



LWD Composite Log

Natural Formation Evaluation
Azimuthal Gamma Ray
Gamma Ray
Drilling Dynamics
Wellbore Survey
Rotary Steerable

Scale: Company: Cub Creek Energy

1:1200 MD

Well: Markham 4

Depth Reference: Field: Weld County (NAD83, True North)

Driller's Depth County: Weld County State: Colorado

Status: Surface Location: Other Services:

Final Print

Latitude: Longitude: Directional VSS

API No: 05-123-43243-00

Job ID: 8071553

SEC: 32

TWN: 4N

RGE: 68W

Permanent Datum (P.D.): Ground Level

Elevation: 5042.00 ft

KB: N/A

Log Measured From: Rig Floor

Above P.D.

17.00 ft

DF: 5059.00 ft

GL: 5042.00 ft

Dates Interval Logged

Magnetic Field Reference

Date From: 2016-08-28

Top: (ft) 1523.00

Azi Reference North: True

Dip Angle: (deg) 66.75

Date To: 2016-09-01

Bottom: (ft) 12055.00

Total Magnetic Field Strength: (nT)

52429

Spud Date: 2016-07-28

Mag to Reference North Correction: (deg)

8.59 E

Borehole Record

Casing Record

Hole Size (in)	From (ft)	To (ft)	Size (in)	Weight (lb/ft)	From (ft)	To (ft)
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13.500	97.00	1535.00	9.625	36.00	17.00	1525.00
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8.750	1535.00	12055.00				
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Mud Record

Deviation Record

Type	From (ft)	To (ft)	Hole Size (in)	Interval (ft)	Inc Az (Start)	Inc Az (End)
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Water Based Mud	1535.00	12055.00	13.500	1438.00	0.71 244.10	14.53 130.05
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			8.750	10520.00	14.53 130.05	91.69 271.04
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Acquisition System Software Version

Other

Baker Hughes Cadence

G3.3

PlotStudio 3.3.7410.1

Rig:

Xtreme 18

Contractor: Xtreme Coil Drilling Corp

District:

RMD

Unit:

D&E

"These interpretations and analyses ("Interpretations") are opinions provided by Baker Hughes Oilfield Operations, Inc ("Baker Hughes"), based upon industry practice, empirical relationships, assumptions and measurements, (many of which may be provided by the customer). The Interpretations are not infallible and may be subject to different opinions. Vjwu."Dcmgt"Jwi jgu"fqgu"pqv"ycttcpv"vjgkt"ceewtce{"."eqttgevpguu."qt"eqorngvgpguu."qt"vjcv"vjg"ewuvqogtøu"cpflqt"cp{"vjktf"rctv{øu"tgnkcpeg"qp"uwej"Kpvgtrtgvcvkqpu"yknn"ceeqornkuj"cp{"rctvkewnct"tguwnvu0"Vjg"ewuvqogt"cuuwogu"hwnn"responsibility for the use of the Interpretations and for decisions based thereon and the customer agrees to release, defend and indemnify Baker Hughes, its parent, subsidiaries and affiliated or related entities, and subcontractors, together with its and their officers, directors, employees, agents and invitees against, any and all claims, losses, damages, or expenses sustained by the customer or any third party arising out of reliance upon or use of the Interpretations, without regard to the cause(s) thereof, including without limitation any form of negligence on the part of Baker Hughes. Unless other contract terms have been agreed to by the parties, each party's liabilities and qdnkicvkqpu"ujcnn"dg"iqxgtpgf"d{"Dcmgt"Jwi jgu"Kpeqtrqtcvgføu"Yqtnfykfg"Vgtou"cpf"Eqpfkvkqpu0\$""

Log Run Summary

Run No	Bit Run No.	Bit Size (in)	Bit Type	Bit Gauge Length (in)	Assembly Type	Logged Interval		Bit Depth Interval		Date / Time		Circ. Hours (h)
						Top	Bottom	From	To	Start Logging	End Logging	
						(ft)	(ft)	(ft)	(ft)			
2	2	8.750	PDC	2.00	AutoTrak Curve	1523.00	6488.00	1535.00	6488.00	2016-08-28 02:23	2016-08-29 11:53	30.44
3	3	8.750	PDC	3.50	AutoTrak Curve	6476.00	7886.00	6488.00	8127.00	2016-08-29 21:21	2016-08-30 15:00	20.29
4	3	8.750	PDC	3.50	AutoTrak Curve	7886.00	11657.00	8127.00	12055.00	2016-08-31 05:28	2016-09-01 18:38	38.71

Crew

Name		Arrive Wellsite	Depart Wellsite	Name		Arrive Wellsite	Depart Wellsite	Name		Arrive Wellsite	Depart Wellsite
Matthew Delmore		2016-08-27	2016-09-02	Robbie Opperule		2016-08-27	2016-08-31	Wade Ditton		2016-08-27	2016-09-02
Austin Small		2016-08-28	2016-09-02	Adam Harris		2016-08-31	2016-09-02				

Mud Properties Record

Date / Time	Run No.	Measured Depth (ft)	Mud Type	Density (ppg)	Viscosity (cP)	pH	Fluid Loss (cm3)	Oil / Water	Source	Total Chlorides (ppm)	K+ (%)
2016-08-27 15:30	2	1535.00	Water Based Mud	8.5	30	8.3	10.0	0.4/97.9	Active Pit	2200	0.00
2016-08-28 03:30	2	1660.00	Water Based Mud	8.5	2	10.5	17.0	0.0/98.4	Active Pit	1700	0.00
2016-08-28 15:30	2	4000.00	Water Based Mud	8.9	3	8.3	19.0	0.0/96.8	Active Pit	1600	0.00
2016-08-29 03:30	2	5800.00	Water Based Mud	8.5	2	8.5	25.0	0.0/98.9	Active Pit	1500	0.00
2016-08-29 15:30	2	6488.00	Water Based Mud	9.9	11	10.1	8.6	1.5/90.4	Active Pit	2200	0.00
2016-08-30 15:30	3	7960.00	Water Based Mud	10.0	12	9.5	5.8	1.4/90.5	Active Pit	2500	0.00
2016-08-30 03:00	3	7070.00	Water Based Mud	10.0	10	9.5	6.0	1.5/90.3	Active Pit	2400	0.00
2016-08-31 03:30	4	8126.00	Water Based Mud	10.2	13	9.5	5.7	1.4/89.6	Active Pit	2400	0.00
2016-08-31 15:30	4	9300.00	Water Based Mud	10.0	13	8.5	5.8	1.5/90.4	Active Pit	2500	0.00
2016-09-01 03:30	4	10800.00	Water Based Mud	10.2	14	9.5	5.6	2.0/89	Active Pit	2400	0.00
2016-09-01 15:30	4	11800.00	Water Based Mud	10.0	10	9.7	5.9	2.0/89.9	Active Pit	2300	0.00

Equipment and Service Data

Run No.	Tool	Serial Number	Measurement	Sensor Offset (ft)	Bit Offset (ft)	Max O.D. (in)	Min I.D. (in)
2	ATC_SU	12339220	Near Bit VSS	5.93	6.67	7.000	4.330
2	ATC_SU	12339220	Near Bit Inclination	5.93	6.67	7.000	4.330
2	ATC_MWD	12127531	Gamma (single)	2.21	12.29	7.000	3.250
2	ATC_MWD	12127531	Directional (mag)	12.28	22.36	7.000	3.250
3	ATC_SU	12339220	Near Bit VSS	5.93	6.59	7.000	4.330
3	ATC_SU	12339220	Near Bit Inclination	5.93	6.59	7.000	4.330
3	ATC_MWD	12127531	Gamma (single)	2.21	12.21	7.000	3.250
3	ATC_MWD	12127531	Directional (mag)	12.28	22.28	7.000	3.250

4	ATC_SU	12124244	Near Bit Inclination	5.93	6.59	7.000	4.330
4	ATC_SU	12124244	Near Bit VSS	5.93	6.59	7.000	4.330
4	ATC_MWD	11993844	Gamma (single)	2.74	12.76	7.000	3.250
4	ATC_MWD	11993844	Directional (mag)	12.26	22.28	7.000	3.250

Service and Tool Mnemonics

Mnemonic	Name	Description
ATC_SU	ATC_SU	Auto Trak Curve Steering Unit
ATC_MWD	ATC_MWD	Auto Trak Curve MWD
ATC_LCPM	ATC_LCPM	Auto Trak Curve LCPM

Comments


1	Baker Hughes Run 1 Utilized a 8 inch NaviTrak (Directional, VSS) assembly behind a 13.5 inch bit from 97 ft MD to 1535 ft MD (97 ft TVD to 1528.02 ft TVD). No Logging services were provided for Run 1.
2	Baker Hughes LWD Run 2, 3, and 4 utilized a 6.75 inch AutoTrak Curve Rotary Steerable assembly behind a 8.75 inch bit from 1535 ft MD to 12055 ft MD (1528.02 ft TVD to 7064.62 ft TVD).
3	Small gaps in gamma data are due to tool power cycling off and not recording gamma ray data.
4	Depth Measurements obtained from a depth control system not supplied or operated by Baker Hughes. Due to a lack of control by Baker Hughes logging engineers depth calibrations and measurements could not be independently verified.

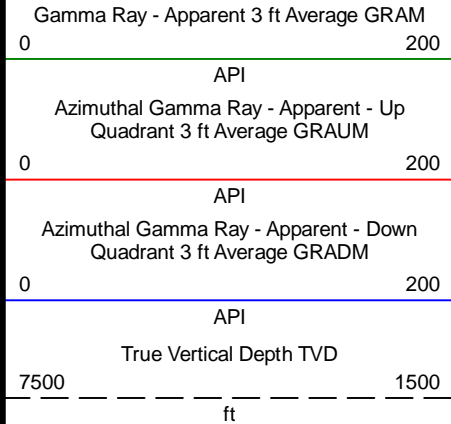
Remarks

Number	Measured Depth (ft)	Hole Section (in)	Run No.	Remark
1	1529.00	8.750	2	The interval from 1523 ft MD to 1535 MD (1520.25 ft TVD to 1528.02 ft TVD) has no surface data due to Gamma Ray bit sensor offset.
2	11658.00	8.750	4	The interval from 11657 ft MD to 12055 ft MD (7076.36 ft TVD to 7064.62 ft TVD) was not logged due to the AutoTrak not transmitting realtime gamma data nor did it record memory gamma data.

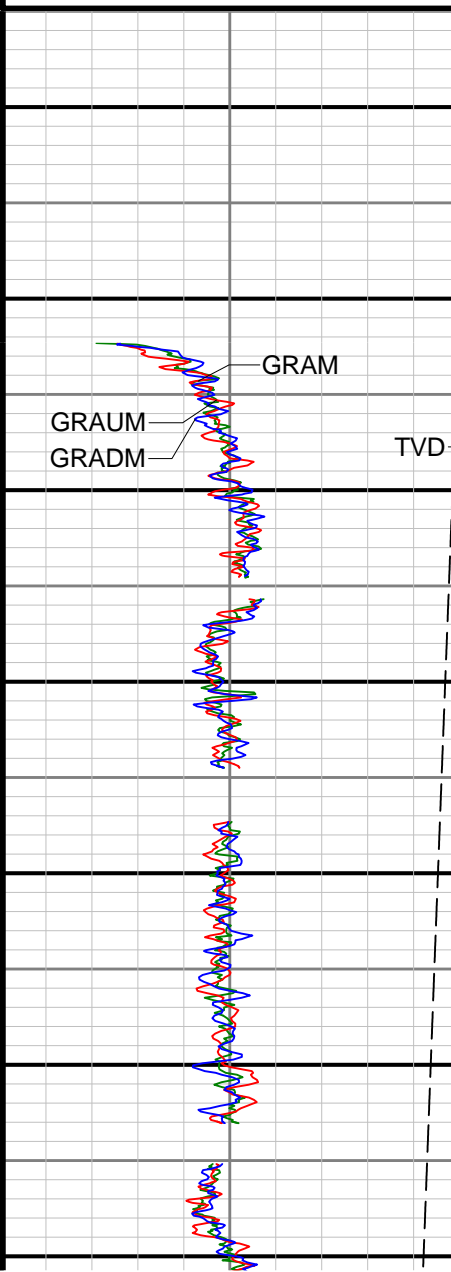
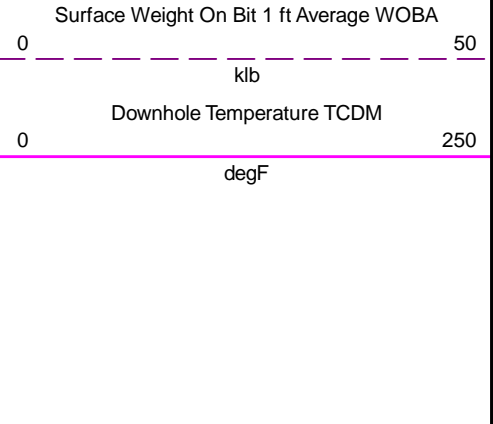
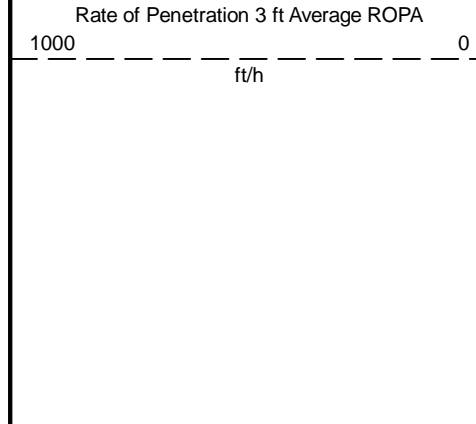
Curve Mnemonics

Presented Curves	Description	Units
ROPA	Depth Averaged ROP 3 ft Average	ft/h
GRADM	Azimuthal Gamma Ray - Apparent - Down Quadrant 3 ft Average	API
GRAM	Gamma Ray - Apparent 3 ft Average	API
GRAUM	Azimuthal Gamma Ray - Apparent - Up Quadrant 3 ft Average	API
TCDM	Downhole Temperature	degF
TVD	True Vertical Depth	ft
WOBA	Weight On Bit, Average 1 ft Average	klb

	Company	Cub Creek Energy		
	Well	Markham 4		
	Interval	Date From:	2016-08-28 02:23:21	Top: 1523.00
	Created	Date To:	2016-09-01 18:38:43	Bottom: 12055.00
		2016-09-02 23:04		



MID 1:1200 feet



1400

1500

1600

1700

1800

1900

200

