

EnCana Oil & Gas (USA) Inc.

Weld County, CO
Sec. 2-T2N-R67W
Echeverria 2B-2H

Plan B

Survey: Sperry MWD Surveys

Sperry Drilling Services Standard Report

12 September, 2012

Well Coordinates: 1,306,483.20 N, 3,178,353.08 E (40° 10' 22.55" N, 104° 51' 42.30" W)
Ground Level: 4,858.00 ft

Local Coordinate Origin:	Centered on Well Echeverria 2B-2H
Viewing Datum:	RKB (13') @ 4871.00ft (Ensign 135)
TVDs to System:	N
North Reference:	Grid
Unit System:	API - US Survey Feet - Custom

Version: 2003.16 Build: 43I

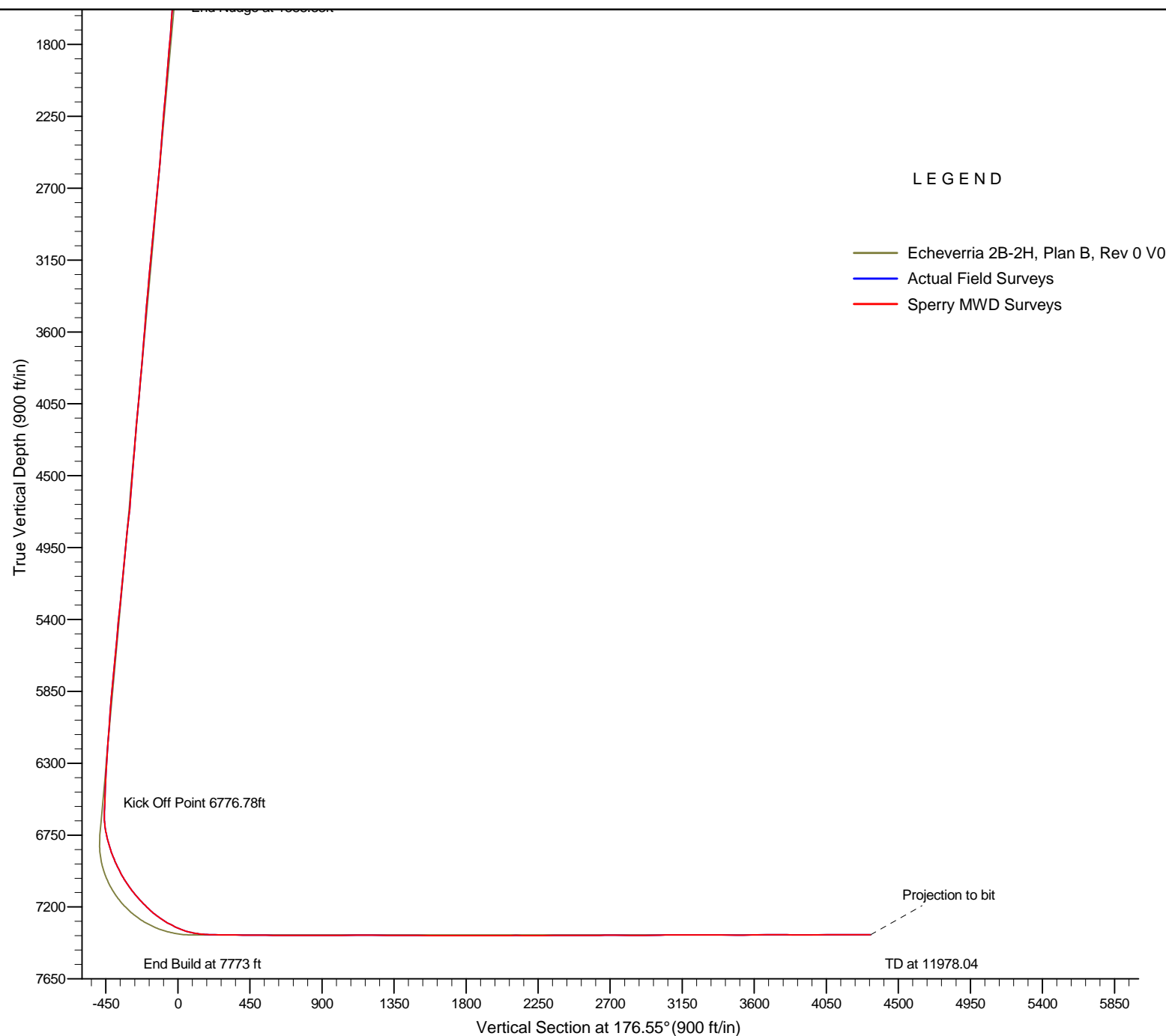
HALLIBURTON

Project: Weld County, CO
Site: Sec. 2-T2N-R67W
Well: Echeverria 2B-2H

EnCana Oil & Gas (USA) Inc.

HALLIBURTON

Sperry Drilling



SECTION DETAILS

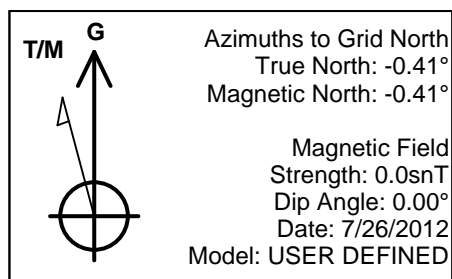
WELL DETAILS: Echeverria 2B-2H

Ground Level: 4858.00			
Northing	Easting	Latitude	Longitude
1306483.20	3178353.00	10° 10' 22.548 N	104° 51' 42.300 W



PROJECT DETAILS: Weld County, CO

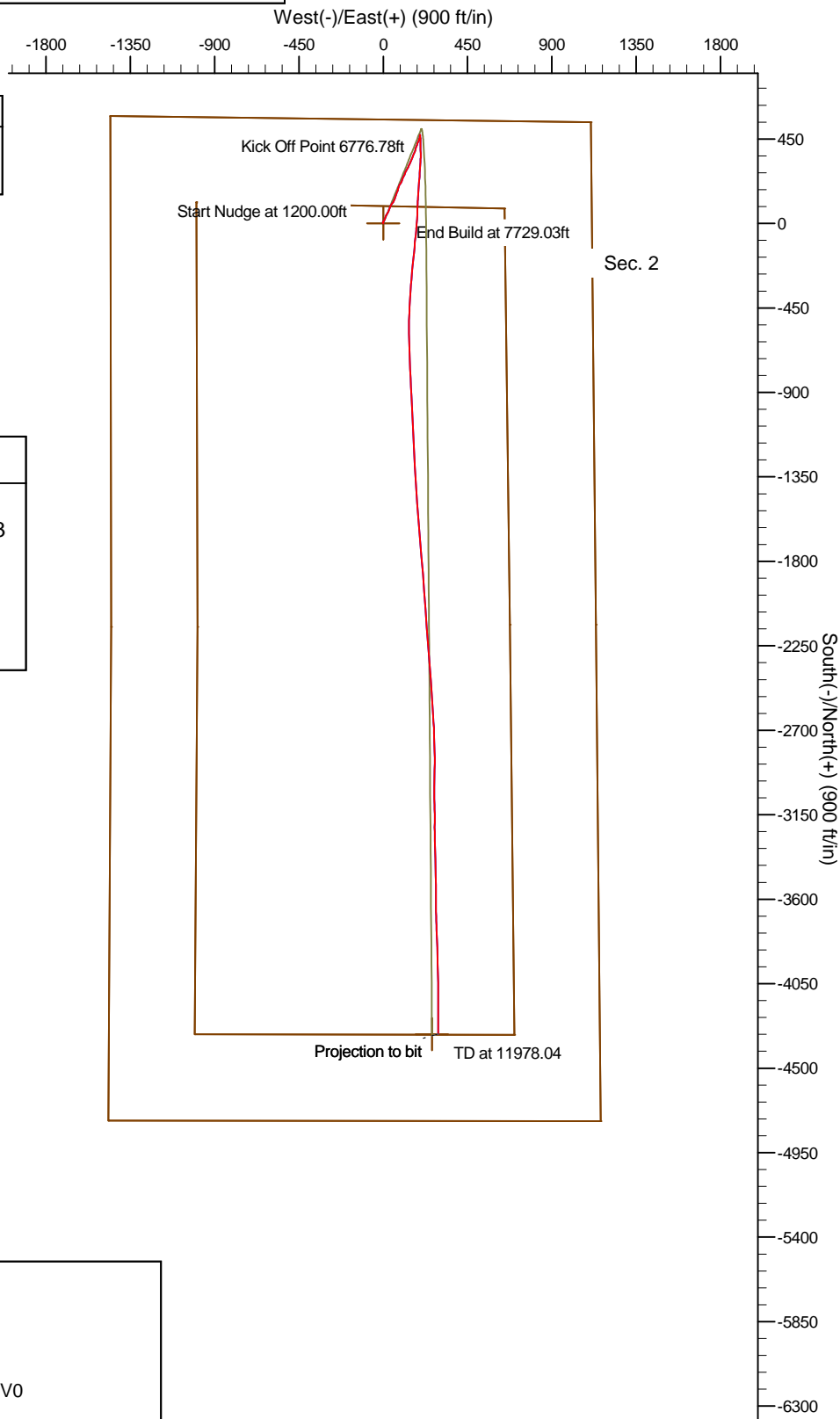
Geodetic System: US State Plane 1983
North American Datum 1983
Ellipsoid: GRS 1980
Zone: Colorado Northern Zone

System Datum: Mean Sea Level
Datum:



LEGEND

-  Echeverria 2B-2H, Plan B, Rev 0 V0
- Actual Field Surveys
-  Sperry MWD Surveys



Survey Report for Echeverria 2B-2H - Sperry MWD Surveys

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
164.00	0.29	60.52	164.00	0.20	0.36	-0.18	0.18
256.00	0.37	32.45	256.00	0.57	0.72	-0.52	0.19
348.00	0.38	350.24	348.00	1.12	0.83	-1.07	0.29
440.00	0.25	15.68	439.99	1.61	0.83	-1.56	0.20
532.00	0.30	334.41	531.99	2.03	0.78	-1.97	0.22
624.00	0.47	323.29	623.99	2.54	0.45	-2.51	0.20
716.00	0.29	317.08	715.99	3.02	0.07	-3.01	0.20
808.00	0.64	304.80	807.99	3.48	-0.51	-3.51	0.39
851.00	0.74	307.82	850.98	3.79	-0.93	-3.84	0.25
996.00	0.47	327.73	995.98	4.87	-1.98	-4.98	0.23
1,088.00	0.76	352.85	1,087.97	5.79	-2.26	-5.92	0.42
1,150.00	0.56	334.69	1,149.97	6.47	-2.44	-6.61	0.46
1,180.00	1.08	348.00	1,179.96	6.88	-2.56	-7.02	1.83
1,211.00	1.73	45.23	1,210.95	7.50	-2.29	-7.62	4.72
1,242.00	3.50	56.42	1,241.92	8.35	-1.17	-8.41	5.92
1,272.00	4.83	47.12	1,271.84	9.72	0.52	-9.67	4.96
1,303.00	5.32	39.85	1,302.72	11.71	2.39	-11.54	2.61
1,334.00	5.57	30.20	1,333.58	14.11	4.07	-13.84	3.06
1,364.00	5.67	22.08	1,363.44	16.74	5.36	-16.39	2.67
1,456.00	5.17	14.11	1,455.03	24.97	8.08	-24.44	0.98
1,551.00	5.31	24.94	1,549.63	33.11	10.98	-32.39	1.05
1,645.00	4.59	25.33	1,643.28	40.46	14.42	-39.51	0.77
1,740.00	5.82	31.74	1,737.89	47.99	18.58	-46.78	1.43
1,835.00	5.59	28.08	1,832.42	56.17	23.29	-54.66	0.45
1,930.00	5.50	22.17	1,926.97	64.46	27.19	-62.71	0.61
2,025.00	4.82	22.63	2,021.59	72.36	30.44	-70.40	0.72
2,119.00	5.82	22.68	2,115.18	80.41	33.80	-78.23	1.06
2,214.00	5.03	18.71	2,209.76	88.80	36.99	-86.41	0.92
2,309.00	5.52	31.98	2,304.36	96.62	40.75	-93.99	1.38
2,404.00	6.11	35.15	2,398.87	104.63	46.08	-101.67	0.71
2,499.00	5.05	36.39	2,493.42	112.13	51.47	-108.83	1.12
2,594.00	6.33	26.87	2,587.95	120.16	56.32	-116.56	1.67
2,688.00	6.15	21.91	2,681.39	129.46	60.54	-125.58	0.60
2,783.00	6.02	18.57	2,775.86	138.90	64.03	-134.80	0.40
2,878.00	5.74	13.41	2,870.36	148.25	66.71	-143.96	0.63
2,973.00	5.17	21.67	2,964.93	156.84	69.40	-152.39	1.02
3,068.00	6.38	24.04	3,059.45	165.64	73.13	-160.94	1.30
3,163.00	6.04	19.26	3,153.89	175.18	76.93	-170.24	0.65
3,258.00	5.27	10.79	3,248.43	184.19	79.39	-179.08	1.19
3,352.00	5.58	19.56	3,342.01	192.73	81.73	-187.47	0.94
3,447.00	5.30	23.07	3,436.58	201.12	85.00	-195.65	0.46
3,542.00	6.11	33.86	3,531.11	209.36	89.53	-203.59	1.41
3,637.00	4.91	30.53	3,625.67	217.06	94.41	-210.99	1.31
3,732.00	5.46	21.97	3,720.28	224.75	98.17	-218.44	1.00
3,827.00	5.13	18.05	3,814.88	232.98	101.18	-226.47	0.52
3,921.00	6.00	25.51	3,908.44	241.41	104.60	-234.68	1.20
4,016.00	5.80	25.37	4,002.93	250.23	108.79	-243.23	0.21
4,111.00	5.75	24.67	4,097.45	258.89	112.83	-251.64	0.09
4,206.00	5.68	23.73	4,191.98	267.52	116.71	-260.01	0.12

Survey Report for Echeverria 2B-2H - Sperry MWD Surveys

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)
4,301.00	4.65	19.03	4,286.59	275.46	119.86	-267.76	1.17
4,395.00	5.74	29.64	4,380.21	283.15	123.43	-275.21	1.54
4,490.00	5.50	29.12	4,474.75	291.26	127.99	-283.03	0.26
4,585.00	5.34	27.32	4,569.32	299.16	132.24	-290.67	0.25
4,680.00	5.06	27.72	4,663.93	306.80	136.21	-298.05	0.30
4,775.00	6.84	24.97	4,758.42	315.64	140.55	-306.61	1.90
4,869.00	6.88	24.53	4,851.75	325.83	145.25	-316.51	0.07
4,964.00	6.73	23.94	4,946.08	336.10	149.87	-326.47	0.17
5,059.00	5.93	21.97	5,040.50	345.74	153.97	-335.85	0.87
5,153.00	5.01	19.74	5,134.07	354.10	157.17	-344.01	1.00
5,248.00	6.82	21.52	5,228.56	363.26	160.64	-352.93	1.91
5,343.00	6.52	21.24	5,322.91	373.53	164.66	-362.95	0.32
5,438.00	5.84	19.38	5,417.36	383.12	168.22	-372.30	0.75
5,533.00	5.00	18.54	5,511.94	391.60	171.14	-380.60	0.89
5,628.00	6.33	17.42	5,606.47	400.52	174.03	-389.33	1.40
5,723.00	5.75	15.62	5,700.94	410.10	176.88	-398.72	0.64
5,817.00	5.88	22.56	5,794.46	419.09	179.99	-407.50	0.76
5,912.00	5.15	21.14	5,889.02	427.56	183.40	-415.75	0.78
6,007.00	4.93	19.78	5,983.65	435.37	186.31	-423.38	0.26
6,102.00	4.21	24.80	6,078.35	442.38	189.16	-430.20	0.87
6,196.00	4.72	17.39	6,172.07	449.20	191.76	-436.85	0.82
6,291.00	3.97	14.09	6,266.79	456.12	193.73	-443.64	0.83
6,386.00	3.21	6.65	6,361.61	461.96	194.84	-449.40	0.94
6,481.00	2.42	11.06	6,456.49	466.57	195.53	-453.96	0.86
6,576.00	1.93	13.97	6,551.42	470.09	196.30	-457.43	0.53
6,607.00	1.95	13.05	6,582.40	471.11	196.55	-458.43	0.12
6,671.00	0.80	147.76	6,646.39	471.79	197.03	-459.08	4.03
6,702.00	4.86	178.96	6,677.35	470.29	197.17	-457.58	13.54
6,734.00	8.85	175.74	6,709.11	466.48	197.38	-453.76	12.52
6,765.00	11.61	178.79	6,739.62	460.98	197.62	-448.26	9.07
6,797.00	13.54	177.86	6,770.85	454.02	197.83	-441.30	6.06
6,829.00	15.85	177.24	6,801.80	445.91	198.18	-433.18	7.24
6,860.00	17.72	178.55	6,831.48	436.97	198.50	-424.23	6.15
6,892.00	19.88	179.59	6,861.77	426.66	198.67	-413.93	6.83
6,922.00	21.86	178.39	6,889.80	415.97	198.86	-403.26	6.75
6,955.00	24.06	179.13	6,920.18	403.10	199.13	-390.39	6.72
6,987.00	25.81	178.67	6,949.20	389.61	199.39	-376.91	5.50
7,018.00	27.34	178.20	6,976.92	375.75	199.78	-363.05	4.98
7,050.00	28.69	180.64	7,005.17	360.73	199.92	-348.05	5.53
7,081.00	31.65	182.27	7,031.97	345.15	199.51	-332.53	9.91
7,113.00	34.69	183.32	7,058.76	327.67	198.65	-315.13	9.67
7,145.00	37.12	183.94	7,084.67	308.94	197.46	-296.50	7.68
7,176.00	38.87	183.54	7,109.10	289.90	196.22	-277.57	5.70
7,208.00	40.67	183.26	7,133.70	269.47	195.01	-257.25	5.65
7,239.00	42.62	183.46	7,156.86	248.90	193.80	-236.79	6.30
7,271.00	44.14	184.62	7,180.12	226.98	192.25	-215.01	5.36
7,303.00	46.01	184.74	7,202.72	204.40	190.40	-192.58	5.85
7,334.00	48.08	184.87	7,223.84	181.79	188.50	-170.12	6.68
7,366.00	50.88	184.34	7,244.63	157.55	186.55	-146.04	8.84
7,397.00	54.12	183.71	7,263.50	133.02	184.82	-121.66	10.58

Survey Report for Echeverria 2B-2H - Sperry MWD Surveys

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)
7,429.00	57.10	181.28	7,281.57	106.64	183.69	-95.40	11.22
7,461.00	60.52	181.46	7,298.14	79.28	183.03	-68.13	10.70
7,492.00	62.75	182.96	7,312.87	52.03	181.97	-40.98	8.36
7,524.00	64.80	183.56	7,327.01	23.37	180.34	-12.48	6.62
7,556.00	67.95	184.33	7,339.83	-5.88	178.32	16.59	10.09
7,588.00	72.61	185.69	7,350.63	-35.88	175.69	46.38	15.10
7,619.00	77.41	185.57	7,358.64	-65.67	172.75	75.94	15.49
7,651.00	80.24	185.36	7,364.84	-96.91	169.76	106.95	8.87
7,683.00	83.89	185.45	7,369.26	-128.46	166.78	138.26	11.41
7,714.00	86.26	186.10	7,371.92	-159.19	163.67	168.75	7.93
7,725.00	86.88	185.77	7,372.58	-170.11	162.53	179.58	6.38
7,779.00	89.07	185.36	7,374.49	-223.82	157.30	232.88	4.13
7,810.00	89.63	185.56	7,374.84	-254.68	154.35	263.50	1.92
7,855.00	89.13	184.89	7,375.33	-299.49	150.25	307.98	1.86
7,907.00	89.20	183.76	7,376.08	-351.33	146.33	359.50	2.18
7,952.00	89.69	183.64	7,376.52	-396.24	143.43	404.15	1.12
8,002.00	90.00	183.24	7,376.66	-446.14	140.43	453.78	1.01
8,047.00	89.63	181.68	7,376.80	-491.10	138.50	498.54	3.56
8,097.00	89.51	180.20	7,377.18	-541.09	137.68	548.39	2.97
8,142.00	88.83	179.09	7,377.83	-586.09	137.95	593.32	2.89
8,191.00	89.07	178.29	7,378.73	-635.06	139.07	642.28	1.70
8,236.00	90.12	178.36	7,379.04	-680.04	140.39	687.26	2.34
8,286.00	90.74	178.00	7,378.67	-730.02	141.98	737.24	1.43
8,331.00	91.05	177.65	7,377.97	-774.98	143.69	782.22	1.04
8,381.00	90.25	177.74	7,377.40	-824.93	145.70	832.20	1.61
8,426.00	89.38	177.09	7,377.54	-869.89	147.73	877.20	2.41
8,476.00	89.57	176.84	7,378.00	-919.81	150.37	927.20	0.63
8,571.00	90.25	177.31	7,378.15	-1,014.69	155.22	1,022.19	0.87
8,666.00	90.80	177.26	7,377.28	-1,109.58	159.72	1,117.18	0.58
8,761.00	89.75	177.28	7,376.82	-1,204.47	164.25	1,212.17	1.11
8,855.00	89.63	177.02	7,377.33	-1,298.35	168.92	1,306.16	0.30
8,950.00	89.57	176.33	7,378.00	-1,393.19	174.43	1,401.16	0.73
9,045.00	89.44	175.57	7,378.82	-1,487.95	181.14	1,496.15	0.81
9,140.00	89.14	175.45	7,379.99	-1,582.65	188.57	1,591.13	0.34
9,235.00	90.31	175.72	7,380.45	-1,677.36	195.89	1,686.11	1.26
9,330.00	90.00	174.99	7,380.19	-1,772.05	203.58	1,781.09	0.83
9,425.00	90.31	175.35	7,379.94	-1,866.71	211.58	1,876.06	0.50
9,519.00	89.88	175.81	7,379.78	-1,960.43	218.82	1,970.05	0.67
9,614.00	90.68	176.18	7,379.32	-2,055.20	225.46	2,065.04	0.93
9,709.00	89.44	175.21	7,379.22	-2,149.93	232.59	2,160.03	1.66
9,804.00	90.49	175.91	7,379.27	-2,244.64	239.94	2,255.01	1.33
9,899.00	90.80	175.33	7,378.21	-2,339.36	247.20	2,349.99	0.69
9,994.00	88.95	175.80	7,378.41	-2,434.07	254.54	2,444.97	2.01
10,089.00	90.43	176.69	7,378.93	-2,528.86	260.77	2,539.97	1.82
10,184.00	91.17	176.42	7,377.60	-2,623.68	266.47	2,634.96	0.83
10,279.00	89.20	177.54	7,377.29	-2,718.54	271.48	2,729.95	2.39
10,373.00	89.38	179.21	7,378.46	-2,812.49	274.14	2,823.89	1.79
10,468.00	90.99	181.10	7,378.15	-2,907.48	273.89	2,918.69	2.61
10,563.00	91.11	180.29	7,376.41	-3,002.46	272.73	3,013.43	0.86
10,658.00	89.19	178.54	7,376.16	-3,097.44	273.70	3,108.30	2.73
10,753.00	91.49	180.62	7,375.60	-3,192.43	274.40	3,203.15	3.26

Survey Report for Echeverria 2B-2H - Sperry MWD Surveys

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)
10,848.00	88.76	177.94	7,375.39	-3,287.40	275.59	3,298.03	4.03
10,943.00	90.12	178.85	7,376.32	-3,382.36	278.26	3,392.97	1.72
11,037.00	89.51	178.50	7,376.62	-3,476.33	280.43	3,486.91	0.75
11,132.00	90.99	179.80	7,376.21	-3,571.32	281.84	3,581.80	2.07
11,227.00	91.54	179.66	7,374.11	-3,666.29	282.29	3,676.63	0.60
11,322.00	88.83	177.08	7,373.80	-3,761.23	284.99	3,771.57	3.94
11,417.00	89.94	179.10	7,374.82	-3,856.17	288.15	3,866.52	2.43
11,511.00	90.25	178.21	7,374.67	-3,950.14	290.36	3,960.46	1.00
11,606.00	90.49	179.13	7,374.05	-4,045.11	292.56	4,055.39	1.00
11,701.00	89.88	180.49	7,373.75	-4,140.11	292.88	4,150.23	1.57
11,796.00	90.56	179.74	7,373.38	-4,235.11	292.69	4,245.05	1.07
11,837.00	90.12	179.48	7,373.14	-4,276.11	292.97	4,285.99	1.25
11,879.00	90.12	179.48	7,373.05	-4,318.11	293.35	4,327.93	0.00
Projection to bit							

Survey Annotations

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
11,879.00	7,373.05	-4,318.11	293.35	Projection to bit

Vertical Section Information

Angle Type	Target	Azimuth (°)	Origin Type	Origin		Start TVD (ft)
				+N/-S (ft)	+E/-W (ft)	
User	Echeverria 2B-2H_Plan B_BHL	176.55	Slot	0.00	0.00	0.00

Survey tool program

From (ft)	To (ft)	Survey/Plan	Survey Tool
164.00	11,879.00	Sperry MWD Surveys	MWD

Survey Report for Echeverria 2B-2H - Sperry MWD Surveys**Targets**

Target Name - hit/miss target - Shape	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (ft)	Easting (ft)	Latitude	Longitude
Echeverria 2B-2H_4 - survey hits target center - Polygon	0.00	0.00	0.00	0.00	0.00	1,306,483.20	3,178,353.08	40° 10' 22.548 N	104° 51' 42.300 W
Echeverria 2B-2H_P - survey misses target center by 36.30ft at 11879.00ft MD (7373.05 TVD, -4318.11 N, 293.35 E) - Point	0.00	0.00	7,388.00	-4,318.61	260.27	1,302,164.59	3,178,613.35	40° 9' 39.852 N	104° 51' 39.348 W
Echeverria 2B-2H_S - survey hits target center - Polygon	0.00	0.00	0.00	0.00	0.00	1,306,483.20	3,178,353.08	40° 10' 22.548 N	104° 51' 42.300 W
Echeverria 2B-2H_P - survey misses target center by 33.14ft at 11879.00ft MD (7373.05 TVD, -4318.11 N, 293.35 E) - Point	0.00	0.00	7,375.01	-4,318.61	260.27	1,302,164.59	3,178,613.35	40° 9' 39.852 N	104° 51' 39.348 W

North Reference Sheet for Sec. 2-T2N-R67W - Echeverria 2B-2H - Plan B

All data is in US Feet unless otherwise stated. Directions and Coordinates are relative to Grid North Reference.

Vertical Depths are relative to RKB (13') @ 4871.00ft (Ensign 135). Northing and Easting are relative to Echeverria 2B-2H

Coordinate System is US State Plane 1983, Colorado Northern Zone using datum North American Datum 1983, ellipsoid GRS 1980

Projection method is Lambert Conformal Conic (2 parallel)

Central Meridian is 105° 30' 0.000 W°, Longitude Origin: 0° 0' 0.000 E°, Latitude Origin: 40° 47' 0.000 N°

False Easting: 3,000,000.00ft, False Northing: 1,000,000.00ft, Scale Reduction: 0.99995776

Grid Coordinates of Well: 1,306,483.20 ft N, 3,178,353.08 ft E

Geographical Coordinates of Well: 40° 10' 22.55" N, 104° 51' 42.30" W

Grid Convergence at Surface is: 0.41°

Based upon Minimum Curvature type calculations, at a Measured Depth of 11,879.00ft
the Bottom Hole Displacement is 4,328.06ft in the Direction of 176.11° (Grid).

Magnetic Convergence at surface is: ° (26 July 2012, , User Defined)

