



**Weatherford**

**Spectral Gamma Ray -  
Compensated Sonic Log 1:200  
Main Pass**

COMPANY IODP Exploration 347 Baltic Sea  
 WELL BSB-3/Hole 59E  
 FIELD Denmark  
 PROVINCE/COUNTY Denmark  
 COUNTRY/STATE Denmark  
 LOCATION

Latitude 55 00.299 N Other Services 8-Arm Caliper Imager  
 Longitude 10 06.507 E Resistivity

Permanent Datum M.S.L., Elevation 36.27 metres  
 Log Measured From GL  
 Drilling Measured From GL

Elevations:  
 KB metres 39.17  
 DF metres 39.17  
 GL metres 39.17

Date	31-OCT-2013	
Run Number	3	
Service Order	50004126	
Depth Driller	100.80	metres
Depth Logger	60.80	metres
First Reading	58.00	metres
Last Reading	15.00	metres
Casing Driller	15.00	metres
Casing Logger	15.00	metres
Bit Size	8.500	inches
Hole Fluid Type	Sea Water	
Density / Viscosity		
PH / Fluid Loss		
Sample Source		
Rm @ Measured Temp		
Rmf @ Measured Temp		
Rmc @ Measured Temp		
Source Rmf / Rmc		
Rm @ BHT		
Time Since Circulation		
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 High Resolution.
3. No repeat passes per client request.
4. All Main Passes correlated to to drill bit depth.
5. Depth correction for Main Pass Resistivity DO = +1.0m.
6. Depth correction for Main Pass SGS and Compensated Sonic DO = +2.0m.

**BOREHOLE RECORD**

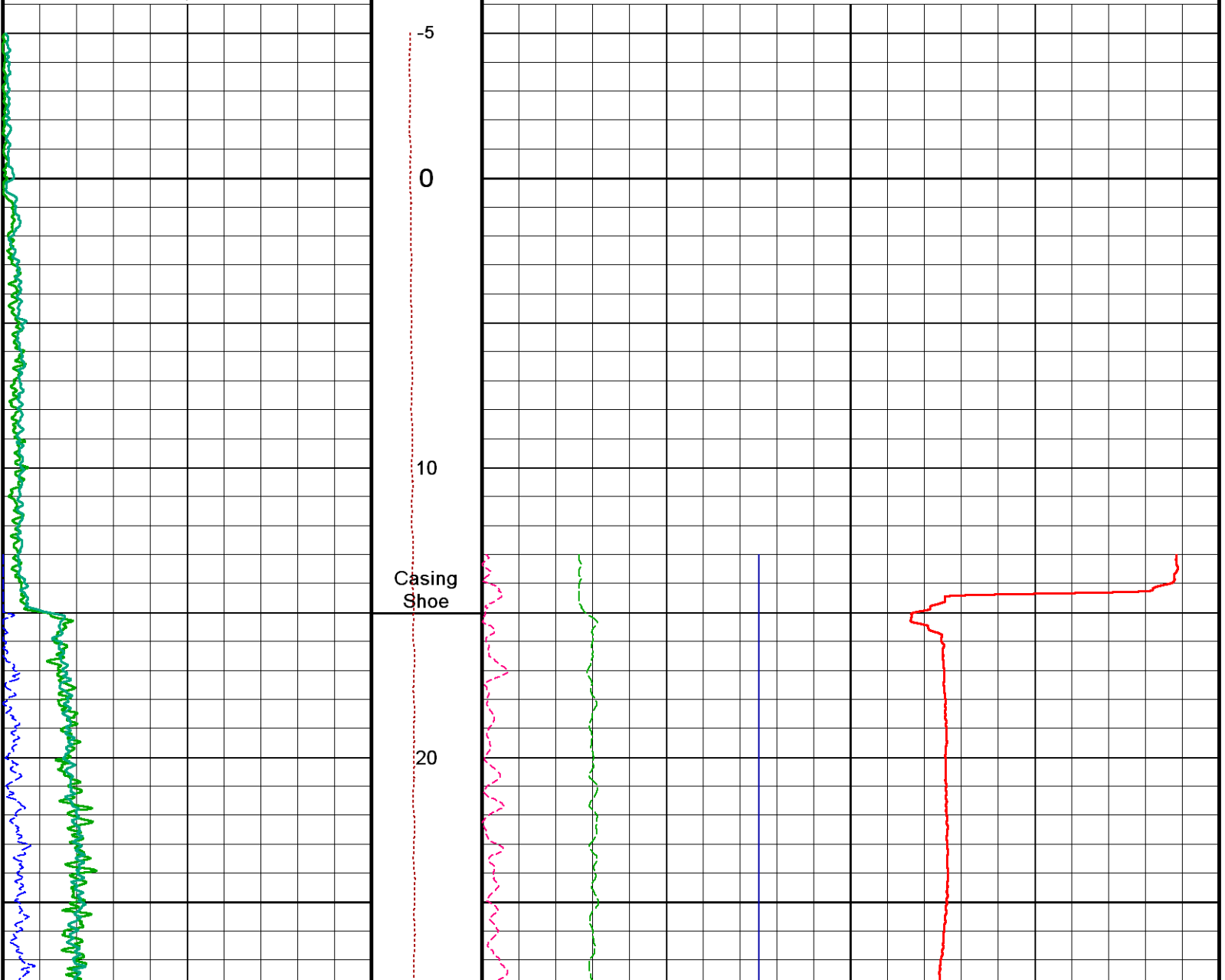
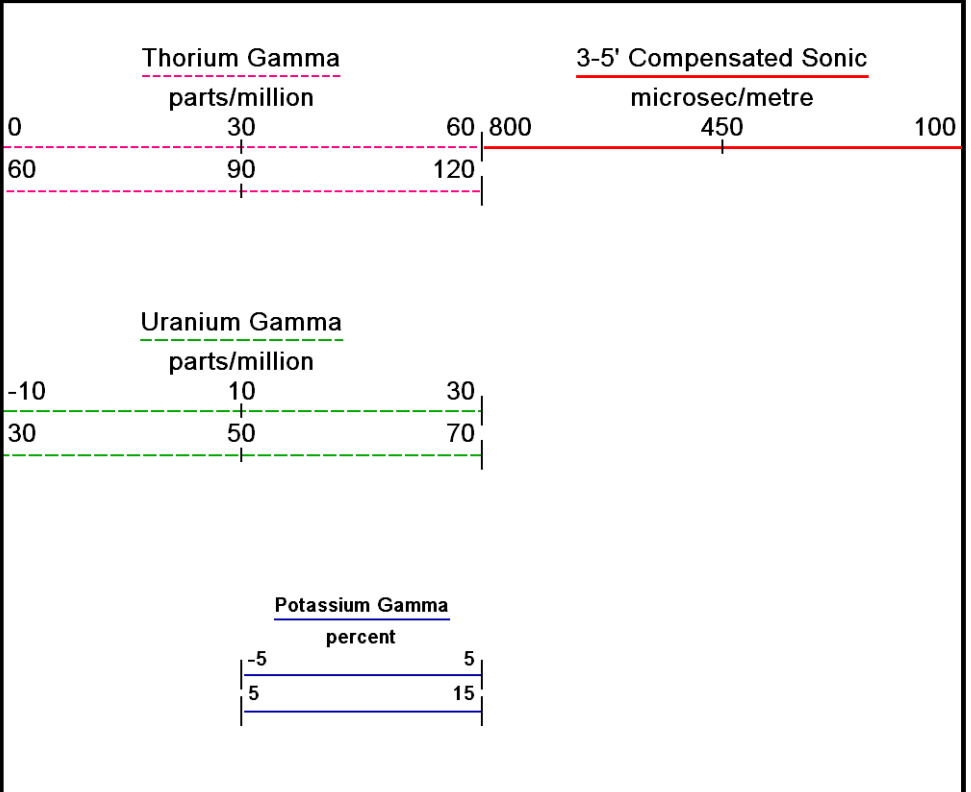
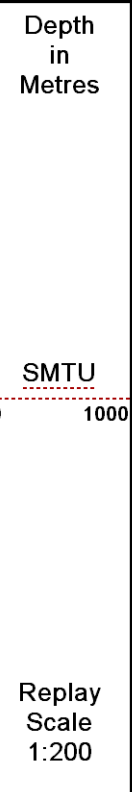
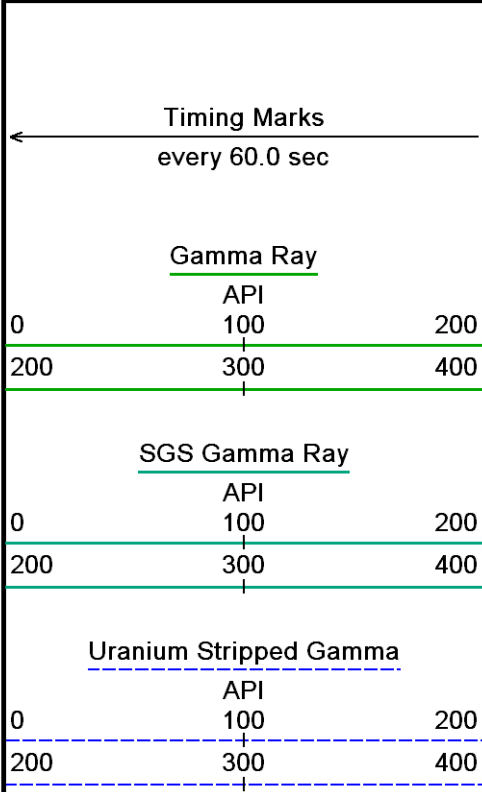
Last Edited: 31-OCT-2013 16:55

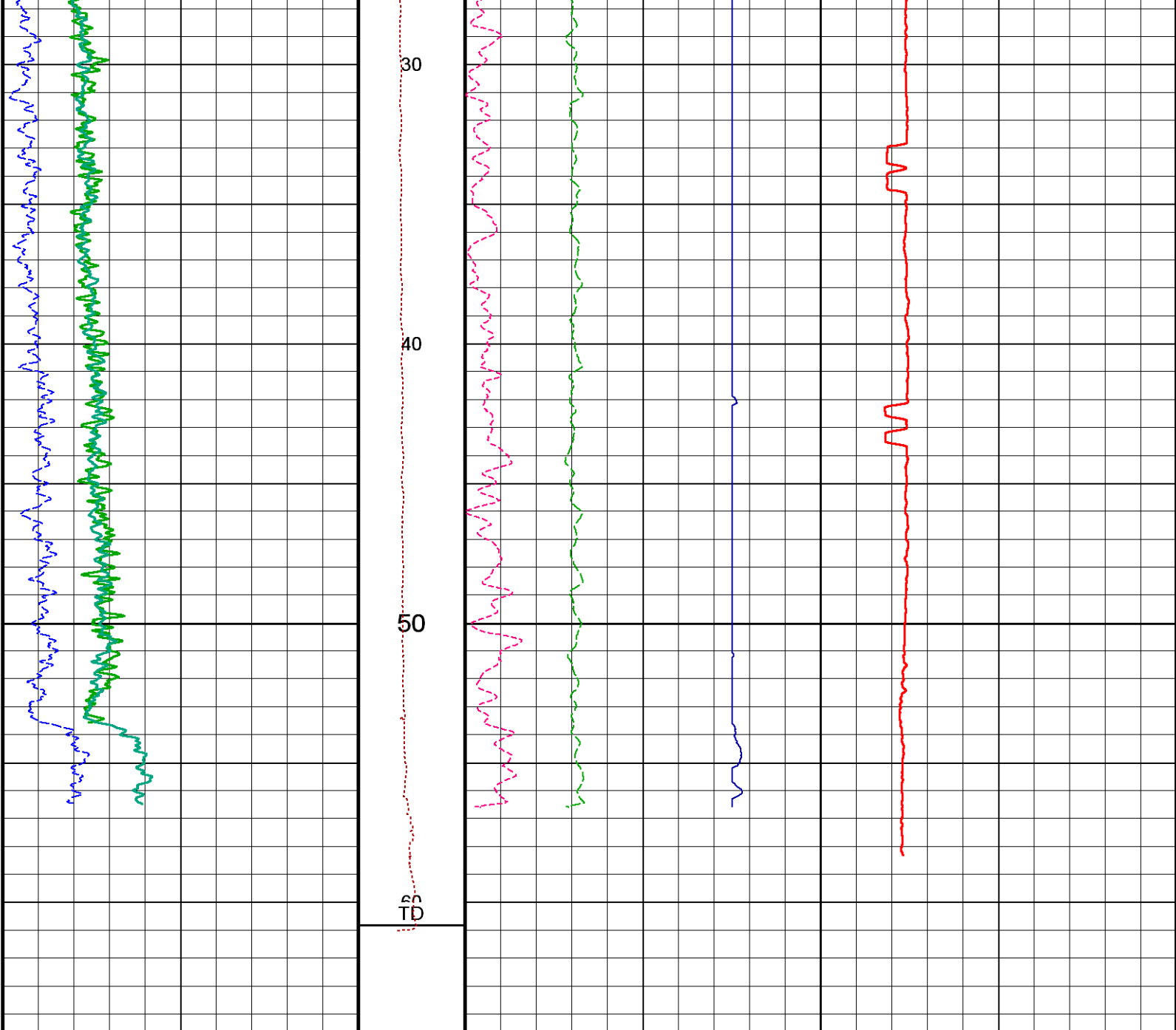
Bit Size inches	Depth From metres	Depth To metres
8.500	0.00	100.80

**CASING RECORD**

Type	Size inches	Depth From metres	Shoe Depth metres	Weight pounds/ft
	5.500	0.00	15.00	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

SGS Gamma Ray  
API  
0 100 200  
200 300 400

Uranium Stripped Gamma  
API  
0 100 200

Depth  
in  
Metres

60  
TD

SMTU  
0 1000

Replay

Thorium Gamma  
parts/million  
0 30 60 800  
60 90 120

Uranium Gamma  
parts/million  
-10 10 30  
30 50 70

Potassium Gamma  
percent  
-5 5  
5 15

3-5' Compensated Sonic  
microsec/metre  
450 100

100	200	400
200	300	400

Scale  
1:200

Depth Based Data - Maximum Sampling Increment 2.5cm  
 Plotted on 31-OCT-2013 17:38  
 Filename: C:\Well Manager\sgs113mss391\_splice\_BSB3\_59E.dta  
 Recorded on 31-OCT-2013 15:18  
 System Versions: Plotted with 13.07.1135



### BEFORE SURVEY CALIBRATION

C:\Well Manager\COPY of sgs113mss391mcg387\_BSB\_3\_59E\_Main\_Pass.dta

General Constants All 000 Last Edited on 01-OCT-2013,00:16

**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 %

Sonic Constants MSS-D.A 391 Last Edited on 30-OCT-2013,07:46

Maximum Boundary Contrast 328.08 micro-sec/m  
 Fluid Transit Time 620.08 micro-sec/m  
 Limestone Transit Time 155.84 micro-sec/m  
 Sandstone Transit Time 182.09 micro-sec/m  
 Dolomite Transit Time 142.72 micro-sec/m  
 Sonic used for Porosities 3-5' Compensated Sonic  
 Correction for Sonde Skew Applied  
 Cycle Stretch Algorithm Applied  
 MN3FT N/A micro-sec  
 MX3FT N/A micro-sec  
 Hunt-Raymer Constant 272.72 micro-sec/m

Sonde Mode Compensated  
 Hole Type Open Hole

Sonde Parameters  
 Measured Calibrated

Offset N/A 0.0000  
 Free Pipe N/A N/A  
 Peak Amplitude Source N/A

Waveform	Start Time (micro-sec)	Width (micro-sec)	Pre Gain	Start Gain	Discriminator (mV)
3'	N/A	N/A	N/A	N/A	N/A
4'	N/A	N/A	N/A	N/A	N/A
5'	N/A	N/A	N/A	N/A	N/A
6'	N/A	N/A	N/A	N/A	N/A

Processed Fixed Gate Parameters

Waveform Used For Processing	N/A		
Start Time (micro-sec)	End Time (micro-sec)	Discriminator (mV)	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A

Full Waveform Parameters

Use 3' Waveform to derive TR	N/A
Use 4' Waveform to derive TR	N/A
Use 5' Waveform to derive TR	N/A
Use 6' Waveform to derive TR	N/A
3' Waveform Discriminator Level	N/A mV
4' Waveform Discriminator Level	N/A mV
5' Waveform Discriminator Level	N/A mV
6' Waveform Discriminator Level	N/A mV
3' Waveform Filter	N/A
4' Waveform Filter	N/A
5' Waveform Filter	N/A
6' Waveform Filter	N/A
Semblance Level	N/A
Semblance Window Width	N/A micro-sec
Sonic 1 Despiker	N/A N/A
Sonic 2 Despiker	N/A N/A

Spectral Gamma Calibration SGS-E.J 113

Base Calibration on 03-MAR-2010 09:23  
 Field Calibration on 03-MAR-2010 08:20

Base Calibration

Potassium Calibrator

	Gate 1	Gate 2	Gate 3	Gate 4	Gate 5
Background	77.9	23.5	2.4	0.9	1.5
Calibrator (Gross)	203.9	108.4	25.0	0.9	1.5
Calibrator (Net)	126.0	84.9	22.6	-0.1	0.1

Concentrations	K %	U ppm	Th ppm
	5.8	0.0	0.0

Uranium Calibrator

	Gate 1	Gate 2	Gate 3	Gate 4	Gate 5
Background	77.9	23.5	2.4	0.9	1.5
Calibrator (Gross)	480.0	165.5	14.6	8.6	4.2
Calibrator (Net)	402.1	142.0	12.1	7.6	2.7

Concentrations	K %	U ppm	Th ppm
	0.0	9.8	0.0

Thorium Calibrator

	Gate 1	Gate 2	Gate 3	Gate 4	Gate 5
Background	77.9	23.5	2.4	0.9	1.5
Calibrator (Gross)	394.9	141.9	11.2	6.6	15.0
Calibrator (Net)	317.0	118.4	8.8	5.7	13.6

Concentrations	K %	U ppm	Th ppm
	0.0	0.0	44.3

Mixture Calibrator

	Gate 1	Gate 2	Gate 3	Gate 4	Gate 5
Background	77.9	23.5	2.4	0.9	1.5
Calibrator (Gross)	916.7	366.5	46.0	14.3	18.5
Calibrator (Net)	838.8	343.0	43.6	13.4	17.0

**Field Calibration**

**Gamma Ray**

	Measured	Calibrated (API)
Background	111	22
Calibrator (Gross)	1366	272
Calibrator (Net)	1256	250

**Mixture Calibrator**

	Gate 1	Gate 2	Gate 3	Gate 4	Gate 5
Background	77.9	23.5	2.4	0.9	1.5
Calibrator (Gross)	916.7	366.5	46.0	14.3	18.5
Calibrator (Net)	838.8	343.0	43.6	13.4	17.0

**Spectral Gamma Constants SGS-E.J 113**

Last Edited on 08-SEP-2013,08:26

Background Calibrator Number	000
Mixture Calibrator Number	000
Potassium Calibrator Number	000
Uranium Calibrator Number	000
Thorium Calibrator Number	000
Mud Density	1.13 gm/cc
Caliper Source for Processing	Bit Size
Tool Position	Eccentred
Concentration of KCl	kppm
K Mud Type	Chloride
K Mud Concentration	6.72 %

**DOWNHOLE EQUIPMENT**

C:\Well Manager\Copy of sgs113mss391mcg387\_BSB\_3\_59E\_Main\_Pass.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

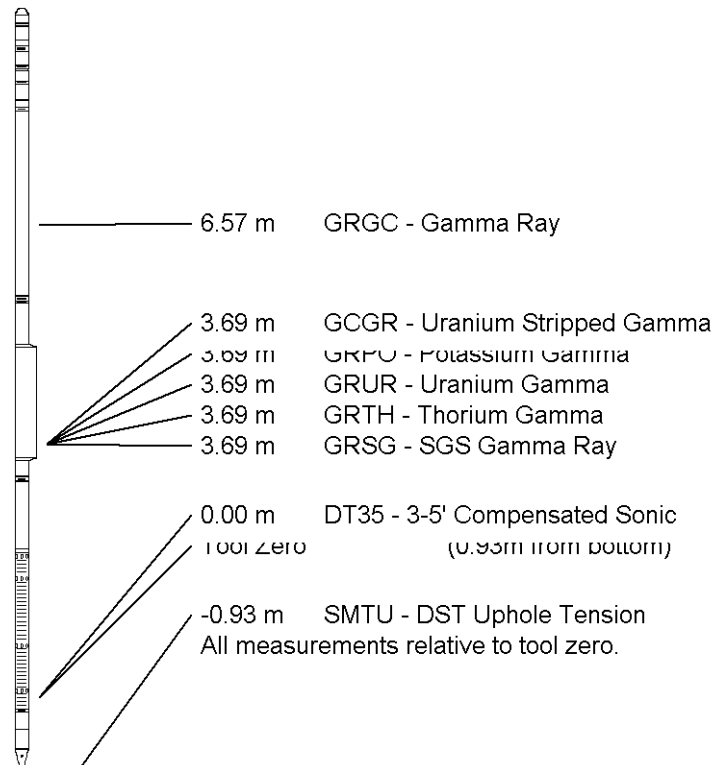
Compact Comms Gamma  
 MCG-D.J 387 LG: 2.65 m WT: 63.9 lb OD: 57 mm

Spectral Gamma Ray Sub  
 SGS-E.J 113 LG: 2.37 m WT: 105.8 lb OD: 90 mm

Compact Sonic  
 MSS-D.A 391 LG: 3.82 m WT: 72.8 lb OD: 57 mm

Compact Hole Finder  
 HFS 1 LG: 0.24 m WT: 2.2 lb OD: 57 mm

Total Length: 10.27 m Weight: 282.2 lb



**COMPANY**

IODP Exploration 347 Baltic Sea

**WELL**

BSB-3/Hole 59E

**FIELD**

Denmark

FIELD Denmark  
PROVINCE/COUNTY Denmark  
COUNTRY/STATE Denmark

Elevation Kelly Bushing	39.17	metres	First Reading	58.00	metres
Elevation Drill Floor	39.17	metres	Depth Driller	100.80	metres
Elevation Ground Level	39.17	metres	Depth Logger	60.80	metres



**Weatherford**<sup>®</sup>

Spectral Gamma Ray -  
Compensated Sonic Log 1:200  
Main Pass