CML IMPULSE SHUTTLE ARRAY INDUCTION LOG

Weatherford®

COMPANY	SANDRIDGE E&P LLC
WELL	HUCK 3120 1-9H
FIELD	SIX MOONS
PROVINCE/COUNTY	COMANCHE
COUNTRY/STATE	U.S.A. / KANSAS
LOCATION	SL:200'FNL & 1100' FEL
	BH: 330' FSL & 660' FEL

40 Years of Wireline 1970 2010

SEC	TWP	RGE	Other Services
9	31S	20W	MPD/MDN

API Number 15-033-216410100
Permit Number

Permanent Datum GL, Elevation 2094 feet
Log Measured From KB
Drilling Measured From KB

Elevations:	feet
KB	2114.00
DF	2114.00
GL	2094.00

Date	22-JUN-2012			
Run Number	ONE			
Depth Driller	9584.00	feet		
Depth Logger	9544.00	feet		
First Reading	9540.00	feet		
Last Reading	5840.00	feet		
Casing Driller	5851.00	feet		
Casing Logger	5844.00	feet		
Bit Size	6.125	inches		
Hole Fluid Type	WBM			
Density / Viscosity	9.40 lb/USg	29.00 CP		
PH / Fluid Loss	10.50	60.00 ml/30Min		
Sample Source	MUD TANK			
Rm @ Measured Temp	0.90 @ 83.0	ohm-m		
Rmf @ Measured Temp	0.72 @ 83.0	ohm-m		
Rmc @ Measured Temp	1.08 @ 83.0	ohm-m		
Source Rmf / Rmc	CALC	CALC		
Rm @ BHT	0.57 @130.0	ohm-m		
Time Since Circulation	2 HOURS			
Max Recorded Temp	130.00	deg F		
Equipment Name	COMPACT			
Equipment / Base	18006	OKC		
Recorded By	MIKE GARRISON			
Witnessed By	KATHY GENTRY			
	3535165		AFE DC12054	

Last Edited: 23-JUN-2012 00:58

BOREHOLE RECORD

Bit Size inches	Depth From feet	Depth To feet
6.125	5845.00	9584.00

CASING RECORD

Type	Size inches	Depth From feet	Shoe Depth feet	Weight pounds/ft
INTER	7.000	0.00	5844.00	24.00

REMARKS

WLS LOGGING SOFTWARE VERSION 12.02.4401WAS USED

ALL LOGS WERE SET TO DEPTH WITH MWD

DRILL PIPE DEPTH DURING DEPLOYMENT: 9470
LOGGING TOOL DEPTH AFTER DEPLOYMENT: 9544
4.5" PRODUCTION CASING USED TO CALCULATE AHV

OPERATORS: S.WORLEY, K. CHAFFIN
S.O: 3535165
RIG: LARIAT 41

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.

2 INCH MAIN LOG

Depth Based Data - Maximum Sampling Increment 10.0cm
Filename: C:\Minimus 12.02.4401\Data\SDRG(HUCK 3120 1-9H)\HUCK 3120 1-9H RTAP2.dta
System Versions: Processed with 12.02.4401 Plotted with 12.02.4401

Plotted on 23-JUN-2012 01:05
Recorded on 23-JUN-2012 00:20

6200
6300
6400
6500
6600
6700
Array Ind. Six Res Rt
Array Ind. Six Res 20
Array Ind. Six Cond Ct
MGS Gamma Ray

6800
6900
7000
7100
7200

7300
7400
7500
7600
7700
7800
Array Ind. Six Res Rt
Array Ind. Six Res 20
Array Ind. Six Cond Ct
MGS Gamma Ray

7900
8000
8100
8200
8300

8400
8500
8600
8700
8800
8900
Array Ind. Six Res Rt
Array Ind. Six Res 20
Array Ind. Six Cond Ct
MGS Gamma Ray

9000
9100
9200
9300
9400
Array Ind. Six Res Rt
Array Ind. Six Res 20
Array Ind. Six Cond Ct
MGS Gamma Ray

Depth Based Data - Maximum Sampling Increment 10.0cm
Plotted on 23-JUN-2012 01:05
Filename: C:\Minimus 12.02.4401\Data\SDRG(HUCK 3120 1-9H)\HUCK 3120 1-9H RTAP2.dta
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System Versions: Processed with 12.02.4401 Plotted with 12.02.4401

2 INCH MAIN LOG

5 INCH MAIN LOG

Depth Based Data - Maximum Sampling Increment 10.0cm
Plotted on 23-JUN-2012 01:05
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Replay
Scale
1:240
ohm metres
0.20
2000
1
10
100
1000
5838
Casing
Shoe
5850
127°
5900
128°
5950
Array Ind. Six Res Rt
Array Ind. Six Res 60
Array Ind. Six Res 40
Array Ind. Six Res 20
MGS Gamma Ray
128°
6000
128°

6050
128°
6100
128°
6150
128°
6200
128°
6250

128°
6300
128°
Array Ind. Six Res Rt
Array Ind. Six Res 60
6350
Array Ind. Six Res 40
Array Ind. Six Res 20
MGS Gamma Ray
128°
6400
128°
6450

128°
6500
128°
6550
128°
6600
128°
6650
128°
6700

MGS Gamma Ray
129°
6750
129°
6800
129°
6850
129°
6900
Array Ind. Six Res Rt
Array Ind. Six Res 60
Array Ind. Six Res 40
Array Ind. Six Res 20

129°
6950
129°
7000
129°
7050
129°
7100
129°
Array Ind. Six Res Rt
Array Ind. Six Res 60
Array Ind. Six Res 40
Array Ind. Six Res 20
MGS Gamma Ray

MSC Gamma Ray
7150
129°
7200
129°
7250
129°
7300
129°
7350

129°
7400
129°
7450
129°
7500
Array Ind. Six Res Rt
Array Ind. Six Res 60
Array Ind. Six Res 40
Array Ind. Six Res 20
MGS Gamma Ray
129°
7550

129°
7600
129°
7650
129°
7700
130°
7750
129°
7800

130°
7850
130°
7900
Array Ind. Six Res Rt
Array Ind. Six Res 60
Array Ind. Six Res 40
Array Ind. Six Res 20
MGS Gamma Ray
130°
7950
130°
8000

130°
8050
130°
8100
130°
8150
130°
8200
130°

8250
130°
8300
Array Ind. Six Res Rt
Array Ind. Six Res 60
Array Ind. Six Res 40
Array Ind. Six Res 20
MGS Gamma Ray
130°
8350
130°
8400
130°
8450

130°
8500
130°
8550
130°
8600
130°
8650

130°
8700
Array Ind. Six Res Rt
Array Ind. Six Res 60
Array Ind. Six Res 40
Array Ind. Six Res 20
MGS Gamma Ray
130°
8750
130°
8800
130°
8850
130°
8900

130°
8950
130°
9000
130°
9050
130°
9100
MGS Gamma Ray
Array Ind. Six Res Rt
Array Ind. Six Res 60
Array Ind. Six Res 40
Array Ind. Six Res 20

130°
9150
130°
9200
130°
9250
130°
9300
130°

9350
130°
9400
130°
9450
129°
9500
9550
9558
Depth
Array Ind. Six Res Rt
Array Ind. Six Res 60
Array Ind. Six Res 40
Array Ind. Six Res 20

Depth Based Data - Maximum Sampling Increment 10.0cm — Plotted on 23-JUN-2012 01:06

Filename: C:\Minimus 12.02.4401\Data\SDRG(HUCK 3120 1-9H)\HUCK 3120 1-9H RTAP2.dta — Recorded on 23-JUN-2012 00:20

System Versions: Processed with 12.02.4401 Plotted with 12.02.4401

5 INCH MAIN LOG

BEFORE SURVEY CALIBRATION

C:\Minimus 12.02.4401\Data\SDRG(HUCK 3120 1-9H)\HUCK 3120 1-9H RTAP.dta

Down-hole Tension Calibration All 000

Field Calibration on 24-FEB-2009 00:00

Reading No	Measured	Calibrated (lbs)
1	14953.75	0.00
2	17846.38	1500.00

General Constants All 000

Last Edited on 21-JUN-2012 15:00

General Parameters		
Mud Resistivity	1.100	ohm-metres
Mud Resistivity Temperature	78.000	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	4.500	inches
Caliper for Differential Caliper	Density Caliper	
Rwa Parameters		
Porosity used	Limestone Density Por.	
Resistivity used	Array Ind. One Res Rt	
RWA Constant A	0.610	
RWA Constant M	2.150	

Down-hole Tension Calibration SMS 0

Field Calibration on 29-MAR-2011 00:00

Reading No	Measured	Calibrated (lbs)
1	15152.07	0.00
2	19175.97	2000.00

Strain Gauge Constants SER-B.A 162

Last Edited on

Atmospheric Pressure	14.70	psi

Serial Number	0
Calibration Date	000000000000
Base Check Date	
Dead Weight Serial Number	0
Dead Weight Gravitational Correction	1.0

Temperature	75.0		150.0		250.0		350.0 degrees F	
Pressure psia	Inc.	Dec.	Inc.	Dec.	Inc.	Dec.	Inc.	Dec.
0.0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2000.0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
4000.0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
6000.0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
8000.0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
10000.0	0.000		0.000		0.000		0.000	

MMS Parameters MMS-E.B 165

Last Edited on 22-JUN-2012 04:32

Logging Parameters

Firmware Version	2v40	
Caliper Open On	MAI	
Caliper Open Delay	0.0	minutes
Caliper Closed On	Unknown	
Caliper Closed Delay	N/A	minutes
Sample Rate	1.00	seconds
Use Deep Sleep	No	
Delay Deep Sleep	N/A	
Deep Sleep Wake Time	N/A	minutes
Deep Sleep Wake on Temperature	N/A	
Deep Sleep Wake Temperature	N/A	degrees C
Deep Sleep Wake on Pressure	N/A	
Deep Sleep Wake Pressure	N/A	psi
MMI Pad Pressure	4.0	

Release Parameters

Pulse Duration Base Level	10.0	seconds
Pulse Duration Transition Time	60.0	seconds
Pulse Duration Status Pulse From	20.0	seconds
Pulse Duration Caliper Close From	145.0	seconds
Pulse Duration Caliper Open From	150.0	seconds
Pulse Duration Release Pulse From	215.0	seconds
Pulse Duration Release Pulse To	280.0	seconds
Pulse Release Duration	240.0	seconds
Pulse Discriminator Pressure Band	96.0	seconds
Pulse Pressure Discriminator	213.0	seconds
Use Negative Pulsing	No	
Good Status Reply Open Hole	0.0	seconds
Good Status Reply Cased Hole	20.0	seconds
Bad Status Reply	60.0	seconds
Status Pulse To	80.0	seconds
Caliper Close To	0.0	seconds
Caliper Open To	210.0	seconds

Configuration

SER,MMS,MGS,MDN,MPD,MPD,MAI

Gamma Calibration MGS-C.J 135

Field Calibration on 20-JUN-2012 09:50

	Measured	Calibrated (API)
Background	42	14
Calibrator (Gross)	1203	403
Calibrator (Net)	1160	389

Gamma Constants MGS-C.J 135

Last Edited on 21-JUN-2012 15:02

Gamma Calibrator Number	389	
Mud Density	1.00	gm/cc
Caliper Source for Processing	Density Caliper	
Tool Position	Eccentred	
Concentration of KCl	0.00	kppm

High Resolution Temperature Constants MGS-C.J 135

Last Edited on

High Resolution Temperature Constants MDS-B.J 389

Pre-filter Length	11

Neutron Calibration MDN-B.J 390

Base Calibration on 24-APR-2012 16:14
Field Check on

Base Calibration

	Measured Near	Measured Far	Calibrated (cps) Near	Calibrated (cps) Far
	2974	91	3714	110
Ratio	32.653		33.764	

Field Calibrator at Base	Calibrated (cps)	
	1236	1843
Ratio	0.671	

Field Check	Calibrated (cps)	
	0	0
Ratio	0.000	

Neutron Constants MDN-B.J 390

Last Edited on 16-JUN-2012 14:17

Neutron Source Id	P31112B	
Neutron Jig Number	5917NC	
Epithermal Neutron	No	
Caliper Source for Processing	Bit Size	
Stand-off	0.00	inches
Mud Density	1.00	gm/cc
Limestone Sigma	7.10	cu
Sandstone Sigma	4.26	cu
Dolomite Sigma	4.70	cu
Formation Pressure Source	Constant Value	
Formation Pressure	0.00	kpsi
Temperature Source	Constant Value	
Temperature	68.00	degrees F
Mud Salinity	0.00	kppm
Formation Fluid Salinity Source	Constant Value	
Formation Fluid Salinity	0.00	kppm
Barite Mud Correction	Not Applied	
Salinity Correction	Not Applied	

High Resolution Temperature Calibration MAI-B.J 389

Field Calibration on 19-OCT-2011 09:44

	Measured	Calibrated(Deg F)
Lower	10.00	50.00
Upper	100.00	212.00

High Resolution Temperature Constants MAI-B.J 389

Last Edited on

Pre-filter Length	11

Induction Calibration MAI-B.J 389

Base Calibration on 19-OCT-2011 09:44
Field Check on 20-JUN-2012 09:52

Base Calibration

Test Loop Calibration

Channel	Measured Low	Measured High	Calibrated (mmho/m) Low	Calibrated (mmho/m) High
1	16.7	465.5	9.3	966.2
2	6.4	384.0	7.6	821.4
3	3.1	258.9	5.2	566.0
4	1.8	133.7	2.6	279.2

Array Temperature 78.1 Deg F

Channel	Base Check (mmho/m) Low	Base Check (mmho/m) High	Field Check (mmho/m) Low	Field Check (mmho/m) High
1	0.0	0.0	13.3	3897.9
2	0.0	0.0	29.6	3510.2
3	0.0	0.0	29.8	3051.0
4	0.0	0.0	20.0	2064.1
Deep	0.0	0.0	19.4	2014.0
Medium	0.0	0.0	43.1	4006.5
Shallow	0.0	0.0	42.5	5154.2

Array Temperature 0.0 51.8 Deg F

Induction Constants MAI-B.J 389

Last Edited on 22-JUN-2012 20:21

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	0.50	inches
Number of Fins on Stand-off	6.0000	
Stand-off Fin Angle	60.00	degrees
Stand-off Fin Width	0.5000	inches
Borehole Corr. Rm Source	Temperature Corr	
Temp. for Rm Corr.	Borehole Temp. Unfilt.	
Squasher Start	0.0020	mhos/metre
Squasher Offset	N/A	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	

Caliper Calibration MPD-C.J 393

Base Calibration on 09-APR-2012 15:26
Field Calibration on 20-JUN-2012 09:51

Base Calibration

Reading No	Measured	Calibrator Size (in)
1	16224	4.01
2	24416	5.96
3	32900	7.98
4	41094	9.86
5	50128	11.88
6	N/A	N/A

Field Calibration

Measured Caliper (in)	Actual Caliper (in)
5.92	5.96

Photo Density Calibration MPD-C.J 393

Base Calibration on 09-APR-2012 15:24
Field Check on 20-JUN-2012 09:51

Density Calibration

Base Calibration	Measured		Calibrated (sdu)	
	Near	Far	Near	Far
Reference 1	58016	27308	59869	31110
Reference 2	24483	2694	24557	2522

Field Check at Base

1260.5	1380.6

Field Check

1239.6	1366.0

PE Calibration

Base Calibration	Measured WS	Measured WH	Ratio	Calibrated Ratio
Background	235	1137		
Reference 1	23358	57816	0.408	0.369
Reference 2	6927	24347	0.288	0.271
Field Check at Base	235.4	1137.5		
Field Check	229.1	1117.2		

Density Constants MPD-C.J 393

Last Edited on 21-JUN-2012 15:02

Density Source Id	p31112b	
Nylon Calibrator Number	18006	
Aluminium Calibrator Number	18006	
Density Shoe Profile	4 inch	
Caliper Source for Processing	Density Caliper	
PE Correction to Density	Not Applied	
Mud Density	1.00	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)
2.71	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
0.00	0.00

DOWNHOLE EQUIPMENT

C:\Minimus 12.02.4401\Data\SDRG(HUCK 3120 1-9H)\HUCK 3120 1-9H RTAP.dta

Shuttle Mechanical Release (SMR A)
SMR-A 166 LG: 8.53 ft WT: 77.2 lb OD: 2.52 in

Shuttle Electrical Release
SER-B.A 162 LG: 6.90 ft WT: 50.7 lb OD: 2.24 in

MBS-F.A 200v Compact Battery Sub
MBS-F.A 134 LG: 10.22 ft WT: 81.6 lb OD: 2.24 in

Compact Memory Sub E.B
MMS-E.B 165 LG: 5.20 ft WT: 37.5 lb OD: 2.24 in

Compact Short Gamma
MGS-C.J 135 LG: 3.41 ft WT: 24.3 lb OD: 2.24 in

Compact Collar Locator
MCL-B.J 72 LG: 3.17 ft WT: 26.5 lb OD: 2.24 in

SKJ-E.B Compact Knuckle Joint
SKJ-E.B 477 LG: 2.17 ft WT: 24.3 lb OD: 2.24 in

SHA-H Compact Swivel Head Adaptor
SHA-H 185 LG: 2.30 ft WT: 22.0 lb OD: 2.24 in

MIS-D.A Compact Inline Bowspring sub

53.57 ft GRGM - MGS Gamma Ray
51.58 ft GSXT - MGS External Temperature

MIS-D.A 596 LG: 5.70 ft WT: 33.1 lb OD: 2.24 in

Compact Neutron
MDN-B.J 390 LG: 5.04 ft WT: 50.7 lb OD: 2.24 in

Compact Density/Caliper
MPD-C.J 393 LG: 9.59 ft WT: 90.4 lb OD: 2.24 in

MIS-A.A Compact Inline Bowspring sub
MIS-A.A 277 LG: 5.70 ft WT: 33.1 lb OD: 2.24 in

SHA-J.A Compact Swivel Head Adaptor
SHA-J.A 270 LG: 2.30 ft WT: 22.0 lb OD: 2.24 in

SKJ-E.B Compact Knuckle Joint
SKJ-E.B 472 LG: 2.17 ft WT: 24.3 lb OD: 2.24 in

MIS-E.B Compact Inline Standoff sub
MIS-E.B 573 LG: 2.14 ft WT: 15.4 lb OD: 2.24 in

Compact Induction
MAI-B.J 389 LG: 12.52 ft WT: 48.5 lb OD: 2.24 in

Total Length: 87.05 ft Weight: 661.4 lb

34.70 ft NPRL - Limestone Neutron Por.

27.46 ft CLDC - Density Caliper
25.53 ft DPRL - Limestone Density Por.
25.53 ft DEN - Compensated Density
25.53 ft DCOR - Density Correction
25.47 ft PDPE - PE

2.58 ft RILM - Medium Induction
2.58 ft RILD - Deep Induction
Tool Zero (1.84ft from bottom)
All measurements relative to tool zero.

COMPANY	SANDRIDGE E&P LLC
WELL	HUCK 3120 1-9H
FIELD	SIX MOONS
PROVINCE/COUNTY	COMANCHE
COUNTRY/STATE	U.S.A. / KANSAS

Elevation Kelly Bushing	2114.00	feet	First Reading	9540.00	feet
Elevation Drill Floor	2114.00	feet	Depth Driller	9584.00	feet
Elevation Ground Level	2094.00	feet	Depth Logger	9544.00	feet

Weatherford®

CML IMPULSE SHUTTLE ARRAY INDUCTION LOG

40 Years of Wireline 1970 2010

6000
6100
6200
6300
6400
6500
6600
6700
6800
6900
7000
Array Ind. Six Res 20
Array Ind. Six Cond Ct
MGS Gamma Ray

7100
7200
7300
7400
Array Ind. Six Res Ru
Array Ind. Six Res 20
MGS Gamma Ray
7500
Array Ind. Six Cond Ct
7600
7700
7800
7900
8000
8100

8200
8300
8400
8500
8600
8700
8800
8900
9000
9100
9200
Array Ind. Six Res Rt
Array Ind. Six Res 20
MCS Gamma Ray
Array Ind. Six Cond Ct

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WELL	HUCK 3120 1-9H
FIELD	SIX MOONS
PROVINCE/COUNTY	COMANCHE
COUNTRY/STATE	U.S.A. / KANSAS

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Elevation Ground Level	2094.00	feet	Depth Logger	9544.00	feet

Weatherford

CML IMPULSE SHUTTLE
ARRAY INDUCTION
LOG

40 Years of Wireline