

Anadarko Petroleum Corp.

Weld County, CO (NAD 83)
Sec. 23-T3N-R68W
BENSON FARMS 23N-19HZ

Plan A

Plan: Rev A0 Permit

Sperry Drilling Services

Proposal Report

18 February, 2014

Well Coordinates: 1,318,486.10 N, 3,150,571.69 E (40° 12' 22.99" N, 104° 57' 39.25" W)

Ground Level: 4,962.00 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 BENSON FARMS 23N-19HZ

RKB = 17' @ 4979.00usft (Drilling Rig)

N

True

Dec-Deg - API - US Survey Feet - Custom

HALLIBURTON

Project: Weld County, CO (NAD 83)
Site: Sec. 23-T3N-R68W
Well: BENSON FARMS 23N-19HZ
Wellbore: Plan A
Design: Rev A0 Permit

Anadarko Petroleum Corp.

HALLIBURTON
Sperry Drilling

SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSec	Target
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
2	3000.00	0.00	0.00	3000.00	0.00	0.00	0.00	0.00	0.00	
3	3366.63	7.33	352.35	3365.63	23.22	-3.12	2.00	352.35	-3.08	
4	6574.51	7.33	352.35	6547.28	429.00	-57.59	0.00	0.00	-56.91	
5	7491.55	90.75	89.91	7125.00	504.57	522.59	10.00	97.40	523.38	BENSON FARMS 23N-19HZ_CP
6	14386.12	90.75	89.91	7035.00	515.14	7416.57	0.00	0.00	7417.37	BENSON FARMS 23N-19HZ_BHL

WELLBORE TARGET DETAILS (LAT/LONG)

Name	TVD	+N/-S	+E/-W	Latitude	Longitude	Polygon
BENSON FARMS 23N-19HZ_LD	0.00	0.00	0.00	40.206385	-104.960904	Polygon
BENSON FARMS 23N-19HZ_SEC	0.00	0.00	0.00	40.206385	-104.960904	Polygon
BENSON FARMS 23N-19HZ_SHL	0.00	0.00	0.00	40.206385	-104.960904	Polygon
BENSON FARMS 23N-19HZ_BHL	7035.00	515.14	7416.57	40.207796	-104.934351	Point
BENSON FARMS 23N-19HZ_CP	7125.00	504.57	522.59	40.207770	-104.959033	Point

West(-)/East(+) (1400 usft/in)

2100 2800 3500 4200 4900 5600 6300 7000

South(-)/North(+) (1400 usft/in)

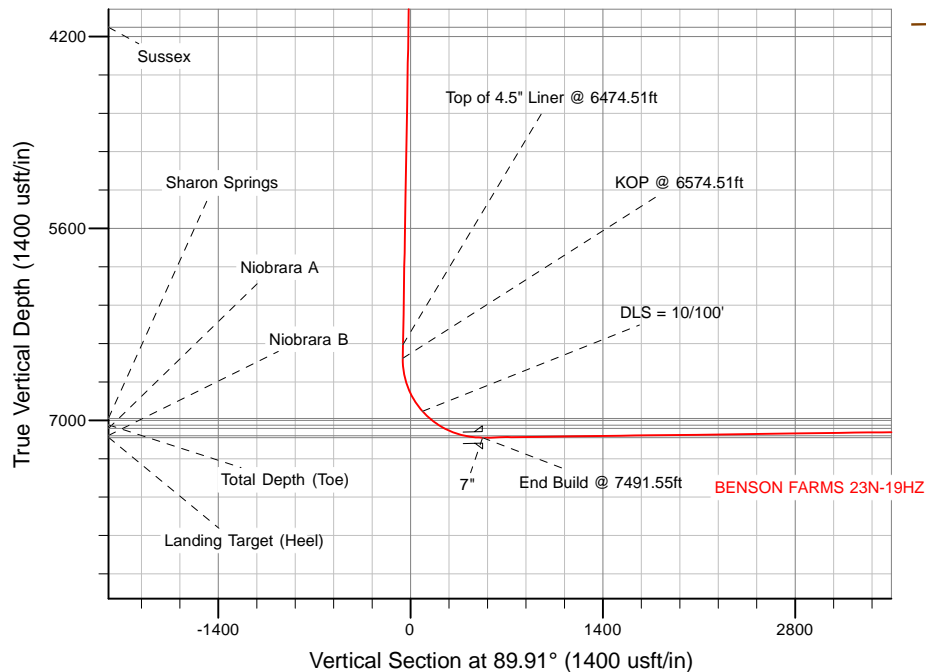
2100
1400
700
0
-700
-1400
-2100

737' FSL
71' FEL

1235' FSL
460' FWL

1235' FSL
2071' FWL

BENSON FARMS 23N-19HZ



TVD MD

6448.09 6474.51 Top of 4.5" Liner @ 6474.51ft
6547.28 6574.51 KOP @ 6574.51ft

WELL DETAILS: BENSON FARMS 23N-19HZ

Ground Level: 4962.00

RKB = 17' @ 4979.00usft (Drilling Rig)

Plan: Rev A0 Permit (BENSON FARMS 23N-19HZ/Plan A)

Created By: Clint Eshelman Date: 2/19/2014
Reviewed: _____ Date: _____

Plan Report for BENSON FARMS 23N-19HZ - Rev A0 Permit

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	Toolface Azimuth (°)
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
BENSON FARMS 23N-19HZ_LD - BENSON FARMS 23N-19HZ_SEC - BENSON FARMS 23N-19HZ_SHL										
100.00	0.00	0.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
200.00	0.00	0.00	200.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
300.00	0.00	0.00	300.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
400.00	0.00	0.00	400.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
500.00	0.00	0.00	500.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
600.00	0.00	0.00	600.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
700.00	0.00	0.00	700.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
800.00	0.00	0.00	800.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
900.00	0.00	0.00	900.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1,000.00	0.00	0.00	1,000.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1,061.00	0.00	0.00	1,061.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fox Hills Marker										
1,100.00	0.00	0.00	1,100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1,111.00	0.00	0.00	1,111.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
9 5/8"										
1,200.00	0.00	0.00	1,200.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1,300.00	0.00	0.00	1,300.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1,400.00	0.00	0.00	1,400.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1,500.00	0.00	0.00	1,500.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1,600.00	0.00	0.00	1,600.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1,700.00	0.00	0.00	1,700.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1,800.00	0.00	0.00	1,800.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1,900.00	0.00	0.00	1,900.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2,000.00	0.00	0.00	2,000.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2,100.00	0.00	0.00	2,100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2,200.00	0.00	0.00	2,200.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2,300.00	0.00	0.00	2,300.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2,400.00	0.00	0.00	2,400.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2,500.00	0.00	0.00	2,500.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2,600.00	0.00	0.00	2,600.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2,700.00	0.00	0.00	2,700.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2,800.00	0.00	0.00	2,800.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2,900.00	0.00	0.00	2,900.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3,000.00	0.00	0.00	3,000.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Begin Nudge @ 3000.00ft										
3,100.00	2.00	352.35	3,099.98	1.73	-0.23	-0.23	2.00	2.00	0.00	352.35
3,200.00	4.00	352.35	3,199.84	6.92	-0.93	-0.92	2.00	2.00	0.00	0.00
3,300.00	6.00	352.35	3,299.45	15.55	-2.09	-2.06	2.00	2.00	0.00	0.00
3,366.63	7.33	352.35	3,365.63	23.22	-3.12	-3.08	2.00	2.00	0.00	0.00
End Nudge @ 3366.63ft										
3,400.00	7.33	352.35	3,398.73	27.44	-3.68	-3.64	0.00	0.00	0.00	0.00
3,500.00	7.33	352.35	3,497.91	40.09	-5.38	-5.32	0.00	0.00	0.00	0.00
3,600.00	7.33	352.35	3,597.09	52.74	-7.08	-7.00	0.00	0.00	0.00	0.00
3,675.53	7.33	352.35	3,672.00	62.29	-8.36	-8.26	0.00	0.00	0.00	0.00
Parkman										
3,700.00	7.33	352.35	3,696.27	65.39	-8.78	-8.67	0.00	0.00	0.00	0.00
3,800.00	7.33	352.35	3,795.46	78.04	-10.48	-10.35	0.00	0.00	0.00	0.00
3,900.00	7.33	352.35	3,894.64	90.69	-12.17	-12.03	0.00	0.00	0.00	0.00
4,000.00	7.33	352.35	3,993.82	103.34	-13.87	-13.71	0.00	0.00	0.00	0.00
4,100.00	7.33	352.35	4,093.00	115.99	-15.57	-15.39	0.00	0.00	0.00	0.00
4,139.32	7.33	352.35	4,132.00	120.96	-16.24	-16.05	0.00	0.00	0.00	0.00
Sussex										
4,200.00	7.33	352.35	4,192.18	128.64	-17.27	-17.07	0.00	0.00	0.00	0.00
4,300.00	7.33	352.35	4,291.37	141.29	-18.97	-18.74	0.00	0.00	0.00	0.00
4,400.00	7.33	352.35	4,390.55	153.94	-20.66	-20.42	0.00	0.00	0.00	0.00

Plan Report for BENSON FARMS 23N-19HZ - Rev A0 Permit

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	Toolface Azimuth (°)
4,500.00	7.33	352.35	4,489.73	166.58	-22.36	-22.10	0.00	0.00	0.00	0.00
4,600.00	7.33	352.35	4,588.91	179.23	-24.06	-23.78	0.00	0.00	0.00	0.00
4,700.00	7.33	352.35	4,688.10	191.88	-25.76	-25.46	0.00	0.00	0.00	0.00
4,800.00	7.33	352.35	4,787.28	204.53	-27.46	-27.13	0.00	0.00	0.00	0.00
4,900.00	7.33	352.35	4,886.46	217.18	-29.15	-28.81	0.00	0.00	0.00	0.00
5,000.00	7.33	352.35	4,985.64	229.83	-30.85	-30.49	0.00	0.00	0.00	0.00
5,100.00	7.33	352.35	5,084.82	242.48	-32.55	-32.17	0.00	0.00	0.00	0.00
5,200.00	7.33	352.35	5,184.01	255.13	-34.25	-33.85	0.00	0.00	0.00	0.00
5,300.00	7.33	352.35	5,283.19	267.78	-35.95	-35.53	0.00	0.00	0.00	0.00
5,400.00	7.33	352.35	5,382.37	280.43	-37.64	-37.20	0.00	0.00	0.00	0.00
5,500.00	7.33	352.35	5,481.55	293.08	-39.34	-38.88	0.00	0.00	0.00	0.00
5,600.00	7.33	352.35	5,580.74	305.73	-41.04	-40.56	0.00	0.00	0.00	0.00
5,700.00	7.33	352.35	5,679.92	318.38	-42.74	-42.24	0.00	0.00	0.00	0.00
5,800.00	7.33	352.35	5,779.10	331.03	-44.44	-43.92	0.00	0.00	0.00	0.00
5,900.00	7.33	352.35	5,878.28	343.68	-46.13	-45.59	0.00	0.00	0.00	0.00
6,000.00	7.33	352.35	5,977.46	356.33	-47.83	-47.27	0.00	0.00	0.00	0.00
6,100.00	7.33	352.35	6,076.65	368.98	-49.53	-48.95	0.00	0.00	0.00	0.00
6,200.00	7.33	352.35	6,175.83	381.63	-51.23	-50.63	0.00	0.00	0.00	0.00
6,300.00	7.33	352.35	6,275.01	394.27	-52.93	-52.31	0.00	0.00	0.00	0.00
6,400.00	7.33	352.35	6,374.19	406.92	-54.62	-53.98	0.00	0.00	0.00	0.00
6,474.51	7.33	352.35	6,448.09	416.35	-55.89	-55.24	0.00	0.00	0.00	0.00
Top of 4.5" Liner @ 6474.51ft										
6,500.00	7.33	352.35	6,473.38	419.57	-56.32	-55.66	0.00	0.00	0.00	0.00
6,574.51	7.33	352.35	6,547.28	429.00	-57.59	-56.91	0.00	0.00	0.00	0.00
KOP @ 6574.51ft										
6,600.00	7.44	12.25	6,572.56	432.22	-57.45	-56.77	10.00	0.44	78.07	97.40
6,700.00	13.66	58.16	6,670.97	444.82	-46.02	-45.32	10.00	6.22	45.90	77.66
6,800.00	22.73	72.09	6,765.91	457.02	-17.52	-16.81	10.00	9.07	13.93	32.40
6,900.00	32.34	78.19	6,854.50	468.47	27.16	27.89	10.00	9.61	6.10	19.12
7,000.00	42.12	81.70	6,934.03	478.81	86.67	87.42	10.00	9.78	3.51	13.69
DLS = 10/100'										
7,073.03	49.30	83.52	6,985.00	485.48	138.48	139.24	10.00	9.84	2.48	10.88
Sharon Springs										
7,100.00	51.96	84.09	7,002.11	487.72	159.21	159.97	10.00	9.87	2.12	9.61
7,200.00	61.85	85.90	7,056.64	494.95	242.56	243.34	10.00	9.88	1.81	9.25
7,202.89	62.13	85.95	7,058.00	495.13	245.11	245.88	10.00	9.90	1.62	8.25
Niobrara A										
7,300.00	71.75	87.41	7,095.99	500.26	334.20	334.99	10.00	9.90	1.50	8.23
7,356.35	77.34	88.17	7,111.00	502.35	388.45	389.24	10.00	9.91	1.36	7.66
Niobrara B										
7,400.00	81.67	88.75	7,118.95	503.50	431.35	432.14	10.00	9.92	1.31	7.45
7,491.55	90.75	89.91	7,125.00	504.57	522.59	523.38	10.00	9.92	1.27	7.35
End Build @ 7491.55ft - Landing Target (Heel) - 7" - BENSON FARMS 23N-19HZ_CP										
7,500.00	90.75	89.91	7,124.89	504.58	531.04	531.83	0.00	0.00	0.00	7.27
7,600.00	90.75	89.91	7,123.58	504.73	631.03	631.83	0.00	0.00	0.00	0.00
7,700.00	90.75	89.91	7,122.28	504.89	731.02	731.82	0.00	0.00	0.00	0.00
7,800.00	90.75	89.91	7,120.97	505.04	831.02	831.81	0.00	0.00	0.00	0.00
7,900.00	90.75	89.91	7,119.67	505.19	931.01	931.80	0.00	0.00	0.00	0.00
8,000.00	90.75	89.91	7,118.36	505.35	1,031.00	1,031.79	0.00	0.00	0.00	0.00
8,100.00	90.75	89.91	7,117.06	505.50	1,130.99	1,131.78	0.00	0.00	0.00	0.00
8,200.00	90.75	89.91	7,115.75	505.65	1,230.98	1,231.77	0.00	0.00	0.00	0.00
8,300.00	90.75	89.91	7,114.45	505.81	1,330.97	1,331.77	0.00	0.00	0.00	0.00
8,400.00	90.75	89.91	7,113.14	505.96	1,430.96	1,431.76	0.00	0.00	0.00	0.00
8,500.00	90.75	89.91	7,111.84	506.12	1,530.96	1,531.75	0.00	0.00	0.00	0.00
8,600.00	90.75	89.91	7,110.53	506.27	1,630.95	1,631.74	0.00	0.00	0.00	0.00
8,700.00	90.75	89.91	7,109.23	506.42	1,730.94	1,731.73	0.00	0.00	0.00	0.00
8,800.00	90.75	89.91	7,107.92	506.58	1,830.93	1,831.72	0.00	0.00	0.00	0.00
8,900.00	90.75	89.91	7,106.61	506.73	1,930.92	1,931.71	0.00	0.00	0.00	0.00
9,000.00	90.75	89.91	7,105.31	506.88	2,030.91	2,031.71	0.00	0.00	0.00	0.00

Plan Report for BENSON FARMS 23N-19HZ - Rev A0 Permit

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	Toolface Azimuth (°)
9,100.00	90.75	89.91	7,104.00	507.04	2,130.90	2,131.70	0.00	0.00	0.00	0.00
9,200.00	90.75	89.91	7,102.70	507.19	2,230.90	2,231.69	0.00	0.00	0.00	0.00
9,300.00	90.75	89.91	7,101.39	507.34	2,330.89	2,331.68	0.00	0.00	0.00	0.00
9,400.00	90.75	89.91	7,100.09	507.50	2,430.88	2,431.67	0.00	0.00	0.00	0.00
9,500.00	90.75	89.91	7,098.78	507.65	2,530.87	2,531.66	0.00	0.00	0.00	0.00
9,600.00	90.75	89.91	7,097.48	507.80	2,630.86	2,631.66	0.00	0.00	0.00	0.00
9,700.00	90.75	89.91	7,096.17	507.96	2,730.85	2,731.65	0.00	0.00	0.00	0.00
9,800.00	90.75	89.91	7,094.87	508.11	2,830.84	2,831.64	0.00	0.00	0.00	0.00
9,900.00	90.75	89.91	7,093.56	508.26	2,930.83	2,931.63	0.00	0.00	0.00	0.00
10,000.00	90.75	89.91	7,092.26	508.42	3,030.83	3,031.62	0.00	0.00	0.00	0.00
10,100.00	90.75	89.91	7,090.95	508.57	3,130.82	3,131.61	0.00	0.00	0.00	0.00
10,200.00	90.75	89.91	7,089.64	508.72	3,230.81	3,231.60	0.00	0.00	0.00	0.00
10,300.00	90.75	89.91	7,088.34	508.88	3,330.80	3,331.60	0.00	0.00	0.00	0.00
10,400.00	90.75	89.91	7,087.03	509.03	3,430.79	3,431.59	0.00	0.00	0.00	0.00
10,500.00	90.75	89.91	7,085.73	509.18	3,530.78	3,531.58	0.00	0.00	0.00	0.00
10,600.00	90.75	89.91	7,084.42	509.34	3,630.77	3,631.57	0.00	0.00	0.00	0.00
10,700.00	90.75	89.91	7,083.12	509.49	3,730.77	3,731.56	0.00	0.00	0.00	0.00
10,800.00	90.75	89.91	7,081.81	509.64	3,830.76	3,831.55	0.00	0.00	0.00	0.00
10,900.00	90.75	89.91	7,080.51	509.80	3,930.75	3,931.54	0.00	0.00	0.00	0.00
11,000.00	90.75	89.91	7,079.20	509.95	4,030.74	4,031.54	0.00	0.00	0.00	0.00
11,100.00	90.75	89.91	7,077.90	510.10	4,130.73	4,131.53	0.00	0.00	0.00	0.00
11,200.00	90.75	89.91	7,076.59	510.26	4,230.72	4,231.52	0.00	0.00	0.00	0.00
11,300.00	90.75	89.91	7,075.29	510.41	4,330.71	4,331.51	0.00	0.00	0.00	0.00
11,400.00	90.75	89.91	7,073.98	510.56	4,430.71	4,431.50	0.00	0.00	0.00	0.00
11,500.00	90.75	89.91	7,072.67	510.72	4,530.70	4,531.49	0.00	0.00	0.00	0.00
11,600.00	90.75	89.91	7,071.37	510.87	4,630.69	4,631.48	0.00	0.00	0.00	0.00
11,700.00	90.75	89.91	7,070.06	511.02	4,730.68	4,731.48	0.00	0.00	0.00	0.00
11,800.00	90.75	89.91	7,068.76	511.18	4,830.67	4,831.47	0.00	0.00	0.00	0.00
11,900.00	90.75	89.91	7,067.45	511.33	4,930.66	4,931.46	0.00	0.00	0.00	0.00
12,000.00	90.75	89.91	7,066.15	511.48	5,030.65	5,031.45	0.00	0.00	0.00	0.00
12,100.00	90.75	89.91	7,064.84	511.64	5,130.64	5,131.44	0.00	0.00	0.00	0.00
12,200.00	90.75	89.91	7,063.54	511.79	5,230.64	5,231.43	0.00	0.00	0.00	0.00
12,300.00	90.75	89.91	7,062.23	511.94	5,330.63	5,331.43	0.00	0.00	0.00	0.00
12,400.00	90.75	89.91	7,060.93	512.10	5,430.62	5,431.42	0.00	0.00	0.00	0.00
12,500.00	90.75	89.91	7,059.62	512.25	5,530.61	5,531.41	0.00	0.00	0.00	0.00
12,600.00	90.75	89.91	7,058.32	512.40	5,630.60	5,631.40	0.00	0.00	0.00	0.00
12,700.00	90.75	89.91	7,057.01	512.56	5,730.59	5,731.39	0.00	0.00	0.00	0.00
12,800.00	90.75	89.91	7,055.70	512.71	5,830.58	5,831.38	0.00	0.00	0.00	0.00
12,900.00	90.75	89.91	7,054.40	512.87	5,930.58	5,931.37	0.00	0.00	0.00	0.00
13,000.00	90.75	89.91	7,053.09	513.02	6,030.57	6,031.37	0.00	0.00	0.00	0.00
13,100.00	90.75	89.91	7,051.79	513.17	6,130.56	6,131.36	0.00	0.00	0.00	0.00
13,200.00	90.75	89.91	7,050.48	513.33	6,230.55	6,231.35	0.00	0.00	0.00	0.00
13,300.00	90.75	89.91	7,049.18	513.48	6,330.54	6,331.34	0.00	0.00	0.00	0.00
13,400.00	90.75	89.91	7,047.87	513.63	6,430.53	6,431.33	0.00	0.00	0.00	0.00
13,500.00	90.75	89.91	7,046.57	513.79	6,530.52	6,531.32	0.00	0.00	0.00	0.00
13,600.00	90.75	89.91	7,045.26	513.94	6,630.52	6,631.31	0.00	0.00	0.00	0.00
13,700.00	90.75	89.91	7,043.96	514.09	6,730.51	6,731.31	0.00	0.00	0.00	0.00
13,800.00	90.75	89.91	7,042.65	514.25	6,830.50	6,831.30	0.00	0.00	0.00	0.00
13,900.00	90.75	89.91	7,041.35	514.40	6,930.49	6,931.29	0.00	0.00	0.00	0.00
14,000.00	90.75	89.91	7,040.04	514.55	7,030.48	7,031.28	0.00	0.00	0.00	0.00
14,100.00	90.75	89.91	7,038.73	514.71	7,130.47	7,131.27	0.00	0.00	0.00	0.00
14,200.00	90.75	89.91	7,037.43	514.86	7,230.46	7,231.26	0.00	0.00	0.00	0.00
14,300.00	90.75	89.91	7,036.12	515.01	7,330.45	7,331.25	0.00	0.00	0.00	0.00
14,386.12	90.75	89.91	7,035.00	515.14	7,416.57	7,417.37	0.00	0.00	0.00	0.00

TD Well @ 14386.12ft - Total Depth (Toe) - BENSON FARMS 23N-19HZ_BHL

Plan Report for BENSON FARMS 23N-19HZ - Rev A0 Permit**Plan Annotations**

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
3,000.00	3,000.00	0.00	0.00	Begin Nudge @ 3000.00ft
3,366.63	3,366.63	23.22	-3.12	End Nudge @ 3366.63ft
6,474.51	6,448.09	416.35	-55.89	Top of 4.5" Liner @ 6474.51ft
6,574.51	6,547.28	429.00	-57.59	KOP @ 6574.51ft
7,000.00	6,934.03	478.81	86.67	DLS = 10/100'
7,491.55	7,125.00	504.57	522.59	End Build @ 7491.55ft
14,386.12	7,035.00	515.14	7,416.57	TD Well @ 14386.12ft

Vertical Section Information

Angle Type	Target	Azimuth (°)	Origin Type	Origin		Start TVD (usft)
				+N/_S (usft)	+E/-W (usft)	
User	No Target (Freehand)	89.91	Slot	0.00	0.00	0.00

Survey tool program

From (usft)	To (usft)	Survey/Plan	Survey Tool
0.00	7,491.55	Rev A0 Permit	MWD
7,491.55	14,386.12	Rev A0 Permit	MWD

Casing Details

Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")
1,111.00	1,111.00	9 5/8"	9-5/8	13-1/2
7,491.55	7,125.00	7"	7	8-3/4

Formation Details

Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
1,061.00	1,061.00	Fox Hills Marker		0.00	
3,675.53	3,672.00	Parkman		0.00	
4,139.32	4,132.00	Sussex		0.00	
7,073.03	6,985.00	Sharon Springs		0.00	
7,202.89	7,058.00	Niobrara A		0.00	
7,356.35	7,111.00	Niobrara B		0.00	
7,491.55	7,125.00	Landing Target (Heel)		0.00	
14,386.12	7,035.00	Total Depth (Toe)		0.00	

Plan Report for BENSON FARMS 23N-19HZ - Rev A0 Permit

Targets associated with this wellbore

Target Name	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Shape
BENSON FARMS 23N-19HZ_LD	0.00	0.00	0.00	Polygon
BENSON FARMS 23N-19HZ_SEC	0.00	0.00	0.00	Point
BENSON FARMS 23N-19HZ_SHL	0.00	0.00	0.00	Point
BENSON FARMS 23N-19HZ_BHL	7,035.00	515.14	7,416.57	Point
BENSON FARMS 23N-19HZ_CP	7,125.00	504.57	522.59	Point

Directional Difficulty Index

Average Dogleg over Survey:	0.00 °/100usft	Maximum Dogleg over Survey:	0.00 °/100usft at 2.00 usft
Net Tortosity applicable to Plans:	0.00 °/100usft	Directional Difficulty Index:	6.318

Audit Info

North Reference Sheet for Sec. 23-T3N-R68W - BENSON FARMS 23N-19HZ - 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 = 17' @ 4979.00usft (Drilling Rig). Northing and Easting are relative to BENSON FARMS 23N-19HZ
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 -105.50°, Longitude Origin:0.000000°, Latitude Origin:40.783333°
False Easting: 3,000,000.00usft, False Northing: 1,000,000.00usft, Scale Reduction: 0.99995714

Grid Coordinates of Well: 1,318,486.10 usft N, 3,150,571.69 usft E
Geographical Coordinates of Well: 40° 12' 22.99" N, 104° 57' 39.25" W
Grid Convergence at Surface is: 0.35°

Based upon Minimum Curvature type calculations, at a Measured Depth of 14,386.12usft
the Bottom Hole Displacement is 7,434.44usft in the Direction of 86.03° (True).
Magnetic Convergence at surface is: -8.29° (12 February 2014, , BGGM2013)

