/A	N/A	N/A	MM/M
X Sonde Error Correction − 2	0	2.897	N/A	N/A	N/A	N/A	MM/M
X Sonde Error Correction − 3	0	−11.83	N/A	N/A	N/A	N/A	MM/M
X Sonde Error Correction − 4	0	45.25	N/A	N/A	N/A	N/A	MM/M

X Sonde Error Correction − 5	0	4.755	N/A	N/A	N/A	N/A	MM/M
X Sonde Error Correction − 6	0	4.629	N/A	N/A	N/A	N/A	MM/M
X Sonde Error Correction − 7	0	5.289	N/A	N/A	N/A	N/A	MM/M

Array Induction Tool − M Wellsite Calibration − Mud Gain Correction
Master: 9−Jan−2007 16:33

Coarse − Mag, Real, Imag − 0	0	1.054	N/A	N/A	N/A	N/A	
Coarse − Mag, Real, Imag − 1	0	1.067	N/A	N/A	N/A	N/A	
Coarse − Mag, Real, Imag − 2	0	1.067	N/A	N/A	N/A	N/A	
Fine − Mag, Real, Imag − 0	0	1.077	N/A	N/A	N/A	N/A	
Fine − Mag, Real, Imag − 1	0	1.077	N/A	N/A	N/A	N/A	
Fine − Mag, Real, Imag − 2	0	1.077	N/A	N/A	N/A	N/A	

High resolution Integrated Logging Tool−DTS Wellsite Calibration − Stab Measurement Summary
Before: 2−Mar−2007 21:28

BS Window Ratio	0.7427	N/A	0.7435	N/A	N/A	N/A	
BS Window Sum	29280	N/A	29240	N/A	N/A	N/A	CPS
SS Window Ratio	0.4849	N/A	0.4833	N/A	N/A	N/A	
SS Window Sum	13080	N/A	13060	N/A	N/A	N/A	CPS
LS Window Ratio	0.3035	N/A	0.2974	N/A	N/A	N/A	
LS Window Sum	1545	N/A	1536	N/A	N/A	N/A	CPS

High resolution Integrated Logging Tool−DTS Wellsite Calibration − Photo−multiplier High Voltages Calibrations
Before: 2−Mar−2007 21:28

BS PM High Voltage (Command)	1376	N/A	1352	N/A	N/A	N/A	V
SS PM High Voltage (Command)	1421	N/A	1410	N/A	N/A	N/A	V
LS PM High Voltage (Command)	1301	N/A	1310	N/A	N/A	N/A	V

High resolution Integrated Logging Tool−DTS Wellsite Calibration − Crystal Quality Resolutions Calibration
Before: 2−Mar−2007 21:28

BS Crystal Resolution	10.78	N/A	10.84	N/A	N/A	N/A	%
SS Crystal Resolution	8.916	N/A	8.780	N/A	N/A	N/A	%
LS Crystal Resolution	8.952	N/A	9.048	N/A	N/A	N/A	%

High resolution Integrated Logging Tool−DTS Wellsite Calibration − MCFL Calibration
Before: 2−Mar−2007 21:29

Raw B0 Resistivity	3875	N/A	3870	N/A	N/A	N/A	OHMM
Raw B1 Resistivity	3830	N/A	3819	N/A	N/A	N/A	OHMM
Raw B2 Resistivity	3830	N/A	3828	N/A	N/A	N/A	OHMM

High resolution Integrated Logging Tool−DTS Wellsite Calibration − HILT Caliper Calibration
Before: 2−Mar−2007 21:51

HILT Caliper Zero Measurement	254.0	N/A	199.8	N/A	N/A	N/A	MM
HILT Caliper Plus Measurement	508.0	N/A	382.4	N/A	N/A	N/A	MM

High resolution Integrated Logging Tool−DTS Wellsite Calibration − Detector Calibration
Before: 2−Mar−2007 21:25

Gamma Ray Background	30.00	N/A	23.72	N/A	N/A	N/A	GAPI
Gamma Ray (Jig − Bkg)	185.1	N/A	185.1	N/A	N/A	16.83	GAPI
Gamma Ray (Calibrated)	165.0	N/A	165.0	N/A	N/A	15.00	GAPI

High resolution Integrated Logging Tool−DTS Wellsite Calibration − Zero Measurement
Master: 10−Jan−2007 15:23 Before: 2−Mar−2007 21:23

CNTC Background	26.53	26.53	26.48	N/A	N/A	3.980	CPS
CFTC Background	29.66	29.66	29.06	N/A	N/A	4.449	CPS

High resolution Integrated Logging Tool−DTS Wellsite Calibration − Ratio Measurement
Master: 10−Jan−2007 15:23

Thermal Near Corr. (Tank)	6031	6292	N/A	N/A	N/A	N/A	CPS
Thermal Far Corr. (Tank)	2793	2647	N/A	N/A	N/A	N/A	CPS
CNTC/CFTC (Tank)	2.159	2.377	N/A	N/A	N/A	N/A	

High resolution Integrated Logging Tool−DTS Wellsite Calibration − Accelerometer Calibration
Before: 3−Mar−2007 6:35

Z−Axis Acceleration	9.810	N/A	9.812	N/A	N/A	N/A	M/S2

High resolution Integrated Logging Tool−DTS Master Calibration − Inversion results
Master: 14−Feb−2007 15:55

Rho Aluminum	2596	2599	−−	−−	−−	−−	K/M3
Rho Magnesium	1686	1686	−−	−−	−−	−−	K/M3
Pe Aluminum	2.570	2.556	−−	−−	−−	−−	
Pe Magnesium	2.650	2.631	−−	−−	−−	−−	

High resolution Integrated Logging Tool−DTS Master Calibration − Deviation Summary
Master: 14−Feb−2007 15:55

BS Average Deviation	0	0.2316	−−	−−	−−	−−	%
BS Max Deviation	0	0.7406	−−	−−	−−	−−	%
SS Average Deviation	0	0.2254	−−	−−	−−	−−	%
SS Max Deviation	0	1.106	−−	−−	−−	−−	%
LS Average Deviation	0	0.6026	−−	−−	−−	−−	%
LS Max Deviation	0	1.170	−−	−−	−−	−−	%

Combinable Magnetic Resonance Tool − B Master Calibration − Calibration Fixture Measurement

Master: 3−Mar−2007 6:32

Tool Temperature MCAL	27.00	25.19	−−	−−	−−	−−	DEGC
LOOP Measurement MCAL	2300	1870	−−	−−	−−	−−	
Hall Probe B0 MCAL	52.00	52.68	−−	−−	−−	−−	MTES
Cal. Fixture Amplitude MCAL	37.50	28.32	−−	−−	−−	−−	%

Environment Measurement Sonde Wellsite Calibration − EMS Caliper Calibration

Before: 2−Mar−2007 22:46

Radius 1 Short Radius	101.6	N/A	100.3	N/A	N/A	5.080	MM
Radius 1 Long Radius	152.4	N/A	160.0	N/A	N/A	5.080	MM
Radius 2 Short Radius	152.4	N/A	165.1	N/A	N/A	5.080	MM
Radius 2 Long Radius	101.6	N/A	100.0	N/A	N/A	5.080	MM
Radius 3 Short Radius	101.6	N/A	94.47	N/A	N/A	5.080	MM
Radius 3 Long Radius	152.4	N/A	155.7	N/A	N/A	5.080	MM
Radius 4 Short Radius	152.4	N/A	160.1	N/A	N/A	5.080	MM
Radius 4 Long Radius	101.6	N/A	104.3	N/A	N/A	5.080	MM
Radius 5 Short Radius	101.6	N/A	107.8	N/A	N/A	5.080	MM
Radius 5 Long Radius	152.4	N/A	165.1	N/A	N/A	5.080	MM
Radius 6 Short Radius	152.4	N/A	162.4	N/A	N/A	5.080	MM
Radius 6 Long Radius	101.6	N/A	103.8	N/A	N/A	5.080	MM

The GLS−VJ source activity is acceptable.

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

NCT−B Water Temperature 18.0 DEGC.
Thermal Housing Size 85.725 MM.
NSR−F serial number 5196

Array Induction Tool − M / Equipment Identification

Primary Equipment:

Rm/SP Bottom Nose	AMRM − A	
Array Induction Sonde	AMIS − A	175

Auxiliary Equipment:

Array Induction Tool − M Wellsite Calibration

Electronics Calibration Check − Thru Cal Mag. & Phase

Idx	Phase	Value	Thru Cal Magnitude V	Nominal	Value	Thru Cal Phase DEG	Nominal
0	Master	0.6106		0.6100	194.5		197.0
	Before	0.6119			192.9		
1	Master	1.251		1.270	193.4		196.0
	Before	1.254			191.8		
2	Master	0.6204		0.6200	189.7		192.0
	Before	0.6215			188.2		
3	Master	0.6999		0.7000	189.0		191.0
	Before	0.7012			187.4		
4	Master	1.310		1.340	182.7		185.0
	Before	1.313			181.1		
5	Master	1.909		1.960	181.0		182.0
	Before	1.912			179.4		
6	Master	1.905		1.960	181.1		181.0
	Before	1.909			179.5		
7	Master	1.370		1.410	180.5		175.0
	Before	1.372			178.8		
		60.00 %		140.0 %	Nom −60.00		Nom + 60.00

		(Minimum)	(Nominal)	(Maximum)			(Minimum)	(Nominal)	(Maximum)

Master: 9−Jan−2007 16:33 Before: 2−Mar−2007 21:07

Array Induction Tool − M Wellsite Calibration

Electronics Calibration Check − Auxiliary

Phase	Array Induction SPA Plus MV	Value
Master		992.5
Before		992.9
	941.0 (Minimum) 991.0 (Nominal) 1040 (Maximum)	

Phase	Array Induction SPA Zero MV	Value
Master		−0.1065
Before		−0.06589
	−50.00 (Minimum) 0 (Nominal) 50.00 (Maximum)	

Phase	Array Induction Temperature Plus V	Value
Master		0.9193
Before		0.9197
	0.8710 (Minimum) 0.9170 (Nominal) 0.9630 (Maximum)	

Phase	Array Induction Temperature Zero V	Value
Master		−0.0001016
Before		−7.390E−00
	−0.05000 (Minimum) 0 (Nominal) 0.05000 (Maximum)	

Master: 9−Jan−2007 16:33 Before: 2−Mar−2007 21:07

Array Induction Tool − M Wellsite Calibration

Test Loop Gain Correction

Idx	Value	Test Loop Gain Correction Magnitude V	Value	Test Loop Gain Correction Phase DEG
0	1.044	0.9500 (Minimum) 1.000 (Nominal) 1.050 (Maximum)	0.7534	−3.000 (Minimum) 0 (Nominal) 3.000 (Maximum)
1	1.044	0.9500 (Minimum) 1.000 (Nominal) 1.050 (Maximum)	0.6562	−3.000 (Minimum) 0 (Nominal) 3.000 (Maximum)
2	1.026	0.9500 (Minimum) 1.000 (Nominal) 1.050 (Maximum)	0.06160	−3.000 (Minimum) 0 (Nominal) 3.000 (Maximum)
3	1.018	0.9500 (Minimum) 1.000 (Nominal) 1.050 (Maximum)	0.1409	−3.000 (Minimum) 0 (Nominal) 3.000 (Maximum)
4	1.005	0.9500 (Minimum) 1.000 (Nominal) 1.050 (Maximum)	0.1225	−3.000 (Minimum) 0 (Nominal) 3.000 (Maximum)
5	1.004	0.9500 (Minimum) 1.000 (Nominal) 1.050 (Maximum)	0.05437	−3.000 (Minimum) 0 (Nominal) 3.000 (Maximum)
6	1.013	0.9500 (Minimum) 1.000 (Nominal) 1.050 (Maximum)	0.4129	−3.000 (Minimum) 0 (Nominal) 3.000 (Maximum)
7	1.025	0.9500 (Minimum) 1.000 (Nominal) 1.050 (Maximum)	0.09432	−3.000 (Minimum) 0 (Nominal) 3.000 (Maximum)

Master: 9−Jan−2007 16:33

Array Induction Tool − M Wellsite Calibration

Sonde Error Correction

Idx	Value	R Sonde Error Correction MM/M	Value	X Sonde Error Correction MM/M
0	−18.53	−231.0 (Minimum) −56.00 (Nominal) 119.0 (Maximum)	186.1	−2250 (Minimum) 0 (Nominal) 2250 (Maximum)
1	176.7	114.0 (Minimum) 159.0 (Nominal) 204.0 (Maximum)	−10.08	−625.0 (Minimum) 0 (Nominal) 625.0 (Maximum)
2	101.8	66.00 (Minimum) 111.0 (Nominal) 156.0 (Maximum)	2.897	−350.0 (Minimum) 0 (Nominal) 350.0 (Maximum)
3	56.95	39.00 (Minimum) 64.00 (Nominal) 89.30 (Maximum)	−11.83	−250.0 (Minimum) 0 (Nominal) 250.0 (Maximum)
4	23.72	15.00 (Minimum) 25.00 (Nominal) 35.00 (Maximum)	45.25	−63.00 (Minimum) 0 (Nominal) 63.00 (Maximum)
5	11.78		4.755	

		4.000 (Minimum)	14.00 (Nominal)	24.00 (Maximum)		−50.00 (Minimum)	0 (Nominal)	50.00 (Maximum)
6	9.211				4.629			
		5.000 (Minimum)	10.00 (Nominal)	15.00 (Maximum)		−30.00 (Minimum)	0 (Nominal)	30.00 (Maximum)
7	−2.205				5.289			
		−5.000 (Minimum)	0 (Nominal)	5.000 (Maximum)		−30.00 (Minimum)	0 (Nominal)	30.00 (Maximum)

Master: 9−Jan−2007 16:33

Array Induction Tool − M Wellsite Calibration

Mud Gain Correction

Idx	Value	Coarse − Mag, Real, Imag			Value	Fine − Mag, Real, Imag		
0	1.054				1.077			
		0.8000 (Minimum)	1.000 (Nominal)	1.200 (Maximum)		0.8000 (Minimum)	1.000 (Nominal)	1.200 (Maximum)
1	1.067				1.077			
		0.8000 (Minimum)	1.000 (Nominal)	1.200 (Maximum)		0.8000 (Minimum)	1.000 (Nominal)	1.200 (Maximum)
2	1.067				1.077			
		0.8000 (Minimum)	1.000 (Nominal)	1.200 (Maximum)		0.8000 (Minimum)	1.000 (Nominal)	1.200 (Maximum)

Master: 9−Jan−2007 16:33

Array Induction Tool − M Master Calibration

Electronics Calibration Check − Thru Cal Mag. & Phase

Idx	Phase	Value	Thru Cal Magnitude V		Nominal	Value	Thru Cal Phase DEG		Nominal
0	Master	0.6106			0.6100	194.5			197.0
1	Master	1.251			1.270	193.4			196.0
2	Master	0.6204			0.6200	189.7			192.0
3	Master	0.6999			0.7000	189.0			191.0
4	Master	1.310			1.340	182.7			185.0
5	Master	1.909			1.960	181.0			182.0
6	Master	1.905			1.960	181.1			181.0
7	Master	1.370			1.410	180.5			175.0
		60.00 % (Minimum)		140.0 % (Maximum)		Nom −60.00 (Minimum)		Nom + 60.00 (Maximum)	

Master: 9−Jan−2007 16:33

Array Induction Tool − M Master Calibration

Electronics Calibration Check − Auxiliary

Phase	Array Induction SPA Plus MV			Value	Phase	Array Induction SPA Zero MV			Value
Master				992.5	Master				−0.1065
	941.0 (Minimum)	991.0 (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				0.9193	Master				−0.0001016
	0.8710 (Minimum)	0.9170 (Nominal)	0.9630 (Maximum)			−0.05000 (Minimum)	0 (Nominal)	0.05000 (Maximum)	

Master: 9−Jan−2007 16:33

Array Induction Tool − M Master Calibration

Test Loop Gain Correction

Idx	Value	Test Loop Gain Correction Magnitude V			Value	Test Loop Gain Correction Phase DEG		
0	1.044				0.7534			
		0.9500 (Minimum)	1.000 (Nominal)	1.050 (Maximum)		−3.000 (Minimum)	0 (Nominal)	3.000 (Maximum)
1	1.044				0.6562			
		0.9500 (Minimum)	1.000 (Nominal)	1.050 (Maximum)		−3.000 (Minimum)	0 (Nominal)	3.000 (Maximum)
2	1.026				0.06160			

		0.9500 (Minimum)	1.000 (Nominal)	1.050 (Maximum)		−3.000 (Minimum)	0 (Nominal)	3.000 (Maximum)
3	1.018				0.1409			
		0.9500 (Minimum)	1.000 (Nominal)	1.050 (Maximum)		−3.000 (Minimum)	0 (Nominal)	3.000 (Maximum)
4	1.005				0.1225			
		0.9500 (Minimum)	1.000 (Nominal)	1.050 (Maximum)		−3.000 (Minimum)	0 (Nominal)	3.000 (Maximum)
5	1.004				0.05437			
		0.9500 (Minimum)	1.000 (Nominal)	1.050 (Maximum)		−3.000 (Minimum)	0 (Nominal)	3.000 (Maximum)
6	1.013				0.4129			
		0.9500 (Minimum)	1.000 (Nominal)	1.050 (Maximum)		−3.000 (Minimum)	0 (Nominal)	3.000 (Maximum)
7	1.025				0.09432			
		0.9500 (Minimum)	1.000 (Nominal)	1.050 (Maximum)		−3.000 (Minimum)	0 (Nominal)	3.000 (Maximum)

Master: 9−Jan−2007 16:33

Array Induction Tool − M Master Calibration

Sonde Error Correction

Idx	Value	R Sonde Error Correction MM/M			Value	X Sonde Error Correction MM/M		
0	−18.53				186.1			
		−231.0 (Minimum)	−56.00 (Nominal)	119.0 (Maximum)		−2250 (Minimum)	0 (Nominal)	2250 (Maximum)
1	176.7				−10.08			
		114.0 (Minimum)	159.0 (Nominal)	204.0 (Maximum)		−625.0 (Minimum)	0 (Nominal)	625.0 (Maximum)
2	101.8				2.897			
		66.00 (Minimum)	111.0 (Nominal)	156.0 (Maximum)		−350.0 (Minimum)	0 (Nominal)	350.0 (Maximum)
3	56.95				−11.83			
		39.00 (Minimum)	64.00 (Nominal)	89.30 (Maximum)		−250.0 (Minimum)	0 (Nominal)	250.0 (Maximum)
4	23.72				45.25			
		15.00 (Minimum)	25.00 (Nominal)	35.00 (Maximum)		−63.00 (Minimum)	0 (Nominal)	63.00 (Maximum)
5	11.78				4.755			
		4.000 (Minimum)	14.00 (Nominal)	24.00 (Maximum)		−50.00 (Minimum)	0 (Nominal)	50.00 (Maximum)
6	9.211				4.629			
		5.000 (Minimum)	10.00 (Nominal)	15.00 (Maximum)		−30.00 (Minimum)	0 (Nominal)	30.00 (Maximum)
7	−2.205				5.289			
		−5.000 (Minimum)	0 (Nominal)	5.000 (Maximum)		−30.00 (Minimum)	0 (Nominal)	30.00 (Maximum)

Master: 9−Jan−2007 16:33

Array Induction Tool − M Master Calibration

Mud Gain Correction

Idx	Value	Coarse − Mag, Real, Imag			Value	Fine − Mag, Real, Imag		
0	1.054				1.077			
		0.8000 (Minimum)	1.000 (Nominal)	1.200 (Maximum)		0.8000 (Minimum)	1.000 (Nominal)	1.200 (Maximum)
1	1.067				1.077			
		0.8000 (Minimum)	1.000 (Nominal)	1.200 (Maximum)		0.8000 (Minimum)	1.000 (Nominal)	1.200 (Maximum)
2	1.067				1.077			
		0.8000 (Minimum)	1.000 (Nominal)	1.200 (Maximum)		0.8000 (Minimum)	1.000 (Nominal)	1.200 (Maximum)

Master: 9−Jan−2007 16:33

High resolution Integrated Logging Tool−DTS / Equipment Identification

Primary Equipment:

HILT high−Resolution Mechanical Sonde	HRMS − H	4707

HILT Rxo Gamma−ray Device	HRGD − H	4761
HILT Micro Cylindrically Focused Log Dev	MCFL − H	
GR Logging Source	GLS − VJ	1904
HILT High Res. Control Cartridge	HRCC − H	4721
HILT Gamma−Ray Neutron Sonde−DTS	HGNS − H	4730
HILT Gamma−Ray Device	HGR −	
HILT Neutron Detector with Alpha Source	HCNT − H	
Auxiliary Equipment:		
Neutron Calibration Tank	NCT − B	
Gamma Source Radioactive	GSR − U/Y	6710

High resolution Integrated Logging Tool−DTS Wellsite Calibration

Stab Measurement Summary

Phase	BS Window Ratio	Value	Phase	SS Window Ratio	Value	Phase	LS Window Ratio	Value
Before		0.7435	Before		0.4833	Before		0.2974
	0.7056 (Minimum) 0.7427 (Nominal) 0.7799 (Maximum)			0.4606 (Minimum) 0.4849 (Nominal) 0.5091 (Maximum)			0.2883 (Minimum) 0.3035 (Nominal) 0.3186 (Maximum)	
Phase	BS Window Sum CPS	Value	Phase	SS Window Sum CPS	Value	Phase	LS Window Sum CPS	Value
Before		29240	Before		13060	Before		1536
	27820 (Minimum) 29280 (Nominal) 30740 (Maximum)			12430 (Minimum) 13080 (Nominal) 13740 (Maximum)			1468 (Minimum) 1545 (Nominal) 1622 (Maximum)	

Before: 2−Mar−2007 21:28

High resolution Integrated Logging Tool−DTS 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
Before		1352	Before		1410	Before		1310
	1276 (Minimum) 1376 (Nominal) 1476 (Maximum)			1321 (Minimum) 1421 (Nominal) 1521 (Maximum)			1201 (Minimum) 1301 (Nominal) 1401 (Maximum)	

Before: 2−Mar−2007 21:28

High resolution Integrated Logging Tool−DTS Wellsite Calibration

Crystal Quality Resolutions Calibration

Phase	BS Crystal Resolution %	Value	Phase	SS Crystal Resolution %	Value	Phase	LS Crystal Resolution %	Value
Before		10.84	Before		8.780	Before		9.048
	9.775 (Minimum) 10.78 (Nominal) 11.78 (Maximum)			7.916 (Minimum) 8.916 (Nominal) 9.916 (Maximum)			7.952 (Minimum) 8.952 (Nominal) 9.952 (Maximum)	

Before: 2−Mar−2007 21:28

High resolution Integrated Logging Tool−DTS Wellsite Calibration

MCFL Calibration

Phase	Raw B0 Resistivity OHMM	Value	Phase	Raw B1 Resistivity OHMM	Value	Phase	Raw B2 Resistivity OHMM	Value
Before		3870	Before		3819	Before		3828
	3565 (Minimum) 3875 (Nominal) 4185 (Maximum)			3524 (Minimum) 3830 (Nominal) 4136 (Maximum)			3524 (Minimum) 3830 (Nominal) 4136 (Maximum)	

Before: 2−Mar−2007 21:29

High resolution Integrated Logging Tool−DTS Wellsite Calibration

HILT Caliper Calibration

Phase	HILT Caliper Zero Measurement MM	Value	Phase	HILT Caliper Plus Measurement MM	Value
Before		199.8	Before		382.4
	190.5 (Minimum) 254.0 (Nominal) 317.5 (Maximum)			381.0 (Minimum) 508.0 (Nominal) 635.0 (Maximum)	

Before: 2−Mar−2007 21:51

High resolution Integrated Logging Tool−DTS Wellsite Calibration

Detector Calibration

Phase	Gamma Ray Background GAPI	Value	Phase	Gamma Ray (Jig − Bkg) GAPI	Value	Phase	Gamma Ray (Calibrated) GAPI	Value
Before		23.72	Before		185.1	Before		165.0
	0 (Minimum) 30.00 (Nominal) 120.0 (Maximum)			168.3 (Minimum) 185.1 (Nominal) 201.9 (Maximum)			150.0 (Minimum) 165.0 (Nominal) 180.0 (Maximum)	

Before: 2−Mar−2007 21:25

High resolution Integrated Logging Tool−DTS Wellsite Calibration

Zero Measurement

Phase	CNTC Background CPS	Value	Phase	CFTC Background CPS	Value

Phase	CNTC Background CPS	Value	Phase	CFTC Background CPS	Value
Master		26.53	Master		29.66
Before		26.48	Before		29.06
	5.000 (Minimum) 26.53 (Nominal) 40.00 (Maximum)			5.000 (Minimum) 29.66 (Nominal) 40.00 (Maximum)	

Master: 10−Jan−2007 15:23 Before: 2−Mar−2007 21:23

High resolution Integrated Logging Tool−DTS Wellsite Calibration

Ratio Measurement

Phase	Thermal Near Corr. (Tank) CPS	Value	Phase	Thermal Far Corr. (Tank) CPS	Value	Phase	CNTC/CFTC (Tank)	Value
Master		6292	Master		2647	Master		2.377
	5000 (Minimum) 6031 (Nominal) 7200 (Maximum)			2075 (Minimum) 2793 (Nominal) 3125 (Maximum)			2.120 (Minimum) 2.159 (Nominal) 2.540 (Maximum)	

Master: 10−Jan−2007 15:23

High resolution Integrated Logging Tool−DTS
Wellsite Calibration

Accelerometer Calibration

Phase	Z−Axis Acceleration M/S2	Value
Before		9.812
	9.610 (Minimum) 9.810 (Nominal) 10.01 (Maximum)	

Before: 3−Mar−2007 6:35

High resolution Integrated Logging Tool−DTS Master Calibration

Inversion results

Phase	Rho Aluminum K/M3	Value	Phase	Rho Magnesium K/M3	Value
Master		2599	Master		1686
	2586 (Minimum) 2596 (Nominal) 2606 (Maximum)			1676 (Minimum) 1686 (Nominal) 1696 (Maximum)	
Phase	Pe Aluminum	Value	Phase	Pe Magnesium	Value
Master		2.556	Master		2.631
	2.470 (Minimum) 2.570 (Nominal) 2.670 (Maximum)			2.550 (Minimum) 2.650 (Nominal) 2.750 (Maximum)	

Master: 14−Feb−2007 15:55

High resolution Integrated Logging Tool−DTS Master Calibration

Deviation Summary

Phase	BS Average Deviation %	Value	Phase	SS Average Deviation %	Value	Phase	LS Average Deviation %	Value
Master		0.2316	Master		0.2254	Master		0.6026
	−0.6000 (Minimum) 0 (Nominal) 0.6000 (Maximum)			−1.000 (Minimum) 0 (Nominal) 1.000 (Maximum)			−1.500 (Minimum) 0 (Nominal) 1.500 (Maximum)	
Phase	BS Max Deviation %	Value	Phase	SS Max Deviation %	Value	Phase	LS Max Deviation %	Value
Master		0.7406	Master		1.106	Master		1.170
	−1.600 (Minimum) 0 (Nominal) 1.600 (Maximum)			−2.500 (Minimum) 0 (Nominal) 2.500 (Maximum)			−3.500 (Minimum) 0 (Nominal) 3.500 (Maximum)	

Master: 14−Feb−2007 15:55

High resolution Integrated Logging Tool−DTS Master Calibration

Zero Measurement

Phase	CNTC Background CPS	Value	Phase	CFTC Background CPS	Value
Master		26.53	Master		29.66
	5.000 (Minimum) 26.53 (Nominal) 40.00 (Maximum)			5.000 (Minimum) 29.66 (Nominal) 40.00 (Maximum)	

Master: 10−Jan−2007 15:23

High resolution Integrated Logging Tool−DTS Master Calibration

Tank Measurement

Phase	Thermal Near Corr. (Tank) CPS	Value	Phase	Thermal Far Corr. (Tank) CPS	Value	Phase	CNTC/CFTC (Tank)	Value
Master		6292	Master		2647	Master		2.377
	5000 (Minimum) 6031 (Nominal) 7200 (Maximum)			2075 (Minimum) 2793 (Nominal) 3125 (Maximum)			2.120 (Minimum) 2.159 (Nominal) 2.540 (Maximum)	

Master: 10−Jan−2007 15:23

Combinable Magnetic Resonance Tool − B / Equipment Identification

Primary Equipment:

CMR−B Sonde	CMRS − BA	182
CMR Cartridge	CMRC − BA	202

Auxiliary Equipment:

Combinable Magnetic Resonance Tool − B Master Calibration

Calibration Fixture Measurement

Phase	Tool Temperature MCAL DEGC	Value
Master		25.19
	10.00 (Minimum) 27.00 (Nominal) 44.00 (Maximum)	

Phase	LOOP Measurement MCAL	Value
Master		1870
	1500 (Minimum) 2300 (Nominal) 2900 (Maximum)	

Phase	Hall Probe B0 MCAL MTES	Value
Master		52.68
	50.00 (Minimum) 52.00 (Nominal) 55.00 (Maximum)	

Phase	Cal. Fixture Amplitude MCAL %	Value
Master		28.32
	25.00 (Minimum) 37.50 (Nominal) 50.00 (Maximum)	

Master: 3−Mar−2007 6:32

Environment Measurement Sonde / Equipment Identification

Primary Equipment:

EMS Mechanical	EMM − B
EMS Long Caliper Extention	LONG −
EMS Cartridge	EMC − B
EMS Adaptor	EMA − B
Resistivity Meter	RES −

Auxiliary Equipment:

Electronics Cartridge Housing	ECH − KH

Environment Measurement Sonde Wellsite Calibration

EMS Caliper Calibration

Phase	Radius 1 Short Radius MM	Value
Before		100.3
	76.20 (Minimum) 101.6 (Nominal) 127.0 (Maximum)	

Phase	Radius 1 Long Radius MM	Value
Before		160.0
	127.0 (Minimum) 152.4 (Nominal) 177.8 (Maximum)	

Phase	Radius 2 Short Radius MM	Value
Before		165.1
	127.0 (Minimum) 152.4 (Nominal) 177.8 (Maximum)	

Phase	Radius 2 Long Radius MM	Value
Before		100.0
	76.20 (Minimum) 101.6 (Nominal) 127.0 (Maximum)	

Phase	Radius 3 Short Radius MM	Value
Before		94.47
	76.20 (Minimum) 101.6 (Nominal) 127.0 (Maximum)	

Phase	Radius 3 Long Radius MM	Value
Before		155.7
	127.0 (Minimum) 152.4 (Nominal) 177.8 (Maximum)	

Phase	Radius 4 Short Radius MM	Value
Before		160.1
	127.0 (Minimum) 152.4 (Nominal) 177.8 (Maximum)	

Phase	Radius 4 Long Radius MM	Value
Before		104.3
	76.20 (Minimum) 101.6 (Nominal) 127.0 (Maximum)	

Phase	Radius 5 Short Radius MM	Value
Before		107.8
	76.20 (Minimum) 101.6 (Nominal) 127.0 (Maximum)	

Phase	Radius 5 Long Radius MM	Value
Before		165.1
	127.0 (Minimum) 152.4 (Nominal) 177.8 (Maximum)	

Phase	Radius 6 Short Radius MM	Value
Before		162.4
	127.0 (Minimum) 152.4 (Nominal) 177.8 (Maximum)	

Phase	Radius 6 Long Radius MM	Value
Before		103.8
	76.20 (Minimum) 101.6 (Nominal) 127.0 (Maximum)	

Before: 2−Mar−2007 22:46

Company: **JOGMEC**

Schlumberger

Well: **AURORA/JOGMEC/NRCAN MALLIK 2L−38**
Field: **MALLIK**
Province: **NWT**

CEMENT VOLUME LOG