



**Weatherford**

Dual Resistivity - Sonic

Density - Neutron

1:500

COMPANY	Santos & Partners		
WELL	Marmbulligan 1		
FIELD	Marmbulligan		
PROVINCE/COUNTY			
COUNTRY/STATE	Northern Territory		
LOCATION	OT Downs Basin		
Latitude	16°11'58.80" S	Other Services	
Longitude	134°46'18.80" E	Dipmeter Acoustic Scanner	
Permanent Datum , Elevation 130 metres			
Log Measured From GL		Elevations:	
Drilling Measured From Surface		KB DF GL	
Date	14-SEPT-2016		
Run Number	1		
Service Order			
Depth Driller	674.80	metres	
Depth Logger	675.32	metres	
First Reading	675.20	metres	
Last Reading	5.00	metres	
Casing Driller	106.70	metres	
Casing Logger	106.80	metres	
Bit Size	3.875	inches	
Hole Fluid Type	KCL		
Density / Viscosity	1.08 g/c3	31.00	
PH / Fluid Loss			
Sample Source	TANKS		
Rm @ Measured Temp	0.066 @ 25.0	ohm-m	
Rmf @ Measured Temp	0.061 @ 25.0	ohm-m	
Rmc @ Measured Temp	0.099 @ 25.0	ohm-m	
Source Rmf / Rmc	CALC	CALC	
Rm @ BHT	0.041 @ 56.0	ohm-m	
Time Since Circulation	1 HRS 15 MIN		
Max Recorded Temp	56.00	deg C	
Equipment / Base	377	EMD	
Recorded By	Duncan Hinton		
Witnessed By	Paul McGliveray	Nick Howlett	
STOP CIRC	12:00 14-SEPT-2016		

## REMARKS

# RUN NUMBER 1 IS THE PRIMARY DEPTH REFERENCE LOG. ALL OTHER RUNS ARE CORRELATED BACK TO THIS LOG.

# CUSTOMER SCALES AND INTERVALS LOGGED

# RUN 1: SQD, VO4  
- Tool Bridged at 109.7M  
- POOH and wait on wiper trip

# RUN 2: DUMMY  
- Tool Bridged at 135.1M  
- POOH and wait on wiper trip

# RUN 3: SQD, VO4  
- TIME ON BOTTOM 13:30 / 14 SEPT 2016  
- VO4/SQD - 341/433 - Calibrated 3 August 2016  
- MAX TEMP ON RUN 56 DEG C

# RUN 4: RR5  
- TIME ON BOTTOM 17:00 / 14 SEPT 2016  
- RR5 - 595 - Calibrated 5 Aug 2016

# RUN 5: MS2  
- TIME ON BOTTOM 19:00 / 14 SEPT 2016  
- MS2 - 422  
- MAX TEMP ON RUN 56 DEG C

# RUN 6: DD6  
- TIME ON BOTTOM 22:05 / 14 SEPT 2016  
- DD6 - 733 - Calibrated 3 August 2016

- MAX TEMP ON RUN 56 DEG C

# RUN 7: NN2

- TIME ON BOTTOM 01:10 / 15 SEPT 2016

- NN2 - 549 - Calibrated 3 August 2016

- MAX TEMP ON RUN 56 DEG C

# RUN 8: ATV

- TIME ON BOTTOM 04:20 / 15 SEPT 2016

- ATV - 100804

# RIG: FORACO 12

# NO REPEAT SECTION LOGGED AS PER CLIENT REQUIRMENT

# LOGGING CREW: ENGINEER - D. HINTON; N. HOWLETT

## BOREHOLE RECORD

Last Edited: 15-SEP-2016 02:07

Bit Size inches	Depth From metres	Depth To metres
8.500	0.00	107.70
3.780	107.70	674.80

## CASING RECORD

Type	Size inches	Depth From metres	Shoe Depth metres	Weight pounds/ft
SURFACE	4.500	0.00	106.70	11.42

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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Main Log 1:500

↓

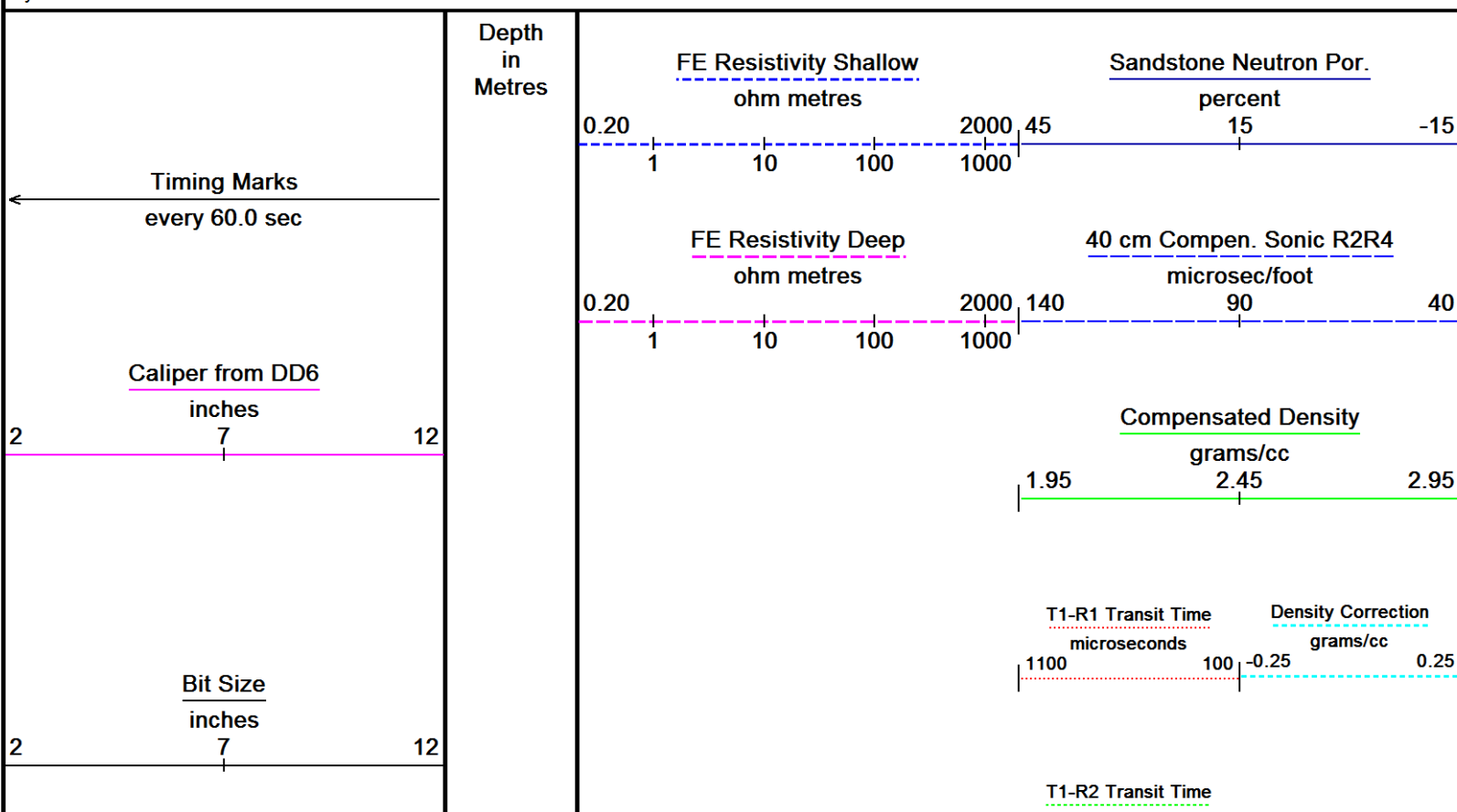
Depth Based Data - Maximum Sampling Increment 10.0cm

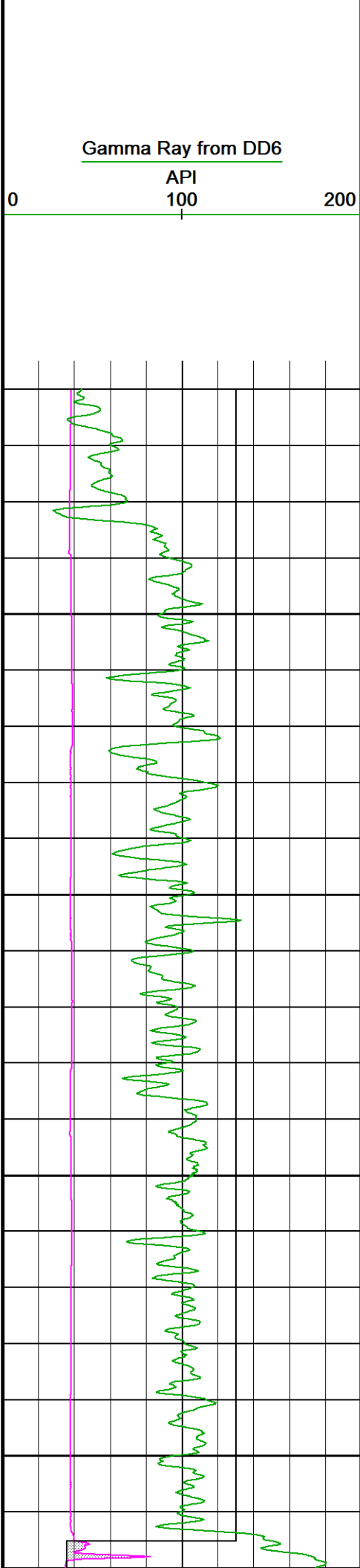
Plotted on 15-SEP-2016 11:52

Filename: C:\Users\E6410\AppData\Loc...\Marmbulligan 1\_WL Suite 1\_DD6-NN2-MS2-RR5\_MAIN.dta

Recorded on 14-SEP-2016 17:44

System Versions: Plotted with 13.07.0258



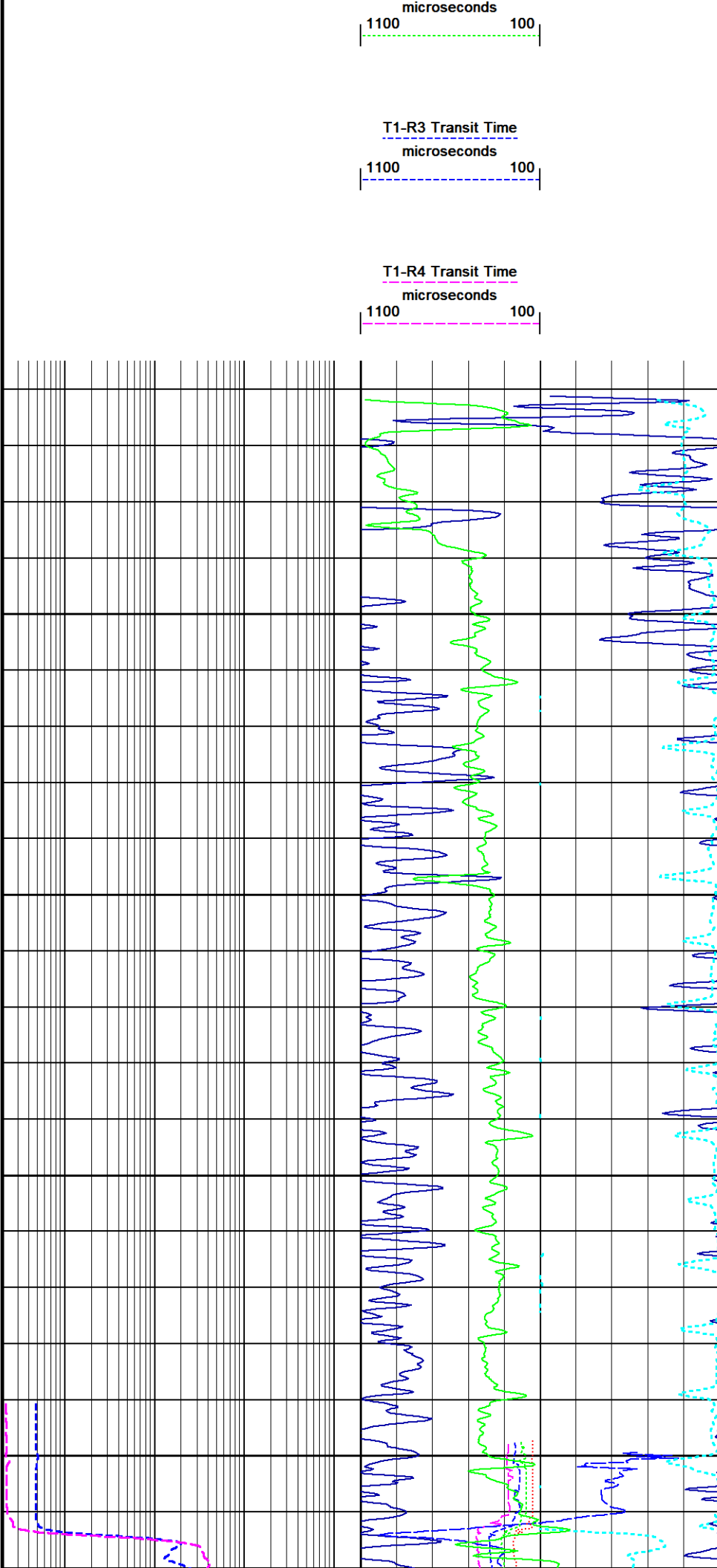


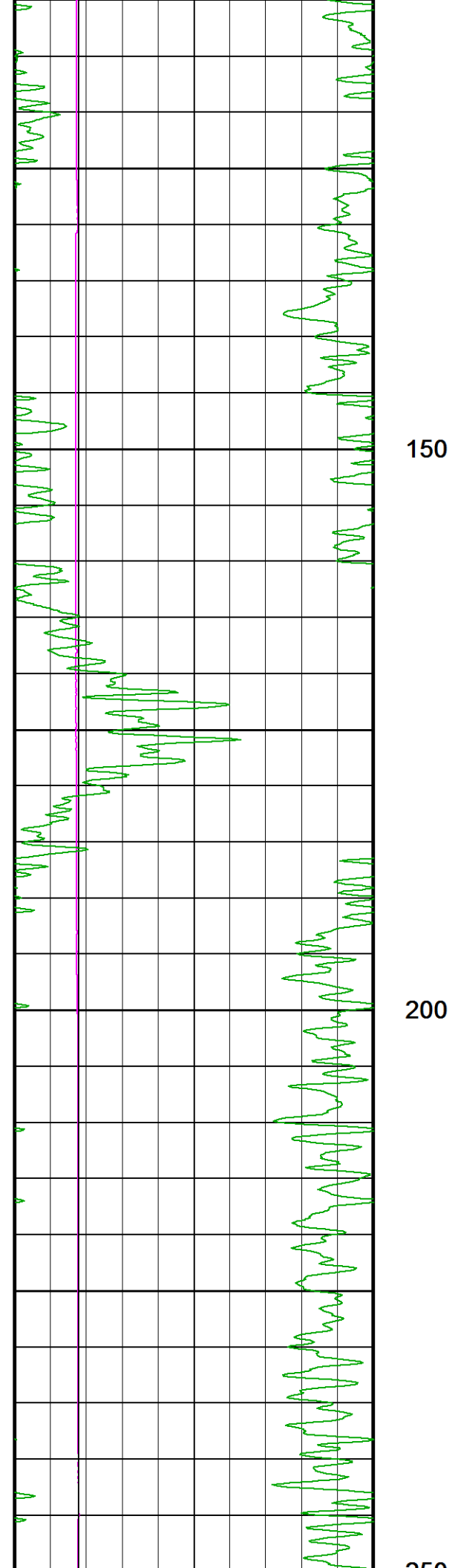
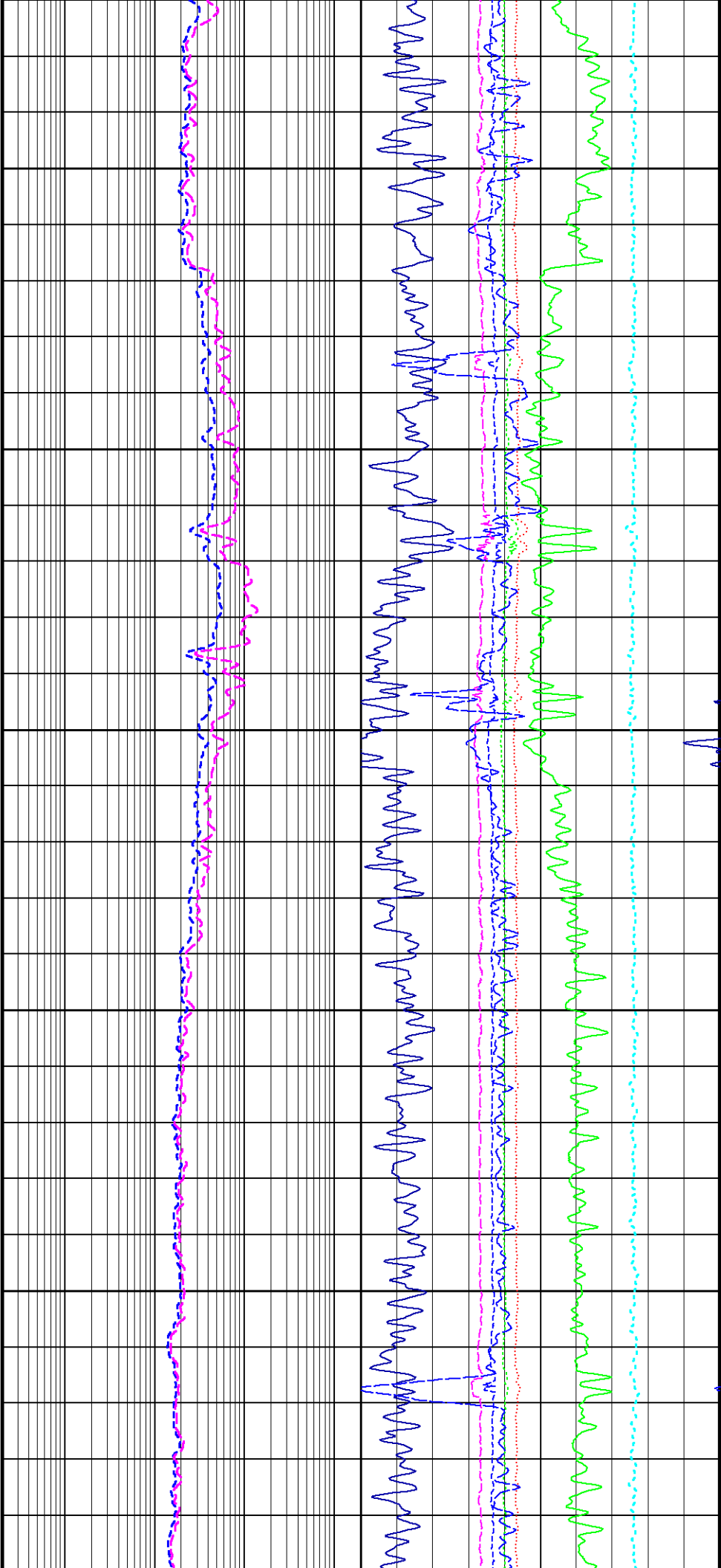
Replay  
Scale  
1:500

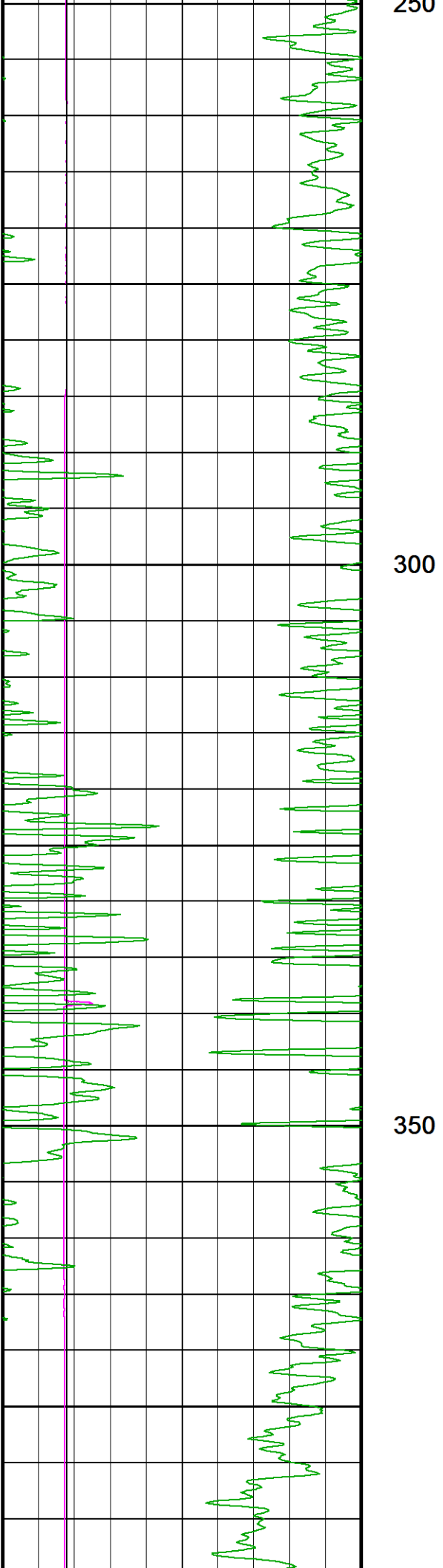
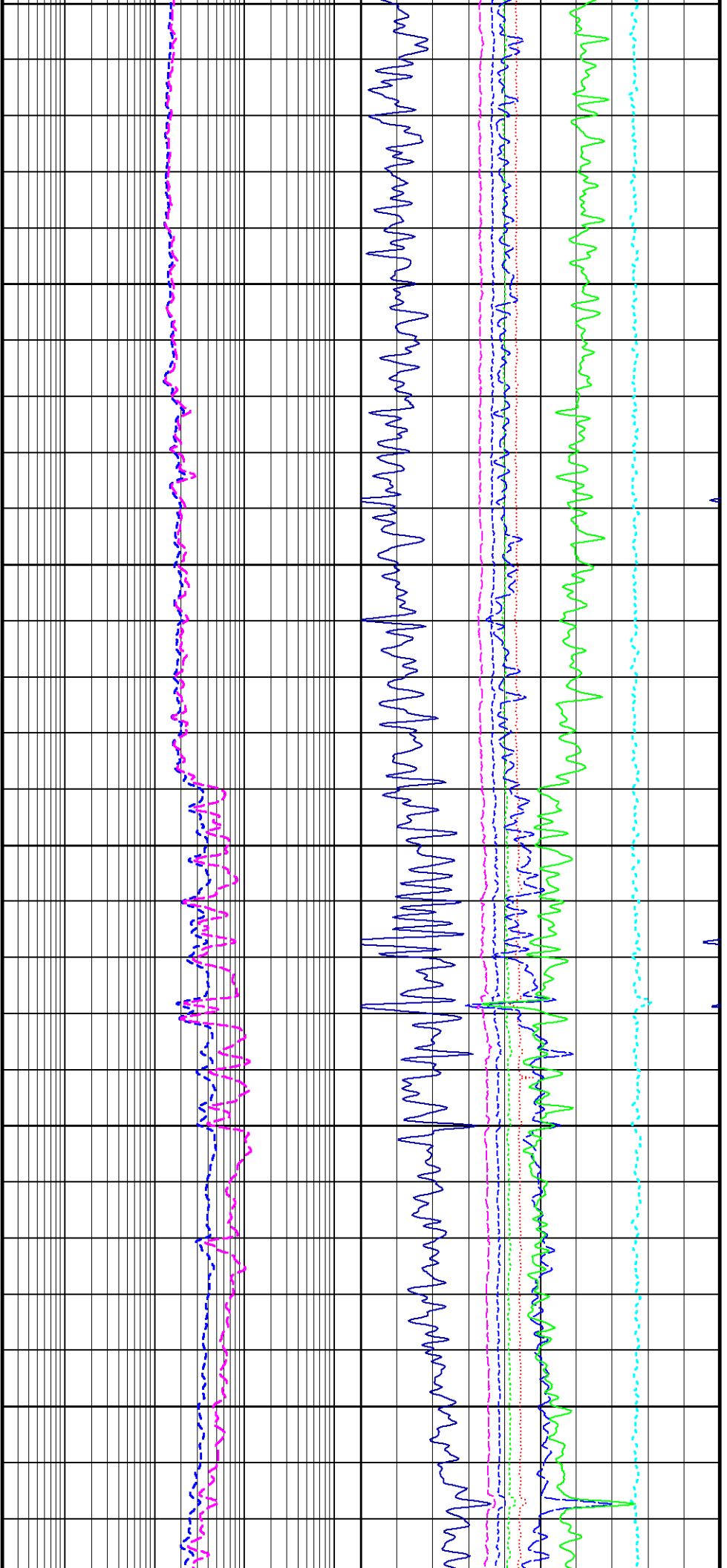
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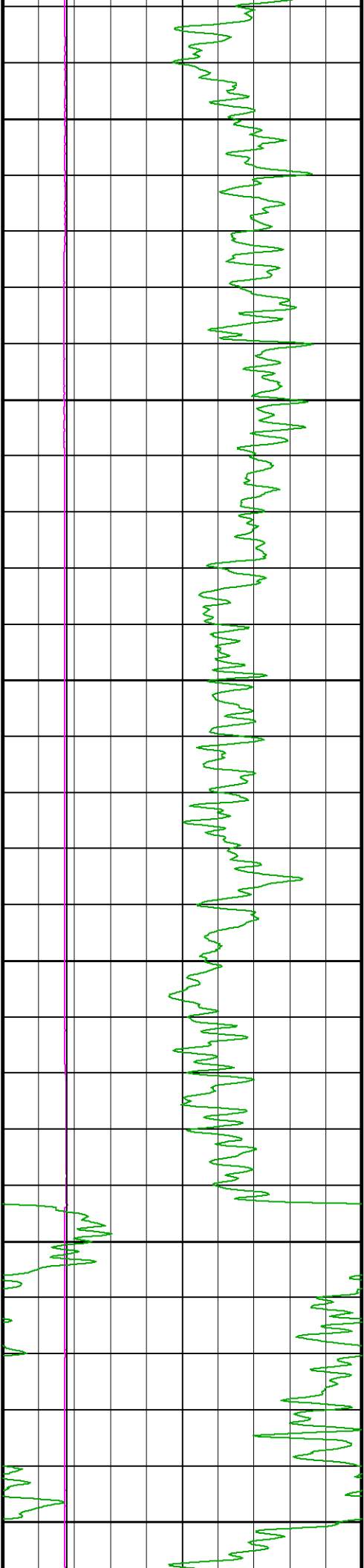
50

100





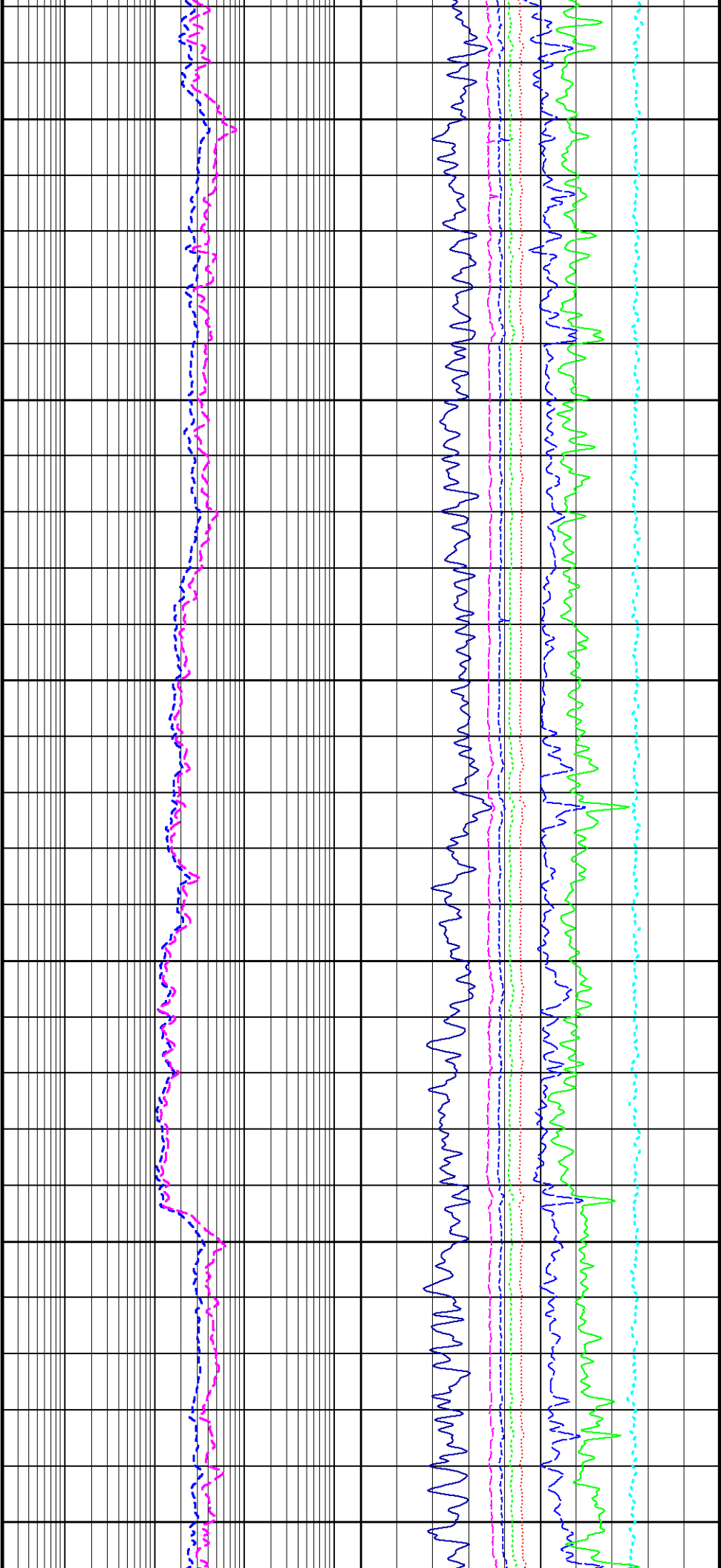


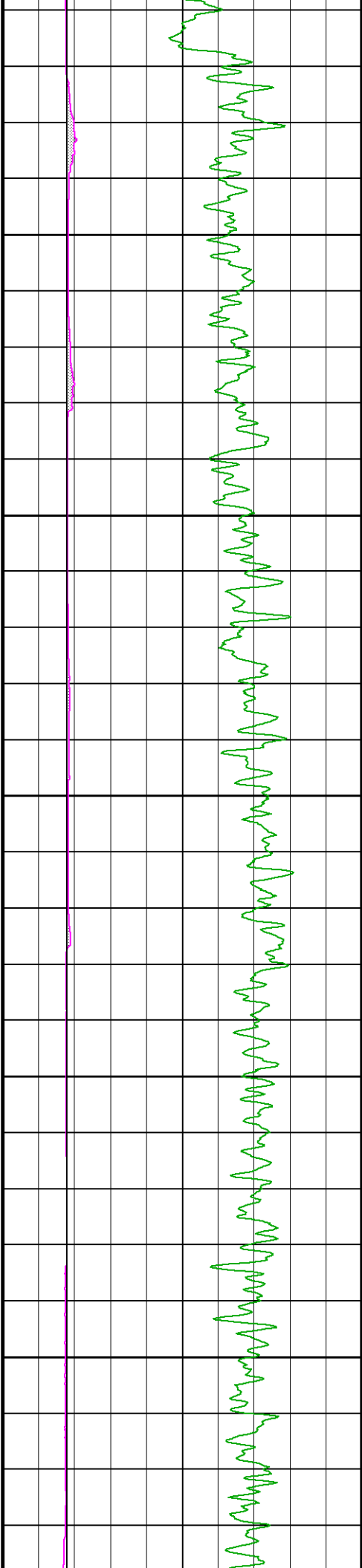


400

450

500

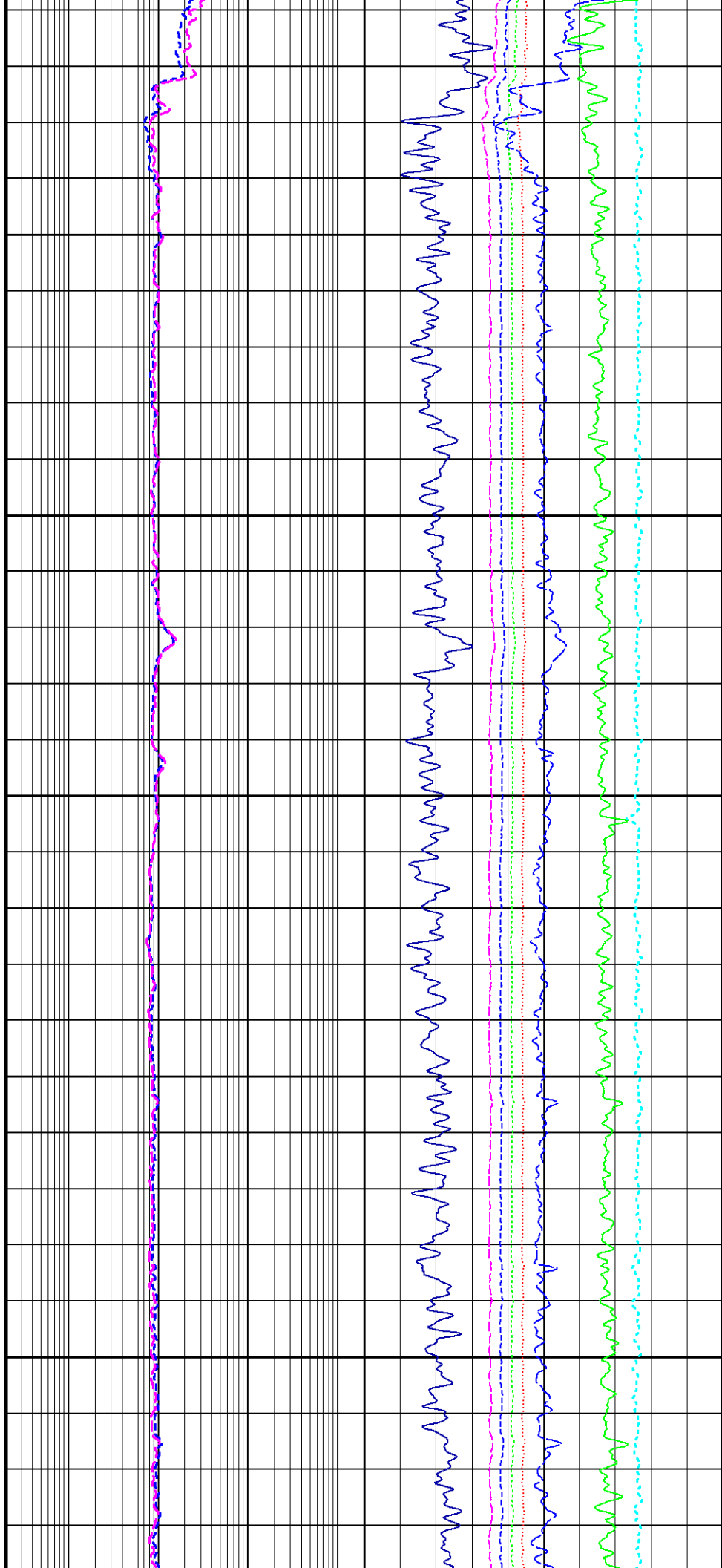


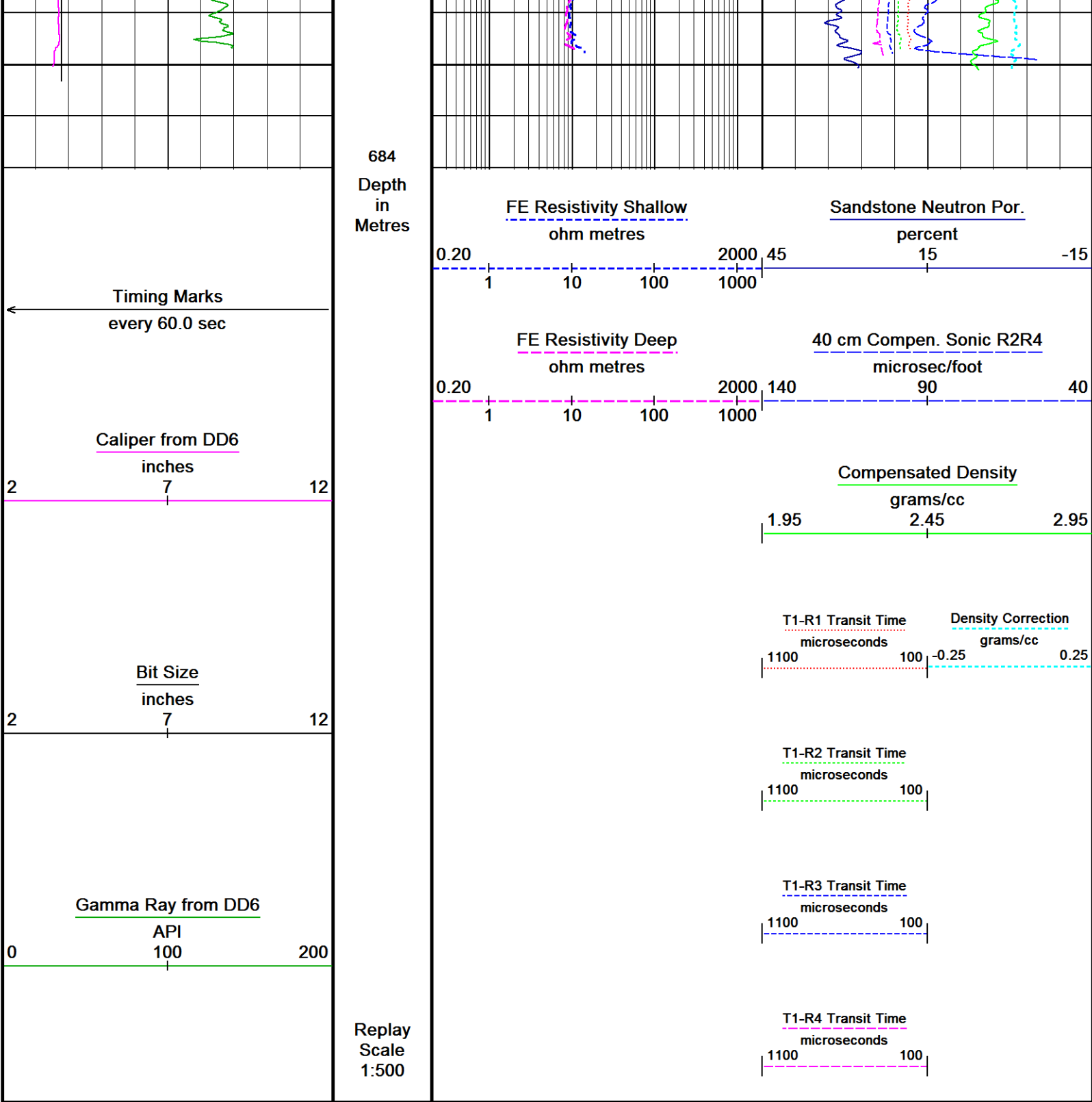


550

600

650





BEFORE SURVEY CALIBRATION		
C:\Users\E6410\AppData\Local\Temp\Weatherford PreView0\0\Marmbulligan 1_WL Suite 1_DD6-NN2-MS2-RR5_MAIN.dta		
Caliper Calibration DD6-A.A 733		Base Calibration on 17-AUG-2016,18:35 Field Calibration on
Base Calibration		
Reading No	Measured	Calibrator Size (in)
1	2136	3.00
2	2597	4.00
3	2000	5.00



3	3008	5.00
4	3462	6.00
5	3930	7.00
6	5145	9.00

Field Calibration

Measured Caliper (in)

Actual Caliper (in)

Density Calibration DD6-A.A 733

Base Calibration on 17-AUG-2016,18:41

Field Check on

Base Calibration

Wet Hole

Measured

Calibrated (sdu)

Brd

Lsd

Brd

Lsd

Reference 1

3413

1983

36843

17425

Reference 2

1161

42

13911

455

Dry Hole

Measured

Calibrated (sdu)

Reference 1

1

2

3

4

Reference 2

5

6

7

8

Field Check at Base

Calibrated (sdu)

0.0

0.0

Field Check

Calibrated (sdu)

Density Constants DD6-A.A 733

Last Edited on 17-AUG-2016,18:29

Processing Type

DD3

Density Source Id

8246CN

Aluminium Calibrator Number

000

Caliper Source for Processing

Caliper from Density

Gamma Strip Coefficient

0.50

Mud Density

1.11

gm/cc

Mud Filtrate Density

1.00

gm/cc

BRD Scaler

-0.50

LSD Scaler

1.50

Matrix Density (gm/cc)

Depth (m)

2.71

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

Wet Hole Normalisation

Measured g/cc

Calibrated g/cc

DENB Point 1

1.00

1.00

DENB Point 2

3.00

3.00

DENL Point 1

1.00

1.00

DENL Point 2

3.00

3.00

Dry Hole Normalisation

Measured g/cc

Calibrated g/cc

DENB Point 1

1.00

1.00

DENB Point 2

3.00

3.00

DENL Point 1

1.00

1.00

DENL Point 2

3.00

3.00

Gamma Calibration DD6-A.A 733

Field Calibration on 17-AUG-2016,18:27

Measured

Calibrated (API)

Background

9

15

Calibrator (Gross)

296

470

Calibrator (Net)

287

455

Gamma Constants DD6-A.A 733

Last Edited on 17-AUG-2016,18:27

Gamma Calibrator Number		428	
General Constants All 000		Last Edited on 14-SEP-2016,22:55	
General Parameters			
Mud Resistivity	0.066	ohm-metres	
Mud Resistivity Temperature	25.000	degrees C	
Water Level	0.000	metres	
Borehole Fluid Processing	Wet Hole		
Hole/Annular Volume and Differential Caliper Parameters			
HVOL Method	Single Caliper		
HVOL Caliper 1	Caliper from DD6		
HVOL Caliper 2	N/A		
Annular Volume Diameter	3.000	inches	
Caliper for Differential Caliper	None		
Rwa Parameters			
Porosity used	N/A		
Resistivity used	N/A		
RWA Constant A	N/A		
RWA Constant M	N/A		
SW/APOR Tool Source			
Sonic Constants MS2-A.A 422		Last Edited on 12-SEP-2016,19:34	
Maximum Boundary Contrast	100.00	micro-sec/ft	
Fluid Transit Time	189.00	micro-sec/ft	
Limestone Transit Time	47.50	micro-sec/ft	
Sandstone Transit Time	55.50	micro-sec/ft	
Dolomite Transit Time	43.50	micro-sec/ft	
Sonic for Porosities	DTCA-60 cm Compensated	Sonic R1R4	
Hunt-Raymer Constant	83.13	micro-sec/ft	
Transit Time for UCS Curve	DTCC-20 cm Compensated	Sonic R3R4	
UCS Constant	196.09	kpsi	
UCS Exponent	0.0410	feet/sec	
Transmitter-Receiver 1 Offset	24.00	inches	
Transmitter-Receiver 2 Offset	32.00	inches	
Transmitter-Receiver 3 Offset	40.00	inches	
Transmitter-Receiver 4 Offset	48.00	inches	
Neutron Calibration NN2-A 549		Base Calibration on 15-SEP-2016,01:32	
Base Calibration	Short	Long	
Reading	Measured	Calibrated	Measured
1	110	1235	48
			57
Neutron Constants NN2-A 549		Last Edited on 15-SEP-2016,03:26	
Neutron Source Id	1009N		
Neutron Calibrator Number – Short	56.8		
Neutron Calibrator Number – Long	1235		
Porosity Equation Type	1 Curie		
Caliper Source for Processing	BIT		
FE Calibration RR5-A.A 595		Field Calibration on 14-SEP-2016,17:34	
	Measured (cps)	Calibrated (ohm-m)	
	Shallow	Deep	Shallow
			Deep
Reference 1	4520.00	4475.00	2.76
Reference 2	3020.00	2975.00	1.92
			2758.00
			1918.00
FE Constants RR5-A.A 595		Last Edited on 14-SEP-2016,15:53	
Rt Constant PEN1 (deep > shallow)	2.100		
Rt Constant PEN2 (deep < shallow)	1.900		
Shallow K Factor	0.197		
Deep K Factor	0.137		
Tool standoff	Zero		
Caliper for hole size correction	Bit Size		
Caliper Value hole size correction	N/A	inches	
Mud Resistivity hole size correction	Temperature Corr Constant		

Temperature for Rm Corr.

25.000

Deg C

COMPANY	Santos & Partners
WELL	Marmbulligan 1
FIELD	Marmbulligan
PROVINCE/COUNTY	
COUNTRY/STATE	Northern Territory

Elevation Kelly Bushing		metres	First Reading		metres
Elevation Drill Floor	175.00	metres	Depth Driller	674.80	metres
Elevation Ground Level	175.00	metres	Depth Logger	675.32	metres



Dual Resistivity - Sonic

Density - Neutron

1:500

**Weatherford®**