

Noble Energy

Weld County, CO (NAD 83)

Sec. 2-T9N-R58W (Sharpe State 2 /Davis State (PAD)

Sharpe State LD02-79-1BHN

05-123-39852

Original Wellbore

Design: Actual Surveys

Sperry Drilling Services

Final Report

13 January, 2015

Surface UWI : 05-123-39852

Well Coordinates: 1,529,486.42 N, 3,460,582.12 E (40° 46' 29.89" N, 103° 50' 13.09" W)

Ground Level: 4,749.00 usft

Local Coordinate Origin:

Centered on Well Sharpe State LD02-79-1BHN

Viewing Datum:

KB=24 @ 4773.00usft (H&P 273)

TVDs to System:

N

North Reference:

Grid

Unit System:

Dec-Deg - API - US Survey Feet - Custom

Geodetic Scale Factor Applied

Version: 5000.1 Build: 70

HALLIBURTON

Project: Weld County, CO (NAD 83)
 Site: Sec. 2-T9N-R58W (Sharpe State 2 /Davis State (PAD)
 Well: Sharpe State LD02-79-1BHN
 Wellbore: Original Wellbore
 Design: Actual Surveys



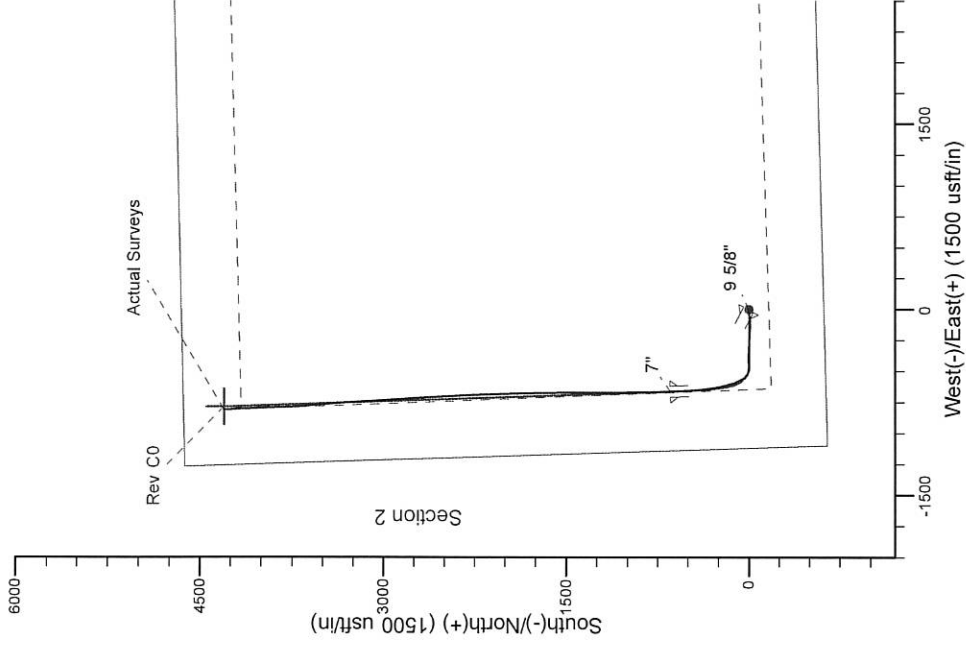
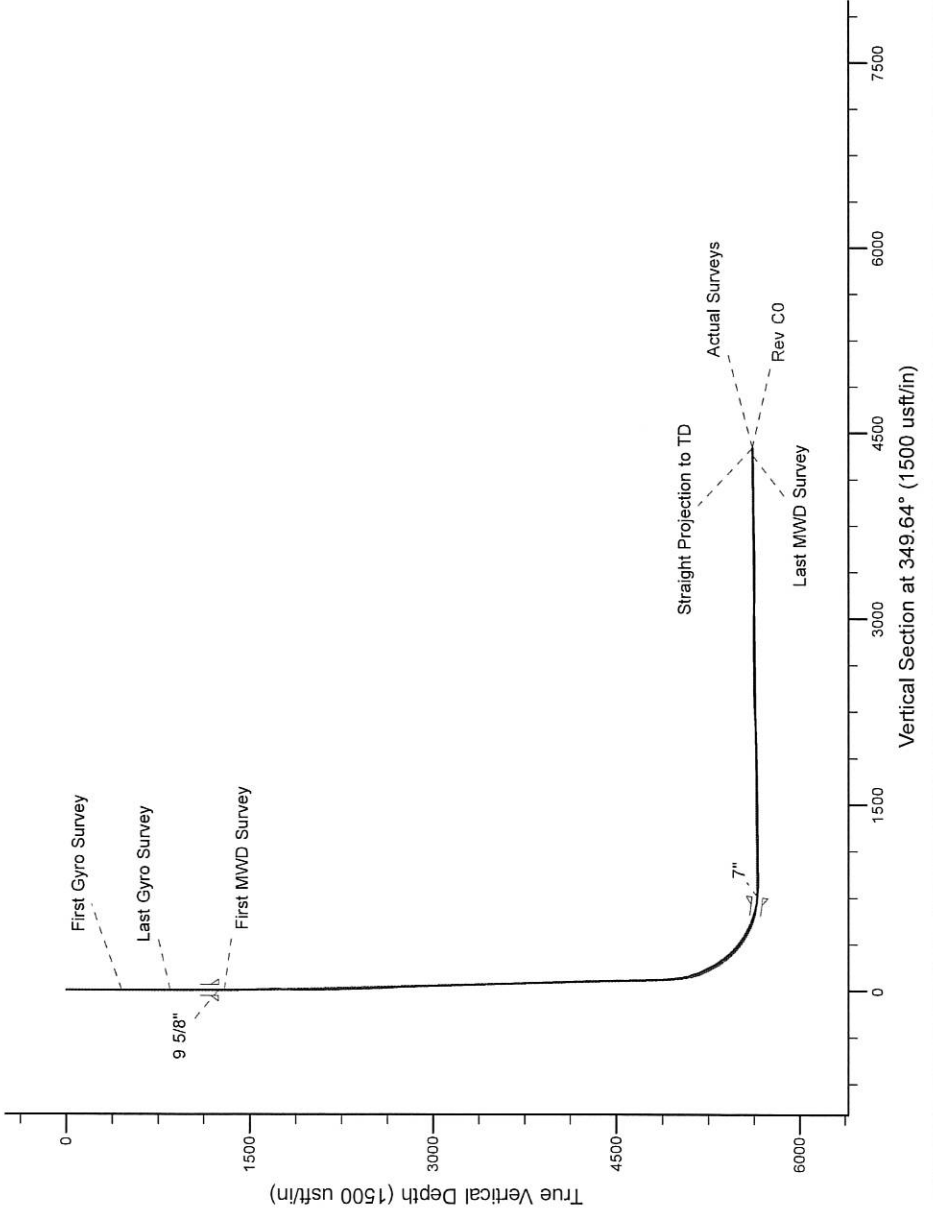
Platted SHL: 615' FSL, 1117' FWL
 Platted Lat/Long: 40.77497 N, 103.836970 W
 Location: Sec. 2-T9N-R58W

~7" Casing: 1280' FSL, 476' FWL
 Lat/Long: 40.776775N, 103.839321W
 State Planes - CO Northern: 1530131.72N, 3459918.64E
 Location: Sec. 2-T9N-R58W

Platted BHL: 330' FNL, 470' FWL
 Lat/Long: 40.786820N, 103.839520W
 State Planes - CO Northern: 1533789.82N, 3459795.13E
 Location: Sec. 2-T9N-R58W

LEGEND

- Sharpe State LD02-79-1BHN, Original Wellbore, Rev C0 V0
- Actual Surveys



WELL DETAILS: Sharpe State LD02-79-1BHN

Ground Level: 4749.00
 KB=24 @ 4773.00usft (H&P 273)

Created By: Gordy Roth
 Created On: 1/13/15

Design Report for Sharpe State LD02-79-1BHN - Actual Surveys

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
450.00	0.20	357.02	450.00	0.78	-0.04	0.78	0.04
First Gyro Survey							
850.00	0.10	350.83	850.00	1.83	-0.13	1.82	0.03
Last Gyro Survey							
1,292.00	0.38	119.61	1,291.99	1.48	1.08	1.26	0.10
First MWD Survey							
1,385.00	2.99	278.06	1,384.96	1.67	-1.05	1.83	3.60
1,477.00	4.97	278.77	1,476.73	2.61	-7.37	3.90	2.15
1,570.00	7.05	271.03	1,569.22	3.33	-17.06	6.35	2.40
1,663.00	7.71	260.84	1,661.45	2.44	-28.92	7.60	1.57
1,755.00	7.53	255.61	1,752.64	-0.04	-40.86	7.31	0.78
1,848.00	7.63	248.21	1,844.83	-3.85	-52.49	5.66	1.05
1,940.00	8.37	261.54	1,935.94	-7.10	-64.79	4.67	2.16
2,033.00	8.29	257.58	2,027.96	-9.54	-78.03	4.66	0.62
2,124.00	8.57	274.19	2,117.99	-10.45	-91.20	6.12	2.68
2,217.00	8.13	271.83	2,210.00	-9.74	-104.68	9.25	0.60
2,309.00	7.74	267.36	2,301.12	-9.81	-117.37	11.46	0.79
2,402.00	7.54	264.71	2,393.30	-10.66	-129.71	12.84	0.44
2,495.00	8.22	277.41	2,485.43	-10.37	-142.38	15.41	2.00
2,590.00	8.25	276.47	2,579.45	-8.73	-155.88	19.46	0.15
2,684.00	8.76	276.37	2,672.41	-7.17	-169.70	23.47	0.54
2,779.00	8.99	275.06	2,766.27	-5.71	-184.28	27.53	0.32
2,873.00	8.92	273.01	2,859.13	-4.68	-198.87	31.17	0.35
2,968.00	8.76	269.39	2,953.00	-4.37	-213.46	34.10	0.61
3,063.00	8.19	269.66	3,046.96	-4.49	-227.46	36.50	0.60
3,157.00	8.07	266.53	3,140.02	-4.93	-240.74	38.46	0.49
3,252.00	8.58	266.29	3,234.02	-5.79	-254.47	40.08	0.54
3,442.00	7.89	276.86	3,422.07	-5.15	-281.56	45.58	0.87
3,536.00	7.95	276.37	3,515.17	-3.66	-294.43	49.37	0.10
3,631.00	8.17	276.68	3,609.23	-2.15	-307.66	53.24	0.24
3,726.00	8.05	277.29	3,703.28	-0.52	-320.97	57.23	0.16
3,821.00	7.92	276.42	3,797.36	1.06	-334.07	61.14	0.19
3,915.00	7.18	276.34	3,890.55	2.43	-346.34	64.70	0.79
4,010.00	8.14	272.68	3,984.70	3.40	-358.96	67.92	1.13
4,104.00	7.83	269.85	4,077.79	3.70	-372.01	70.56	0.53
4,199.00	7.77	269.19	4,171.91	3.59	-384.91	72.77	0.11
4,294.00	7.40	263.80	4,266.08	2.84	-397.41	74.28	0.84
4,389.00	8.56	271.36	4,360.16	2.34	-410.56	76.16	1.64
4,483.00	8.19	268.85	4,453.16	2.38	-424.25	78.66	0.55
4,578.00	7.49	265.92	4,547.27	1.80	-437.19	80.42	0.85
4,673.00	7.68	270.48	4,641.44	1.41	-449.71	82.29	0.66
4,767.00	7.11	267.34	4,734.66	1.19	-461.81	84.25	0.74
4,910.00	7.82	278.22	4,876.45	2.18	-480.28	88.54	1.10
4,958.00	10.59	283.40	4,923.83	3.66	-487.80	91.36	6.02
5,006.00	14.87	279.60	4,970.64	5.71	-498.17	95.24	9.08
5,052.00	17.76	284.27	5,014.78	8.43	-510.79	100.18	6.89
5,100.00	18.16	299.54	5,060.47	13.92	-524.40	108.03	9.82
5,147.00	20.45	313.57	5,104.85	23.20	-536.73	119.38	10.97
5,195.00	24.14	321.95	5,149.26	36.72	-548.86	134.86	10.13

Design Report for Sharpe State LD02-79-1BHN - Actual Surveys

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)
5,242.00	25.75	326.66	5,191.88	52.82	-560.40	152.77	5.44
5,290.00	27.06	330.63	5,234.88	71.05	-571.49	172.69	4.58
5,337.00	29.29	334.87	5,276.31	90.78	-581.61	193.92	6.37
5,385.00	33.10	338.87	5,317.37	113.64	-591.33	218.16	9.03
5,432.00	36.53	342.76	5,355.95	138.98	-600.10	244.67	8.69
5,480.00	38.57	344.89	5,394.01	167.08	-608.24	273.77	5.04
5,527.00	42.65	346.21	5,429.68	196.70	-615.86	304.28	8.87
5,575.00	46.32	347.79	5,463.92	229.47	-623.41	337.87	7.99
5,622.00	49.67	349.12	5,495.37	263.68	-630.39	372.78	7.43
5,670.00	54.56	350.89	5,524.84	300.98	-636.94	410.65	10.59
5,716.00	59.55	353.43	5,549.85	339.21	-642.18	449.20	11.79
5,764.00	63.58	353.90	5,572.70	381.15	-646.83	491.29	8.44
5,810.00	66.02	354.59	5,592.28	422.56	-651.00	532.78	5.48
5,858.00	69.51	356.05	5,610.45	466.83	-654.62	576.98	7.80
5,905.00	72.85	356.83	5,625.61	511.23	-657.38	621.15	7.28
5,953.00	77.58	357.41	5,637.85	557.57	-659.71	667.15	9.92
5,996.00	80.93	357.50	5,645.87	599.77	-661.58	709.00	7.79
6,106.00	87.10	358.06	5,657.33	709.03	-665.82	817.24	5.63
6,200.00	91.42	358.73	5,658.55	802.96	-668.45	910.11	4.65
6,264.00	91.14	358.80	5,657.12	866.93	-669.83	973.29	0.45
6,358.00	91.29	359.40	5,655.12	960.90	-671.30	1,065.99	0.66
6,453.00	90.31	0.07	5,653.80	1,055.89	-671.74	1,159.50	1.25
6,548.00	89.82	0.28	5,653.69	1,150.89	-671.45	1,252.90	0.56
6,642.00	89.04	0.26	5,654.62	1,244.88	-671.01	1,345.28	0.83
6,737.00	91.33	0.15	5,654.32	1,339.87	-670.67	1,438.66	2.41
6,832.00	91.73	359.73	5,651.78	1,434.84	-670.77	1,532.10	0.61
6,926.00	91.94	359.92	5,648.77	1,528.79	-671.06	1,624.57	0.30
7,020.00	91.33	359.23	5,646.09	1,622.75	-671.75	1,717.12	0.98
7,114.00	91.17	358.79	5,644.04	1,716.71	-673.38	1,809.84	0.50
7,208.00	90.46	358.21	5,642.70	1,810.67	-675.84	1,902.71	0.98
7,302.00	90.99	358.38	5,641.51	1,904.62	-678.63	1,995.63	0.59
7,397.00	92.34	358.46	5,638.75	1,999.54	-681.25	2,089.47	1.42
7,492.00	93.02	358.54	5,634.31	2,094.40	-683.74	2,183.24	0.72
7,586.00	91.85	357.56	5,630.32	2,188.26	-686.93	2,276.14	1.62
7,681.00	92.07	357.30	5,627.07	2,283.11	-691.19	2,370.20	0.36
7,776.00	90.18	357.14	5,625.20	2,377.98	-695.80	2,464.35	2.00
7,871.00	90.43	356.57	5,624.70	2,472.83	-701.01	2,558.60	0.66
7,965.00	90.89	356.72	5,623.61	2,566.66	-706.51	2,651.89	0.51
8,060.00	91.33	356.59	5,621.77	2,661.48	-712.05	2,746.16	0.48
8,155.00	90.00	356.96	5,620.67	2,756.32	-717.39	2,840.41	1.45
8,250.00	88.95	354.42	5,621.54	2,851.04	-724.53	2,934.87	2.89
8,344.00	88.86	356.57	5,623.34	2,944.73	-731.91	3,028.36	2.29
8,439.00	88.92	357.28	5,625.18	3,039.57	-737.01	3,122.57	0.75
8,534.00	89.23	356.83	5,626.71	3,134.44	-741.89	3,216.76	0.58
8,629.00	89.48	356.02	5,627.78	3,229.24	-747.81	3,311.09	0.89
8,724.00	90.40	355.97	5,627.88	3,324.01	-754.45	3,405.50	0.97
8,819.00	90.92	355.32	5,626.79	3,418.73	-761.66	3,499.98	0.88
8,914.00	91.85	355.36	5,624.49	3,513.39	-769.38	3,594.48	0.98
9,008.00	90.25	355.10	5,622.77	3,607.04	-777.19	3,688.01	1.72
9,103.00	90.31	355.21	5,622.30	3,701.70	-785.22	3,782.57	0.13
9,198.00	91.11	358.43	5,621.13	3,796.54	-790.48	3,876.80	3.49

Design Report for Sharpe State LD02-79-1BHN - Actual Surveys

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)
9,293.00	91.60	358.13	5,618.88	3,891.47	-793.34	3,970.70	0.60
9,388.00	90.40	357.99	5,617.22	3,986.40	-796.55	4,064.66	1.27
9,482.00	90.15	357.99	5,616.77	4,080.34	-799.85	4,157.66	0.27
9,577.00	90.77	357.32	5,616.01	4,175.25	-803.73	4,251.72	0.96
9,644.00	91.42	357.24	5,614.73	4,242.16	-806.91	4,318.12	0.98
Last MWD Survey							
9,705.00	91.42	357.24	5,613.22	4,303.08	-809.85	4,378.56	0.00
Straight Projection to TD							

Design Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
450.00	450.00	0.78	-0.04	First Gyro Survey
850.00	850.00	1.83	-0.13	Last Gyro Survey
1,292.00	1,291.99	1.48	1.08	First MWD Survey
9,644.00	5,614.73	4,242.16	-806.91	Last MWD Survey
9,705.00	5,613.22	4,303.08	-809.85	Straight Projection to TD

Vertical Section Information

Angle Type	Target	Azimuth (°)	Origin Type	+N/-S (usft)	+E/-W (usft)	Start TVD (usft)
Target	Sharpe State LD02-79-1BHN_BHL	349.64	Slot	0.00	0.00	5,610.37

Survey tool program

From (usft)	To (usft)	Survey/Plan	Survey Tool
450.00	850.00	Gyro Surveys	Flexi-Shot
1,292.00	5,996.00	Intermediate Surveys	MWD
6,106.00	9,705.00	Production Surveys	MWD

Casing Details

Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")
1,245.00	1,245.00	9 5/8"	9-5/8	13-3/4
6,042.00	5,652.09	7"	7	8-3/4

Wellbore Targets

Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
Sharpe State LD02-79	0.00	0.00	5,610.37	4,303.41	-786.99	1,533,789.82	3,459,795.13	40.786820	-103.839520
- hit/miss target									
- Shape									
- actual wellpath misses target center by 23.03usft at 9704.30usft MD (5613.23 TVD, 4302.38 N, -809.82 E)									
- Point									

Design Report for Sharpe State LD02-79-1BHN - Actual Surveys

Directional Difficulty Index

Average Dogleg over Survey:	1.75 °/100usft	Maximum Dogleg over Survey:	11.79 °/100usft at 5,716.00 usft
Net Tortosity applicable to Plans:	0.66 °/100usft	Directional Difficulty Index:	6.150

Audit Info