



**Weatherford**

**GR-Resistivity Log**

1:200

Main Pass 1

COMPANY IODP Expedition 347 Baltic Sea  
 WELL BSB-3/Hole 59B  
 FIELD Lillebelt  
 PROVINCE/COUNTY Denmark  
 COUNTRY/STATE Denmark  
 LOCATION

Latitude 55 00.299 N Other Services Spectral Gamma Ray  
 Longitude 10 06.507 E Compensated Sonic

Permanent Datum M.S.L., Elevation 31.2 metres  
 Log Measured From GL  
 Drilling Measured From GL

Elevations: metres  
 KB 40.60  
 DF 40.60  
 GL 0.00

Date	19-SEP-2013		
Run Number	1		
Service Order	50004126		
Depth Driller	204.00	metres	
Depth Logger	72.00	metres	
First Reading	72.00	metres	
Last Reading	0.00	metres	
Casing Driller	20.00	metres	
Casing Logger	20.00	metres	
Bit Size	8.500	inches	
Hole Fluid Type	Sea Water		
Density / Viscosity	1.00	g/c3	
PH / Fluid Loss			
Sample Source			
Rmf @ Measured Temp			
Rmf @ Measured Temp			
Rmc @ Measured Temp			
Source Rmf / Rmc			
Rm @ BHT			
Time Since Circulation	0.5 hrs		
Max Recorded Temp			
Equipment / Base	16104		
Recorded By	C.Sedlatschek		
Witnessed By	A. Fehr		

**REMARKS**

1. Well Manager Version 13.07.1135 used.
2. All Logs recorded in standard resolution.
3. No repeat pass as per client request.
4. 3 Main Passes run on well 59B.
5. All Main Passes depth correlated to first Downlog.
6. Depth correction for Main Pass 1 = +0.4m.

**BOREHOLE RECORD**

Last Edited: 19-SEP-2013 08:06

Bit Size inches	Depth From metres	Depth To metres
8.500	20.00	204.00

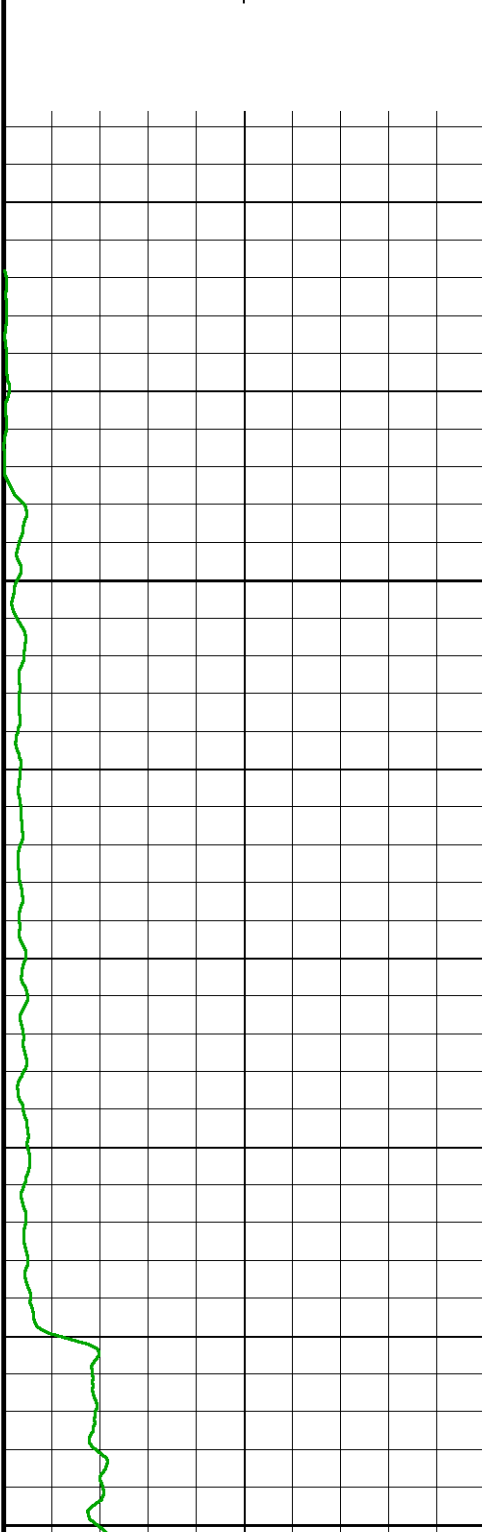
**CASING RECORD**

Type	Size inches	Depth From metres	Shoe Depth metres	Weight pounds/ft
	5.500	0.00	20.00	23.00

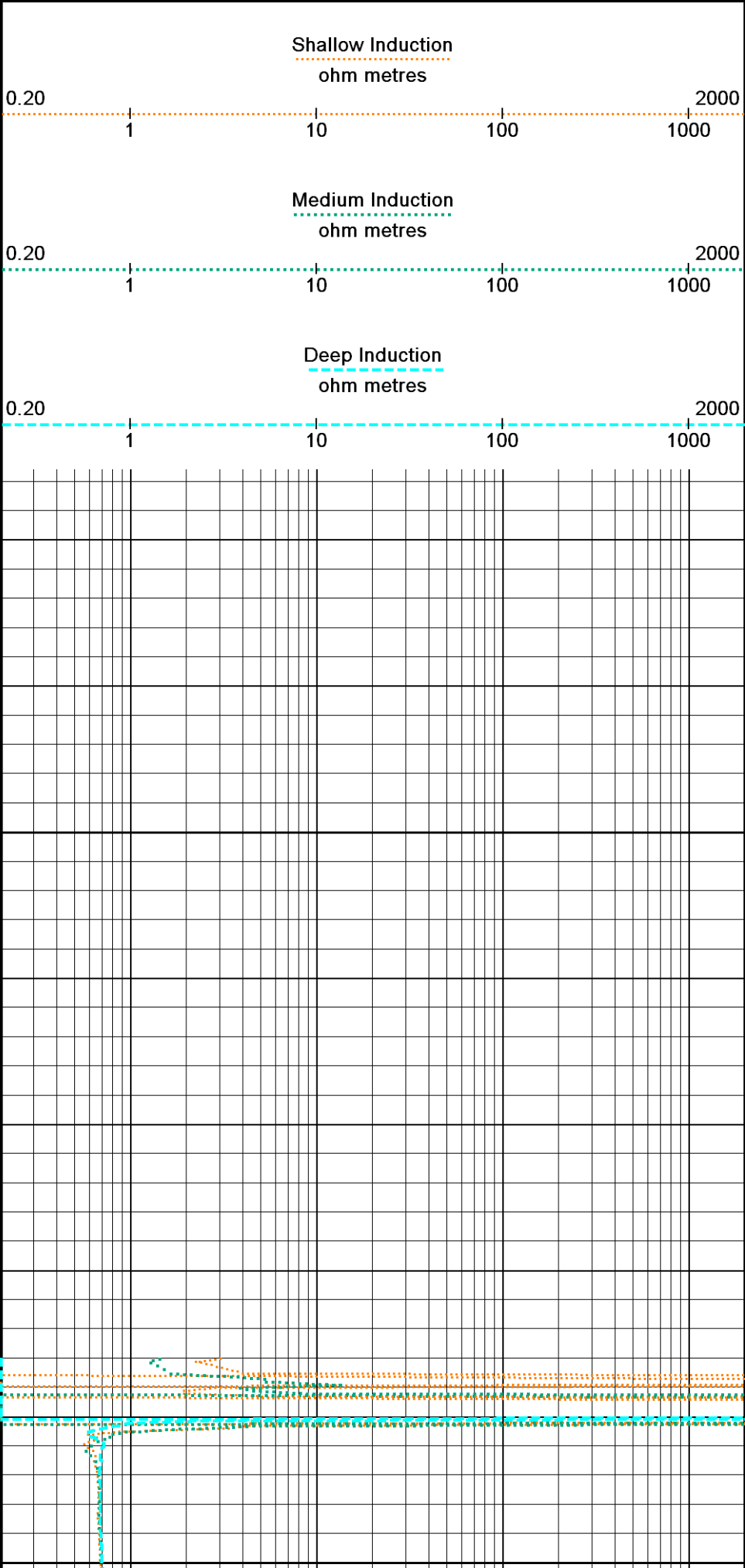
All interpretations are opinions based on inferences from electrical or other measurements and we cannot, and do not, guarantee the accuracy or correctness of any interpretations, and we shall not, except in the case of gross or wilful negligence on our part, be liable or responsible for any loss, costs,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

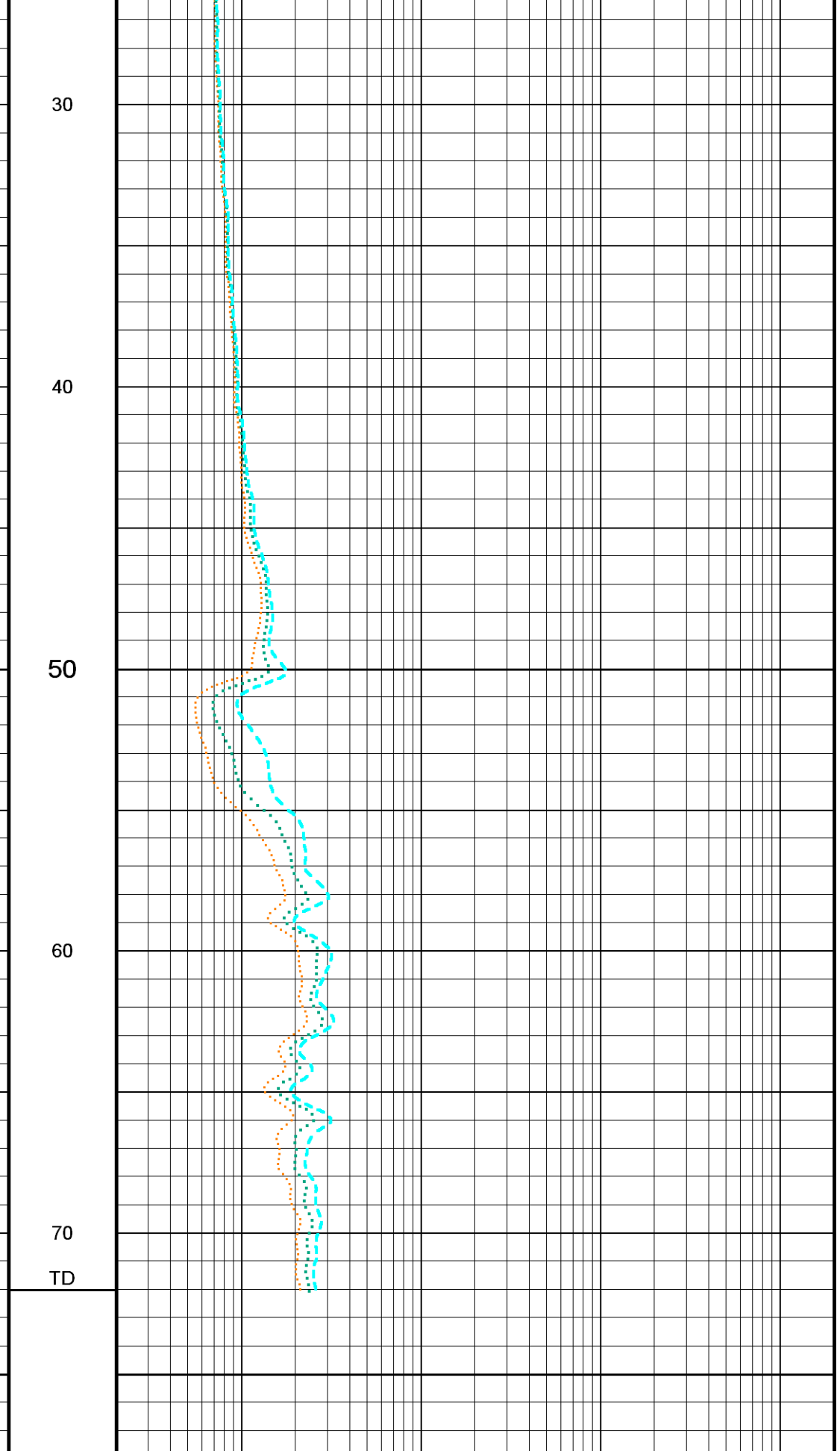
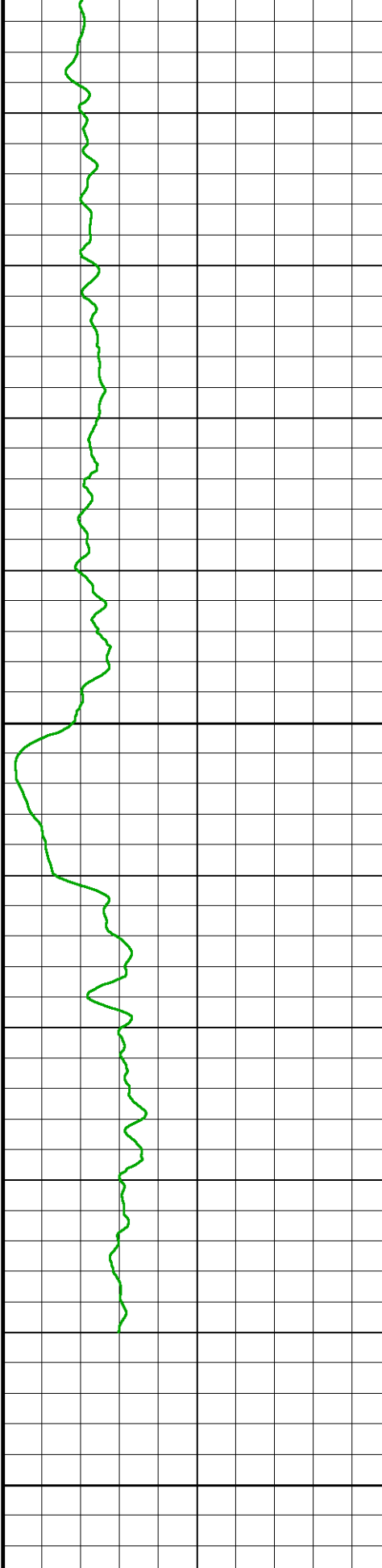
← Timing Marks  
every 60.0 sec

Gamma Ray  
API  
0 100 200  
200 300 400



Depth in Metres  
Replay Scale 1:200  
Casing Shoe





Depth in Metres

Shallow Induction  
ohm metres

0.20

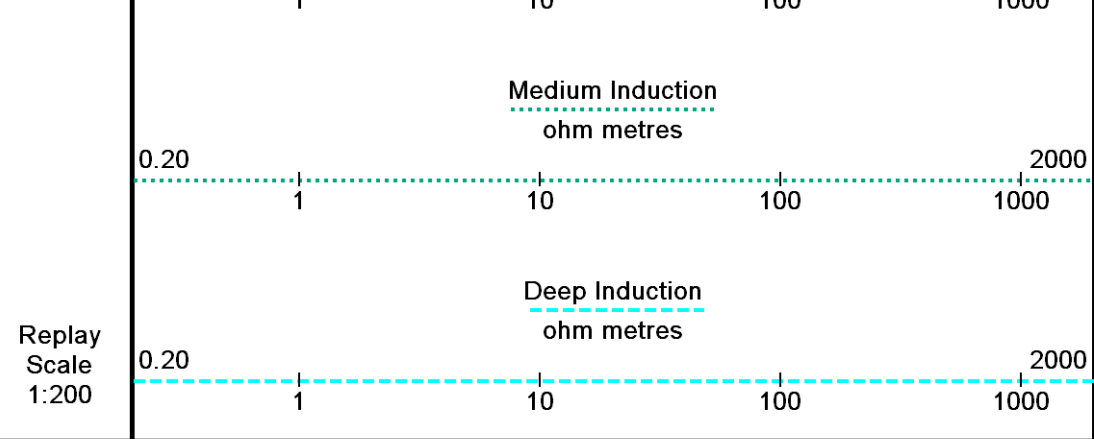
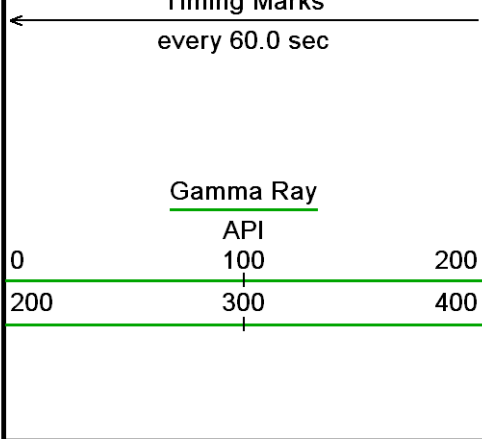
1

10

100

2000

30  
40  
50  
60  
70  
TD



Depth Based Data - Maximum Sampling Increment 10.0cm  
 Plotted on 19-SEP-2013 08:18  
 Filename: C:\Well Manager\Main Pass UP1\_spliced.dta  
 Recorded on 18-SEP-2013 13:26  
 System Versions: Plotted with 13.07.1135



### BEFORE SURVEY CALIBRATION

C:\Well Manager\mai461mcg387\_Main Pass Up1\_depth\_corrected.dta

General Constants All 000

Last Edited on 12-SEP-2013,02:52

General Parameters

Mud Resistivity	3.210	ohm-metres
Mud Resistivity Temperature	20.000	degrees C
Water Level	0.000	metres
Borehole Fluid Processing	Wet Hole	

Hole/Annular Volume and Differential Caliper Parameters

HVOL Method	8 Arm CMI	
HVOL Caliper 1	N/A	
HVOL Caliper 2	N/A	
Annular Volume Diameter	7.000	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	0.000	

Gamma Calibration MCG-D.J 387

Field Calibration on 28-AUG-2013 14:21

	Measured	Calibrated (API)
Background	176	122
Calibrator (Gross)	1239	857
Calibrator (Net)	1063	735

Gamma Constants MCG-D.J 387

Last Edited on 12-SEP-2013,01:55

Gamma Calibrator Number	097	
Mud Density	1.00	gm/cc
Caliper Source for Processing	Bit Size	
Tool Position	Eccentred	
Concentration of KCl		kppm
K Mud Type	Chloride	
K Mud Concentration	0.00	%

Induction Calibration MAI-C.A 461

Base Calibration on 28-AUG-2013 12:43

Field Check on 28-AUG-2013 12:46

Base Calibration

Test Loop Calibration Channel	Measured		Calibrated (mmho/m)	
	Low	High	Low	High
1	16.9	458.4	9.3	967.1
2	5.9	364.5	7.6	822.1
3	2.5	248.7	5.2	566.5

3 5.5 246.7 5.5 566.5  
 4 1.8 128.8 2.6 279.5

Array Temperature 34.7 Deg C

Channel	Base Check (mmho/m)		Field Check (mmho/m)	
	Low	High	Low	High
1			-3.6	2114.0
2			14.9	1979.6
3			14.7	1704.6
4			10.4	1148.6
Deep			8.0	1094.4
Medium			23.5	2267.9
Shallow			23.3	2948.6

Array Temperature 35.8 Deg C

Induction Constants MAI-C.A 461

Last Edited on 18-SEP-2013,11:24

Induction Model	VECTAR		
Caliper for Borehole Corr.	Constant Value		
Hole Size for Borehole Correction	8.500	inches	
Tool Centred	No		
Stand-off Type	Pineapple		
Stand-off	0.49	inches	
Number of Fins on Stand-off	5.0000		
Stand-off Fin Angle	72.00	degrees	
Stand-off Fin Width	1.3878	inches	
Borehole Corr. Rm Source	Constant Value		
Temp. for Rm Corr.	N/A		
Squasher Start	0.0020	mhos/metre	
Squasher Offset	0.0000	mhos/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		

DOWNHOLE EQUIPMENT

C:\Well Manager\mai461mcg387\_Main Pass Up1\_depth\_corrected.dta

CBH-C, Cablehead, 11 pin  
 CBH-CA 171 LG: 0.73 m WT: 24.3 lb OD: 57 mm

11C-11B MTA-K.A Compact Tool Adaptor  
 MTA-K.A 130 LG: 0.47 m WT: 13.2 lb OD: 57 mm

Compact Comms Gamma  
 MCG-D 1387 LG: 2.65 m WT: 63.9 lb OD: 57 mm



4.34 m GRGC - Gamma Ray

Compact Induction  
 MAI-C.A 461 LG: 3.82 m WT: 48.5 lb OD: 57 mm

Total Length: 7.66 m Weight: 149.9 lb



0.79 m RILD - Deep Induction  
 0.79 m RILM - Medium Induction  
 0.79 m VECO - Shallow Induction  
 Tool Zero (0.56m from bottom)

All measurements relative to tool zero.

COMPANY IODP Expedition 347 Baltic Sea  
 WELL BSB-3/Hole 59B  
 FIELD Lillebelt  
 PROVINCE/COUNTY Denmark  
 COUNTRY/STATE Denmark

Elevation Kelly Bushing	40.60	metres	First Reading	72.00	metres
Elevation Drill Floor	40.60	metres	Depth Driller	204.00	metres
Elevation Ground Level	0.00	metres	Depth Logger	72.00	metres



GR-Resistivity Log

1:200

Main Pass 1

**Weatherford**<sup>®</sup>