



Natural Fomation Evaluation
Gamma Ray

Realtime Logs

Scale: Company: Anadarko

1:240 Well: Butterball 4N-15HZ

MEASURED DEPTH Field: Weld County

Country Continental US State Colorado

Status: Surface Location: Other Services:

Field Print Latitude: 40° 8' 47.911" N

API Number: 051233786900 Longitude: 104° 53' 1.856" W

Section:10 TWN: 2N Range67W Directional

Permanent Datum (P.D.): Ground Level Elevation: 4996.00 ft. Elevations: 17.00 ft.

Log Measured From: Kelly Bushing 17.00 ft. Above P.D. KB: 5013.00 ft.

Depth Reference: Driller's Depth GL: 4996.00 ft.

Interval Logged Dates Magnetic Field Reference

Top: 6750.0 ft. Date From: 14/Nov/13 Dip Angle: 66.73 ° Azi Reference North: True

Bottom: 12450.0 ft. Date To: 19/Nov/13 Total Mag to Reference

Spud Date: 12/Nov/13 Field Strength: 52696.7 nT North Correction: 8.62 °

Borehole Record

Casing Record

Hole Size	From	To	Size	Weight	From	To
13.500 in.	Surface	1018.0 ft.	9.000 in.	36.00 lb/ft	Surface	1008.0 ft.
8.750 in.	1018.0 ft.	7745.0 ft.	7.000 in.	26.00 lb/ft	Surface	7729.0 ft.
6.125 in.	7745.0 ft.	12506.0 ft.				

Mud Record

Deviation Record

Type	From	To	Hole Size	Interval	Inc / Az (Start)	Inc / Az (End)
Water Based	Surface	12506.0 ft.	13.500 in.	Surface	0.0 ° / 0.0 °	0.1 ° / 304.4 °
			8.500 in.	Vertical/ Curve	0.4 ° / 175.4 °	82.8 ° / 179.7 °
			6.125 in.	Lateral	82.8 ° / 179.7 °	90.9 ° / 179.2 °
					/	/
					/	/
					/	/

Acquisition System Software Version

Other

Advantage	2.20U4	Rig: / Contractor:	Xtreme 8	/ Anadarko
PATS	6.4.1.34	Job No.:	5828637	
		District: / Unit:	RMD	/

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Log Run Summary

LWD Run No.	BHA Run No.	Bit Run No.	Bit Size (in.)	Bit Type	Bit Gauge Length (in.)	Assembly Type	Logged Interval		Bit Depth Interval		Date / Time		Circ. Time (hrs.)
							Top (ft.)	Bottom (ft.)	From (ft.)	To (ft.)	Start	End	
2	2	3	8.750	PDC	3.500	Mud Motor	6750.0	7703.0	6572.0	7745.0	14/Nov/2013 20:43	15/Nov/2013 11:07	10.37
3	3	4	6.125	PDC	6.000	Mud Motor	7703.0	12450.0	7745.0	12506.0	18/Nov/2013 01:32	19/Nov/2013 13:30	29.02

Crew

Name	Arrive	Depart	Name	Arrive	Depart	Name	Arrive	Depart
	Wellsite	Wellsite		Wellsite	Wellsite		Wellsite	Wellsite
Shirley Arimah	12/Nov/2013	20/Nov/2013	Matthew Dickey	17/Nov/2013	20/Nov/2013			

Mud Properties Record

Date / Time		LWD Run No.	Measured Depth (ft.)	Mud Type	Density (sg)	Viscosity (cp)	pH	Fluid Loss (cc)	Oil / Water	Source	Total Chlorides (ppm)	K+ (%)
14/Nov/2013	19:00	2	6723.0	Water Base	9.9	40	9.0	4.5	1/91	Flowline	1900	N/A
15/Nov/2013	20:00	2	7745.0	Water Base	10.4	45	8.5	3.1	4/87	Flowline	1800	N/A
17/Nov/2013	19:00	3	7745.0	Water Base	9.4	38	8.5	3.0	2/93	Flowline	1600	N/A
18/Nov/2013	19:00	3	13090.0	Water Base	9.5	45	9.0	2.8	5/89	Flowline	1800	N/A

Mnemonics

Curve	Description	Units
GRAX	Gamma Ray Apparent, 0.5 ft. Avg	API
GRIX	Gamma Ray Density	points
GRTX	Gamma Time Since Drilled	min
TCDX	Downhole Temperature	degF
ROP_AVG	Rate of Penetration, 3.0 ft. Avg	ft/hr
WOB_AVG	Surface Weight on Bit, 1.0 ft. Avg	klbs
GRSI	Gamma Ray Sliding Indicator	unitless

Equipment and Service Data

LWD Run No.	Tool	Serial Number	Measurement	Bit Offset (ft.)	Max O.D. (in.)	Min I.D. (in.)
1	DIR	13031158	Directional	48.90	6.750	3.250
1	SRIG	12131378	Gamma	45.52	6.750	3.250
2	DIR	13031158	Directional	43.53	6.750	3.200
2	SRIG	12131378	Gamma	40.15	6.750	3.200
3	DIR	12546344	Directional	54.07	5.070	2.625
3	SRIG	11932890	Gamma	50.69	2.625	2.625

Service and Tool Mnemonics

Mnemonic	Name	Description
DIR	Directional	Wellbore directional survey
SRIG	Inclination and Gamma	Probe based gamma ray and inclination module

Comments

(1) Baker Hughes INTEQ run 1 and run 2 utilized 6 1/2 inch NaviTrak services (Gamma Ray and Directional) behind an 8 3/4 inch bit and steerable assembly from 1018 to 7745 feet MD (1018 to 7399 feet TVD)
(2) Baker Hughes INTEQ run 3 utilized 4 3/4 inch NaviTrak services (Gamma Ray and Directional) behind an 6 1/8 inch bit and steerable assembly from 7745 to 12506 feet MD (7399 to 7394 feet TVD)

Remarks

Number	Measured	Hole	LWD	Remark
	Depth (ft.)	Section (in.)	Run No.	
1	6750	8.750	2	The interval from Surface to 6750 feet MD (6710 feet TVD) was logged not logged due to Baker Hughes logging services began at the top of the curve section.
2	7745	8.750	3	The interval from 7703 to 7745 feet MD (7396 to 7400 feet TVD) was logged up to 40 hours after being drilled due to a trip out of the hole for casing and cement operations.
3	12450	6.125	3	The interval from 12450 to 12506 feet MD (7394 to 7393 feet TVD) was not logged due to sensor offsets to bit at TD.

























































