



LWD MEMORY LOG

Gamma Ray

Scale: **1:1200 MD**

Company: **Noble Energy**

Well: **Bison Ridge Y22-726**

Field: **Weld County**

County: **Weld**

State: **Colorado**

Driller's Depth

Status: **Final Print**

API No: **05-123-45375-00**

Job ID: **8782645**

Permanent Datum (P.D.): **Ground Level**

Log Measured From: **Rig Floor**

Interval Logged

Date From: **2017-12-08**

Date To: **2017-12-11**

Spud Date: **2017-12-07**

Magnetic Field Reference

Azi Reference North: **Grid**

Total Magnetic Field Strength: **(mT)**

Mag to Reference North Correction: **(deg)**

Hole Size (in)

From (ft)

To (ft)

Size (in)

Weight (lb/ft)

From (ft)

To (ft)

Type

From (ft)

To (ft)

Hole Size (in)

Interval (ft)

Inc | Az (Start)

Inc | Az (End)

Type

From (ft)

To (ft)

Size (in)

Interval (ft)

Inc | Az (Start)

Inc | Az (End)

Type

From (ft)

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Type

From (ft)

To (ft)

Size (in)

Interval (ft)

Inc | Az (Start)

Inc | Az (End)

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+ (%)
2017-12-08 09:00	1	2041.00	Diesel-Oil Based Mud	9.3	13	N/A	28.0	79.8/20.2	Active Pit	24000	0.00
2017-12-09 03:15	1	3841.00	Diesel-Oil Based Mud	9.0	11	N/A	20.0	81.3/18.7	Active Pit	24500	0.00
2017-12-09 15:30	1	7373.00	Diesel-Oil Based Mud	9.3	12	N/A	14.0	82.1/17.9	Active Pit	28000	0.00
2017-12-10 03:15	1	9808.00	Diesel-Oil Based Mud	9.4	13	N/A	17.2	82.7/17.3	Active Pit	25000	0.00
2017-12-10 15:00	1	12222.00	Diesel-Oil Based Mud	9.4	13	N/A	16.0	83.1/16.9	Active Pit	25000	0.00
2017-12-11 03:45	1	14577.00	Diesel-Oil Based Mud	9.4	13	N/A	16.0	82/18	Active Pit	27500	0.00
2017-12-11 15:00	1	16268.00	Diesel-Oil Based Mud	9.3	11	N/A	18.8	82.1/17.9	Active Pit	30000	0.00
2017-12-12 03:30	1	17100.00	Diesel-Oil Based Mud	9.2	10	N/A	20.8	84.4/15.6	Active Pit	25000	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)
1	ATC_SU	12088420	Near Bit Inclination	5.93	6.76	7.000	4.330
1	ATC_SU	12088420	Near Bit VSS	5.93	6.76	7.000	4.330
1	ATC_MWD	12332799	Gamma (single)	2.76	12.93	7.000	3.250
1	ATC_MWD	12332799	Directional (mag)	12.27	22.44	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 Depth measurements obtained from a depth control system not supplied or operated by Baker Hughes. Due to lack of control by Baker Hughes logging engineers, depth calibrations and measurements could not be independently verified.
- 2 Baker Hughes LWD Run 1 utilized a 6.75 inch Navigamma service (Gamma Ray and Directional) behind a 8.5 inch bit and rotary steerable assembly from 2041 to 17100 feet MD (2040 to 6937 TVD).
- 3 Large gaps in Gamma Ray data are due to issues with pulsar powering up memory module after a connection.

Remarks

Number	Measured Depth (ft)	Hole Section (in)	Run No.	Remark
1	17087.00	8.500	1	The interval from 16934 to 17100 feet MD (6940 feet TVD) was not logged due to sensor offset at well TD and issues with the pulsar powering the memory module.

**BAKER
HUGHES**
a GE company



Company

Well

Interval

Created

Noble Energy

Bison Ridge Y22-726

Date From: 2017-12-08 13:42:56

Date To: 2017-12-11 14:50:27

2017-12-12 22:21:32

Top: 2041.00

Bottom: 17100.00

Gamma Ray - Apparent 3 ft Average GRAM 0 _____ 150	MID 1:1200 feet	Depth Averaged ROP 10 ft Average ROPA 1000 _____ 0	Weight On Bit, Average 1 ft Average WOBA 0 _____ 50
API True Vertical Depth TVD 7500 _____ 1500 ft		ft/h	klb Downhole Temperature TCDM 0 _____ 300 degF
	19		



























