

# DUAL LATEROLOG MICRO-SPHERICALLY FOCUSED LOG

Fold here

LOGGING DATA

GENERAL			GAMMA		ACOUSTIC			DENSITY			NEUTRON					
Run	Depth		Speed	Scale		Scale		Matrix	Scale		Matrix	Scale		Matrix		
No.	From	To	ft/min	L	R	L	R		L	R		L	R			
ONE	8710	8315	REC	0 API	150 API				30 %	-10 %	2.71 g/cc	30 %	-10 %	LIME		
ONE	8315	8300	REC	0 API	150 API											
DIRECTIONAL INFORMATION																
Maximum Deviation								@	KOP							@
Remarks: RUN ONE: CONNECTOR_SUB/FLEX/DTDD/HDDS/BRIDLE/CR/SP/BRIDLE/BS/GTET/CSNG/FLEX/DLLT/MSFL/BN RAN IN COMBINATION																
RUN TWO: CONNECTOR_SUB/FLEX/DTDD/HDDS/GTET/DSNT/SDLT/BN RAN IN COMBINATION																
BOREHOLE RUGOSITY, BITSIZE, TENSION PULLS AND WASHOUTS MAY EFFECT LOG QUALITY AND REPEATABILITY																
CHLORIDES REPORTED TO BE 54,000 ppm																
ANNULAR HOLE VOLUME CALCULATED USING 4.5-INCH CASING																
NO JEWELRY RAN PER CUSTOMER REQUEST DUE TO BOREHOLE SIZE.																
RUN ONE BRIDGED OUT AT 8580'. LOGGED OUT FROM THERE																
YOU CREW TODAY: B. CALWELL, T. RAFF,								RIG: NABORS M40								
THANK YOU FOR CHOOSING HALLIBURTON ENERGY SERVICES, GRAND JUNCTION, CO (970) 523-3600																
HALLIBURTON DOES NOT GUARANTEE THE ACCURACY OF ANY INTERPRETATION OF THE LOG DATA, CONVERSION OF LOG DATA TO PHYSICAL ROCK PARAMETERS OR RECOMMENDATIONS WHICH MAY BE GIVEN BY HALLIBURTON PERSONNEL OR WHICH APPEAR ON THE LOG OR IN ANY OTHER FORM. ANY USER OF SUCH DATA, INTERPRETATIONS, CONVERSIONS, OR RECOMMENDATIONS AGREES THAT HALLIBURTON IS NOT RESPONSIBLE EXCEPT WHERE DUE TO GROSS NEGLIGENCE OR WILLFUL MISCONDUCT, FOR ANY LOSS, DAMAGES, OR EXPENSES RESULTING FROM THE USE THEREOF.																
HALLIBURTON																

HALLIBURTON

PARAMETERS REPORT

Depth (ft)	Tool Name	Mnemonic	Description	Value	Units
TOP					
	SHARED	BS	Bit Size	6.000	in
	SHARED	UBS	Use Bit Size instead of Caliper for all applications.	No	
	SHARED	MDBS	Mud Base	Water	
	SHARED	MDWT	Borehole Fluid Weight	8.900	ppg
	SHARED	WAGT	Weighting Agent	Natural	
	SHARED	BSAL	Borehole salinity	54000.00	ppm
	SHARED	FSAL	Formation Salinity NaCl	0.00	ppm
	SHARED	KPCT	Percent K in Mud by Weight?	0.00	%
	SHARED	RMUD	Mud Resistivity	0.114	ohmm
	SHARED	TRM	Temperature of Mud	66.8	degF
	SHARED	CSD	Logging Interval is Cased?	No	
	SHARED	ICOD	AHV Casing OD	4.500	in
	SHARED	ST	Surface Temperature	75.0	degF
	SHARED	TD	Total Well Depth	8725.00	ft
	SHARED	BHT	Bottom Hole Temperature	200.0	degF
	SHARED	SVTM	Navigation and Survey Master Tool	NONE	
	SHARED	AZTM	High Res Z Accelerometer Master Tool	GTET	
	SHARED	TEMM	Temperature Master Tool	NONE	
	Rwa / CrossPlot	XPOK	Process Crossplot?	Yes	
	Rwa / CrossPlot	FCHO	Select Source of F	Automatic	
	Rwa / CrossPlot	AFAC	Archie A factor	0.6200	

HALLIBURTON

Plot Time: 03-Dec-14 23:36:01  
Plot Range: 8278.33 ft to 8585 ft  
Data: KINDER\_CD\_4\Well Based\  
Plot File: \\DLLT\2" DLLT

MAIN PASS 2" = 100'

0GAMMA RAY150

api

4CALIPER14

inches

-40SP160

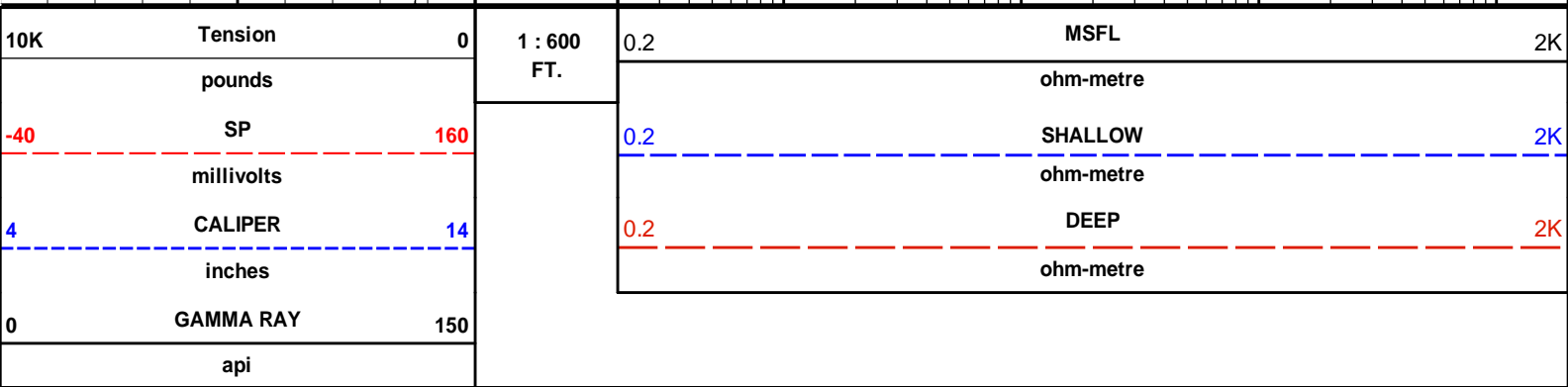
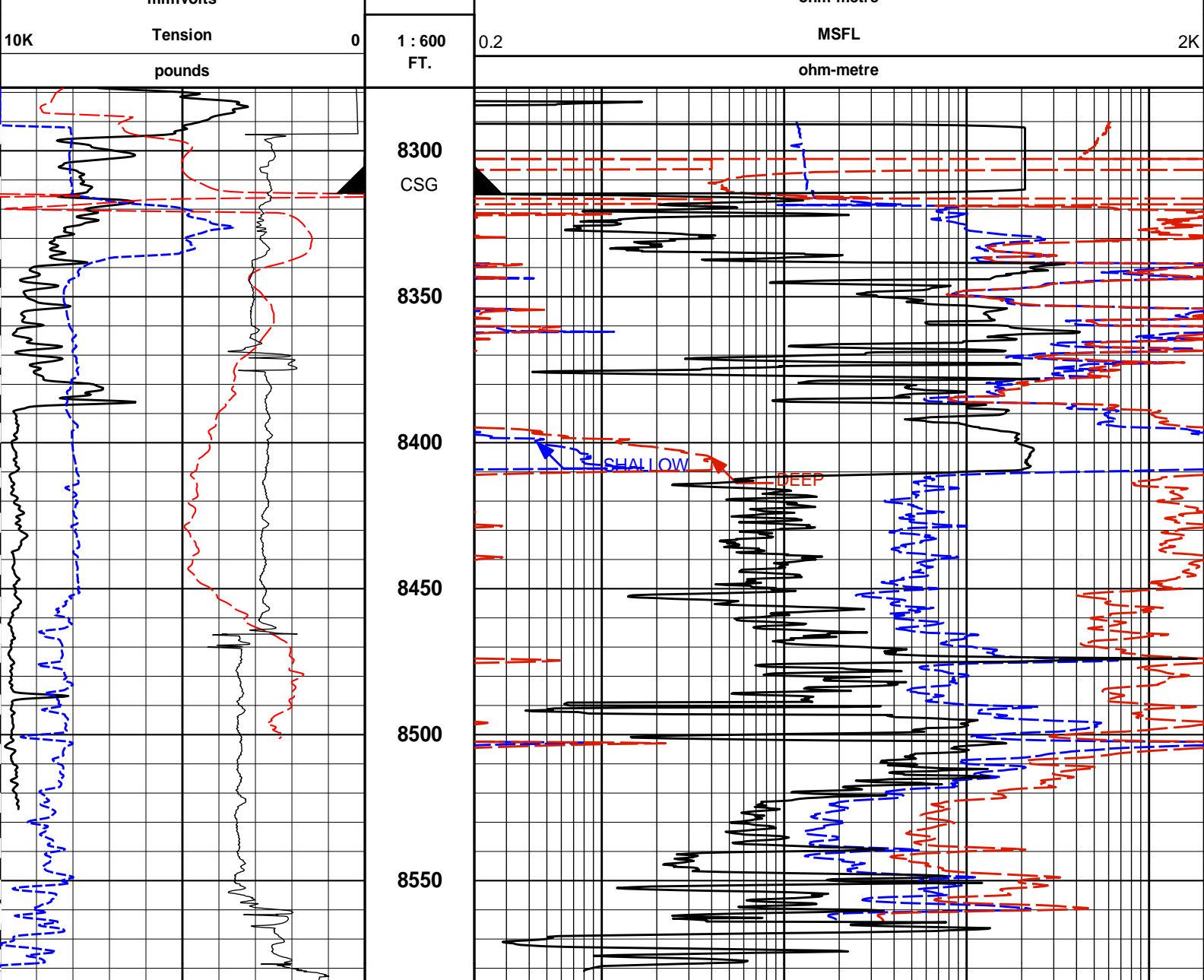
millivolts

0.2DEEP2k

ohm-metre

0.2SHALLOW2k

ohm-metre



HALLIBURTON

Plot Time: 03-Dec-14 23:36:03  
Plot Range: 8278.33 ft to 8585 ft  
Data: KINDER\_CD\_4\Well Based\\*\  
Plot File: \DLLT2" DLLT

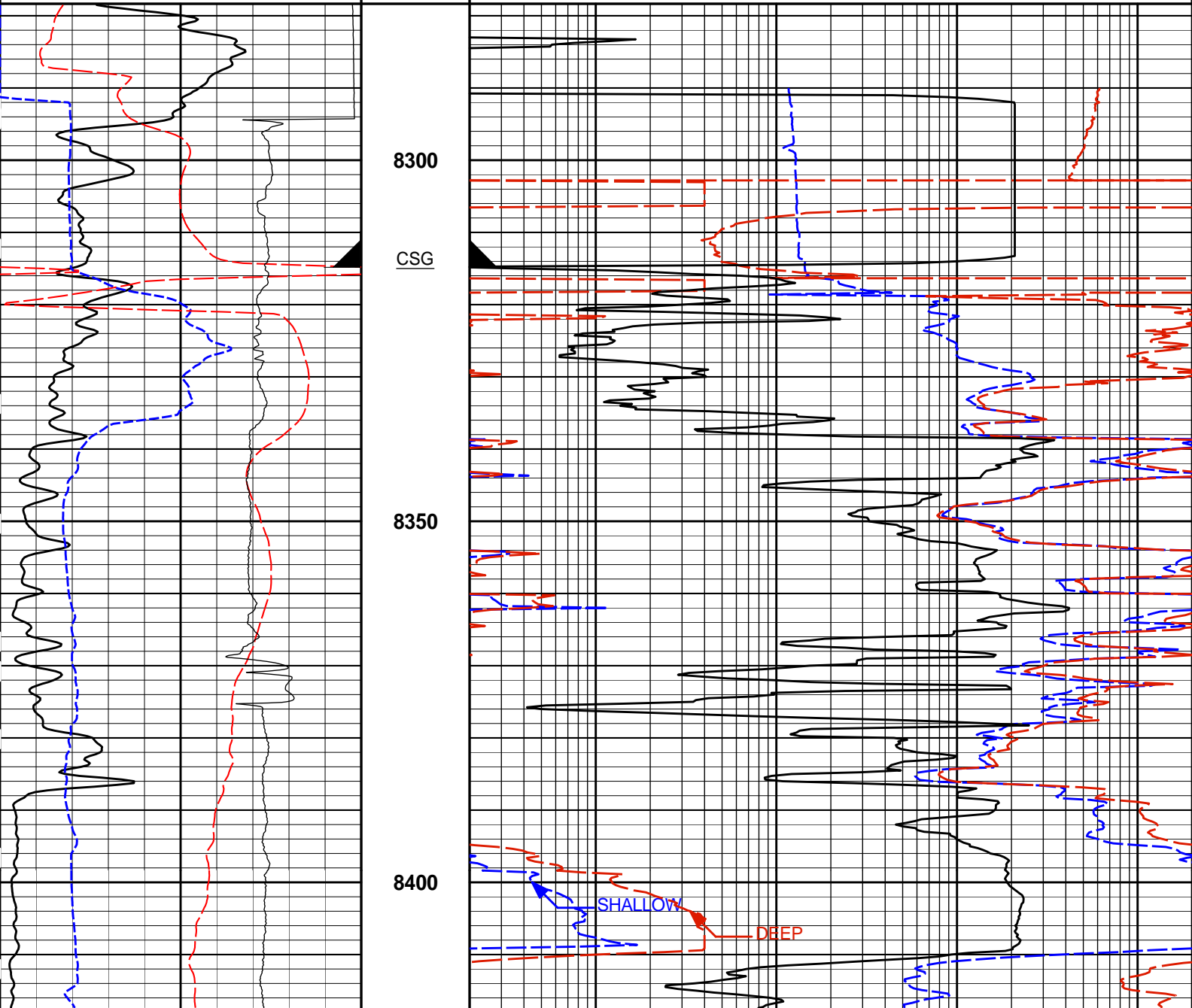
MAIN PASS 2" = 100'

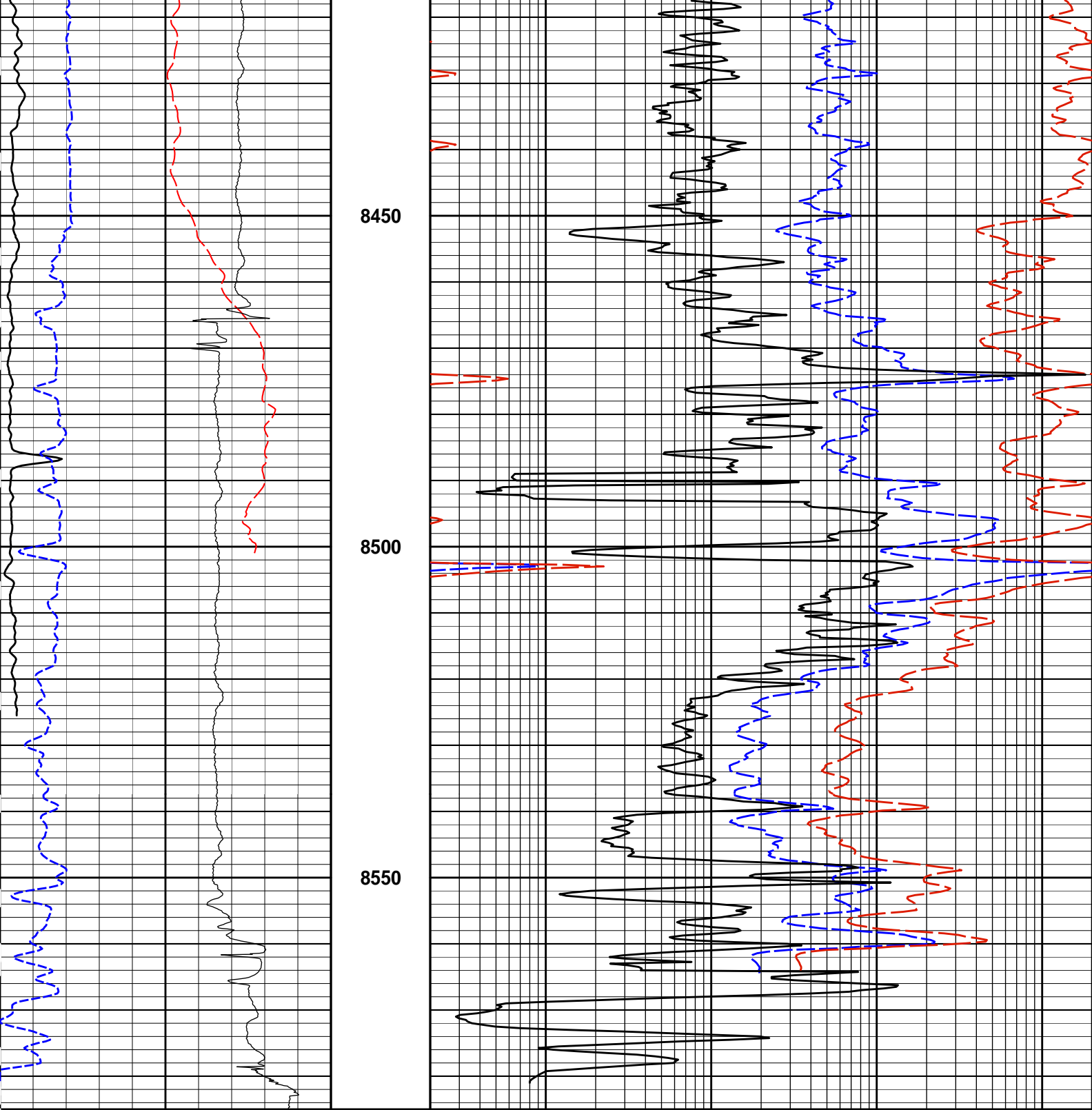
MAIN PASS 5" = 100'

0	GAMMA RAY	150
	api	
4	CALIPER	14
	inches	
-40	SP	160
	millivolts	
10K	Tension	0
	pounds	

1 : 240  
FT.

0.2	DEEP	2K
	ohm-metre	
0.2	SHALLOW	2K
	ohm-metre	
0.2	MSFL	2K
	ohm-metre	





10K	Tension	0	1 : 240	0.2	MSFL	2K
	pounds		FT.		ohm-metre	
-40	SP	160		0.2	SHALLOW	2K
	millivolts				ohm-metre	
4	CALIPER	14		0.2	DEEP	2K
	inches				ohm-metre	
0	GAMMA RAY	150				
	api					

**MAIN PASS 5" = 100'****HALLIBURTON****CALIBRATION REPORT****NATURAL GAMMA RAY TOOL SHOP CALIBRATION****Tool Name:** GTET - 11958949**Reference Calibration Date:** 30-Sep-14 09:24:46**Engineer:** B. RIDDEL**Calibration Date:** 01-Dec-14 07:12:41**Software Version:** WL INSITE R4.2.0 (Build 2)**Calibration Version:** 1

Calibrator Source S/N: MP051807-04

Calibrator API Reference:239.00 api

Equivalent Calibrator API Reference:243.2 api

Measurement	Measured	Calibrated	Units
Background	27.7	27.7	api
Background + Calibrator	270.8	270.9	api
Calibrator	243.1	243.2	api

**NATURAL GAMMA RAY TOOL FIELD CALIBRATION****Tool Name:** GTET - 11958949**Reference Calibration Date:** 01-Dec-14 07:12:41**Engineer:** B. RIDDEL**Calibration Date:** 02-Dec-14 03:08:42**Software Version:** WL INSITE R4.2.0 (Build 2)**Calibration Version:** 1

Calibrator Source S/N: MP051807-04

Calibrator API Reference:239.00 api

Equivalent Calibrator API Reference:243.2 api

Field Verification	Shop	Field	Units
Background	27.7	32.9	api
Background + Calibrator	270.9	276.2	api
Calibrator	243.2	243.3	api

Shop	Field	Difference	Tolerance
243.2	243.3	-0.1	+/- 9.00

**CSNG-FS SHOP CALIBRATION****Tool Name:** CSNG - 10971168**Reference Calibration Date:** 27-May-14 18:23:19**Engineer:** B. RIDDEL**Calibration Date:** 02-Dec-14 03:00:38**Software Version:** WL INSITE R4.2.0 (Build 2)**Calibration Version:** 1**Source SN:** MP051807-04

TITANIUM CASE	Measured	Calibrated	Units
60 KEV Peak Channel #	48.0	48.0	Channel #
239 KEV Peak Channel #	23.6	23.7	Channel #
583 KEV Peak Channel #	52.3	52.9	Channel #
2614 KEV Peak Channel #	213.2	216.4	Channel #
Calibrate Temperature	84.7	53.2	degF

Pass/Fail Summary	Centroid
239 KEV Peak	Passed
583 KEV Peak	Passed
2614 KEV Peak	Passed

Blanket Reference Value: 239.00 API  
Calibrator Value: 271.4 API

	Counts	Units	Measured	Calibrated	Units
Thorium Blanket	1454.2	CPS	340.2	293.2	API
Background	108.0	CPS	68.8	21.8	API

Gamma Ray Gain: 1.01  
Expected Gain Range: 0.85 - 1.15  
Gamma Gain Check: Passed

**CSNG-FS FIELD CALIBRATION**

Tool Name:	CSNG - 10971168	Reference Calibration Date:	02-Dec-14 03:00:38
Engineer:	B. RIDDEL	Calibration Date:	02-Dec-14 03:12:55
Software Version:	WL INSITE R4.2.0 (Build 2)	Calibration Version:	1
Source SN:			

TITANIUM CASE	Shop	Field	Units
60 KEV Peak Channel #	48.0	48.0	Channel #
239 KEV Peak Channel #	23.7	23.7	Channel #
583 KEV Peak Channel #	52.9	52.8	Channel #
2614 KEV Peak Channel #	216.4	216.3	Channel #
Calibrate Temperature	53.2	55.0	degF

Pass/Fail Summary	Centroid
239 KEV Peak	Passed
583 KEV Peak	Passed
2614 KEV Peak	Passed

Blanket Reference Value: 239.00 API  
Calibrator Value: 271.4 API

	Counts	Units	Measured	Calibrated	Units
Thorium Blanket	1457.6	CPS	293.2	293.0	API
Background	107.2	CPS	21.8	21.6	API

Gamma Ray Gain: 1.01  
Expected Gain Range: 0.85 - 1.15  
Gamma Gain Check: Passed

**DUAL LATEROLOG SHOP CALIBRATION**

Tool Name:	DLLT-I Sonde - 10731630	Reference Calibration Date:	14-Oct-14 11:18:22
Engineer:	B. RIDDEL	Calibration Date:	14-Oct-14 11:24:52
Software Version:	WL INSITE R4.2.0 (Build 2)	Calibration Version:	1
Host Tool Name:	DLLT-I Measurement - 11563863	Extra Host Tool Name1:	DLLT-I Power and Telemetry - 11527994

Measurement	Deep	Deep	Shallow	Shallow	Units
-------------	------	------	---------	---------	-------



Measurement	Measured	Calibrated	Measured	Calibrated	Units
External Cal Point #1	1.03	1.04	1.02	1.00	ohmm
External Cal Point #2	119.19	119.47	100.22	99.63	ohmm
External Cal Point #3	1538.94	1541.79	1017.03	1019.96	ohmm
External Check Point	10.52	10.56	9.69	9.62	ohmm
Internal Reference	19.94	20.00	18.36	18.23	ohmm
DUAL LATEROLOG FIELD CALIBRATION					
Tool Name:	DLLT-I Sonde - 10731630		Reference Calibration Date:	14-Oct-14 11:24:52	
Engineer:	B. RIDDEL		Calibration Date:	02-Dec-14 04:09:51	
Software Version:	WL INSITE R4.2.0 (Build 2)		Calibration Version:	1	
Measurement	Deep Shop	Deep Field	Shallow Shop	Shallow Field	Units
Internal Reference	20.00	19.95	18.23	18.18	ohmm
PASS/FAIL SUMMARY					
Measurement	Difference	Tolerance	Pass/Fail		
Internal Deep	0.04	+/- 0.8	Passed		
Internal Shallow	0.05	+/- 0.8	Passed		
MICRO SPHERICALLY FOCUSED LOG SHOP CALIBRATION					
Tool Name:	MSFL - 11555340		Reference Calibration Date:	18-Aug-14 13:39:01	
Engineer:	M. LECUREUX		Calibration Date:	29-Oct-14 14:00:09	
Software Version:	WL INSITE R4.2.0 (Build 2)		Calibration Version:	1	
Measurement	Measured	Calibrated	Units		
External Cal Point #1	0.20	0.20	ohmm		
External Cal Point #2	20.04	20.00	ohmm		
External Cal Point #3	2062.07	2000.00	ohmm		
Internal Reference	20.01	19.97	ohmm		
MICRO SPHERICALLY FOCUSED LOG FIELD CALIBRATION					
Tool Name:	MSFL - 11555340		Reference Calibration Date:	29-Oct-14 14:00:09	
Engineer:	B. RIDDEL		Calibration Date:	02-Dec-14 04:10:14	
Software Version:	WL INSITE R4.2.0 (Build 2)		Calibration Version:	1	
Measurement	Shop	Field	Change	Control Limit On	Units
Internal Reference	19.97	19.96	-0.013	0.800	ohmm
PASS/FAIL SUMMARY					
Internal Reference:			Passed		
CALIPER SHOP CALIBRATION					
Tool Name:	MSFL - 11555340		Reference Calibration Date:	14-Oct-14 11:04:10	
Engineer:	B. RIDDEL		Calibration Date:	14-Oct-14 11:08:35	
Software Version:	WL INSITE R4.2.0 (Build 2)		Calibration Version:	1	
CALIBRATION RINGS AND INTERNAL					
Measurement	Current Reading (Previous Coeff.)	Calibrated (New Coeff.)	Change		
RING DIAMETER:					
Ring #1 (in)	8.36	8.25	0.1100		
Ring #2 (in)	14.99	15.00	-0.0100		
Hi/Lo Internal:					


Lo Internal (in)	4.38	4.21	0.1700
Hi Internal (in)	17.31	17.36	-0.0500

CALIPER FIELD CALIBRATION			
Tool Name:	MSFL - 11555340	Reference Calibration Date:	14-Oct-14 11:08:35
Engineer:	B. RIDDEL	Calibration Date:	02-Dec-14 04:11:42
Software Version:	WL INSITE R4.2.0 (Build 2)	Calibration Version:	1

MEASURED CALIPER VALUES				
Measurement	Shop	Field	Change	Control Limit On New Value
Lo Internal (in)	4.21	4.23	-0.019	+/- 0.500
Hi Internal (in)	17.36	17.36	0.000	+/- 0.500
PASS/FAIL SUMMARY				
Lo Internal Check:			Passed	
Hi Internal Check:			Passed	

CALIBRATION SUMMARY						
Sensor	Shop	Field	Post	Difference	Tolerance	Units
GTET-11958949						
Gamma Ray Calibrator	243.2	243.3	-----	-0.1	+/- 9.00	api
CSNG-10971168						
60 KEV Peak Channel #	48.0	48.0	-----	0.0	-----	Channel #
239 KEV Peak Channel #	23.7	23.7	-----	0.0	-----	Channel #
583 KEV Peak Channel #	52.9	52.8	-----	0.1	-----	Channel #
2614 KEV Peak Channel #	216.4	216.3	-----	0.1	-----	Channel #
DLLT-I Sonde-10731630						
Deep Internal Ref.	20.00	19.95	-----	0.05	+/- 0.8	ohmm
Shallow Internal Ref.	18.23	18.18	-----	0.05	+/- 0.8	ohmm
MSFL-11555340						
MSFL Internal Ref.	19.97	19.96	-----	0.01	+/- 0.800	ohmm
Caliper Lo. Internal	4.21	4.23	-----	-0.02	+/- 0.500	in
Caliper Hi. Internal	17.36	17.36	-----	0.00	+/- 0.500	in
Data: KINDER_CD_4\0001 TPL_DLLT_CSNG\IDLE					Date: 02-Dec-14 19:03:17	

HALLIBURTON	
TOOL STRING DIAGRAM REPORT	

Description	Overbody Description	O.D.	Diagram	Sensors @ Delays	Length	Accumulated Length
Spacer-12345678 100.00 lbs	Regal Standoff 6_75- 00000001 20.00 lbs	Ø 3.625 in Ø 5.000 in*			4.70 ft	120.64 ft
						115.94 ft
Flex Joint - Pressure Comp- 10756977 140.00 lbs		Ø 3.625 in			5.97 ft	109.97 ft

DTDD-10267604  
90.00 lbs

Ø 3.625 in →

← Load Cell @ 108.88 ft

3.66 ft

← Pad Locator @ 107.29 ft



106.31 ft

HDDS-A-00000001  
125.00 lbs

Ø 4.060 in →

4.13 ft



102.19 ft

Isolator Assy.-  
11987166  
274.00 lbs

Ø 3.625 in →

15.00 ft

Return Electrode-  
11037643  
57.00 lbs

Ø 3.625 in →

2.50 ft



84.69 ft

SP Sub-11057551  
60.00 lbs

Ø 3.625 in →

← SP @ 82.91 ft

3.74 ft



80.95 ft

Isolator Assy.-  
11989446  
274.00 lbs

Ø 3.625 in →

15.00 ft

Barrier Sub-  
12345678  
38.00 lbs

Ø 3.625 in →

1.00 ft



64.95 ft

GTET-11958949  
165.00 lbs

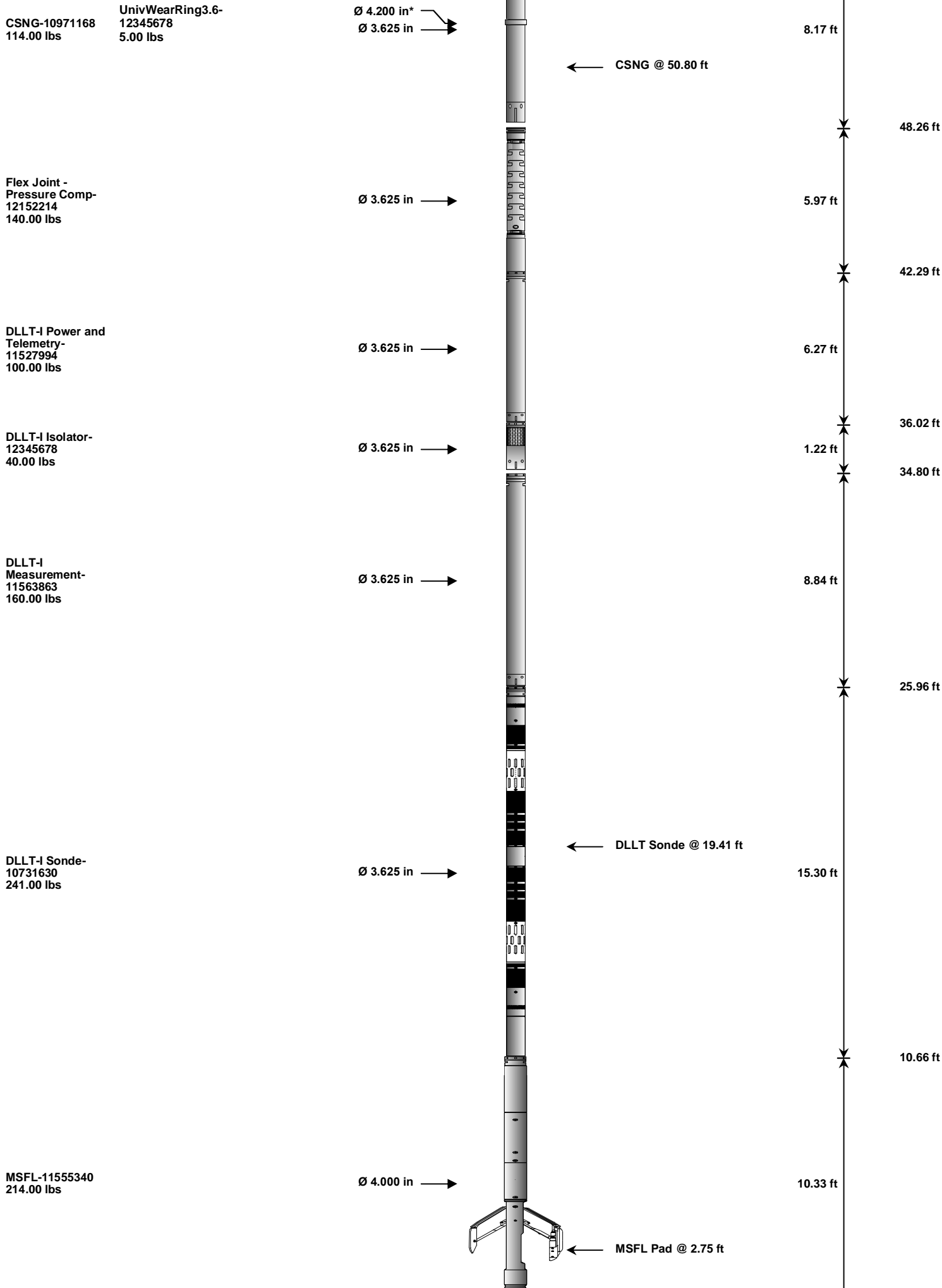
Ø 3.625 in →

8.52 ft

← GammaRay @ 58.89 ft



56.43 ft



**0.00 ft**

Date: 02-Dec-14 17:07:04

COMPANY	KINDER MORGAN CO2 CO LP		
WELL	CD 4		
FIELD	MCELMO		
COUNTY	MONTEZUMA	STATE	CO
HALLIBURTON		DUAL LATEROLOG MICRO-SPHERICALLY FOCUSED LOG	