



Weatherford[®]

**COMPACT TRIPLE COMBO
QUICKLOOK
LOGS**

COMPANY		EAST CHEYENNE GAS STORAGE LLC	
WELL		ECGS No 31-7 WPD005-1	
FIELD		PEETZ WEST	
PROVINCE/COUNTY		LOGAN	
COUNTRY/STATE		US/COLORADO	
LOCATION		1065' FSL & 2185' FEL	
SEC	TWP	RGE	Other Services
31	12N	52W	
API Number		05-075-09410	
Permit Number			
Permanent Datum GL, Elevation 4543 feet			
Log Measured From KB			
Drilling Measured From KB			
Date	16-OCT-2012		
Run Number	ONE		
Depth Driller	5260.00	feet	
Depth Logger	5254.00	feet	
First Reading	5251.00	feet	
Last Reading	4200.00	feet	
Casing Driller	1212.00	feet	
Casing Logger	1212.00	feet	
Bit Size	8.750	inches	
Hole Fluid Type	WBM		
Density / Viscosity	9.80 g/cc	48.00 CP	
PH / Fluid Loss	9.00	7.40 ml/30Min	
Sample Source	FLOWLINE		
Rm @ Measured Temp	6.46 @ 54.2	ohm-m	
Rmf @ Measured Temp	5.17 @ 54.2	ohm-m	
Rmc @ Measured Temp	7.75 @ 54.2	ohm-m	
Source Rmf / Rmc	CALC	CALC	
Rm @ BHT	2.42 @148.0	ohm-m	
Time Since Circulation	4 HOURS		
Max Recorded Temp	148.00	deg F	
Equipment Name	COMPACT		
Equipment / Base	13037	RK SPR	
Recorded By	B. ROSSER		
Witnessed By	J. ASHBY		

BOREHOLE RECORD			Last Edited: 16-OCT-2012 14:49
Bit Size inches	Depth From feet	Depth To feet	
8.750	1212.00	5260.00	
CASING RECORD			
Type	Size inches	Depth From feet	Shoe Depth feet
SURFACE	9.625	0.00	1212.00
			Weight pounds/ft
			36.00

REMARKS	
SOFTWARE VERSION 13.03.6600	
TOOLS RUN: SHA, MCG, MDN, MPD, MIS-A, SKJ, MIS-E, SKJ, SHA, MIM, MIE, SKJ, MFE, MAI RUN IN COMBINATION.	
HARDWARE: MPD: 8" PROFILE PLATE USED.	
MAI: TWO 1 INCH STANDOFFS USED.	
MDN: DUAL BOWSPRING USED.	
MIM: ONE NONMETALIC CENTRALIZING BASKET USED.	
MIE: ONE 1 INCH STANDOFF USED	
2.65 G/CC DENSITY MATRIX USED TO CALCULATE POROSITY FROM TD TO BOTTOM OF FORT HAYES FORMATION(5254FT TO 4700FT)	

7/001 1/.

2.71 G/CC DENSITY MATRIX USED TO CALCULATE POROSITY IN FORT HAYES FORMATION (4700 FT TO 4200 FT).

TIGHT PULLS, BOREHOLE SIZE AND RUGOSITY WILL AFFECT REPEATABILITY AND DATA QUALITY.

ALL INTERVALS LOGGED AND SCALED PER CUSTOMER'S REQUEST.

LAT/ LONG: 40.966620 / -103.221030

TOTAL HOLE VOLUME FROM TD TO SURFACE CASING =1026 CUBIC FEET

ANNULAR VOLUME WITH 7 INCH PRODUCTION CASING FROM TD TO SURFACE CASING = 655 CUBIC FEET

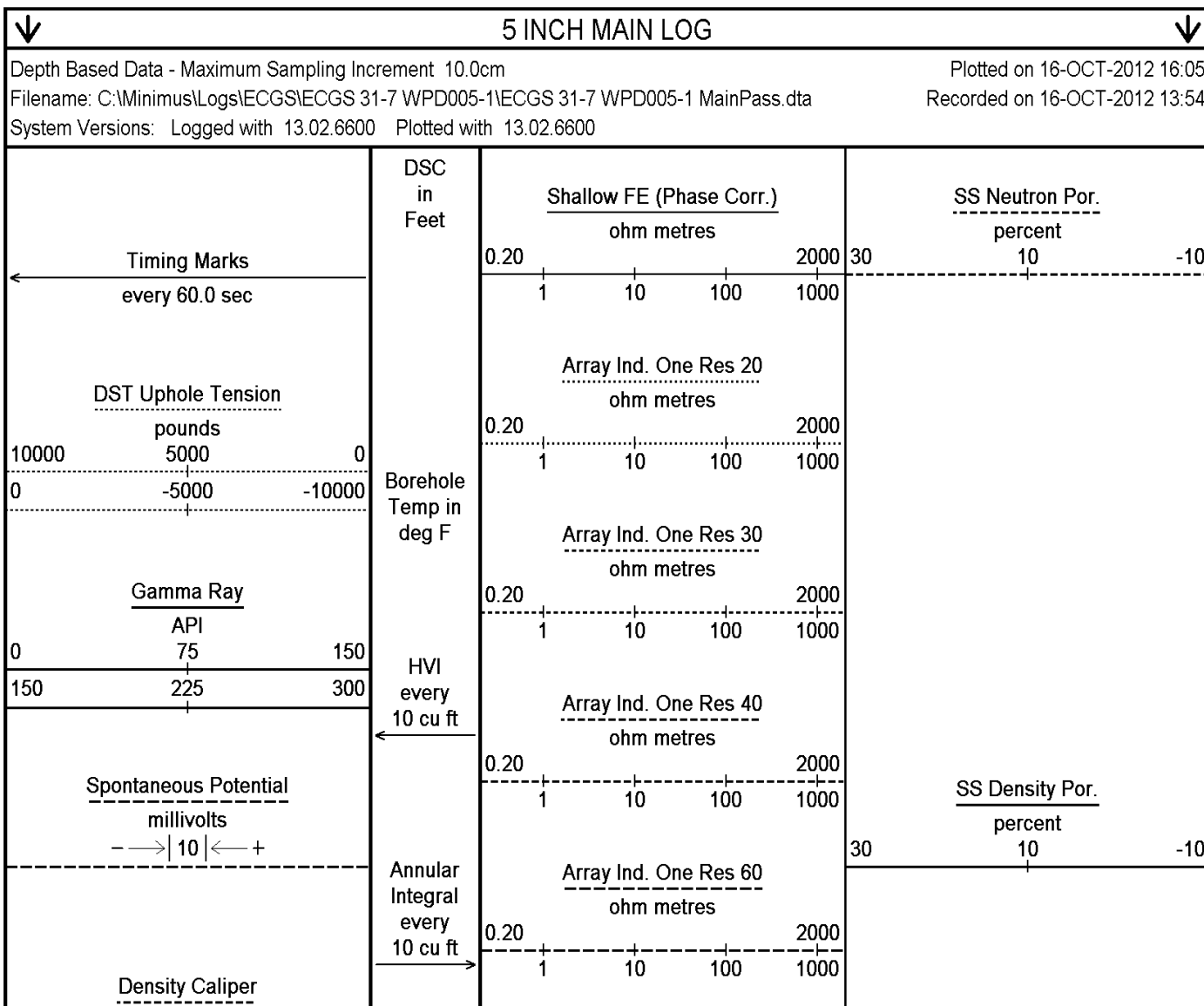
TOTAL VOLUME FROM TD TO 4200 FT = 410 CUBIC FEET

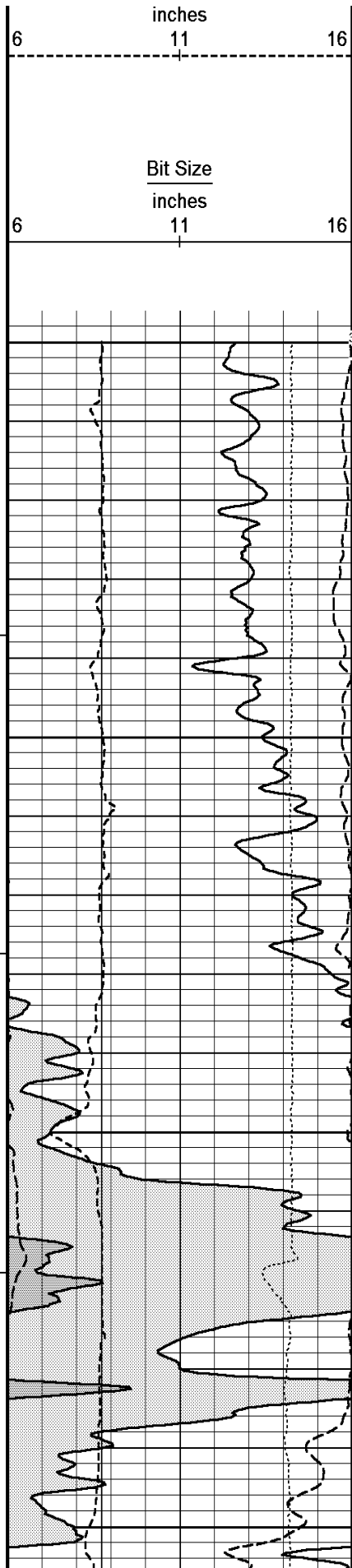
ANNULAR VOLUME WITH 7 INCH PRODUCTION CASING FROM TD TO 4200 FT = 140 CUBIC FEET

SERVICE ORDER: 3535300

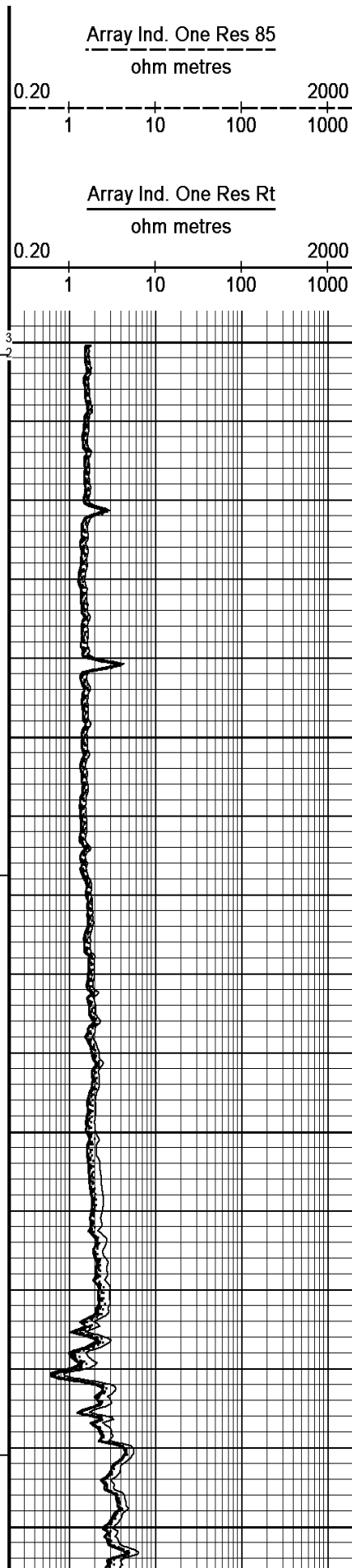
RIG: CADE 22

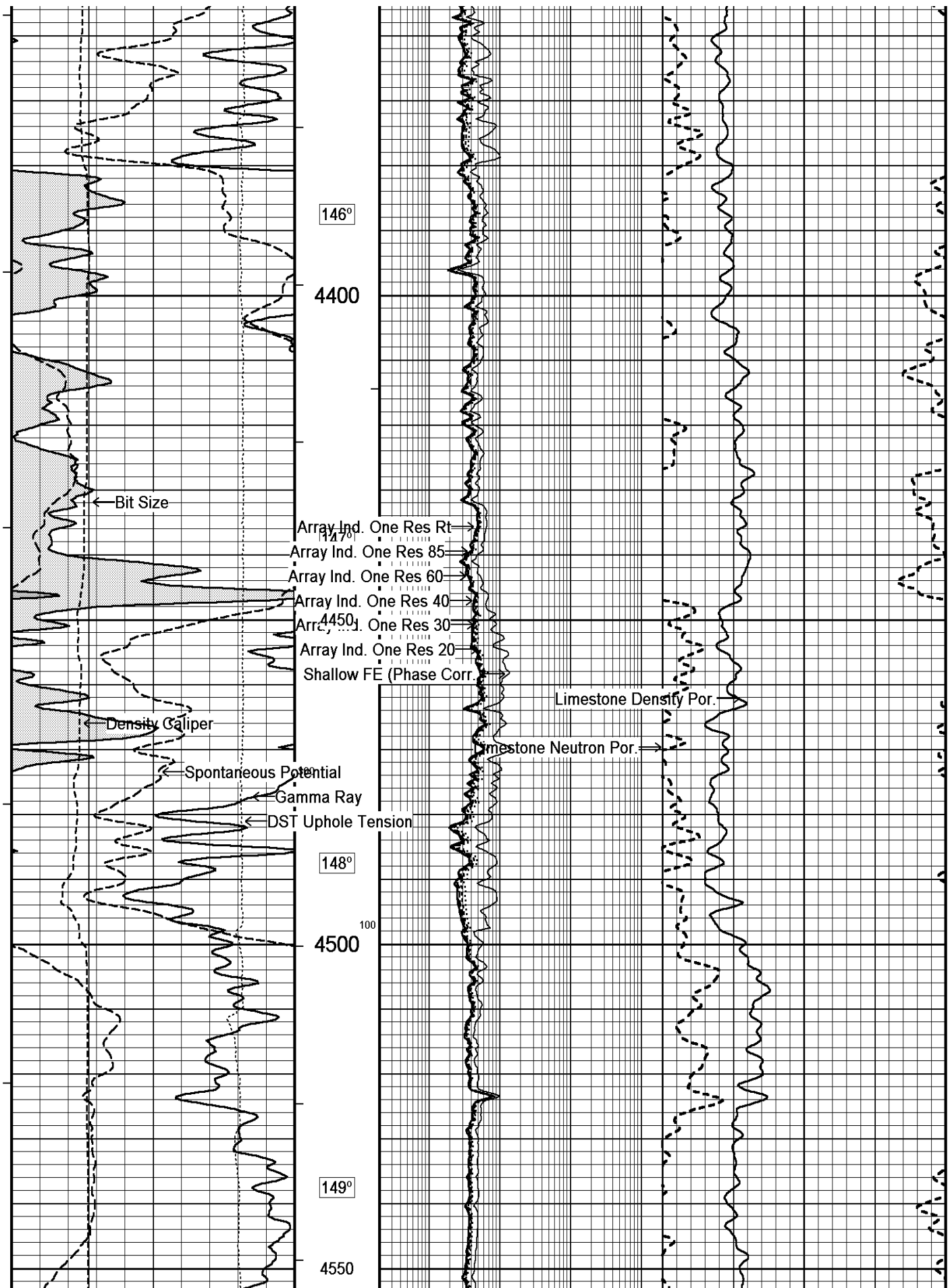
All interpretations are opinions based on inferences from electrical or other measurements and we cannot, and do not, guarantee the accuracy or correctness of any interpretations, and we shall not, except in the case of gross or wilful negligence on our part, be liable or responsible for any loss, costs, damages or expenses incurred or sustained by anyone resulting from any interpretation made by any of our officers, agents or employees. These interpretations are also subject to our general terms and conditions in our price schedule.

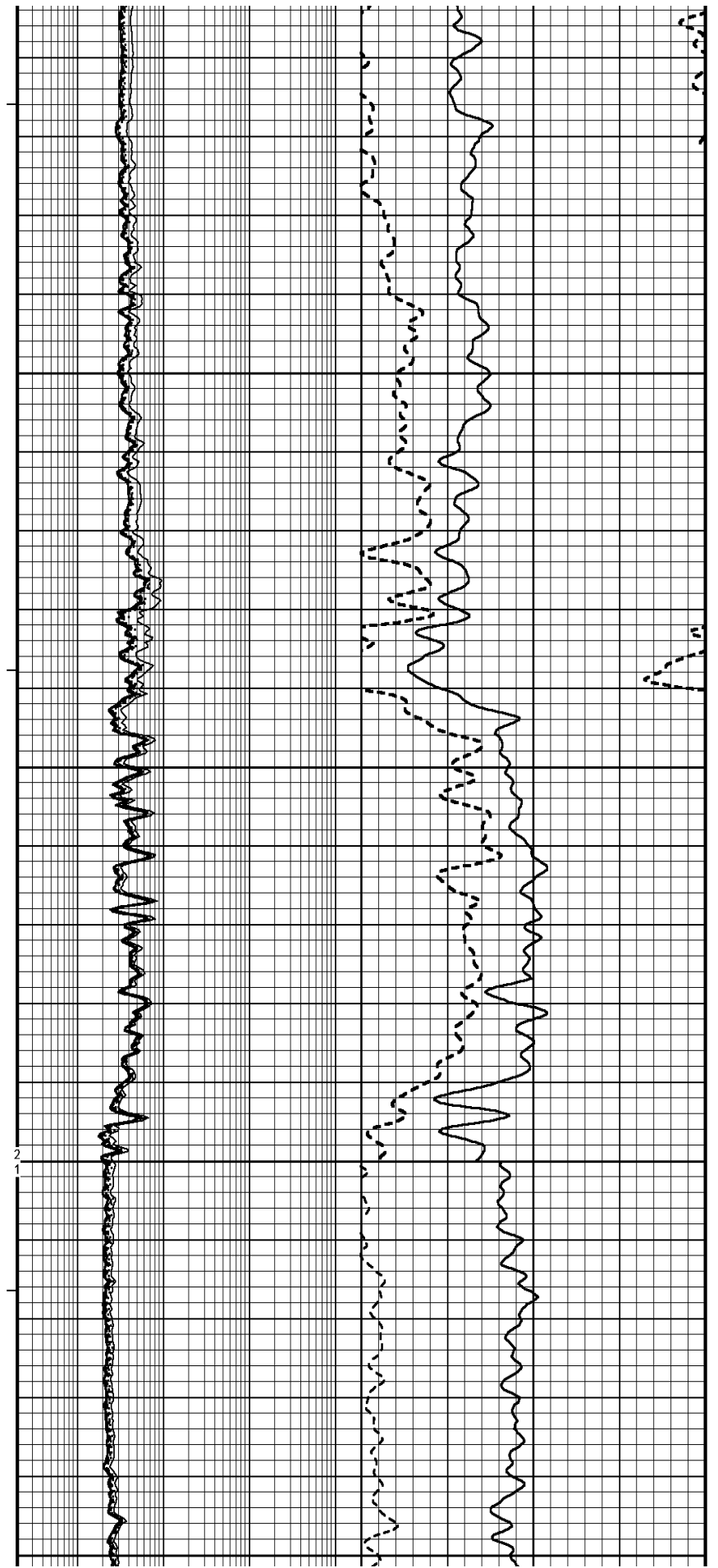
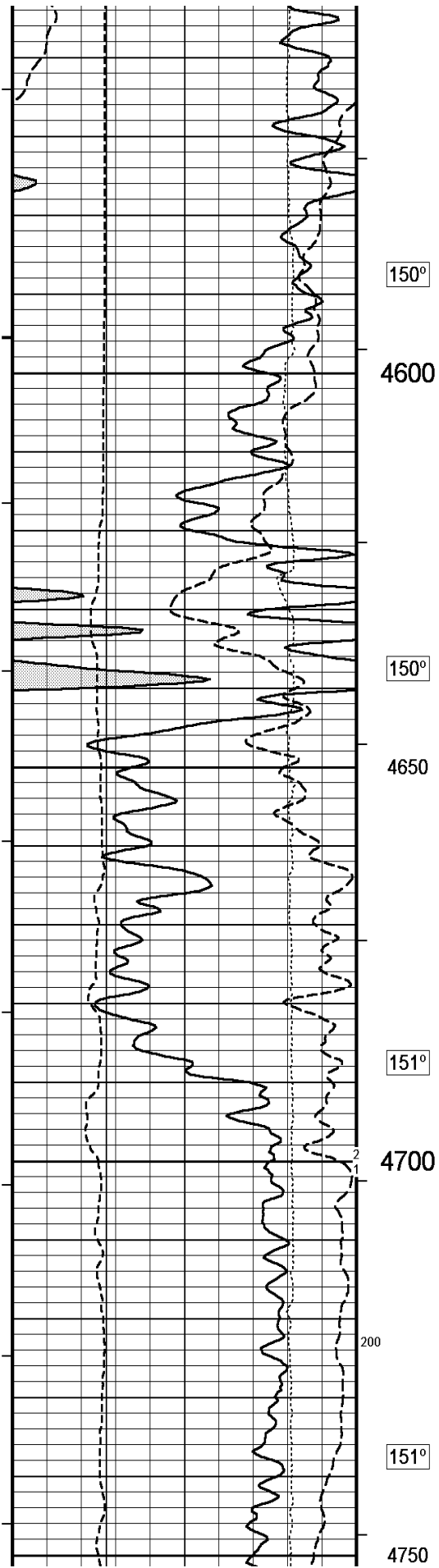


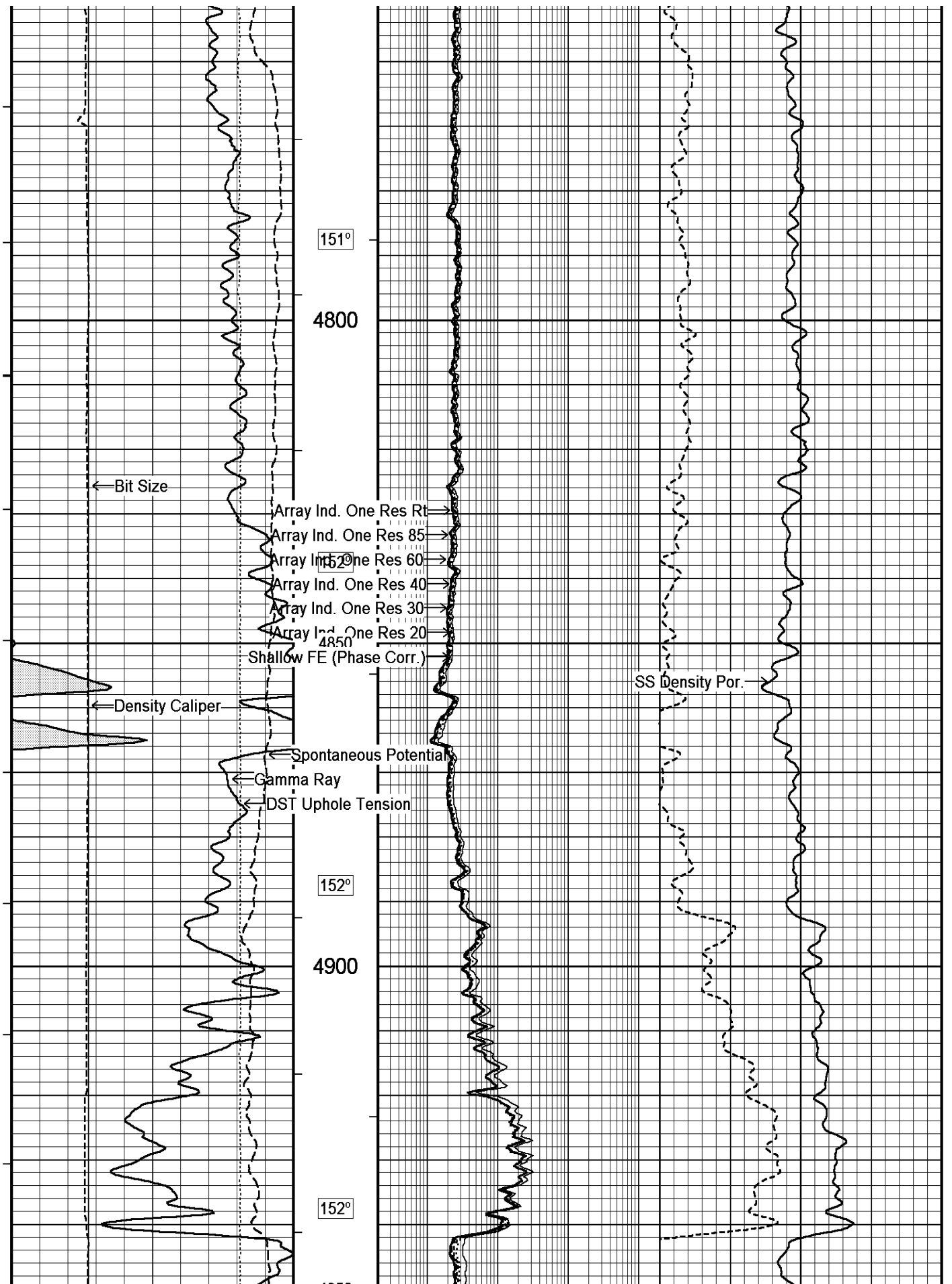


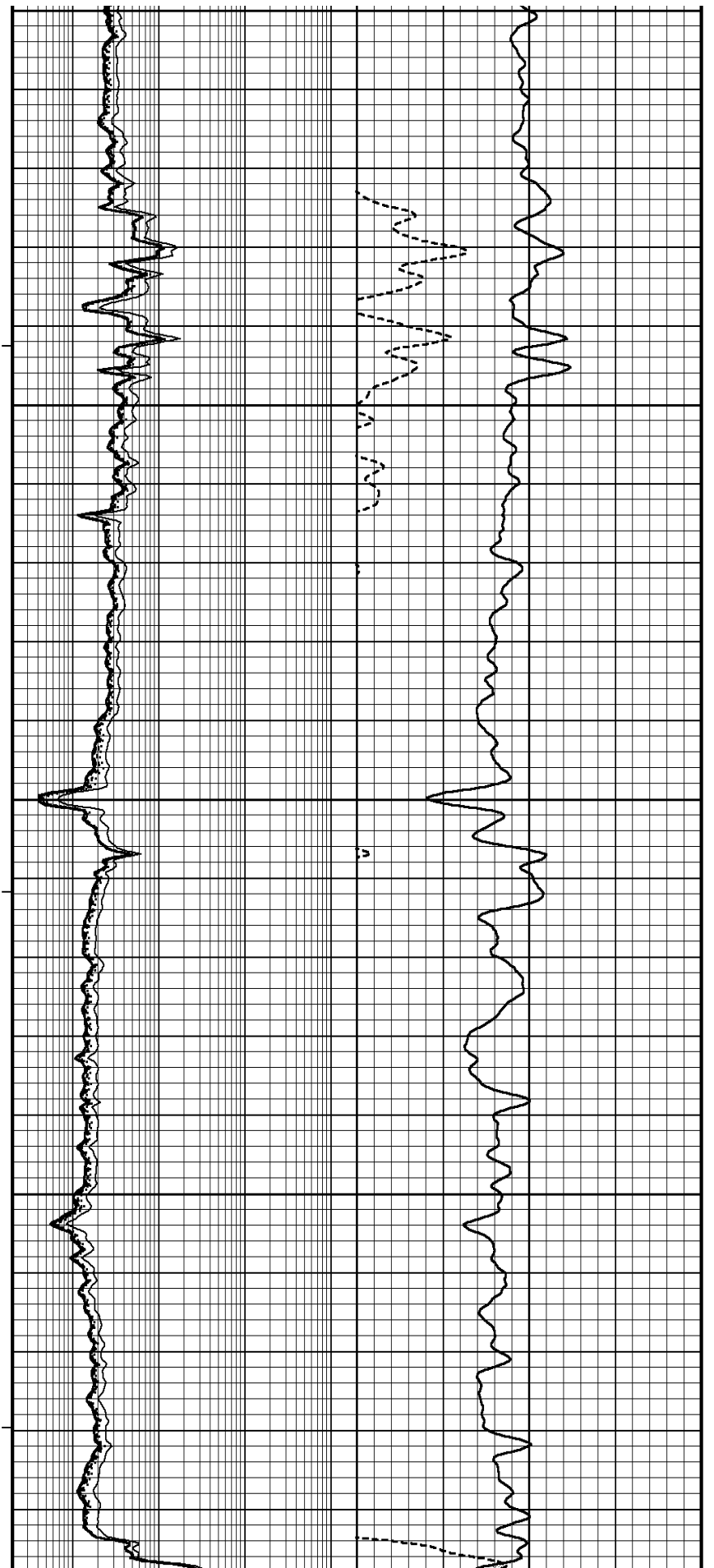
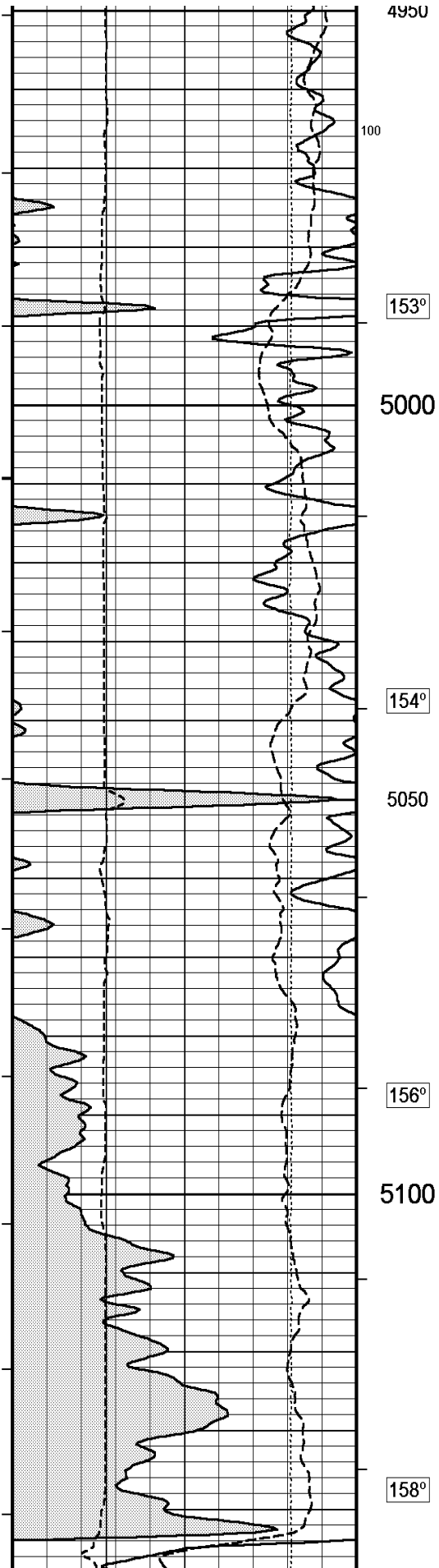
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Scale
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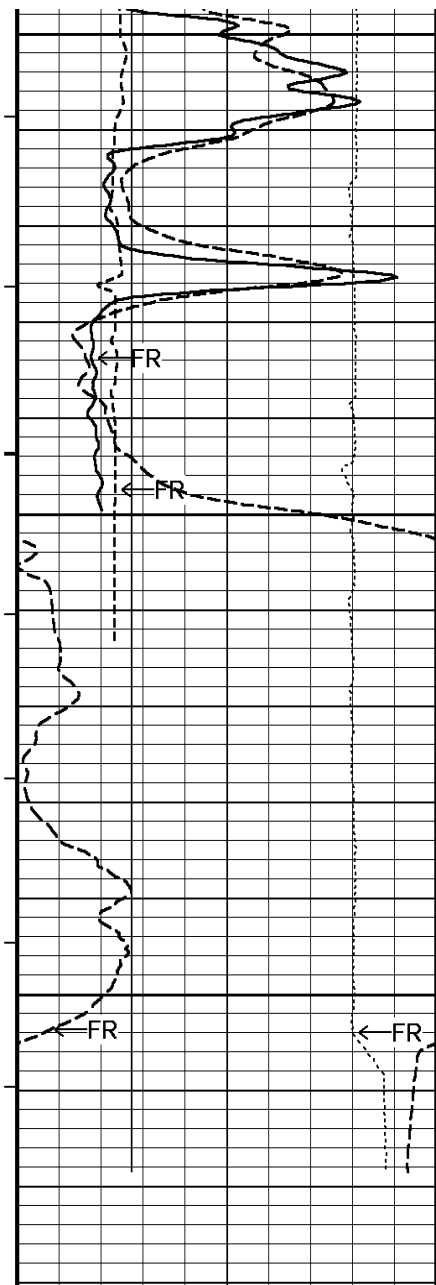












5150

157°

5200

0

5250
TD

DSC
in
Feet

Timing Marks
every 60.0 sec

DST Uphole Tension
pounds

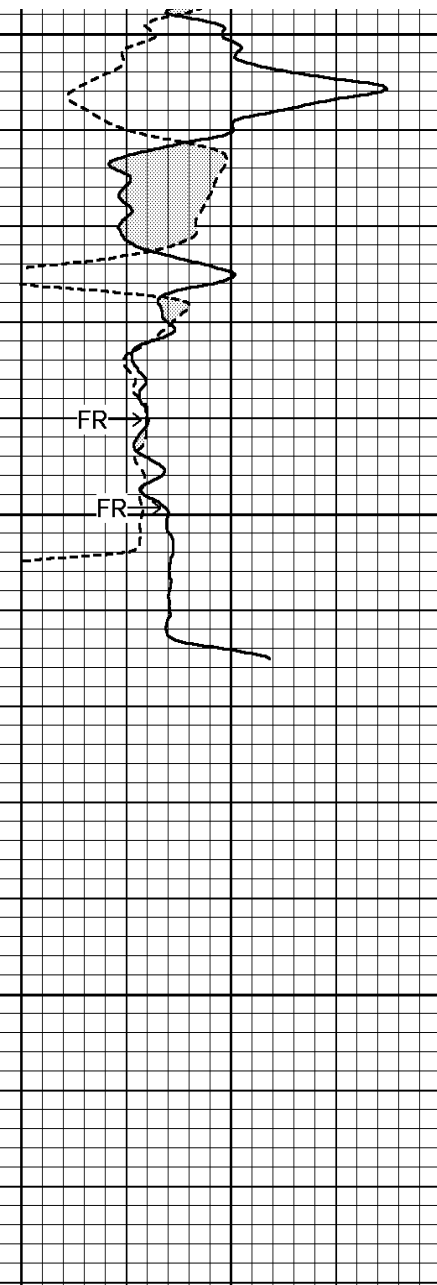
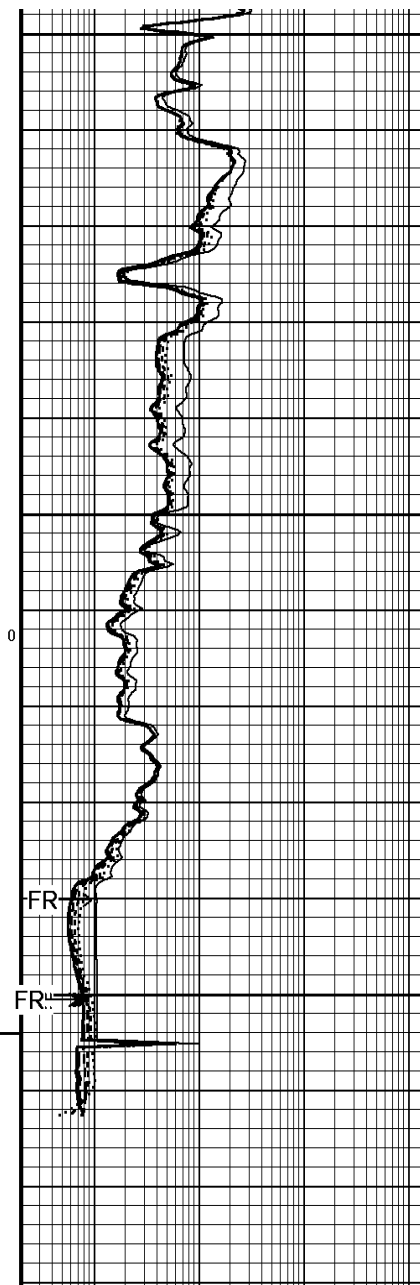
10000 5000 0
0 -5000 -10000

Borehole
Temp in
deg F

Gamma Ray

0 75 150
150 225 300

HVI



Shallow FE (Phase Corr.)

ohm metres

0.20 2000 30
1 10 100 1000

Array Ind. One Res 20

ohm metres

0.20 2000
1 10 100 1000

Array Ind. One Res 30

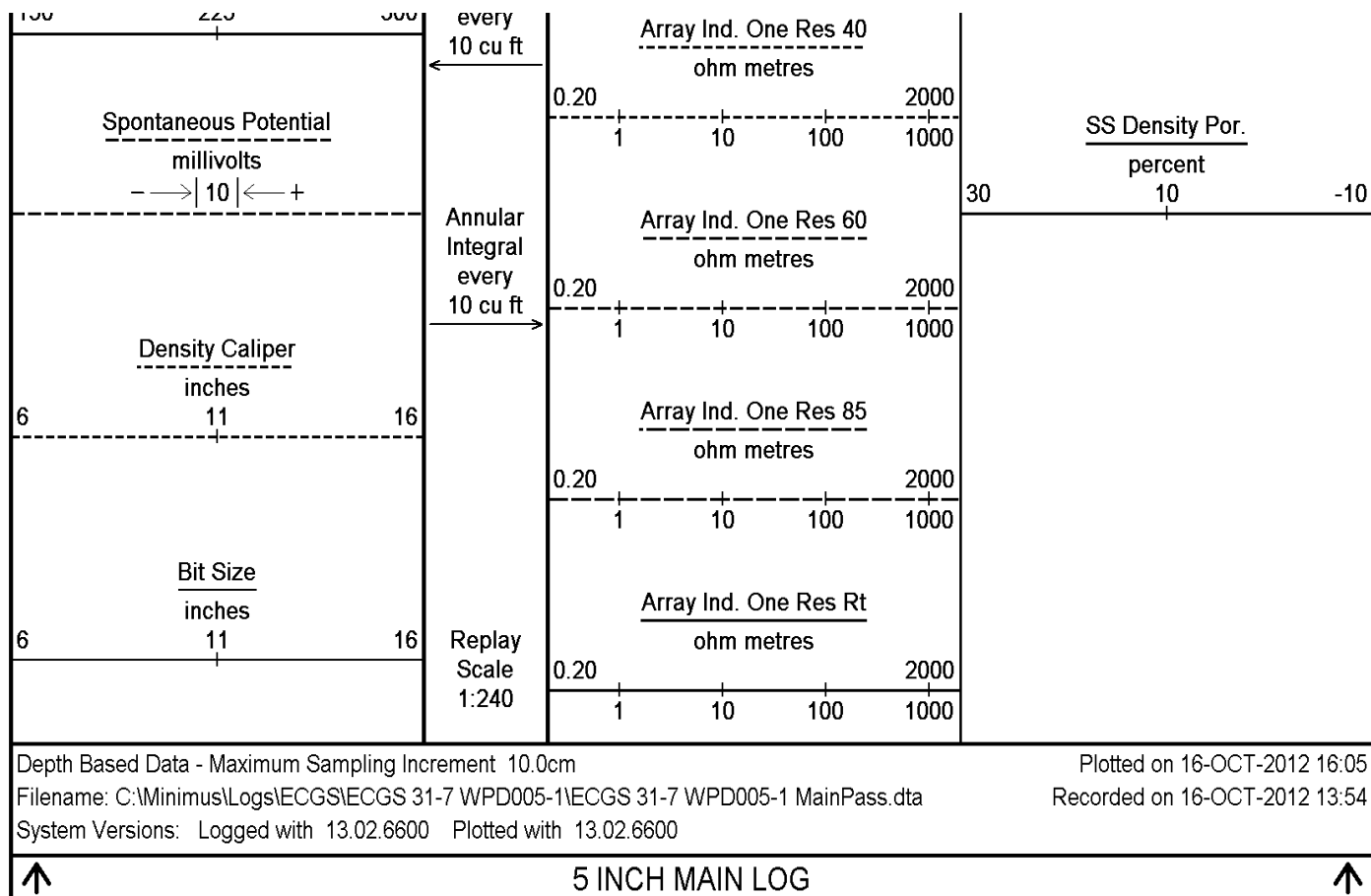
ohm metres

0.20 2000
1 10 100 1000

SS Neutron Por.

percent

30 10 -10



BEFORE SURVEY CALIBRATION		
C:\Minimus\Logs\ECGS\ECGS 31-7 WPD005-1\ECGS 31-7 WPD005-1 Repeat.dta		
Down-hole Tension Calibration All 000		
		Field Calibration on 24-OCT-2010 03:34
Reading No	Measured	0
1	15659.85	0.00
2	15734.68	370.00
General Constants All 000		
Last Edited on 16-OCT-2012,09:44		
General Parameters		
Mud Resistivity	6.420	ohm-metres
Mud Resistivity Temperature	54.200	degrees F
Water Level	0.000	feet
Density/Neutron Processing	Wet Hole	
Hole/Annular Volume and Differential Caliper Parameters		
HVOL Method	Single Caliper	
HVOL Caliper 1	Density Caliper	
HVOL Caliper 2	N/A	
Annular Volume Diameter	7.000	inches
Caliper for Differential Caliper	Density Caliper	
Rwa Parameters		
Porosity used	Base Density Porosity	
Resistivity used	Deep Induction	
RWA Constant A	0.610	
RWA Constant M	2.150	
Down-hole Tension Calibration SMS 0		
Field Calibration on 16-OCT-2012 12:47		

Reading No	Measured	Calibrated (lbs)	
1	15175.17	0.00	
2	16394.83	500.00	
High Resolution Temperature Calibration MCG-D.K 483			Field Calibration on 06-JUL-2012 14:06
	Measured	Calibrated(Deg F)	
Lower	0.00	0.00	
Upper	0.00	0.00	
High Resolution Temperature Constants MCG-D.K 483			Last Edited on
Pre-filter Length	11		
SP Calibration MCG-D.K 483			Field Calibration on 06-JUL-2012 14:06
	Measured	Calibrated (mV)	
Reference 1	100.6	100.1	
Reference 2	-98.9	-100.1	
Gamma Calibration MCG-D.K 483			Field Calibration on 15-OCT-2012 14:49
	Measured	Calibrated (API)	
Background	60	40	
Calibrator (Gross)	788	520	
Calibrator (Net)	728	480	
Gamma Constants MCG-D.K 483			Last Edited on 16-OCT-2012,09:37
Gamma Calibrator Number	GRCC-112		
Mud Density	1.00	gm/cc	
Caliper Source for Processing	Density Caliper		
Tool Position	Eccentred		
Concentration of KCl	0.00	kppm	
Neutron Calibration MDN-B.A 227			Base Calibration on 15-OCT-2012 15:48 Field Check on 15-OCT-2012 15:57
Base Calibration			
	Measured	Calibrated (cps)	
	Near Far	Near Far	
	2896 90	3714 110	
Ratio	32.069	33.764	
Field Calibrator at Base			
		Calibrated (cps)	
		1658 2365	
Ratio		0.701	
Field Check			
		Calibrated (cps)	
		1664 2383	
Ratio		0.698	
Neutron Constants MDN-B.A 227			Last Edited on 16-OCT-2012,13:17
Neutron Source Id	P44382B		
Neutron Jig Number	NEC43		
Epithermal Neutron	No		
Caliper Source for Processing	Density Caliper		
Stand-off	0.00	inches	
Mud Density	1.00	gm/cc	
Limestone Sigma	7.10	cu	
Sandstone Sigma	7.00	cu	
Dolomite Sigma	4.70	cu	
Formation Pressure Source	None		
Formation Pressure	N/A	kpsi	
Temperature Source	None		
Temperature	N/A	degrees F	

Mud Salinity	0.00	kppm			
Salinity Correction	Not Applied				
Formation Fluid Salinity Source	None				
Formation Fluid Salinity	N/A	kppm			
Barite Mud Correction	Not Applied				
Caliper Calibration MIE-A.J 244					
		Base Calibration on 15-OCT-2012 14:34			
		Field Calibration on 15-OCT-2012 14:37			
Base Calibration					
Reading No	Pads 1-5 Meas.	Pads 3-7 Meas.	Calibrator Size (in)		
1	26843	27657	5.96		
2	37134	38542	7.99		
3	46830	48303	9.86		
4	58657	60137	11.93		
5	0	0	0.00		
Reading No	Pad 2 Meas.	Pad 4 Meas.	Pad 6 Meas.	Pad 8 Meas.	Calibrator Size (in)
1	25364	25860	23860	25685	5.96
2	34515	34810	32509	34263	7.99
3	42698	43019	40815	42625	9.86
4	52715	53061	50670	52203	11.93
5	0	0	0	0	0.00
Field Calibration					
	Measured	Measured	Actual		
	Pads 1-5 Caliper(in)	Pads 3-7 Caliper(in)	Caliper(in)		
	7.99	8.00	7.99		
	Measured	Measured	Measured	Measured	Actual
	Pad 2 Caliper(in)	Pad 4 Caliper(in)	Pad 6 Caliper(in)	Pad 8 Caliper(in)	Caliper(in)
	4.00	4.00	4.00	4.00	7.99
Caliper Constants MIE-A.J 244			Last Edited on 15-OCT-2012,14:26		
Caliper Difference for BRKT		0.120	inches		
Accelerometer Parameters MIE-A.J 244					
Date Of Last Accelerometer Calibration		8-FEB-2012,10:33			
	X Accelerometer	Y Accelerometer	Z Accelerometer		
Slope	-1.101858	-1.105662	-1.102074		
Offset	-0.006691	0.007176	-0.004341		
Accelerometer Constants MIE-A.J 244			Last Edited on 15-OCT-2012,14:38		
Accelerometer Calibrator Number		000			
Accelerometer Temperature Characterisation					
X Accelerometer					
Serial Number		1016			
Calibration Date		12-Apr-2011			
	B0	B1	B2	B3	
Bias(g)	0.00000e+000	1.93698e-005	-7.60293e-010	6.54727e-011	
	SF0	SF1	SF2	SF3	
Scale Factor(mA/g)	3.00000e+000	2.59257e-004	6.13375e-007	-3.90888e-010	
Y Accelerometer					
Serial Number		973			
Calibration Date		19-Jan-2011			
	B0	B1	B2	B3	
Bias(g)	0.00000e+000	1.95276e-005	-1.88058e-008	2.74122e-010	
	SF0	SF1	SF2	SF3	
Scale Factor(mA/g)	3.00000e+000	2.75268e-004	3.53140e-007	7.52116e-010	
Z Accelerometer					
Serial Number		1032			
Calibration Date		18-Apr-2011			

Calibration Date 10-APR-2011				
	B0	B1	B2	B3
Bias(g)	0.00000e+000	-1.14960e-005	3.94288e-009	8.97135e-011
	SF0	SF1	SF2	SF3
Scale Factor(mA/g)	3.00000e+000	2.88058e-004	2.44833e-007	8.38007e-010
Magnetometer Parameters MIE-A.J 244				
Date Of Last Magnetometer Calibration		16-FEB-2012,10:58		
	X Magnetometer	Y Magnetometer	Z Magnetometer	
Slope	-1.000000	-1.002948	-0.976095	
Offset	-0.005483	-0.018155	-0.000073	
Magnetometer Constants MIE-A.J 244				Last Edited on 15-OCT-2012,14:39
Magnetometer Calibrator Number		000		
Navigation Constants MIE-A.J 244				Last Edited on 15-OCT-2012,14:39
Magnetic Declination		0.00	degrees	East
Imager Pad Check MIE-A.J 244				Field Check on
Pad 1	Pad Not Tested	Pad 5	Pad Not Tested	
Pad 2	Pad Not Tested	Pad 6	Pad Not Tested	
Pad 3	Pad Not Tested	Pad 7	Pad Not Tested	
Pad 4	Pad Not Tested	Pad 8	Pad Not Tested	
Compact Micro Imager Constants MIE-A.J 244				Last Edited on 15-OCT-2012,14:39
Sonde Configuration		Imager Mode	degrees	
Arm-Pad Kit		Normal Pads (12.25 in)		
Centre Pad 1 Rotational Offset		0.00		
Image/Borehole Ovality Reference		Azimuth of Pad 1	degrees	
Non Active Buttons		Omit	feet	
Search Angle		0.00	feet	
Correlation Interval		3.28	mAmp	
Correlation Step		1.64	mAmp	
Current Offset		0.0000		
Squasher Start		N/A		
Image Processing		Enabled		
FE Calibration MFE-A.A 66				Base Calibration on 15-OCT-2012 13:42 Field Check on 15-OCT-2012 13:46
Base Calibration				
	Measured	Calibrated (ohm-m)		
Reference 1	0.0	0.0		
Reference 2	997.0	126.8		
Base Check		272.6		
Field Check		272.7		
FE Constants MFE-A.A 66				Last Edited on 16-OCT-2012,09:34
Running Mode		No Sleeve		
MFE K Factor		0.1268		
Caliper Source for FE correction		Density Caliper		
Caliper Value for FE correction		N/A	inches	
Rm Source for FE correction		Temperature Corr		
Temp. for Rm Corr.		MCG External Temperature		
Stand-off		1.0	inches	
FE Calibration MAI-A.A 165				Base Calibration on 12-FEB-2009 10:30 Field Check on 04-APR-2009 14:52
Base Calibration				

	Measured	Calibrated (ohm-m)		
Reference 1	0.0	0.0		
Reference 2	976.9	126.8		
Base Check		277.9		
Field Check		278.3		
FE Constants MAI-A.A 165			Last Edited on 04-APR-2009,15:12	
Running Mode	0			
MFE K Factor	0.0000			
Caliper Source for FE correction	Density Caliper			
Caliper Value for FE correction	N/A	inches		
Rm Source for FE correction	Temperature Corr			
Temp. for Rm Corr.	MCG External Temperature			
Stand-off	1.0	inches		
High Resolution Temperature Calibration MAI-A.A 165			Field Calibration on 10-OCT-2011,15:43	
	Measured	Calibrated(Deg F)		
Lower	50.00	50.00		
Upper	75.00	75.00		
High Resolution Temperature Constants MAI-A.A 165			Last Edited on 15-OCT-2012,13:33	
Pre-filter Length	11			
Induction Calibration MAI-A.A 165			Base Calibration on 15-OCT-2012,13:08 Field Check on 15-OCT-2012 13:32	
Base Calibration				
Test Loop Calibration		Measured	Calibrated (mmho/m)	
Channel	Low	High	Low	High
1	17.2	469.6	9.3	966.2
2	6.7	392.8	7.6	821.4
3	4.2	262.3	5.2	566.0
4	1.6	136.6	2.6	279.2
Array Temperature	75.0		Deg F	
Channel	Base Check (mmho/m)		Field Check (mmho/m)	
	Low	High	Low	High
1	12.9	3869.0	13.0	3868.3
2	28.4	3433.8	28.4	3433.0
3	26.7	3021.4	26.7	3021.3
4	19.7	2016.0	19.7	2016.1
Deep	17.3	2011.3	17.3	2011.8
Medium	37.6	3970.8	37.6	3970.3
Shallow	41.2	5011.9	41.3	5010.0
Array Temperature	69.2		70.6	Deg F
Induction Constants MAI-A.A 165			Last Edited on 16-OCT-2012,09:33	
Induction Model	RtAP-WBM			
Caliper for Borehole Corr.	Density Caliper			
Hole Size for Borehole Correction	N/A	inches		
Tool Centred	No			
Stand-off Type	Fins			
Stand-off	1.00	inches		
Number of Fins on Stand-off	6.0000			
Stand-off Fin Angle	60.00	degrees		
Stand-off Fin Width	0.0500	inches		
Borehole Corr. Rm Source	Temperature Corr			
Temp. for Rm Corr.	MCG External Temperature			
Squasher Start	0.0020	mhos/metre		

Squasher Offset		N/A	mhoh/metre	
Borehole Normalisation				
DRM1	0.0000	DRC1		0.0000
DRM2	0.0000	DRC2		0.0000
MRM1	0.0000	MRC1		0.0000
MRM2	0.0000	MRC2		0.0000
SRM1	0.0000	SRC1		0.0000
SRM2	0.0000	SRC2		0.0000
Calibration Site Corrections				
Channel 1		0.00	mmhos/metre	
Channel 2		0.00	mmhos/metre	
Channel 3		0.00	mmhos/metre	
Channel 4		0.00	mmhos/metre	
Apparent Porosity and Water Saturation Constants				
Archie Constant (A)		1.00		
Cementation Exponent (M)		2.00		
Saturation Exponent (N)		2.00		
Saturation of Water for Apor		100.00	percent	
Resistivity of Water for Apor and Sw		0.05	ohm-m	
Resistivity of Mud Filtrate for Sw		0.00	ohm-m	
Source for Rt		0.00		
Source for Rxo		0.00		
Caliper Calibration MPD-C.A 195				Base Calibration on 15-OCT-2012 13:53 Field Calibration on 15-OCT-2012 13:54
Base Calibration				
Reading No		Measured	Calibrator Size (in)	
1		15007	4.00	
2		23645	5.96	
3		32400	7.99	
4		40464	9.86	
5		49760	11.93	
6		N/A	N/A	
Field Calibration				
		Measured Caliper (in)	Actual Caliper (in)	
		7.95	7.99	
Photo Density Calibration MPD-C.A 195				Base Calibration on 15-OCT-2012 14:12 Field Check on 15-OCT-2012 14:18
Density Calibration				
Base Calibration		Measured	Calibrated (sdu)	
	Near	Far	Near	Far
Reference 1	38135	13267	52994	19128
Reference 2	18092	1824	25188	2558
Field Check at Base				
	670.1	775.1		
Field Check				
	667.4	773.4		
PE Calibration				
Base Calibration		Measured	Calibrated	
	WS	WH	Ratio	Ratio
Background	122	602		
Reference 1	13157	38045	0.348	0.309
Reference 2	5216	18018	0.292	0.274
Field Check at Base				
	122.4	602.2		

Field Check

122.5 598.0

Density Constants MPD-C.A 195

Last Edited on 16-OCT-2012,13:16

Density Source Id	2859GW	
Nylon Calibrator Number	535	
Aluminium Calibrator Number	535	
Density Shoe Profile	8 inch	
Caliper Source for Processing	Density Caliper	
PE Correction to Density	Not Applied	
Mud Density	1.17	gm/cc
Mud Density Z/A Multiplier	1.11	
Mud Filtrate Density	1.00	gm/cc
Dry Hole Mud Filtrate Density	1.00	gm/cc
DNCT	0.00	gm/cc
CRCT	0.00	gm/cc
Density Z/A Correction	Hybrid	

Matrix Density (gm/cc)	Depth (ft)
2.68	0.00
0.00	0.00
0.00	0.00
0.00	0.00
0.00	0.00
0.00	0.00
0.00	0.00
0.00	0.00
0.00	0.00

DOWNHOLE EQUIPMENT

C:\Minimus\Logs\ECGS\ECGS 31-7 WPD005-1\ECGS 31-7 WPD005-1 Repeat.dta

CBH-C, Cablehead, 11 pin
CBH-C 102 LG: 2.40 ft WT: 24.3 lb OD: 2.24 in

SHA-H Compact Swivel Head Adaptor
SHA-H 142 LG: 2.30 ft WT: 22.0 lb OD: 2.24 in

Compact Comms Gamma
MCG-D.K 483 LG: 8.70 ft WT: 63.9 lb OD: 2.24 in

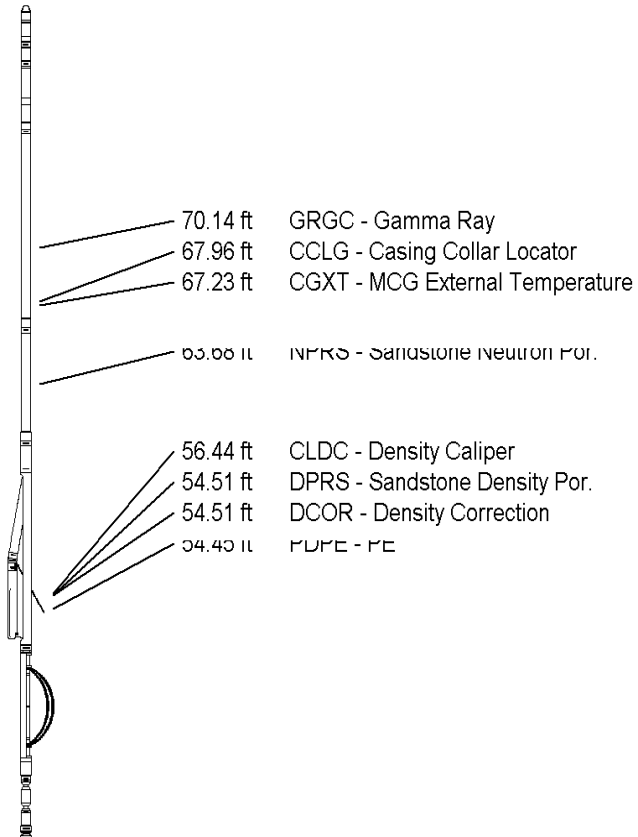
Compact Neutron
MDN-B.A 227 LG: 5.04 ft WT: 50.7 lb OD: 2.24 in

Compact Density/Caliper
MPD-C.A 195 LG: 9.59 ft WT: 90.4 lb OD: 2.45 in

MIS-D.B Compact Inline Bowspring sub
MIS-D.B 658 LG: 5.70 ft WT: 33.1 lb OD: 2.24 in

SKJ-E.B Compact Knuckle Joint
SKJ-E.B 536 LG: 2.17 ft WT: 24.3 lb OD: 2.24 in

MIS-E.A Compact Inline Standoff sub
MIS-E.A 199 LG: 2.14 ft WT: 15.4 lb OD: 2.24 in



SKJ-D.A Compact Knuckle Joint
SKJ-D.A 66 LG: 2.17 ft WT: 24.3 lb OD: 2.24 in

SHA-J.B Compact Swivel Head Adaptor
SHA-J.B 511 LG: 2.30 ft WT: 22.0 lb OD: 2.24 in

Compact MMI Memory Section
MIM-A.J 244 LG: 4.65 ft WT: 26.5 lb OD: 2.24 in

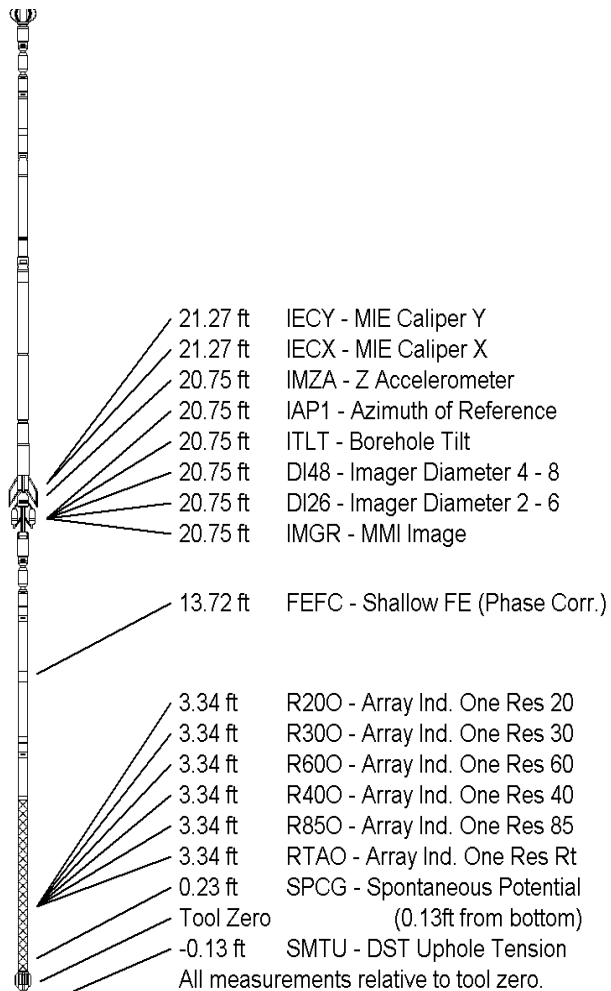
Compact MMI Electrode Section
MIE-A.J 244 LG: 13.96 ft WT: 99.2 lb OD: 4.09 in

SKJ-E.B Compact Knuckle Joint
SKJ-E.B 589 LG: 2.17 ft WT: 24.3 lb OD: 2.24 in

Compact Focussed Electric
MFE-A.A 66 LG: 6.05 ft WT: 48.5 lb OD: 2.24 in

Compact Induction
MAI-A.A 165 LG: 10.81 ft WT: 48.5 lb OD: 2.24 in

Total Length: 80.12 ft Weight: 617.3 lb



COMPANY	EAST CHEYENNE GAS STORAGE LLC
WELL	ECGS No 31-7 WPD005-1
FIELD	PEETZ WEST
PROVINCE/COUNTY	LOGAN
COUNTRY/STATE	USA/COLORADO

Elevation Kelly Bushing	4557.00	feet	First Reading	5251.00	feet
Elevation Drill Floor	4556.00	feet	Depth Driller	5260.00	feet
Elevation Ground Level	4543.00	feet	Depth Logger	5254.00	feet



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