Casedhole Solutions

DUAL INDUCTION LOG

Company	MULL DRILLING COMPANY, INC.
Well	RUTH #1-10
Field	DUST BOWL
County	CHEYENNE
State	COLORADO

Company MULL DRILLING COMPANY, INC.
Well RUTH #1-10
Field DUST BOWL
County CHEYENNE State COLORADO

Location: API # : 05-017-07802-00-00

1444' FSL & 632' FWL
NW - SW

SEC 10 TWP 16S RGE 46W

Other Services
CDL/DNL/PE

Permanent Datum	GROUND LEVEL Elevation	4218
Log Measured From	KELLY BUSHING 13' A.G.L	
Drilling Measured From	KELLY BUSHING	

Elevation
K.B. 4231
D.F. 4229
G.L. 4218

Date	9-17-15		
Run Number	ONE		
Depth Driller	5425		
Depth Logger	5425		
Bottom Logged Interval	5423		
Top Log Interval	00		
Casing Driller	8 5/8 @ 555'		
Casing Logger	550'		
Bit Size	7 7/8		
Type Fluid in Hole	CHEMICAL MUD	CHLORIDES 3,000 PPM	
Density / Viscosity	9.1/61		
pH / Fluid Loss	9.5/8.0		
Source of Sample	FLOWLINE		
Rm @ Meas. Temp	0.90 @ 85F		
Rmf @ Meas. Temp	0.68 @ 85F		
Rmc @ Meas. Temp	1.08 @ 85F		
Source of Rmf / Rmc	MEASUREMENT		
Rm @ BHT	0.59 @ 129F		
Time Circulation Stopped	2 HOURS		
Time Logger on Bottom			
Maximum Recorded Temperature	129F		
Equipment Number	3802		
Location	HAYS, KANSAS		
Recorded By	IAN MABB		
Witnessed By	RUSTY MOURNING		

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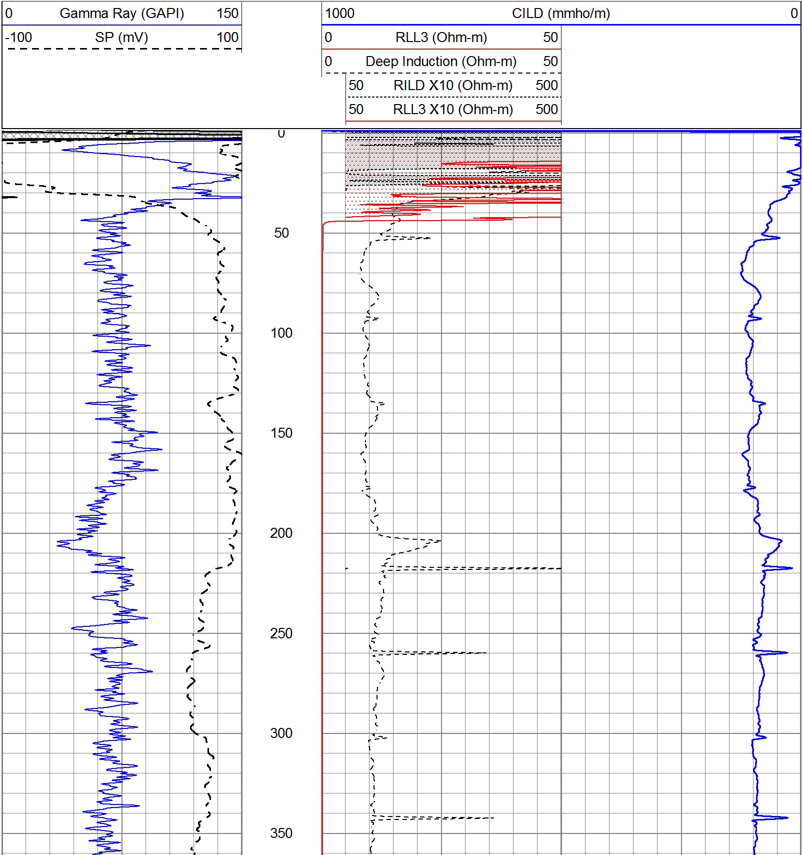
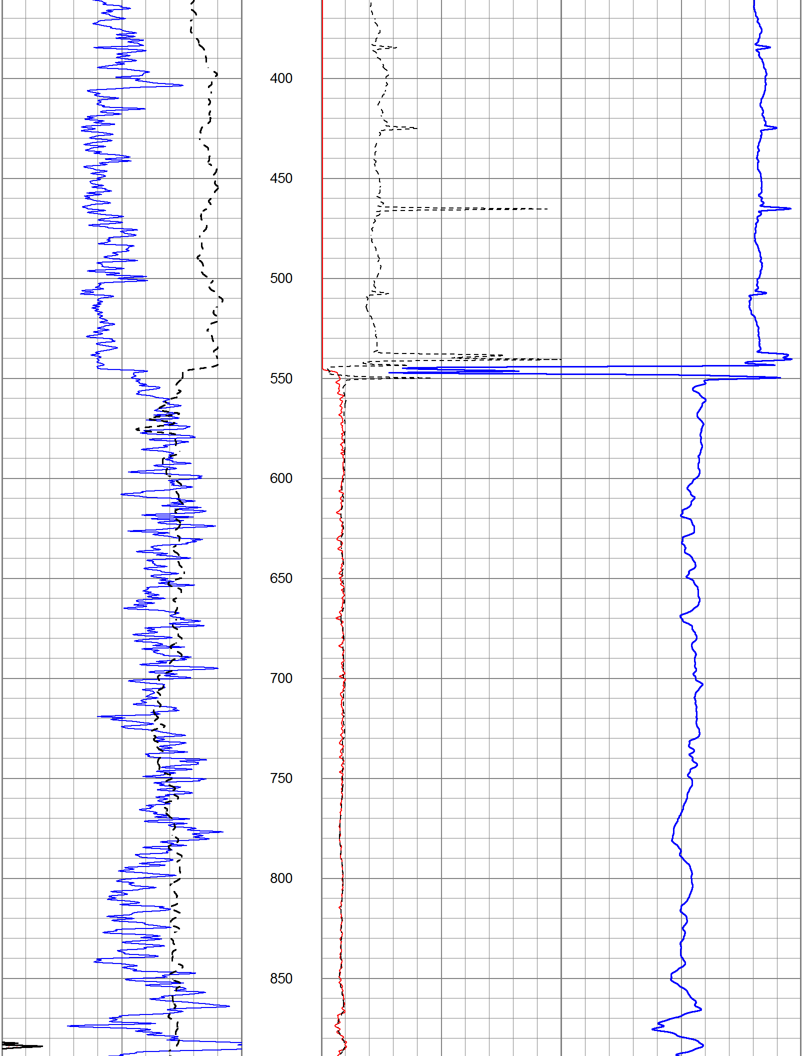
All interpretations are opinions based on inferences from electrical or other measurements and we cannot and do not guarantee the accuracy or correctness of any interpretation, and we shall not, except in the case of gross or willful negligence on our part, be liable or responsible for any loss, costs, 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 set out in our current Price Schedule.

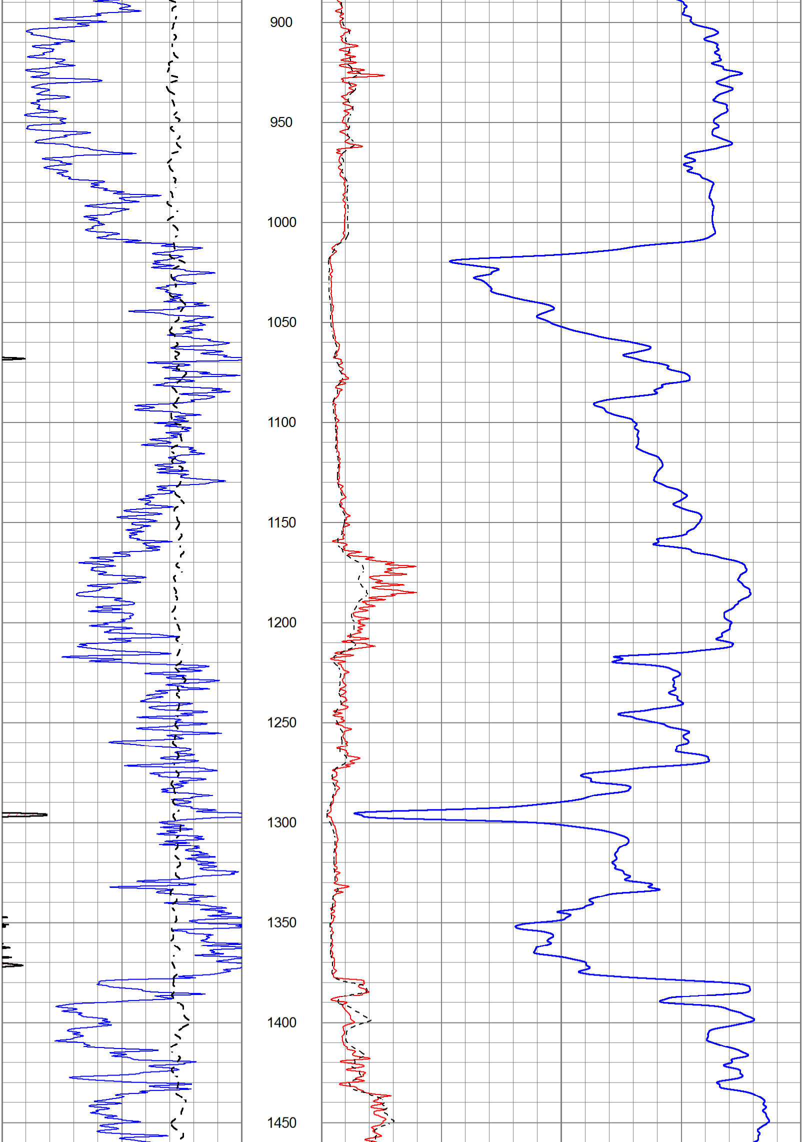
Comments

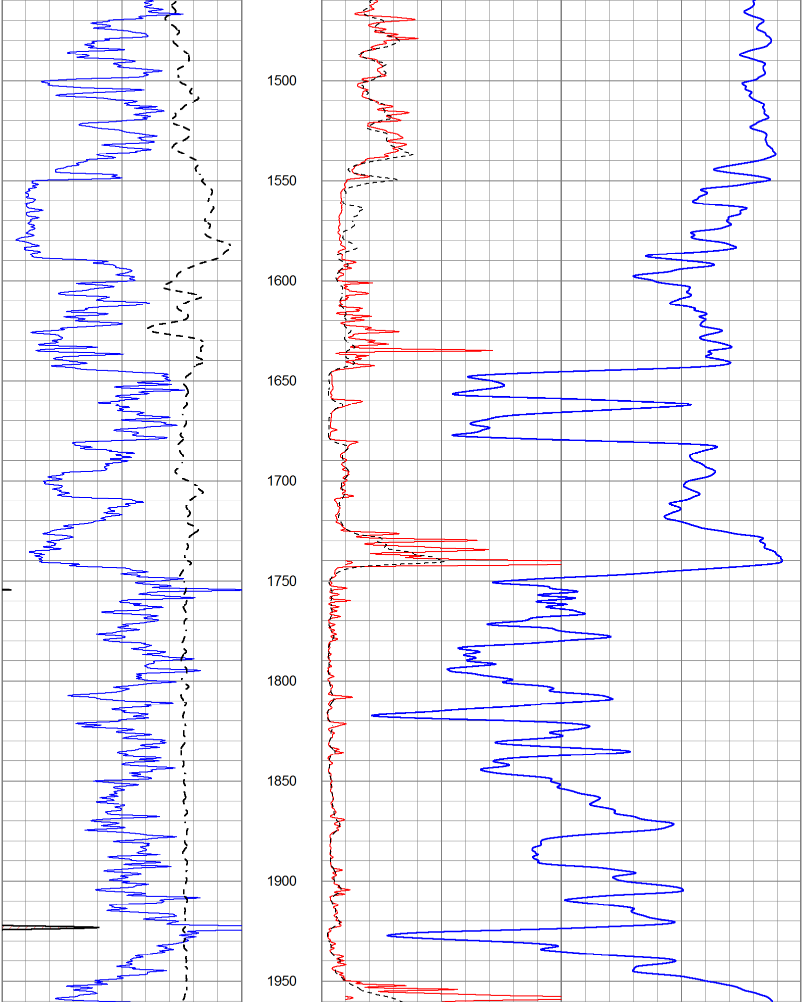
THANK YOU FOR USING C & J CASEDHOLE SOLUTIONS, HAYS, KS. (785) 628-6395
DIRECTIONS : CHEYENNE WELLS, CO - 11 MILES WEST TO FIRSTVIEW (RD 34) - SOUTH TO THE T (RD G) WEST 1/2 MILE - SOUTH 2 MILES - WEST INTO

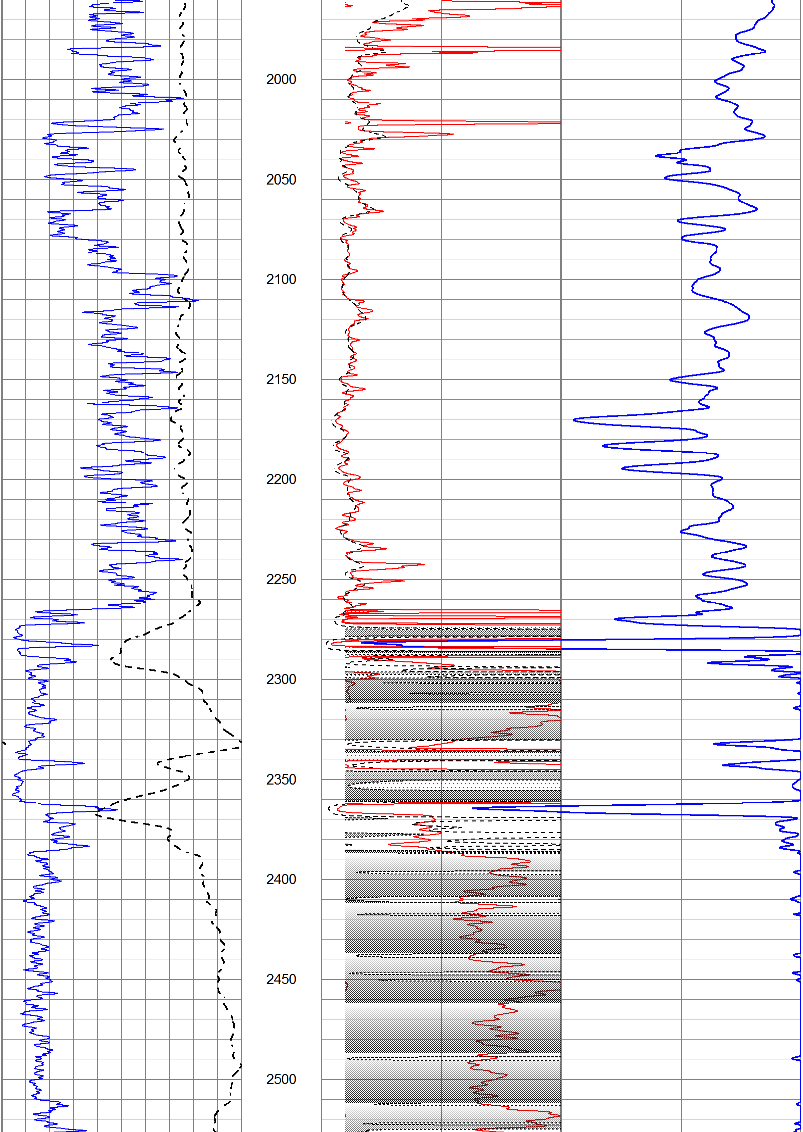
Database File	26610pe8.db
Dataset Pathname	pass3.2
Presentation Format	_dil2
Dataset Creation	Fri Sep 18 02:36:52 2015
Charted by	Depth in Feet scaled 1:600

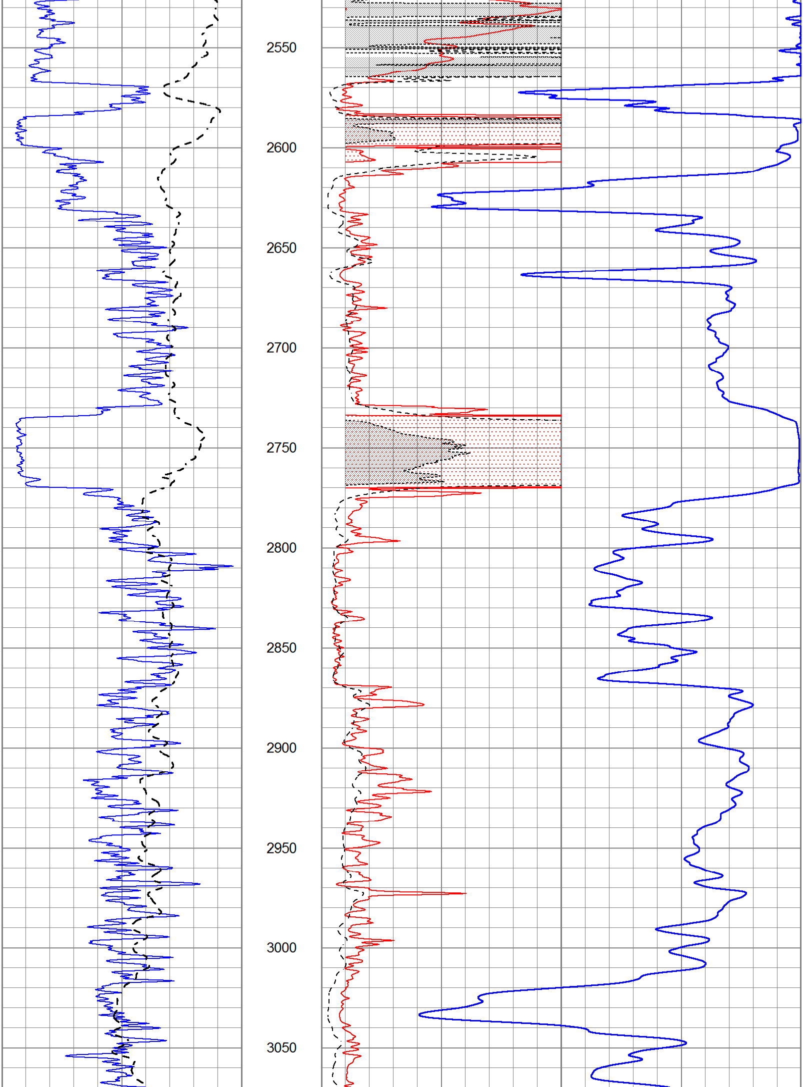


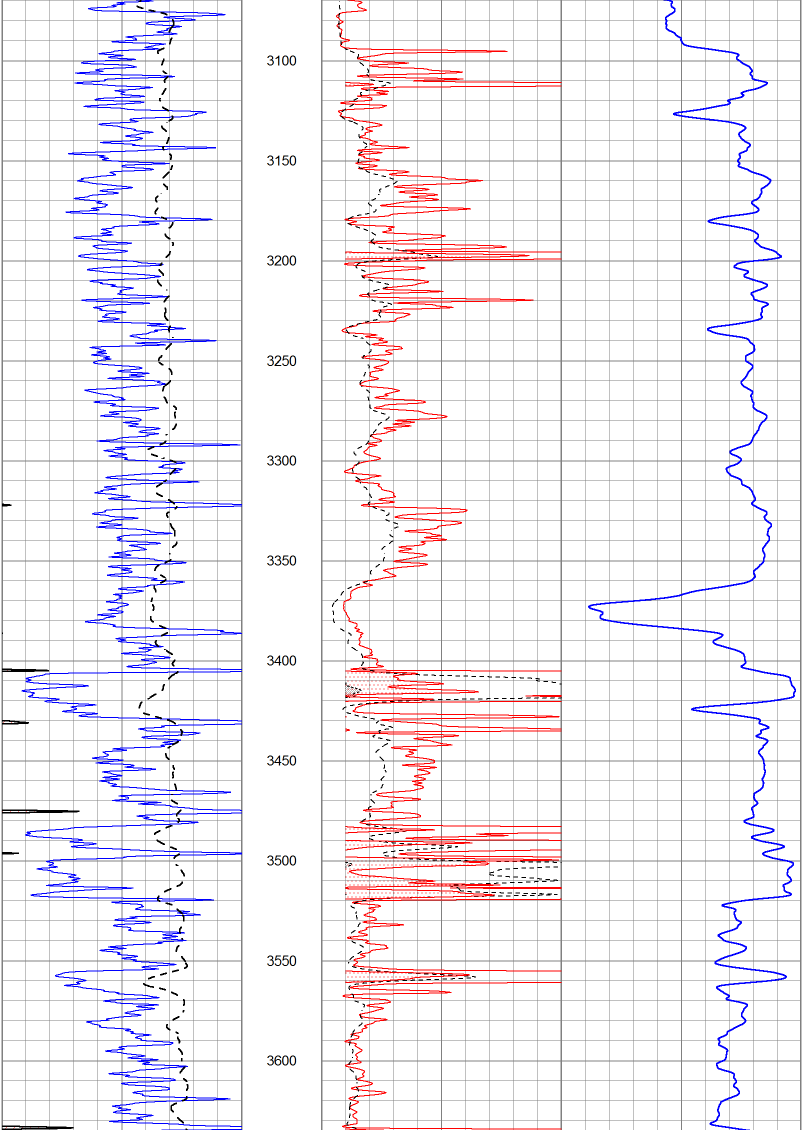


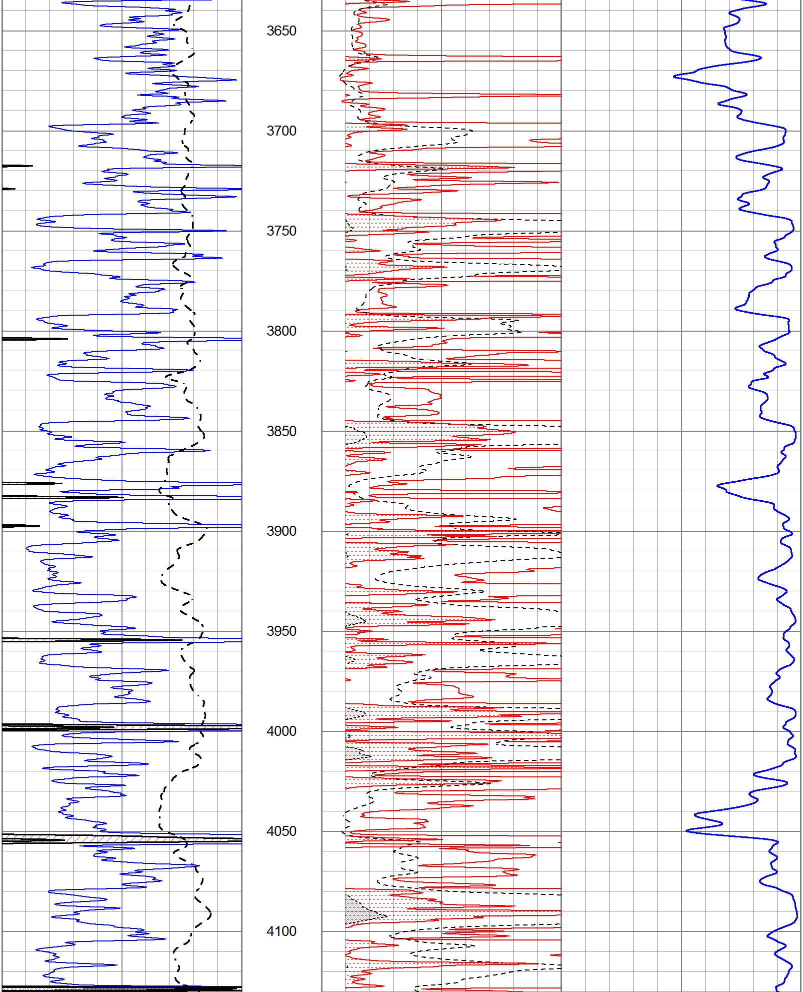


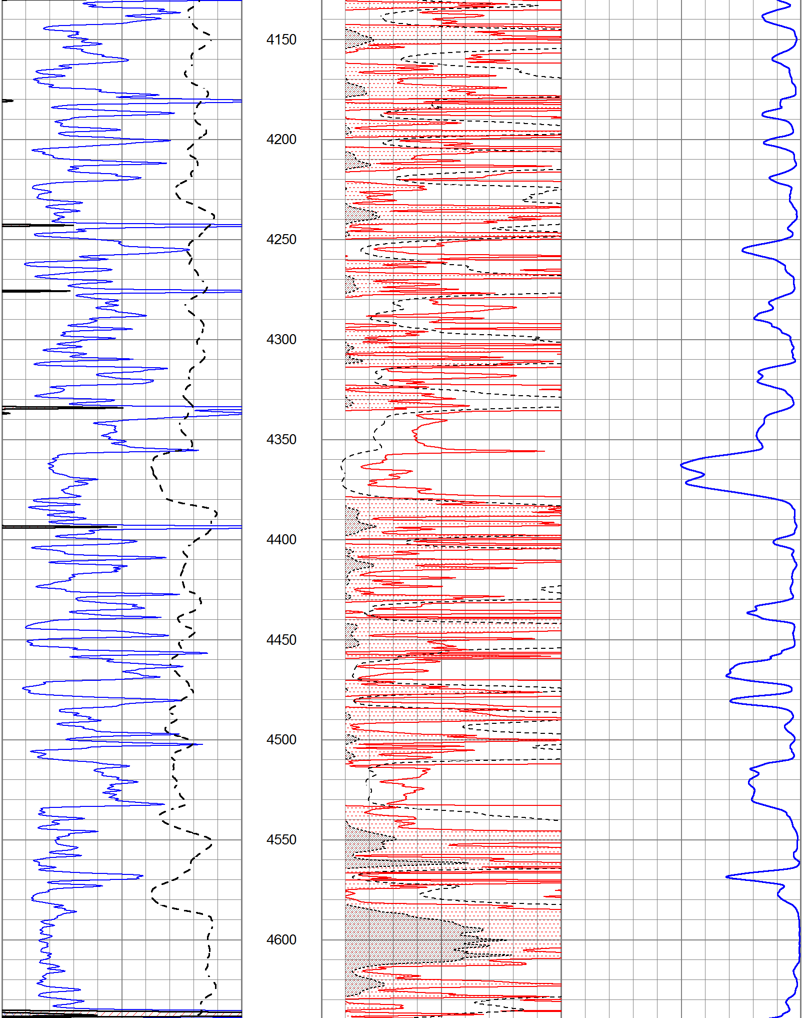


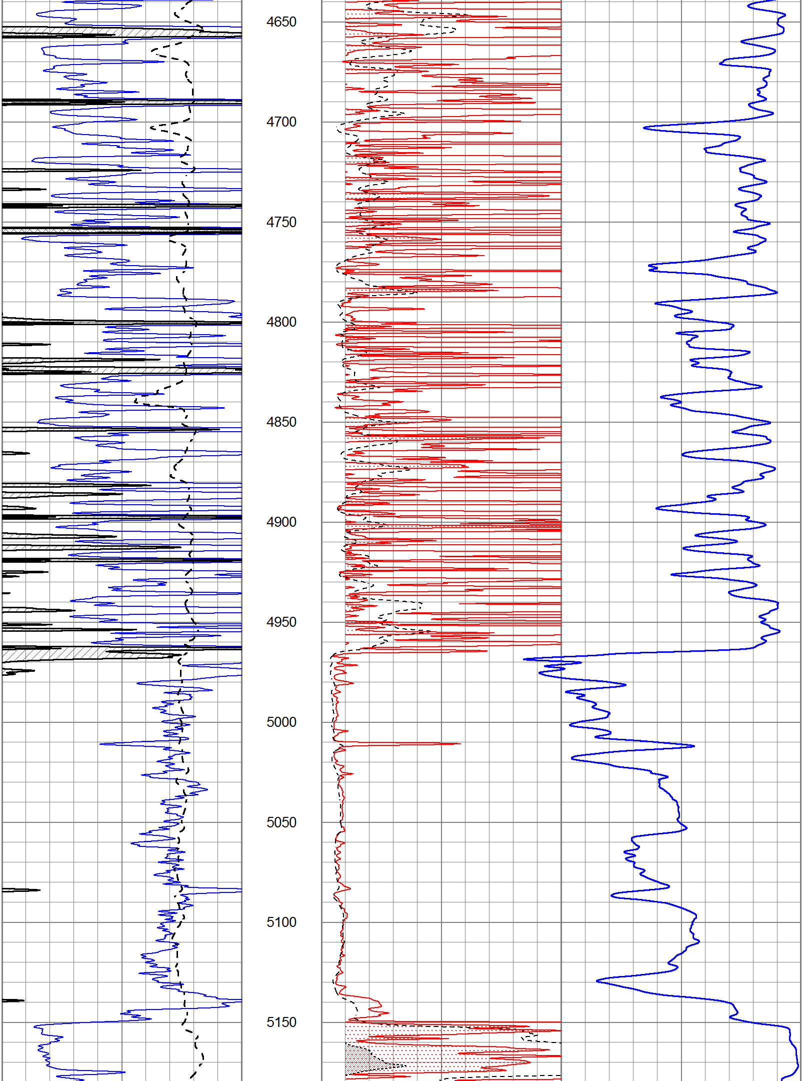


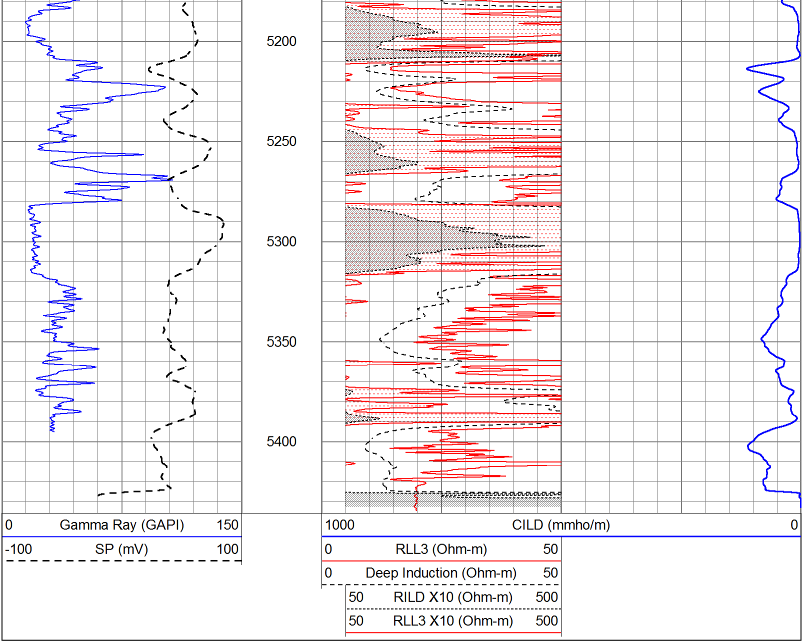












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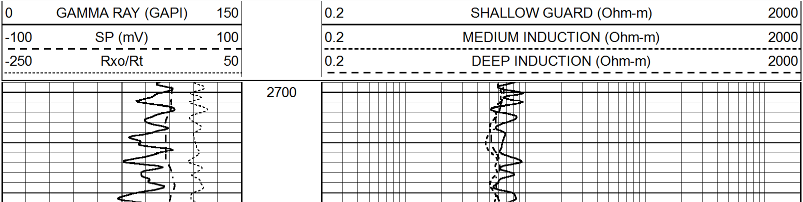
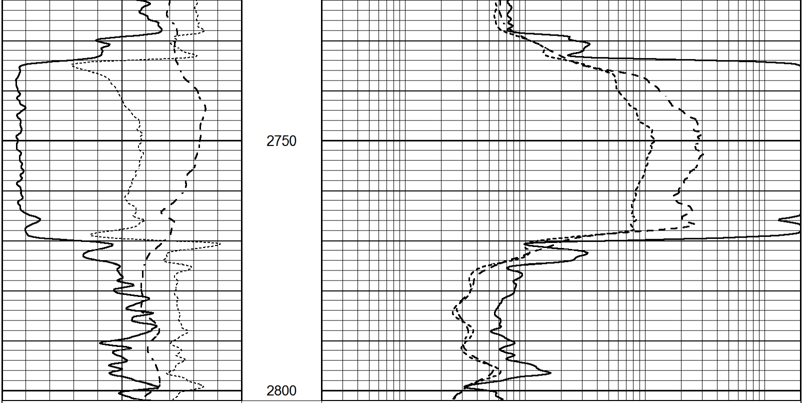
ANHYDRITE SECTION

Database File	26610pe8.db
Dataset Pathname	pass3.1A
Presentation Format	_dil
Dataset Creation	Fri Sep 18 02:14:55 2015
Charted by	Depth in Feet scaled 1:240





0 GAMMA RAY (GAPI) 150	0.2 SHALLOW GUARD (Ohm-m) 2000
-100 SP (mV) 100	0.2 MEDIUM INDUCTION (Ohm-m) 2000
-250 Rxo/Rt 50	0.2 DEEP INDUCTION (Ohm-m) 2000

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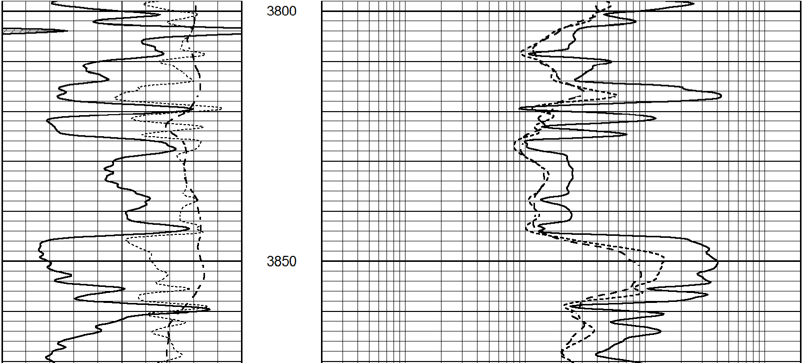
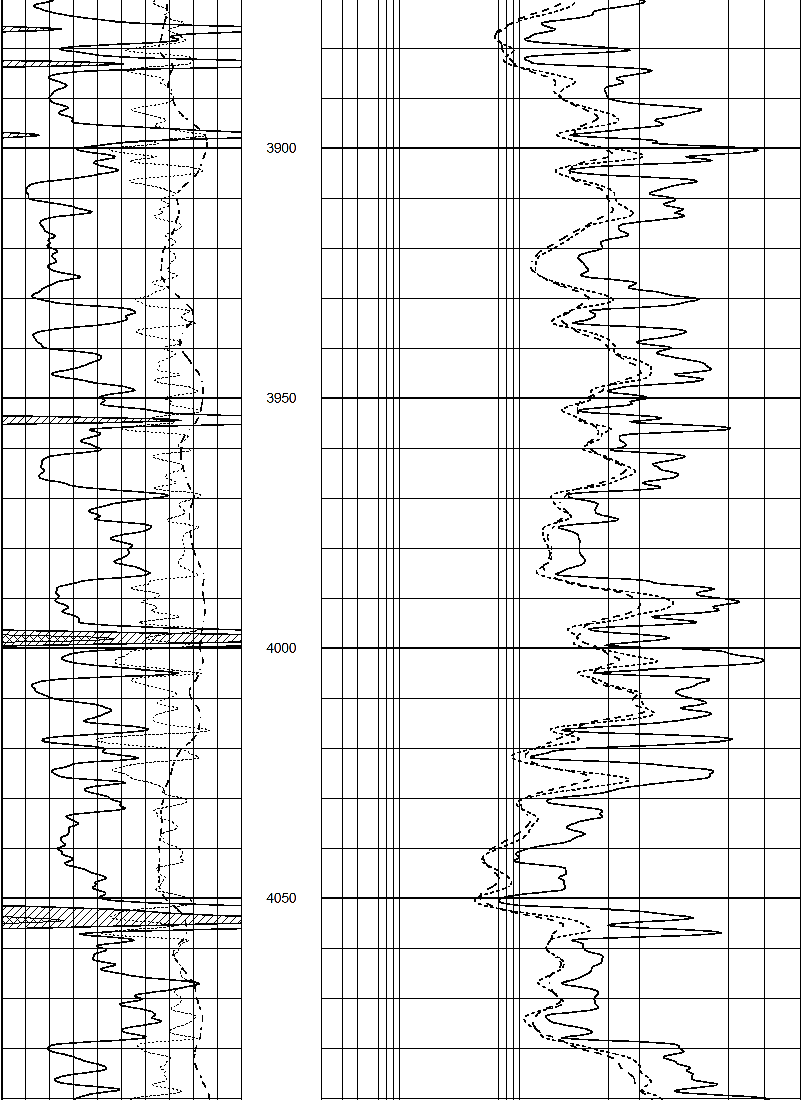
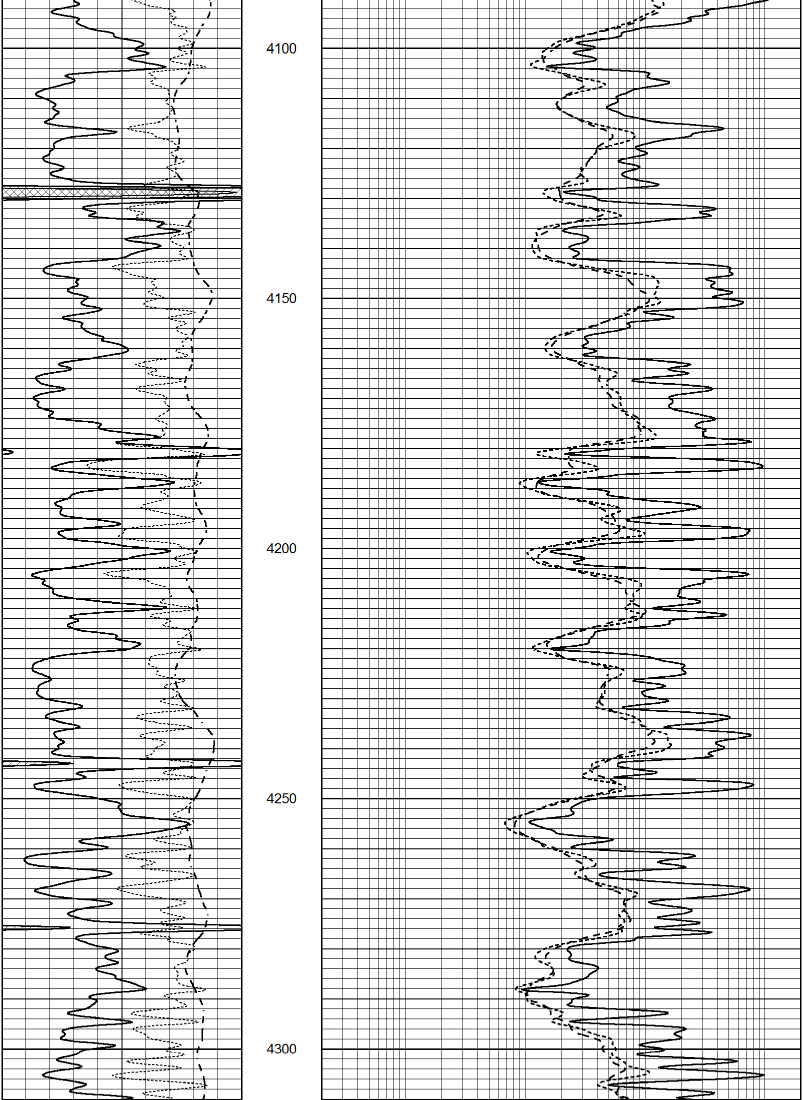
MAIN SECTION

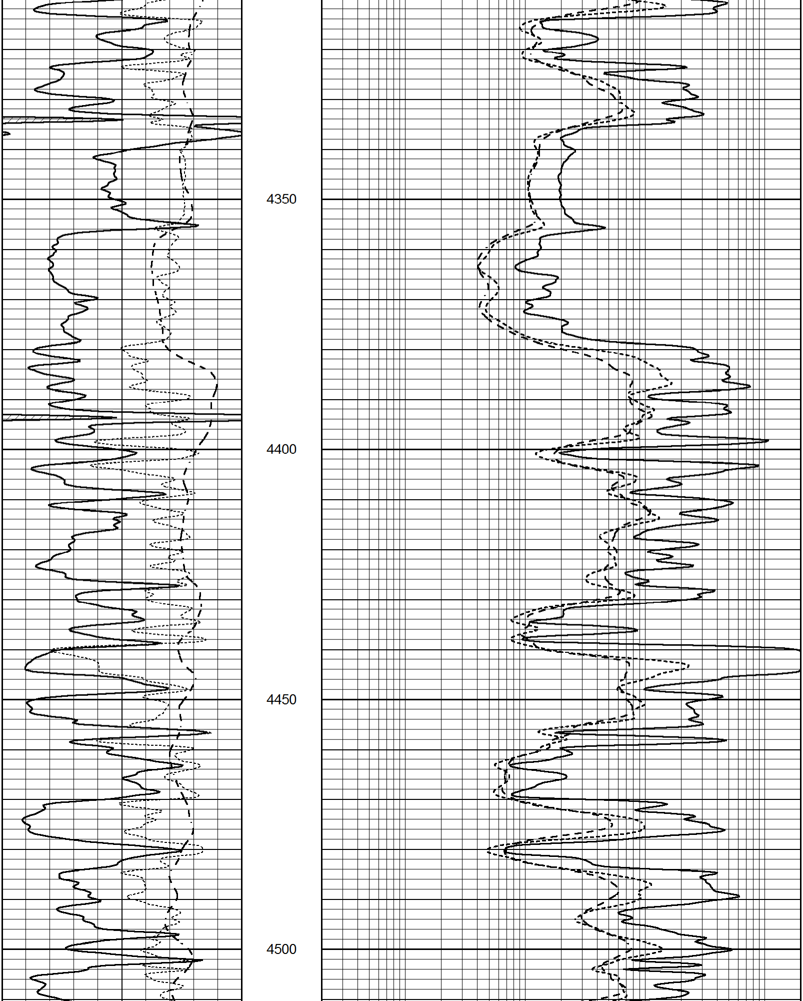
Database File	26610pe8.db
Dataset Pathname	pass3.1
Presentation Format	_dil
Dataset Creation	Fri Sep 18 02:06:22 2015
Charted by	Depth in Feet scaled 1:240

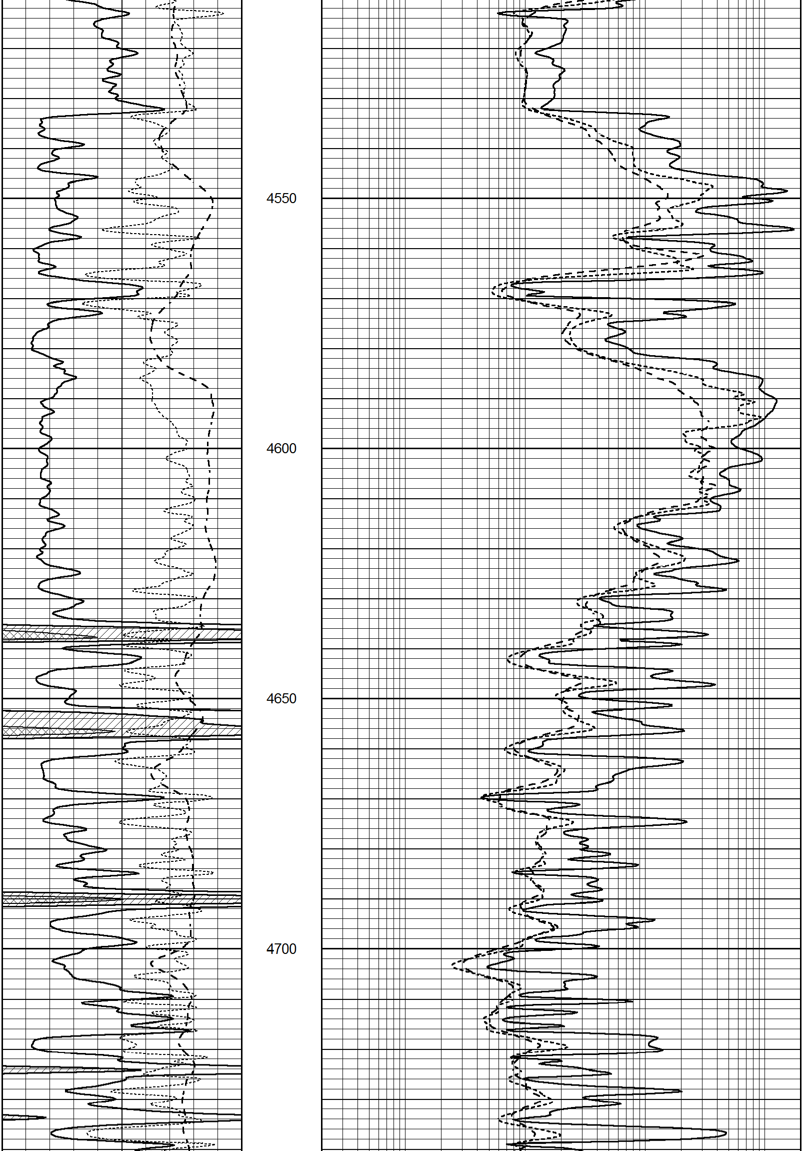
0 GAMMA RAY (GAPI) 150	0.2 SHALLOW GUARD (Ohm-m) 2000
-100 SP (mV) 100	0.2 MEDIUM INDUCTION (Ohm-m) 2000
-250 Rxo/Rt 50	0.2 DEEP INDUCTION (Ohm-m) 2000

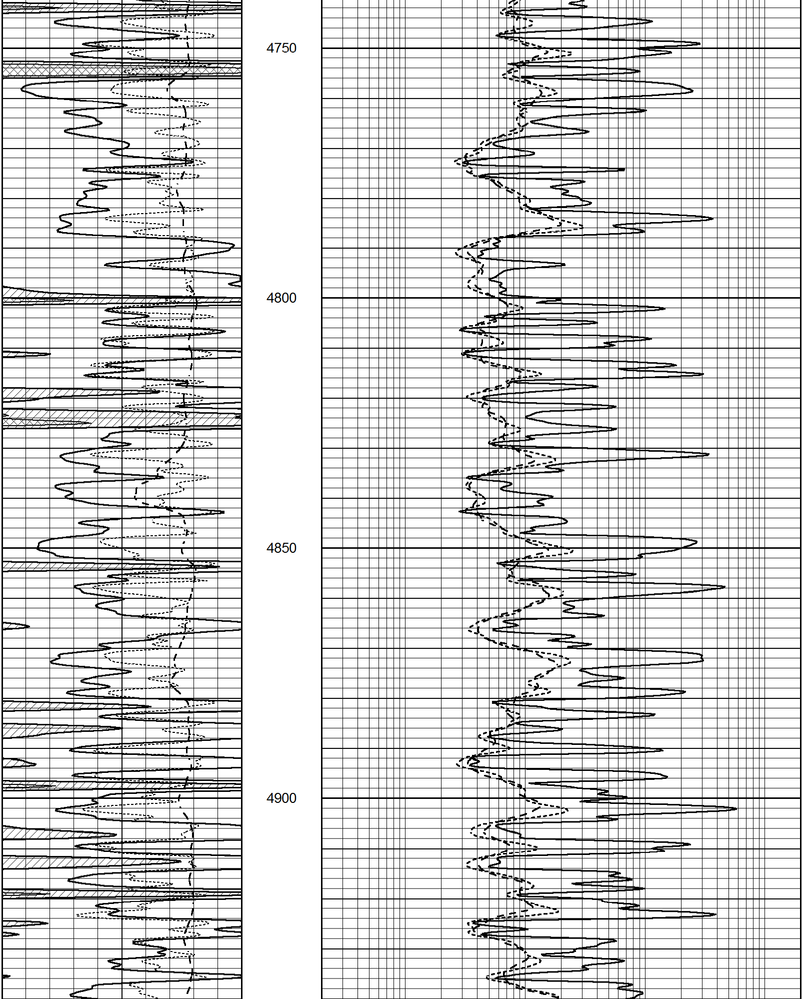


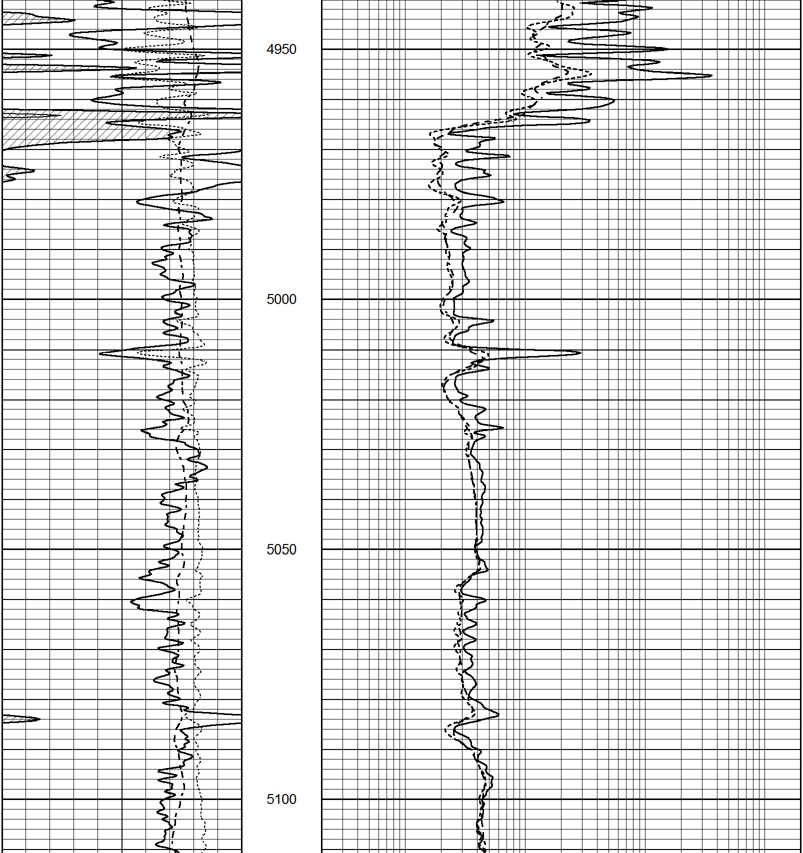


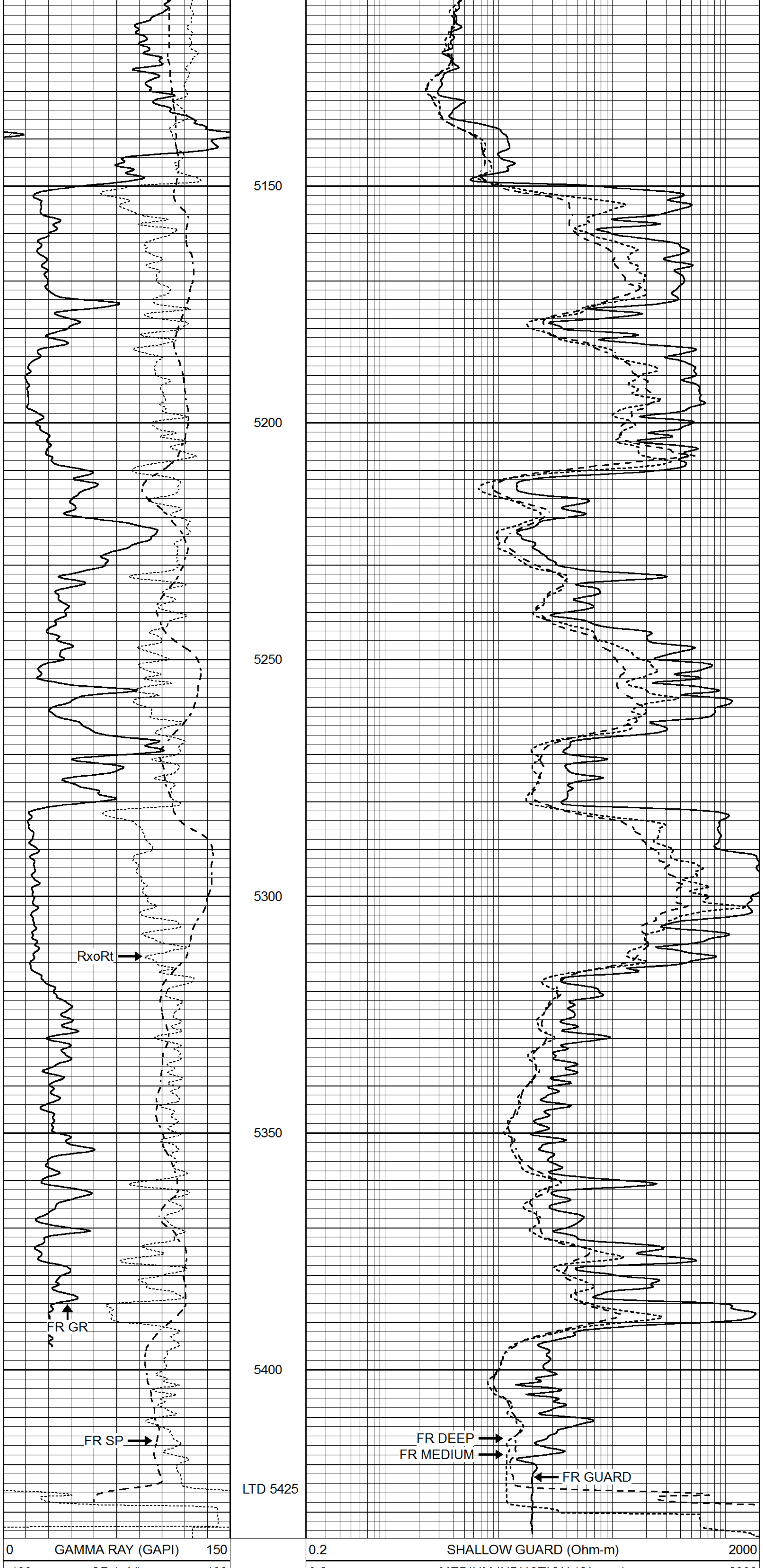












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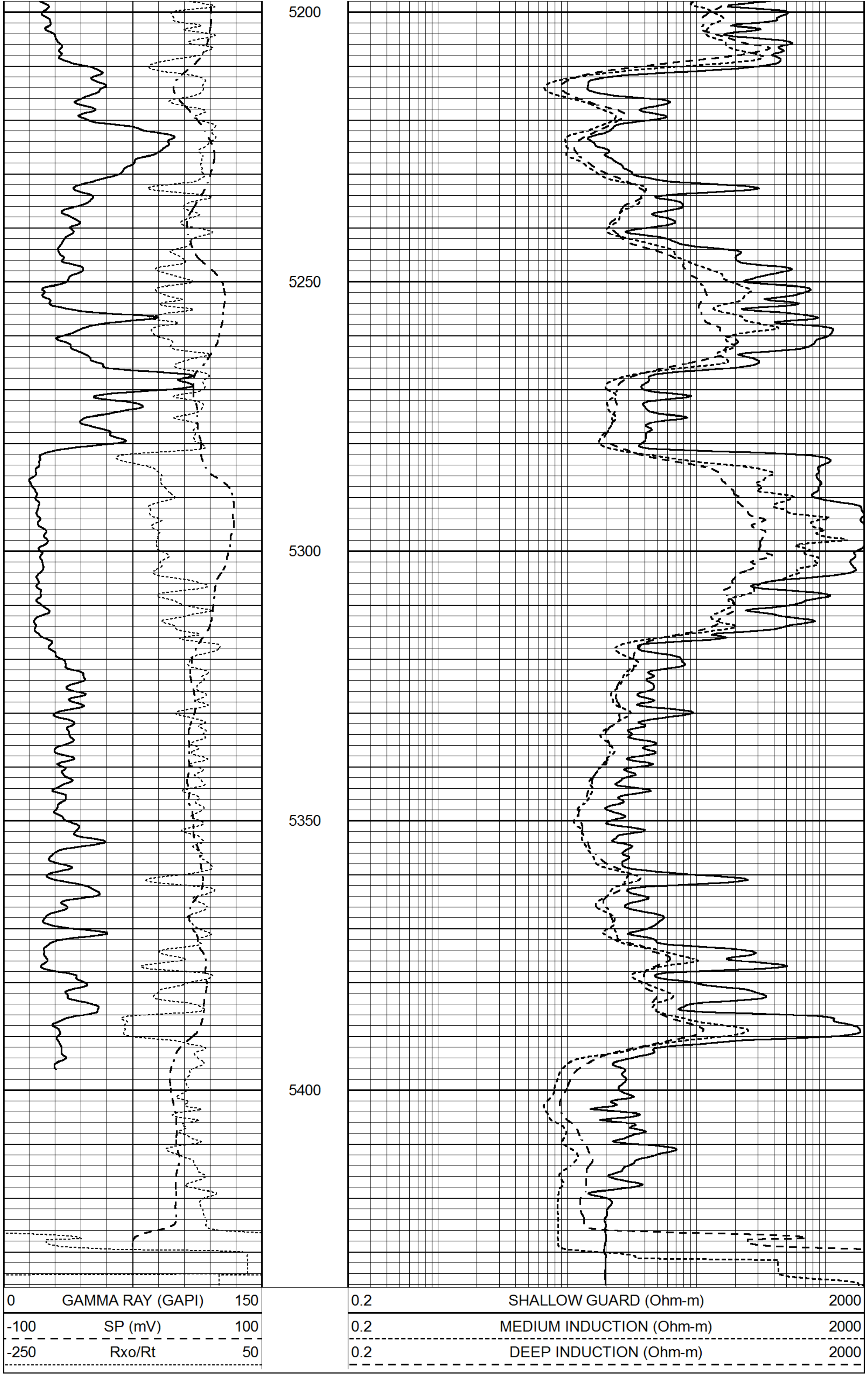
REPEAT SECTION

Database File	26610pe8.db
Dataset Pathname	pass2.2
Presentation Format	_dil
Dataset Creation	Fri Sep 18 01:25:21 2015
Charted by	Depth in Feet scaled 1:240



Calibration Report

Database File	26610pe8.db
Dataset Pathname	pass3.2
Dataset Creation	Fri Sep 18 02:36:52 2015

Dual Induction Calibration Report

Serial-Model:	FW1410-56-Probe
Surface Cal Performed:	Fri Mar 13 14:03:50 2015
Downhole Cal Performed:	Fri Mar 13 15:37:29 2015
After Survey Verification Performed:	Fri Mar 13 15:37:29 2015

Surface Calibration

	Readings			References			Results	
Loop:	Air	Loop		Air	Loop		m	b
Deep	0.008	0.765	V	1.000	400.000	mmho/m	527.061	-3.201
Medium	-0.056	0.761	V	1.000	464.000	mmho/m	567.187	32.510
Internal:	Zero	Cal		Zero	Cal		m	b
Deep	0.005	0.624	V	0.000	400.000	mmho/m	645.611	-3.034
Medium	0.012	0.721	V	0.000	464.000	mmho/m	653.591	-7.532

Downhole Calibration

	Readings			References			Results	
	Zero	Cal		Zero	Cal		m'	b'
Deep	-0.647	301.329	mmho/m	-0.780	336.378	mmho/m	1.117	-0.058
Medium	38.256	411.013	mmho/m	39.046	441.706	mmho/m	1.080	-2.280
LL3		7.471	V		1500.000	Ohm-m		
		0.001	V		20.000	Ohm-m		
		-7.085	V		6000.000	mmho-m		

After Survey Verification

	Readings			Targets			Results	
	Zero	Cal		Zero	Cal		m'	b'
Deep	0.000	0.000	mmho/m	-0.647	301.329	mmho/m	1.000	0.000
Medium	0.000	0.000	mmho/m	38.256	411.013	mmho/m	1.000	0.000
LL3		0.000	Ohm-m		1500.000	Ohm-m		
		0.000	Ohm-m		20.000	Ohm-m		
		0.000	mmho-m		3745.000	mmho-m		

Litho Density Calibration Report

Serial: 140704
Model: V4_10P
Source Number: 74GBq-19

Master Calibration

Performed: Wed Feb 11 18:53:41 2015

	Background	Aluminum	Magnesium	
Window 1	613.01	6027.40	27508.60	cps
Window 2	48.21	1424.77	7132.66	cps
Window 4	266.48	1373.19	5767.15	cps
Window 5	622.07	10090.30	18937.90	cps
Window 6	49.07	1682.84	3271.18	cps
Window 8	298.04	3248.38	5980.58	cps
Bulk Density	-	2.6020	1.6830	g/cc
Pe	-	3.0000	2.5070	b/e

LS Alpha: : -1.8451 SS Alpha: : -0.7542 LS CPE: : 1.0882
LS Beta: : 138648.8473 SS Beta: : 21960.9250 SS CPE: : 1.5181

Before Survey Backround Counts Verification

Performed: Wed Dec 31 18:00:00 1969

Window 1	0.00	cps
Window 2	0.00	cps
Window 4	0.00	cps
Window 5	0.00	cps
Window 6	0.00	cps
Window 8	0.00	cps

After Survey Background Counts Verification

Performed: Wed Dec 31 18:00:00 1969

Window 1	0.00	cps
Window 2	0.00	cps
Window 4	0.00	cps
Window 5	0.00	cps
Window 6	0.00	cps
Window 8	0.00	cps

Lithodensity Caliper Calibration

Performed: Wed Feb 11 18:53:41 2015

Results

Readings		References (in)			
Low	High	Low	High	Gain	Offset
5123.0	9461.6	8.5	14.0	0.0	1.6

Before Survey Caliper Verification

Performed:

	Reference	Reading
Caliper (in)		

After Survey Caliper Verification

Performed:

	Reference	Reading
Caliper (in)		

Compensated Neutron Calibration Report

Serial Number: 080620PMC
Tool Model: NABORS

PRE-SURVEY VERIFICATION

Detector	Readings		Measured	Target
Short Space		cps		
Long Space		cps	pu	pu

POST-SURVEY VERIFICATION

Detector	Readings		Measured	Target
Short Space		cps		
Long Space		cps	pu	pu

Gamma Ray Calibration Report

Serial Number:	46001	
Tool Model:	Probe1	
Performed:	Mon Nov 24 09:45:18 2014	
Calibrator Value:	1.0	GAPI
Background Reading:	0.0	cps
Calibrator Reading:	1.0	cps
Sensitivity:	0.2600	GAPI/cps