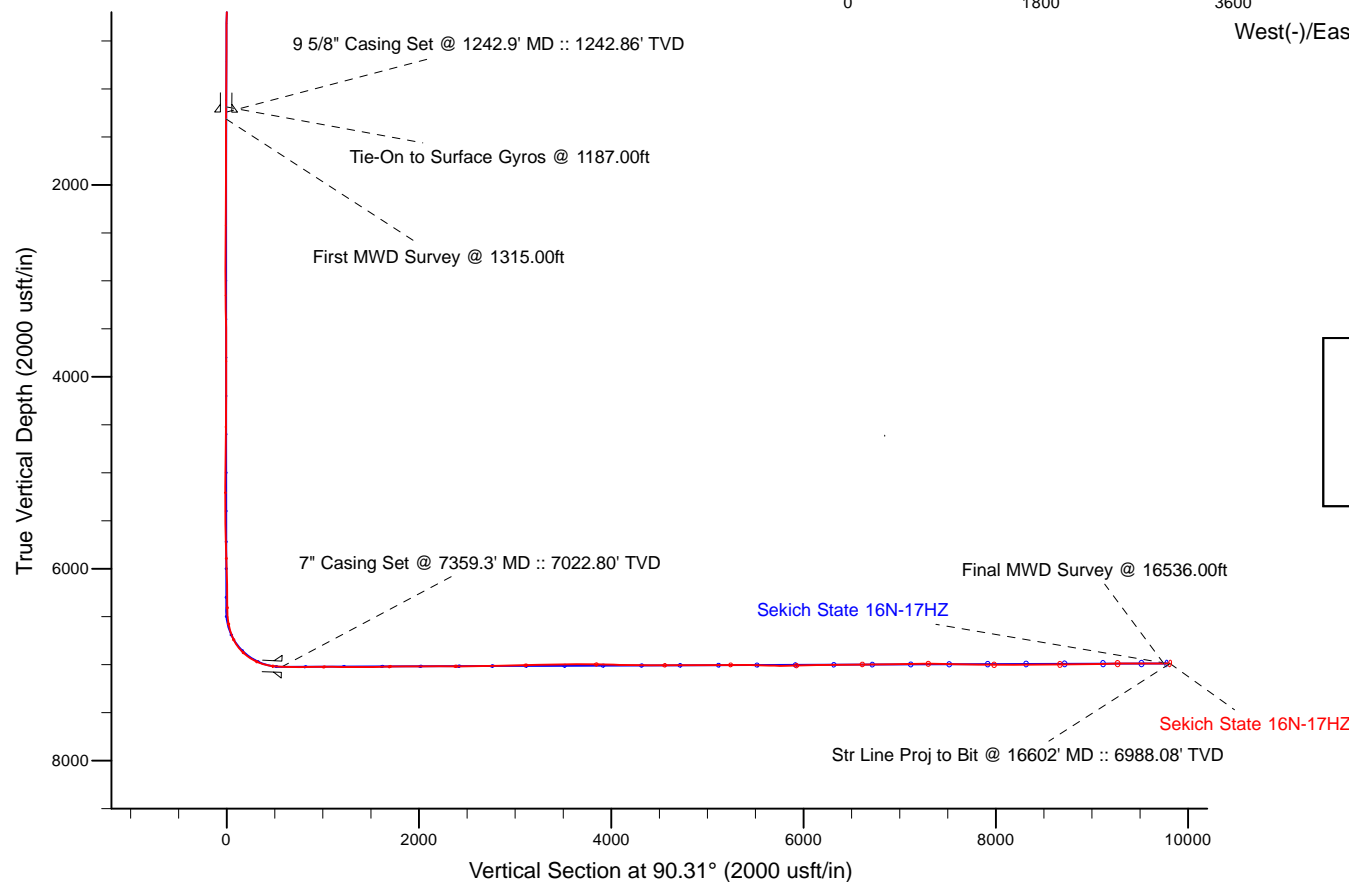
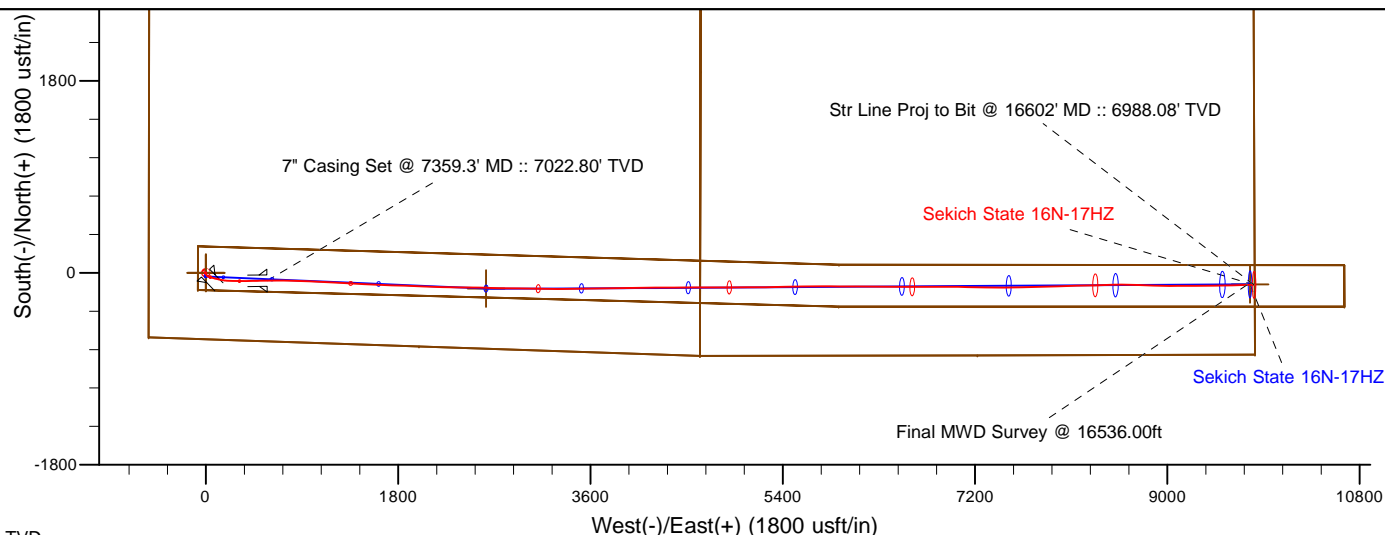


Project: Weld County, CO (NAD 83)
 Site: Sec. 18-T3N-R67W
 Well: Sekich State 16N-17HZ
 Wellbore: Plan A
 Design: Actual Field Surveys



LEGEND

- ✕ Sekich State 16N-17HZ, Plan A, Rev A1 V0
- ✕ Actual Field Surveys

7" Casing: ~569.28' FSL, ~1107.66' FWL
 Lat/Long: 40.220564 N, -104.937790 E
 State Planes - CO Northern: 1,323,691.17' N, 3,156,994.75' E
 Location: Sec. 18-T3N-R67W

BHL: ~654.32' FSL, ~11.55' FEL
 Lat/Long: 40.220448 N, -104.904706 E
 State Planes - CO Northern: 1,323,709.40' N, 3,166,233.56' E
 Location: Sec. 17-T3N-R67W

WELL DETAILS: Sekich State 16N-17HZ

Ground Level: 4875.00
 RKB = 16' @ 4891.00usft (Xtreme 22)

Design: Actual Field Surveys (Sekich State 16N-17HZ/Plan A)

Created By: Clint Eshelman Date: 5/19/2014
 Reviewed: _____ Date: _____

Anadarko Petroleum Corp.

Weld County, CO (NAD 83)

Sec. 18-T3N-R67W

Sekich State 16N-17HZ

Plan A

Design: Actual Field Surveys

Sperry Drilling Services

Standard Report

19 May, 2014

Well Coordinates: 1,323,759.76 N, 3,156,421.79 E (40° 13' 14.74" N, 104° 56' 23.42" W)

Ground Level: 4,875.00 usft

Local Coordinate Origin:

Viewing Datum:

TVDs to System:

North Reference:

Unit System:

Geodetic Scale Factor Applied

Version: 5000.1 Build: 70

Centered on Well Sekich State 16N-17HZ

RKB = 16' @ 4891.00usft (Xtreme 22)

N

True

Dec-Deg - API - US Survey Feet - Custom

HALLIBURTON

Design Report for Sekich State 16N-17HZ - Actual Field 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
16.00	0.00	0.00	16.00	0.00	0.00	0.00	0.00
116.00	0.47	141.74	116.00	-0.32	0.25	0.26	0.47
216.00	0.30	352.26	216.00	-0.38	0.47	0.47	0.74
316.00	0.59	261.53	316.00	-0.20	-0.07	-0.07	0.67
416.00	0.67	201.64	415.99	-0.82	-0.80	-0.79	0.63
516.00	0.19	122.73	515.99	-1.45	-0.87	-0.86	0.66
616.00	0.35	324.57	615.99	-1.29	-0.91	-0.90	0.53
716.00	0.78	282.12	715.98	-0.90	-1.75	-1.75	0.57
816.00	0.86	233.57	815.97	-1.21	-3.02	-3.02	0.68
916.00	0.73	212.27	915.96	-2.19	-3.97	-3.95	0.32
1,016.00	0.39	175.79	1,015.96	-3.07	-4.28	-4.26	0.48
1,116.00	0.06	0.40	1,115.96	-3.35	-4.26	-4.24	0.45
1,187.00	0.33	16.66	1,186.96	-3.12	-4.20	-4.18	0.38
Tie-On to Surface Gyros @ 1187.00ft							
1,242.90	0.36	315.79	1,242.86	-2.84	-4.28	-4.26	0.63
9 5/8" Casing Set @ 1242.9' MD :: 1242.86' TVD							
1,315.00	0.73	285.17	1,314.95	-2.56	-4.88	-4.86	0.63
First MWD Survey @ 1315.00ft							
1,505.00	0.60	287.36	1,504.94	-1.94	-7.00	-6.99	0.07
1,693.00	1.10	165.41	1,692.93	-3.39	-7.48	-7.46	0.80
1,876.00	0.84	21.22	1,875.92	-3.84	-6.55	-6.53	1.01
2,059.00	1.10	346.59	2,058.89	-0.88	-6.47	-6.47	0.34
2,241.00	0.53	286.56	2,240.88	1.05	-7.69	-7.69	0.52
2,424.00	1.08	268.59	2,423.86	1.25	-10.22	-10.23	0.33
2,607.00	0.38	131.44	2,606.85	0.81	-11.49	-11.50	0.76
2,789.00	0.18	339.12	2,788.85	0.68	-11.14	-11.14	0.30
2,971.00	0.46	42.07	2,970.85	1.49	-10.75	-10.76	0.23
3,154.00	0.48	6.68	3,153.84	2.79	-10.17	-10.19	0.16
3,325.00	1.91	139.03	3,324.81	1.35	-8.22	-8.23	1.32
3,496.00	0.37	85.37	3,495.78	-0.75	-5.80	-5.80	1.00
3,667.00	0.35	44.20	3,666.77	-0.34	-4.89	-4.88	0.15
3,839.00	0.23	9.77	3,838.77	0.38	-4.46	-4.46	0.12
4,010.00	0.28	316.90	4,009.77	1.02	-4.69	-4.69	0.14
4,181.00	0.55	347.23	4,180.76	2.13	-5.16	-5.17	0.20
4,352.00	0.47	298.35	4,351.76	3.26	-5.95	-5.97	0.25
4,524.00	1.35	222.05	4,523.74	2.09	-7.93	-7.94	0.77
4,695.00	0.57	254.33	4,694.71	0.37	-10.10	-10.10	0.54
4,866.00	0.49	341.72	4,865.71	0.83	-11.15	-11.15	0.43
5,037.00	0.59	340.75	5,036.70	2.36	-11.67	-11.68	0.06
5,209.00	0.62	255.14	5,208.70	2.96	-12.86	-12.88	0.48
5,380.00	0.90	256.27	5,379.68	2.40	-15.06	-15.07	0.16
5,551.00	1.91	98.08	5,550.66	1.68	-13.54	-13.55	1.62
5,723.00	1.45	88.61	5,722.58	1.33	-8.53	-8.54	0.31
5,894.00	2.57	121.81	5,893.48	-0.64	-3.11	-3.10	0.92
6,066.00	4.11	163.20	6,065.20	-8.57	1.95	2.00	1.61
6,237.00	3.25	163.10	6,235.85	-19.08	5.13	5.24	0.50
6,366.00	1.02	151.63	6,364.75	-23.59	6.74	6.87	1.75
6,409.00	0.61	167.63	6,407.75	-24.15	6.97	7.10	1.08
6,452.00	1.69	136.69	6,450.74	-24.83	7.46	7.59	2.81

Design Report for Sekich State 16N-17HZ - Actual Field Surveys

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)
6,494.00	5.31	128.71	6,492.65	-26.50	9.40	9.54	8.68
6,537.00	8.46	120.69	6,535.34	-29.36	13.67	13.83	7.64
6,580.00	11.69	115.48	6,577.67	-32.85	20.33	20.50	7.80
6,623.00	15.08	110.13	6,619.50	-36.65	29.51	29.71	8.39
6,666.00	17.78	105.85	6,660.74	-40.37	41.08	41.30	6.88
6,709.00	22.61	105.57	6,701.09	-44.38	55.37	55.61	11.23
6,752.00	27.05	105.36	6,740.10	-49.19	72.77	73.04	10.33
6,795.00	32.00	103.98	6,777.51	-54.54	93.27	93.56	11.62
6,837.00	37.13	102.66	6,812.08	-60.01	116.45	116.77	12.34
6,880.00	42.65	101.26	6,845.06	-65.70	143.42	143.77	13.01
6,923.00	47.21	96.79	6,875.50	-70.41	173.40	173.78	12.89
6,966.00	50.73	93.97	6,903.73	-73.43	205.68	206.08	9.56
7,009.00	55.96	91.45	6,929.40	-75.04	240.12	240.53	13.04
7,052.00	60.89	91.24	6,951.90	-75.90	276.74	277.14	11.47
7,094.00	65.77	91.15	6,970.75	-76.68	314.25	314.66	11.62
7,137.00	70.58	90.30	6,986.73	-77.18	354.15	354.56	11.34
7,180.00	74.99	88.58	6,999.46	-76.77	395.21	395.62	10.94
7,223.00	79.15	88.21	7,009.08	-75.59	437.10	437.50	9.71
7,266.00	83.12	88.41	7,015.70	-74.34	479.56	479.95	9.24
7,292.00	85.03	88.47	7,018.38	-73.64	505.41	505.80	7.35
7,359.30	87.44	89.10	7,022.80	-72.22	572.54	572.92	3.71
7" Casing Set @ 7359.3' MD :: 7022.80' TVD							
7,456.00	90.91	90.01	7,024.19	-71.47	669.21	669.59	3.71
7,628.00	89.86	91.84	7,023.04	-74.25	841.18	841.56	1.23
7,799.00	89.64	92.89	7,023.78	-81.30	1,012.03	1,012.45	0.63
7,971.00	89.92	92.41	7,024.44	-89.25	1,183.84	1,184.31	0.32
8,142.00	90.11	93.47	7,024.40	-98.03	1,354.61	1,355.12	0.63
8,313.00	90.01	92.16	7,024.22	-106.42	1,525.40	1,525.96	0.77
8,485.00	92.20	92.70	7,020.90	-113.71	1,697.20	1,697.79	1.31
8,656.00	89.34	91.56	7,018.60	-120.07	1,868.05	1,868.67	1.80
8,828.00	90.54	92.44	7,018.78	-126.07	2,039.94	2,040.59	0.87
8,999.00	90.05	91.64	7,017.90	-132.16	2,210.83	2,211.51	0.55
9,170.00	90.54	90.48	7,017.02	-135.32	2,381.79	2,382.49	0.74
9,348.00	90.45	91.46	7,015.49	-138.33	2,559.76	2,560.47	0.55
9,531.00	90.32	91.08	7,014.26	-142.39	2,742.71	2,743.44	0.22
9,715.00	91.49	90.76	7,011.35	-145.34	2,926.66	2,927.40	0.66
9,899.00	91.68	90.85	7,006.26	-147.93	3,110.57	3,111.33	0.11
10,082.00	91.34	90.25	7,001.44	-149.68	3,293.50	3,294.26	0.38
10,267.00	91.37	89.53	6,997.06	-149.33	3,478.44	3,479.20	0.39
10,449.00	89.71	88.98	6,995.35	-146.96	3,660.41	3,661.15	0.96
10,633.00	89.09	88.72	6,997.27	-143.27	3,844.37	3,845.08	0.37
10,814.00	88.11	88.76	7,001.70	-139.29	4,025.27	4,025.96	0.54
10,997.00	89.96	89.93	7,004.78	-137.20	4,208.22	4,208.90	1.20
11,174.00	89.86	89.94	7,005.06	-137.00	4,385.22	4,385.89	0.06
11,345.00	88.91	89.78	7,006.89	-136.58	4,556.20	4,556.88	0.56
11,516.00	90.54	89.98	7,007.71	-136.22	4,727.20	4,727.86	0.96
11,688.00	90.51	89.57	7,006.14	-135.55	4,899.19	4,899.85	0.24
11,859.00	90.11	89.19	7,005.21	-133.70	5,070.17	5,070.82	0.32
12,030.00	91.28	90.90	7,003.14	-133.83	5,241.15	5,241.80	1.21
12,201.00	88.63	87.47	7,003.27	-131.40	5,412.09	5,412.72	2.53
12,373.00	87.70	89.13	7,008.78	-126.30	5,583.92	5,584.52	1.11

Design Report for Sekich State 16N-17HZ - Actual Field Surveys

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)
12,544.00	89.77	89.86	7,012.55	-124.79	5,754.86	5,755.45	1.28
12,715.00	91.43	90.95	7,010.76	-126.00	5,925.84	5,926.44	1.16
12,887.00	91.28	90.10	7,006.70	-127.58	6,097.78	6,098.38	0.50
13,058.00	91.34	90.44	7,002.79	-128.38	6,268.74	6,269.34	0.20
13,229.00	90.94	90.61	6,999.39	-129.95	6,439.70	6,440.30	0.25
13,401.00	89.74	89.72	6,998.36	-130.44	6,611.69	6,612.30	0.87
13,572.00	89.89	89.89	6,998.92	-129.86	6,782.68	6,783.29	0.13
13,744.00	91.06	90.13	6,997.49	-129.89	6,954.68	6,955.28	0.69
13,915.00	91.46	91.40	6,993.73	-132.17	7,125.61	7,126.23	0.78
14,087.00	89.77	91.52	6,991.88	-136.56	7,297.54	7,298.17	0.99
14,258.00	88.87	89.14	6,993.91	-137.54	7,468.51	7,469.15	1.49
14,429.00	88.53	88.96	6,997.79	-134.71	7,639.45	7,640.06	0.22
14,601.00	89.40	88.44	7,000.90	-130.81	7,811.37	7,811.97	0.59
14,772.00	89.92	87.50	7,001.92	-124.75	7,982.26	7,982.82	0.63
14,943.00	89.89	89.43	7,002.20	-120.17	8,153.19	8,153.72	1.13
15,115.00	90.94	88.08	7,000.95	-116.43	8,325.14	8,325.65	0.99
15,286.00	90.29	88.19	6,999.12	-110.87	8,496.04	8,496.51	0.39
15,457.00	90.17	92.09	6,998.43	-111.28	8,667.00	8,667.48	2.28
15,542.00	90.35	92.06	6,998.04	-114.36	8,751.94	8,752.44	0.21
15,714.00	91.12	90.96	6,995.84	-118.89	8,923.87	8,924.38	0.78
15,885.00	91.40	90.70	6,992.08	-121.37	9,094.81	9,095.33	0.22
16,057.00	90.11	89.84	6,989.81	-122.18	9,266.79	9,267.31	0.90
16,228.00	90.02	88.41	6,989.62	-119.57	9,437.76	9,438.27	0.84
16,399.00	90.01	88.93	6,989.57	-115.60	9,608.71	9,609.20	0.30
16,536.00	90.63	89.16	6,988.81	-113.32	9,745.69	9,746.16	0.48
Final MWD Survey @ 16536.00ft							
16,602.00	90.63	89.16	6,988.08	-112.35	9,811.68	9,812.15	0.00
Str Line Proj to Bit @ 16602' MD :: 6988.08' TVD							

Design Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
1,187.00	1,186.96	-3.12	-4.20	Tie-On to Surface Gyros @ 1187.00ft
1,315.00	1,314.95	-2.56	-4.88	First MWD Survey @ 1315.00ft
16,536.00	6,988.81	-113.32	9,745.69	Final MWD Survey @ 16536.00ft
16,602.00	6,988.08	-112.35	9,811.68	Str Line Proj to Bit @ 16602' MD :: 6988.08' TVD

Vertical Section Information

Angle Type	Target	Azimuth (°)	Origin Type	Origin		Start TVD (usft)
				+N/_S (usft)	+E/-W (usft)	
User	No Target (Freehand)	90.31	Slot	0.00	0.00	0.00

Survey tool program

From (usft)	To (usft)	Survey/Plan	Survey Tool
16.00	1,187.00	MS Energy Gyros	NS-GYRO-MS
1,315.00	7,292.00	MWD Vertical/Build Surveys	MWD+IFR1+MS+sag
7,456.00	16,536.00	MWD Lateral Surveys	MWD+IFR1+MS+sag

Design Report for Sekich State 16N-17HZ - Actual Field Surveys**Casing Details**

Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")
1,242.90	1,242.86	9 5/8" Casing Set @ 1242.9' MD :: 1242.86' TVD	9-5/8	13-1/2
7,359.30	7,022.80	7" Casing Set @ 7359.3' MD :: 7022.80' TVD	7	8-3/4

Wellbore Targets

Target Name - hit/miss target - Shape	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
Sekich State 16N-17H. - actual wellpath hits target center - Polygon	0.00	0.36	0.00	0.00	0.00	1,323,759.76	3,156,421.79	40.220762	-104.939840
Point 1				0.00	4,717.57	-558.72	1,328,477.13	3,155,863.09	
Point 2				0.00	4,587.83	1,964.97	1,328,347.40	3,158,386.67	
Point 3				0.00	4,550.15	4,604.25	1,328,309.72	3,161,025.84	
Point 4				0.00	1,915.88	4,617.05	1,325,675.56	3,161,038.64	
Point 5				0.00	-749.05	4,628.93	1,323,010.75	3,161,050.52	
Point 6				0.00	1,915.88	4,617.05	1,325,675.56	3,161,038.64	
Point 7				0.00	4,550.15	4,604.25	1,328,309.72	3,161,025.84	
Point 8				0.00	4,550.15	4,604.25	1,328,309.72	3,161,025.84	
Point 9				0.00	4,544.02	7,187.92	1,328,303.59	3,163,609.40	
Point 10				0.00	4,548.86	9,772.49	1,328,308.43	3,166,193.86	
Point 11				0.00	-704.63	9,825.10	1,323,055.16	3,166,246.47	
Point 12				0.00	-726.80	7,227.11	1,323,033.00	3,163,648.59	
Point 13				0.00	-749.05	4,628.93	1,323,010.75	3,161,050.52	
Point 14				0.00	-677.27	1,999.42	1,323,082.52	3,158,421.12	
Point 15				0.00	-607.80	-532.02	1,323,151.99	3,155,889.79	
Sekich State 16N-17H. - actual wellpath hits target center - Point	0.00	0.36	0.00	0.00	0.00	1,323,759.76	3,156,421.79	40.220762	-104.939840
Sekich State 16N-17H. - actual wellpath hits target center - Polygon	0.00	0.00	0.00	0.00	0.00	1,323,759.76	3,156,421.79	40.220762	-104.939840
Point 1				0.00	249.95	-74.73	1,324,009.23	3,156,345.48	
Point 2				0.00	76.79	5,924.65	1,323,873.97	3,162,345.58	
Point 3				0.00	72.11	10,656.59	1,323,899.18	3,167,077.25	
Point 4				0.00	-316.49	10,657.04	1,323,510.61	3,167,080.16	
Point 5				0.00	-315.32	5,924.00	1,323,481.88	3,162,347.41	
Point 6				0.00	-159.69	-75.26	1,323,599.61	3,156,347.54	
Sekich State 16N-17H. - actual wellpath misses target center by 28.57usft at 16536.00usft MD (6988.81 TVD, -113.32 N, 9745.69 E) - Point	0.00	0.00	6,988.00	-106.83	9,773.51	1,323,714.68	3,166,195.36	40.220463	-104.904842
Sekich State 16N-17H. - actual wellpath misses target center by 6.75usft at 9410.54usft MD (7015.02 TVD, -139.86 N, 2622.28 E) - Point	0.00	0.00	7,015.21	-146.60	2,622.13	1,323,629.74	3,159,044.68	40.220359	-104.930450

Directional Difficulty Index

Average Dogleg over Survey:	1.19 °/100usft	Maximum Dogleg over Survey:	13.04 °/100usft at 7,009.00 usft
Net Tortousity applicable to Plans:	0.38 °/100usft	Directional Difficulty Index:	6.667

Audit Info

North Reference Sheet for Sec. 18-T3N-R67W - Sekich State 16N-17HZ - Plan A

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

Vertical Depths are relative to RKB = 16' @ 4891.00usft (Xtreme 22). Northing and Easting are relative to Sekich State 16N-17HZ

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 -105.500000°, Longitude Origin:0.000000°, Latitude Origin:40.783333°

False Easting: 3,000,000.00usft, False Northing: 1,000,000.00usft, Scale Reduction: 0.99995698

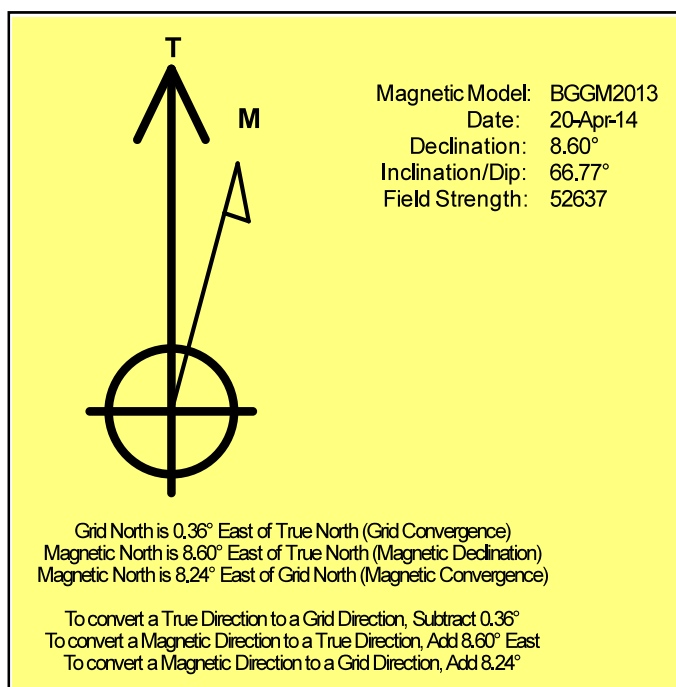
Grid Coordinates of Well: 1,323,759.76 usft N, 3,156,421.79 usft E

Geographical Coordinates of Well: 40° 13' 14.74" N, 104° 56' 23.42" W

Grid Convergence at Surface is: 0.36°

Based upon Minimum Curvature type calculations, at a Measured Depth of 16,602.00usft
the Bottom Hole Displacement is 9,812.32usft in the Direction of 90.66° (True).

Magnetic Convergence at surface is: -8.24° (20 April 2014, , BGGM2013)



Anadarko Petroleum Corp.

Weld County, CO (NAD 83)

Sec. 18-T3N-R67W

Sekich State 16N-17HZ

Plan A

Design: Actual Field Surveys

Sperry Drilling Services

Geodetic Report

19 May, 2014

Well Coordinates: 1,323,759.76 N, 3,156,421.79 E (40° 13' 14.74" N, 104° 56' 23.42" W)

Ground Level: 4,875.00 usft

Local Coordinate Origin:

Viewing Datum:

TVDs to System:

North Reference:

Unit System:

Geodetic Scale Factor Applied

Version: 5000.1 Build: 70

Centered on Well Sekich State 16N-17HZ

RKB = 16' @ 4891.00usft (Xtreme 22)

N

True

Dec-Deg - API - US Survey Feet - Custom

HALLIBURTON

Design Report for Sekich State 16N-17HZ - Actual Field Surveys

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Geographic Coordinates		UTM Coordinates	
				+N/-S (usft)	+E/-W (usft)	Latitude (usft)	Longitude (usft)	Northing (usft)	Easting (usft)
0.00	0.00	0.00	0.00	0.00	0.00	40.220762	-104.939840	1,323,759.76	3,156,421.79
16.00	0.00	0.00	16.00	0.00	0.00	40.220762	-104.939840	1,323,759.76	3,156,421.79
116.00	0.47	141.74	116.00	-0.32	0.25	40.220761	-104.939839	1,323,759.44	3,156,422.04
216.00	0.30	352.26	216.00	-0.38	0.47	40.220761	-104.939839	1,323,759.38	3,156,422.26
316.00	0.59	261.53	316.00	-0.20	-0.07	40.220761	-104.939841	1,323,759.56	3,156,421.72
416.00	0.67	201.64	415.99	-0.82	-0.80	40.220760	-104.939843	1,323,758.94	3,156,421.00
516.00	0.19	122.73	515.99	-1.45	-0.87	40.220758	-104.939843	1,323,758.31	3,156,420.93
616.00	0.35	324.57	615.99	-1.29	-0.91	40.220758	-104.939844	1,323,758.46	3,156,420.89
716.00	0.78	282.12	715.98	-0.90	-1.75	40.220760	-104.939847	1,323,758.85	3,156,420.04
816.00	0.86	233.57	815.97	-1.21	-3.02	40.220759	-104.939851	1,323,758.54	3,156,418.77
916.00	0.73	212.27	915.96	-2.19	-3.97	40.220756	-104.939854	1,323,757.55	3,156,417.84
1,016.00	0.39	175.79	1,015.96	-3.07	-4.28	40.220754	-104.939856	1,323,756.67	3,156,417.53
1,116.00	0.06	0.40	1,115.96	-3.35	-4.26	40.220753	-104.939856	1,323,756.38	3,156,417.55
1,187.00	0.33	16.66	1,186.96	-3.12	-4.20	40.220753	-104.939855	1,323,756.62	3,156,417.61
1,242.90	0.36	315.79	1,242.86	-2.84	-4.28	40.220754	-104.939856	1,323,756.90	3,156,417.53
1,315.00	0.73	285.17	1,314.95	-2.56	-4.88	40.220755	-104.939858	1,323,757.18	3,156,416.93
1,505.00	0.60	287.36	1,504.94	-1.94	-7.00	40.220757	-104.939865	1,323,757.78	3,156,414.81
1,693.00	1.10	165.41	1,692.93	-3.39	-7.48	40.220753	-104.939867	1,323,756.32	3,156,414.33
1,876.00	0.84	21.22	1,875.92	-3.84	-6.55	40.220751	-104.939864	1,323,755.88	3,156,415.26
2,059.00	1.10	346.59	2,058.89	-0.88	-6.47	40.220760	-104.939863	1,323,758.84	3,156,415.32
2,241.00	0.53	286.56	2,240.88	1.05	-7.69	40.220765	-104.939868	1,323,760.77	3,156,414.10
2,424.00	1.08	268.59	2,423.86	1.25	-10.22	40.220765	-104.939877	1,323,760.95	3,156,411.56
2,607.00	0.38	131.44	2,606.85	0.81	-11.49	40.220764	-104.939881	1,323,760.50	3,156,410.29
2,789.00	0.18	339.12	2,788.85	0.68	-11.14	40.220764	-104.939880	1,323,760.37	3,156,410.64
2,971.00	0.46	42.07	2,970.85	1.49	-10.75	40.220766	-104.939879	1,323,761.18	3,156,411.03
3,154.00	0.48	6.68	3,153.84	2.79	-10.17	40.220770	-104.939877	1,323,762.49	3,156,411.60
3,325.00	1.91	139.03	3,324.81	1.35	-8.22	40.220766	-104.939870	1,323,761.07	3,156,413.56
3,496.00	0.37	85.37	3,495.78	-0.75	-5.80	40.220760	-104.939861	1,323,758.97	3,156,415.99
3,667.00	0.35	44.20	3,666.77	-0.34	-4.89	40.220761	-104.939858	1,323,759.40	3,156,416.90
3,839.00	0.23	9.77	3,838.77	0.38	-4.46	40.220763	-104.939856	1,323,760.12	3,156,417.32
4,010.00	0.28	316.90	4,009.77	1.02	-4.69	40.220765	-104.939857	1,323,760.76	3,156,417.09
4,181.00	0.55	347.23	4,180.76	2.13	-5.16	40.220768	-104.939859	1,323,761.86	3,156,416.62
4,352.00	0.47	298.35	4,351.76	3.26	-5.95	40.220771	-104.939862	1,323,762.99	3,156,415.81
4,524.00	1.35	222.05	4,523.74	2.09	-7.93	40.220768	-104.939869	1,323,761.81	3,156,413.84
4,695.00	0.57	254.33	4,694.71	0.37	-10.10	40.220763	-104.939876	1,323,760.07	3,156,411.69
4,866.00	0.49	341.72	4,865.71	0.83	-11.15	40.220764	-104.939880	1,323,760.53	3,156,410.63
5,037.00	0.59	340.75	5,036.70	2.36	-11.67	40.220769	-104.939882	1,323,762.05	3,156,410.11
5,209.00	0.62	255.14	5,208.70	2.96	-12.86	40.220770	-104.939886	1,323,762.64	3,156,408.91
5,380.00	0.90	256.27	5,379.68	2.40	-15.06	40.220769	-104.939894	1,323,762.07	3,156,406.72
5,551.00	1.91	98.08	5,550.66	1.68	-13.54	40.220767	-104.939889	1,323,761.36	3,156,408.24
5,723.00	1.45	88.61	5,722.58	1.33	-8.53	40.220766	-104.939871	1,323,761.04	3,156,413.25
5,894.00	2.57	121.81	5,893.48	-0.64	-3.11	40.220760	-104.939851	1,323,759.11	3,156,418.69

Design Report for Sekich State 16N-17HZ - Actual Field Surveys

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Geographic Coordinates		UTM Coordinates	
				+N/-S (usft)	+E/-W (usft)	Latitude (usft)	Longitude (usft)	Northing (usft)	Easting (usft)
6,066.00	4.11	163.20	6,065.20	-8.57	1.95	40.220739	-104.939833	1,323,751.20	3,156,423.79
6,237.00	3.25	163.10	6,235.85	-19.08	5.13	40.220710	-104.939822	1,323,740.72	3,156,427.04
6,366.00	1.02	151.63	6,364.75	-23.59	6.74	40.220697	-104.939816	1,323,736.22	3,156,428.68
6,409.00	0.61	167.63	6,407.75	-24.15	6.97	40.220696	-104.939815	1,323,735.66	3,156,428.91
6,452.00	1.69	136.69	6,450.74	-24.83	7.46	40.220694	-104.939814	1,323,734.98	3,156,429.40
6,494.00	5.31	128.71	6,492.65	-26.50	9.40	40.220689	-104.939807	1,323,733.33	3,156,431.35
6,537.00	8.46	120.69	6,535.34	-29.36	13.67	40.220681	-104.939791	1,323,730.49	3,156,435.65
6,580.00	11.69	115.48	6,577.67	-32.85	20.33	40.220672	-104.939767	1,323,727.05	3,156,442.32
6,623.00	15.08	110.13	6,619.50	-36.65	29.51	40.220661	-104.939735	1,323,723.30	3,156,451.53
6,666.00	17.78	105.85	6,660.74	-40.37	41.08	40.220651	-104.939693	1,323,719.66	3,156,463.13
6,709.00	22.61	105.57	6,701.09	-44.38	55.37	40.220640	-104.939642	1,323,715.74	3,156,477.44
6,752.00	27.05	105.36	6,740.10	-49.19	72.77	40.220627	-104.939580	1,323,711.03	3,156,494.87
6,795.00	32.00	103.98	6,777.51	-54.54	93.27	40.220612	-104.939506	1,323,705.82	3,156,515.39
6,837.00	37.13	102.66	6,812.08	-60.01	116.45	40.220597	-104.939423	1,323,700.50	3,156,538.61
6,880.00	42.65	101.26	6,845.06	-65.70	143.42	40.220582	-104.939327	1,323,694.97	3,156,565.61
6,923.00	47.21	96.79	6,875.50	-70.41	173.40	40.220569	-104.939219	1,323,690.45	3,156,595.62
6,966.00	50.73	93.97	6,903.73	-73.43	205.68	40.220560	-104.939104	1,323,687.63	3,156,627.92
7,009.00	55.96	91.45	6,929.40	-75.04	240.12	40.220556	-104.938980	1,323,686.25	3,156,662.37
7,052.00	60.89	91.24	6,951.90	-75.90	276.74	40.220554	-104.938849	1,323,685.62	3,156,698.99
7,094.00	65.77	91.15	6,970.75	-76.68	314.25	40.220552	-104.938715	1,323,685.08	3,156,736.50
7,137.00	70.58	90.30	6,986.73	-77.18	354.15	40.220550	-104.938572	1,323,684.83	3,156,776.41
7,180.00	74.99	88.58	6,999.46	-76.77	395.21	40.220551	-104.938425	1,323,685.50	3,156,817.46
7,223.00	79.15	88.21	7,009.08	-75.59	437.10	40.220555	-104.938275	1,323,686.94	3,156,859.33
7,266.00	83.12	88.41	7,015.70	-74.34	479.56	40.220558	-104.938123	1,323,688.46	3,156,901.78
7,292.00	85.03	88.47	7,018.38	-73.64	505.41	40.220560	-104.938030	1,323,689.32	3,156,927.63
7,359.30	87.44	89.10	7,022.80	-72.22	572.54	40.220564	-104.937790	1,323,691.17	3,156,994.75
7,456.00	90.91	90.01	7,024.19	-71.47	669.21	40.220566	-104.937444	1,323,692.53	3,157,091.41
7,628.00	89.86	91.84	7,023.04	-74.25	841.18	40.220558	-104.936828	1,323,690.84	3,157,263.38
7,799.00	89.64	92.89	7,023.78	-81.30	1,012.03	40.220539	-104.936216	1,323,684.86	3,157,434.26
7,971.00	89.92	92.41	7,024.44	-89.25	1,183.84	40.220517	-104.935601	1,323,677.99	3,157,606.12
8,142.00	90.11	93.47	7,024.40	-98.03	1,354.61	40.220493	-104.934990	1,323,670.30	3,157,776.93
8,313.00	90.01	92.16	7,024.22	-106.42	1,525.40	40.220470	-104.934378	1,323,662.98	3,157,947.77
8,485.00	92.20	92.70	7,020.90	-113.71	1,697.20	40.220450	-104.933763	1,323,656.78	3,158,119.60
8,656.00	89.34	91.56	7,018.60	-120.07	1,868.05	40.220432	-104.933151	1,323,651.50	3,158,290.48
8,828.00	90.54	92.44	7,018.78	-126.07	2,039.94	40.220416	-104.932535	1,323,646.59	3,158,462.40
8,999.00	90.05	91.64	7,017.90	-132.16	2,210.83	40.220399	-104.931924	1,323,641.58	3,158,633.31
9,170.00	90.54	90.48	7,017.02	-135.32	2,381.79	40.220390	-104.931311	1,323,639.50	3,158,804.29
9,348.00	90.45	91.46	7,015.49	-138.33	2,559.76	40.220382	-104.930674	1,323,637.61	3,158,982.26
9,531.00	90.32	91.08	7,014.26	-142.39	2,742.71	40.220371	-104.930019	1,323,634.71	3,159,165.22
9,715.00	91.49	90.76	7,011.35	-145.34	2,926.66	40.220363	-104.929360	1,323,632.92	3,159,349.18
9,899.00	91.68	90.85	7,006.26	-147.93	3,110.57	40.220355	-104.928702	1,323,631.50	3,159,533.10
10,082.00	91.34	90.25	7,001.44	-149.68	3,293.50	40.220351	-104.928047	1,323,630.89	3,159,716.02

Design Report for Sekich State 16N-17HZ - Actual Field Surveys

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Geographic Coordinates		UTM Coordinates	
				+N/-S (usft)	+E/-W (usft)	Latitude (usft)	Longitude (usft)	Northing (usft)	Easting (usft)
10,267.00	91.37	89.53	6,997.06	-149.33	3,478.44	40.220351	-104.927384	1,323,632.42	3,159,900.96
10,449.00	89.71	88.98	6,995.35	-146.96	3,660.41	40.220358	-104.926733	1,323,635.93	3,160,082.90
10,633.00	89.09	88.72	6,997.27	-143.27	3,844.37	40.220368	-104.926074	1,323,640.79	3,160,266.82
10,814.00	88.11	88.76	7,001.70	-139.29	4,025.27	40.220379	-104.925426	1,323,645.91	3,160,447.68
10,997.00	89.96	89.93	7,004.78	-137.20	4,208.22	40.220384	-104.924771	1,323,649.16	3,160,630.61
11,174.00	89.86	89.94	7,005.06	-137.00	4,385.22	40.220385	-104.924137	1,323,650.47	3,160,807.59
11,345.00	88.91	89.78	7,006.89	-136.58	4,556.20	40.220386	-104.923525	1,323,651.97	3,160,978.57
11,516.00	90.54	89.98	7,007.71	-136.22	4,727.20	40.220387	-104.922913	1,323,653.41	3,161,149.55
11,688.00	90.51	89.57	7,006.14	-135.55	4,899.19	40.220389	-104.922297	1,323,655.17	3,161,321.52
11,859.00	90.11	89.19	7,005.21	-133.70	5,070.17	40.220394	-104.921685	1,323,658.10	3,161,492.49
12,030.00	91.28	90.90	7,003.14	-133.83	5,241.15	40.220393	-104.921072	1,323,659.05	3,161,663.46
12,201.00	88.63	87.47	7,003.27	-131.40	5,412.09	40.220400	-104.920460	1,323,662.56	3,161,834.37
12,373.00	87.70	89.13	7,008.78	-126.30	5,583.92	40.220414	-104.919845	1,323,668.75	3,162,006.16
12,544.00	89.77	89.86	7,012.55	-124.79	5,754.86	40.220418	-104.919233	1,323,671.33	3,162,177.08
12,715.00	91.43	90.95	7,010.76	-126.00	5,925.84	40.220414	-104.918620	1,323,671.20	3,162,348.05
12,887.00	91.28	90.10	7,006.70	-127.58	6,097.78	40.220410	-104.918005	1,323,670.71	3,162,519.99
13,058.00	91.34	90.44	7,002.79	-128.38	6,268.74	40.220407	-104.917393	1,323,670.99	3,162,690.94
13,229.00	90.94	90.61	6,999.39	-129.95	6,439.70	40.220403	-104.916780	1,323,670.50	3,162,861.90
13,401.00	89.74	89.72	6,998.36	-130.44	6,611.69	40.220402	-104.916165	1,323,671.09	3,163,033.88
13,572.00	89.89	89.89	6,998.92	-129.86	6,782.68	40.220403	-104.915552	1,323,672.76	3,163,204.87
13,744.00	91.06	90.13	6,997.49	-129.89	6,954.68	40.220403	-104.914936	1,323,673.81	3,163,376.85
13,915.00	91.46	91.40	6,993.73	-132.17	7,125.61	40.220396	-104.914324	1,323,672.61	3,163,547.79
14,087.00	89.77	91.52	6,991.88	-136.56	7,297.54	40.220384	-104.913709	1,323,669.31	3,163,719.73
14,258.00	88.87	89.14	6,993.91	-137.54	7,468.51	40.220381	-104.913096	1,323,669.41	3,163,890.70
14,429.00	88.53	88.96	6,997.79	-134.71	7,639.45	40.220389	-104.912484	1,323,673.32	3,164,061.60
14,601.00	89.40	88.44	7,000.90	-130.81	7,811.37	40.220400	-104.911869	1,323,678.31	3,164,233.49
14,772.00	89.92	87.50	7,001.92	-124.75	7,982.26	40.220416	-104.911257	1,323,685.45	3,164,404.33
14,943.00	89.89	89.43	7,002.20	-120.17	8,153.19	40.220429	-104.910645	1,323,691.11	3,164,575.22
15,115.00	90.94	88.08	7,000.95	-116.43	8,325.14	40.220439	-104.910029	1,323,695.93	3,164,747.14
15,286.00	90.29	88.19	6,999.12	-110.87	8,496.04	40.220454	-104.909417	1,323,702.57	3,164,917.99
15,457.00	90.17	92.09	6,998.43	-111.28	8,667.00	40.220452	-104.908805	1,323,703.23	3,165,088.95
15,542.00	90.35	92.06	6,998.04	-114.36	8,751.94	40.220444	-104.908500	1,323,700.69	3,165,173.90
15,714.00	91.12	90.96	6,995.84	-118.89	8,923.87	40.220431	-104.907885	1,323,697.25	3,165,345.84
15,885.00	91.40	90.70	6,992.08	-121.37	9,094.81	40.220424	-104.907273	1,323,695.85	3,165,516.79
16,057.00	90.11	89.84	6,989.81	-122.18	9,266.79	40.220422	-104.906657	1,323,696.13	3,165,688.76
16,228.00	90.02	88.41	6,989.62	-119.57	9,437.76	40.220429	-104.906045	1,323,699.82	3,165,859.71
16,399.00	90.01	88.93	6,989.57	-115.60	9,608.71	40.220440	-104.905432	1,323,704.87	3,166,030.63
16,536.00	90.63	89.16	6,988.81	-113.32	9,745.69	40.220446	-104.904942	1,323,708.02	3,166,167.58
16,602.00	90.63	89.16	6,988.08	-112.35	9,811.68	40.220448	-104.904706	1,323,709.40	3,166,233.56

Design Report for Sekich State 16N-17HZ - Actual Field Surveys

Design Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
1,187.00	1,186.96	-3.12	-4.20	Tie-On to Surface Gyros @ 1187.00ft
1,315.00	1,314.95	-2.56	-4.88	First MWD Survey @ 1315.00ft
16,536.00	6,988.81	-113.32	9,745.69	Final MWD Survey @ 16536.00ft
16,602.00	6,988.08	-112.35	9,811.68	Str Line Proj to Bit @ 16602' MD :: 6988.08' TVD

Vertical Section Information

Angle Type	Target	Azimuth (°)	Origin Type	Origin		Start TVD (usft)
				+N/_S (usft)	+E/-W (usft)	
User	No Target (Freehand)	90.31	Slot	0.00	0.00	0.00

Survey tool program

From (usft)	To (usft)	Survey/Plan	Survey Tool
16.00	1,187.00	MS Energy Gyros	NS-GYRO-MS
1,315.00	7,292.00	MWD Vertical/Build Surveys	MWD+IFR1+MS+sag
7,456.00	16,536.00	MWD Lateral Surveys	MWD+IFR1+MS+sag

Casing Details

Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")
1,242.90	1,242.86	9 5/8" Casing Set @ 1242.9' MD :: 1242.86' TVD	9-5/8	13-1/2
7,359.30	7,022.80	7" Casing Set @ 7359.3' MD :: 7022.80' TVD	7	8-3/4

Design Report for Sekich State 16N-17HZ - Actual Field Surveys

Design Targets

Shape	Target Name	TVD ()	Northing ()	Easting ()	+N/-S	+E/-W	Created	Updated
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Directional Difficulty Index

Average Dogleg over Survey:	1.19 °/100usft	Maximum Dogleg over Survey:	13.04 °/100usft at 7,009.00 usft
Net Tortosity applicable to Plans:	0.38 °/100usft	Directional Difficulty Index:	6.667

Audit Info

North Reference Sheet for Sec. 18-T3N-R67W - Sekich State 16N-17HZ - Plan A

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

Vertical Depths are relative to RKB = 16' @ 4891.00usft (Xtreme 22). Northing and Easting are relative to Sekich State 16N-17HZ

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 -105.500000°, Longitude Origin:0.000000°, Latitude Origin:40.783333°

False Easting: 3,000,000.00usft, False Northing: 1,000,000.00usft, Scale Reduction: 0.99995698

Grid Coordinates of Well: 1,323,759.76 usft N, 3,156,421.79 usft E

Geographical Coordinates of Well: 40° 13' 14.74" N, 104° 56' 23.42" W

Grid Convergence at Surface is: 0.36°

Based upon Minimum Curvature type calculations, at a Measured Depth of 16,602.00usft

the Bottom Hole Displacement is 9,812.32usft in the Direction of 90.66° (True).

Magnetic Convergence at surface is: -8.24° (20 April 2014, , BGGM2013)

