

# Conoco Phillips Company

Arapahoe County, Colorado

Sec. 17-T4S-R65W

Eastern Hills 4-65 17-18 1H

Plan A (Lateral)

Plan: Rev A0

## Sperry Drilling Services

### Proposal Report

28 April, 2014

Well Coordinates: 1,684,148.42 N, 3,230,705.87 E (39° 42' 32.15" N, 104° 40' 47.94" W)

Ground Level: 5,618.70 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 Eastern Hills 4-65 17-18 1H

KB 24' @ 5642.70usft (H&P 280)

N

True

API - US Survey Feet - Custom

**HALLIBURTON**

Project: Arapahoe County, Colorado  
Site: Sec. 17-T4S-R65W  
Well: Eastern Hills 4-65 17-18 1H  
Wellbore: Plan A (Lateral)  
Plan: Rev A0

Conoco Phillips Company

HALLIBURTON  
Sperry Drilling

SECTION DETAILS										
Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSect	Target
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
2	2225.00	0.00	0.00	2225.00	0.00	0.00	0.00	0.00	0.00	
3	2375.00	3.00	0.00	2374.93	3.93	0.00	2.00	0.00	0.09	
4	5851.73	3.00	0.00	5846.90	185.88	0.00	0.00	0.00	4.35	
5	6001.73	0.00	0.00	5996.83	189.81	0.00	2.00	180.00	4.45	
6	7320.95	0.00	0.00	7316.05	189.81	0.00	0.00	0.00	4.45	
7	8217.98	89.70	270.24	7889.00	192.17	-569.98	10.00	270.24	574.33	
8	17483.95	89.70	270.24	7937.00	230.46	-9835.75	0.00	0.00	9838.45	Eastern Hills 4-65 17-18 1H_RevA0(Lateral)_BHL Tgt

Plan: Rev A0 (Eastern Hills 4-65 17-18 1H/Plan A (Lateral))

Created By: Kansa B. Becker

Date: 13:24, April 28 2014

Checked: \_\_\_\_\_

Date: \_\_\_\_\_

Reviewed: \_\_\_\_\_

Date: \_\_\_\_\_

Approved: \_\_\_\_\_

Date: \_\_\_\_\_

T

W

Azimuths to True North

Magnetic Field

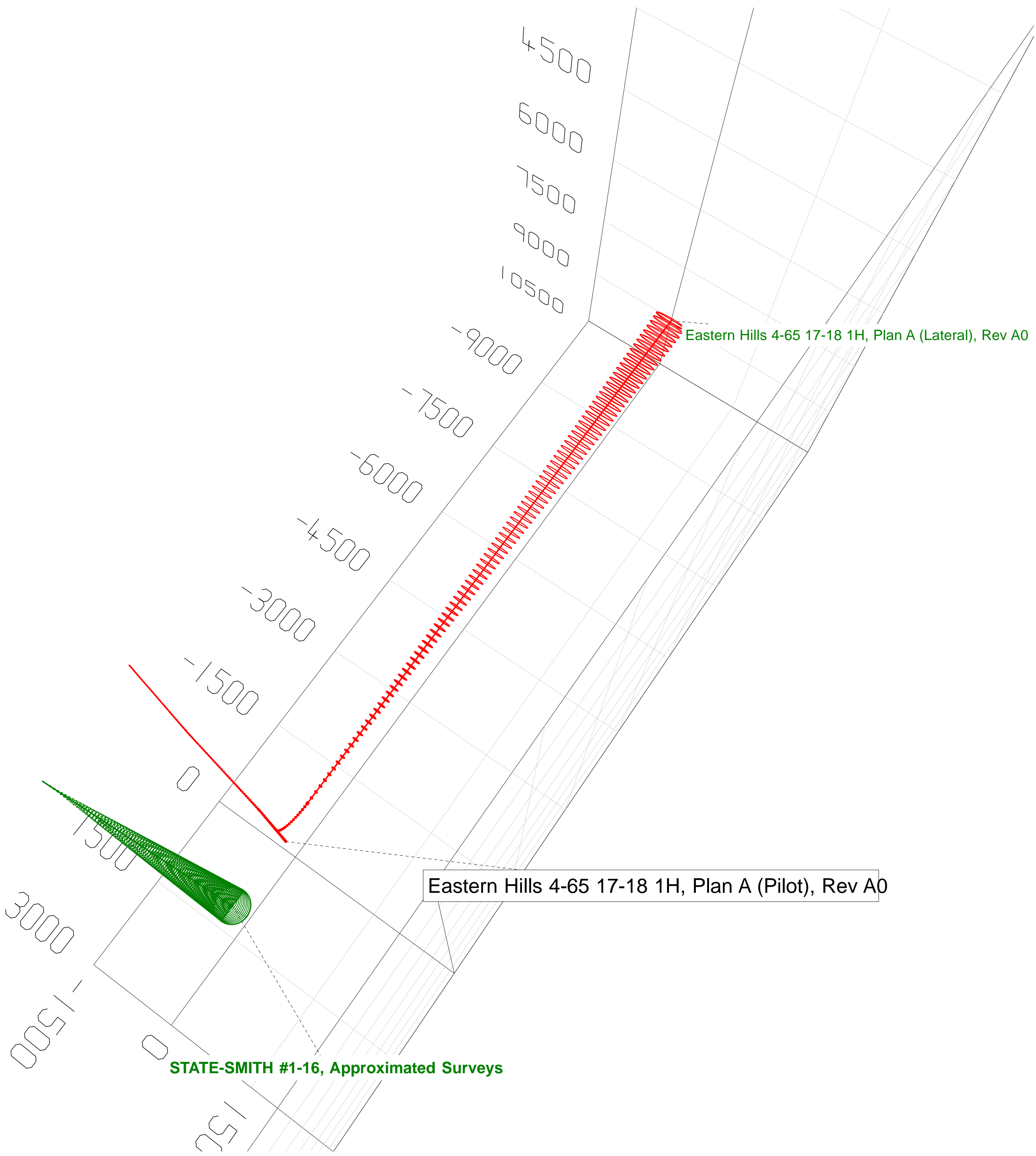
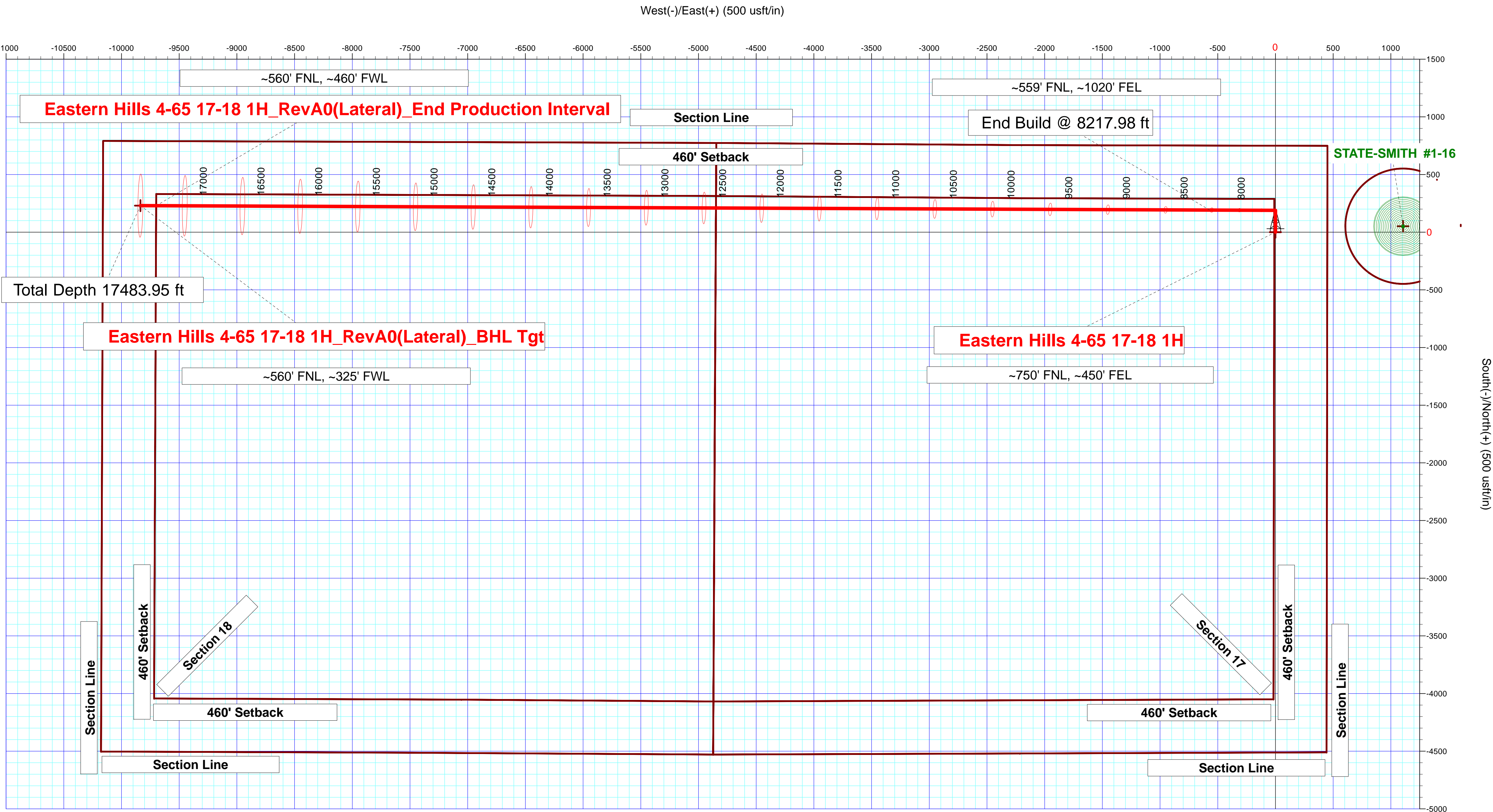
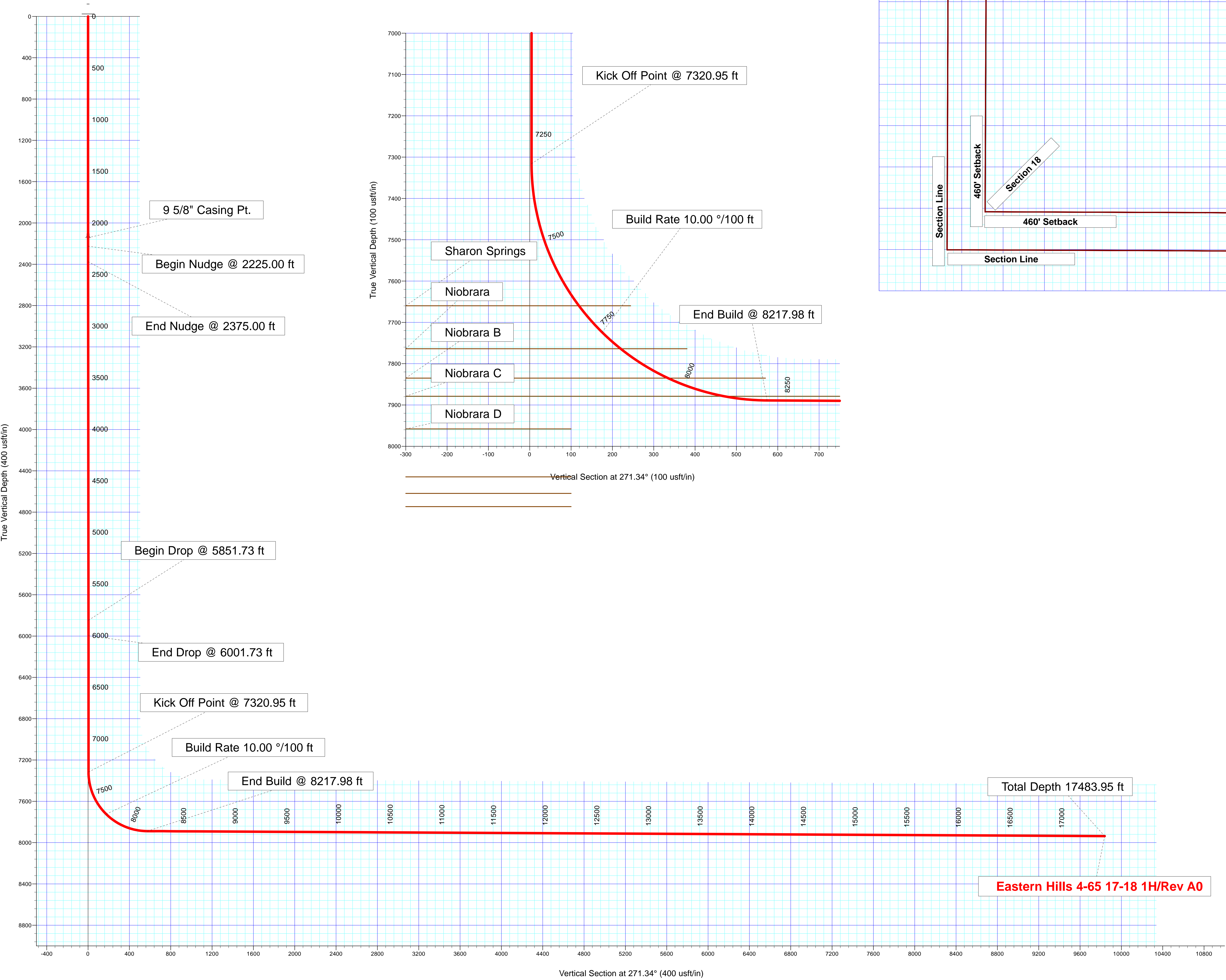
Magnetic North: 8.40°

Strength: 52349.0snT

Dip Angle: 66.39°

Date: 7/24/2014

Model: BGGM2013



## Plan Report for Eastern Hills 4-65 17-18 1H - Rev A0

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
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
1,100.00	0.00	0.00	1,100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
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
1,717.00	0.00	0.00	1,717.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>Fox Hills</b>										
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
1,943.00	0.00	0.00	1,943.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>Pierre Shale</b>										
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
2,143.00	0.00	0.00	2,143.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>Surface casing - 9 5/8" Casing Pt.</b>										
2,200.00	0.00	0.00	2,200.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2,225.00	0.00	0.00	2,225.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>Begin Nudge @ 2225.00 ft</b>										
2,300.00	1.50	0.00	2,299.99	0.98	0.00	0.02	2.00	2.00	0.00	0.00
2,375.00	3.00	0.00	2,374.93	3.93	0.00	0.09	2.00	2.00	0.00	0.00
<b>End Nudge @ 2375.00 ft</b>										
2,400.00	3.00	0.00	2,399.90	5.23	0.00	0.12	0.00	0.00	0.00	0.00
2,500.00	3.00	0.00	2,499.76	10.47	0.00	0.25	0.00	0.00	0.00	0.00
2,600.00	3.00	0.00	2,599.62	15.70	0.00	0.37	0.00	0.00	0.00	0.00
2,700.00	3.00	0.00	2,699.49	20.94	0.00	0.49	0.00	0.00	0.00	0.00
2,800.00	3.00	0.00	2,799.35	26.17	0.00	0.61	0.00	0.00	0.00	0.00
2,900.00	3.00	0.00	2,899.21	31.40	0.00	0.74	0.00	0.00	0.00	0.00
3,000.00	3.00	0.00	2,999.07	36.64	0.00	0.86	0.00	0.00	0.00	0.00
3,100.00	3.00	0.00	3,098.94	41.87	0.00	0.98	0.00	0.00	0.00	0.00
3,200.00	3.00	0.00	3,198.80	47.10	0.00	1.10	0.00	0.00	0.00	0.00
3,300.00	3.00	0.00	3,298.66	52.34	0.00	1.23	0.00	0.00	0.00	0.00
3,400.00	3.00	0.00	3,398.53	57.57	0.00	1.35	0.00	0.00	0.00	0.00
3,500.00	3.00	0.00	3,498.39	62.80	0.00	1.47	0.00	0.00	0.00	0.00
3,600.00	3.00	0.00	3,598.25	68.04	0.00	1.59	0.00	0.00	0.00	0.00
3,700.00	3.00	0.00	3,698.12	73.27	0.00	1.72	0.00	0.00	0.00	0.00
3,800.00	3.00	0.00	3,797.98	78.50	0.00	1.84	0.00	0.00	0.00	0.00
3,900.00	3.00	0.00	3,897.84	83.74	0.00	1.96	0.00	0.00	0.00	0.00
4,000.00	3.00	0.00	3,997.70	88.97	0.00	2.08	0.00	0.00	0.00	0.00
4,100.00	3.00	0.00	4,097.57	94.21	0.00	2.21	0.00	0.00	0.00	0.00
4,200.00	3.00	0.00	4,197.43	99.44	0.00	2.33	0.00	0.00	0.00	0.00
4,300.00	3.00	0.00	4,297.29	104.67	0.00	2.45	0.00	0.00	0.00	0.00
4,400.00	3.00	0.00	4,397.16	109.91	0.00	2.57	0.00	0.00	0.00	0.00
4,500.00	3.00	0.00	4,497.02	115.14	0.00	2.70	0.00	0.00	0.00	0.00
4,600.00	3.00	0.00	4,596.88	120.37	0.00	2.82	0.00	0.00	0.00	0.00
4,700.00	3.00	0.00	4,696.75	125.61	0.00	2.94	0.00	0.00	0.00	0.00

## Plan Report for Eastern Hills 4-65 17-18 1H - Rev A0

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 (°)
4,800.00	3.00	0.00	4,796.61	130.84	0.00	3.06	0.00	0.00	0.00	0.00
4,900.00	3.00	0.00	4,896.47	136.07	0.00	3.19	0.00	0.00	0.00	0.00
5,000.00	3.00	0.00	4,996.33	141.31	0.00	3.31	0.00	0.00	0.00	0.00
5,100.00	3.00	0.00	5,096.20	146.54	0.00	3.43	0.00	0.00	0.00	0.00
5,200.00	3.00	0.00	5,196.06	151.78	0.00	3.56	0.00	0.00	0.00	0.00
5,300.00	3.00	0.00	5,295.92	157.01	0.00	3.68	0.00	0.00	0.00	0.00
5,400.00	3.00	0.00	5,395.79	162.24	0.00	3.80	0.00	0.00	0.00	0.00
5,500.00	3.00	0.00	5,495.65	167.48	0.00	3.92	0.00	0.00	0.00	0.00
5,600.00	3.00	0.00	5,595.51	172.71	0.00	4.05	0.00	0.00	0.00	0.00
5,700.00	3.00	0.00	5,695.37	177.94	0.00	4.17	0.00	0.00	0.00	0.00
5,800.00	3.00	0.00	5,795.24	183.18	0.00	4.29	0.00	0.00	0.00	0.00
5,851.73	3.00	0.00	5,846.90	185.88	0.00	4.35	0.00	0.00	0.00	0.00
<b>Begin Drop @ 5851.73 ft</b>										
5,900.00	2.03	0.00	5,895.12	188.00	0.00	4.40	2.00	-2.00	0.00	180.00
6,000.00	0.03	0.00	5,995.10	189.81	0.00	4.45	2.00	-2.00	0.00	-180.00
6,001.73	0.00	0.00	5,996.83	189.81	0.00	4.45	2.00	-2.00	0.00	-180.00
<b>End Drop @ 6001.73 ft</b>										
6,100.00	0.00	0.00	6,095.10	189.81	0.00	4.45	0.00	0.00	0.00	0.00
6,200.00	0.00	0.00	6,195.10	189.81	0.00	4.45	0.00	0.00	0.00	0.00
6,300.00	0.00	0.00	6,295.10	189.81	0.00	4.45	0.00	0.00	0.00	0.00
6,400.00	0.00	0.00	6,395.10	189.81	0.00	4.45	0.00	0.00	0.00	0.00
6,500.00	0.00	0.00	6,495.10	189.81	0.00	4.45	0.00	0.00	0.00	0.00
6,600.00	0.00	0.00	6,595.10	189.81	0.00	4.45	0.00	0.00	0.00	0.00
6,700.00	0.00	0.00	6,695.10	189.81	0.00	4.45	0.00	0.00	0.00	0.00
6,800.00	0.00	0.00	6,795.10	189.81	0.00	4.45	0.00	0.00	0.00	0.00
6,900.00	0.00	0.00	6,895.10	189.81	0.00	4.45	0.00	0.00	0.00	0.00
7,000.00	0.00	0.00	6,995.10	189.81	0.00	4.45	0.00	0.00	0.00	0.00
7,100.00	0.00	0.00	7,095.10	189.81	0.00	4.45	0.00	0.00	0.00	0.00
7,200.00	0.00	0.00	7,195.10	189.81	0.00	4.45	0.00	0.00	0.00	0.00
7,300.00	0.00	0.00	7,295.10	189.81	0.00	4.45	0.00	0.00	0.00	0.00
7,320.95	0.00	0.00	7,316.05	189.81	0.00	4.45	0.00	0.00	0.00	0.00
<b>Kick Off Point @ 7320.95 ft</b>										
7,400.00	7.90	270.24	7,394.85	189.83	-5.44	9.89	10.00	10.00	0.00	270.24
7,500.00	17.90	270.24	7,492.20	189.93	-27.75	32.19	10.00	10.00	0.00	0.00
7,600.00	27.90	270.24	7,584.20	190.09	-66.62	71.05	10.00	10.00	0.00	0.00
7,689.87	36.89	270.24	7,660.00	190.28	-114.72	119.15	10.00	10.00	0.00	0.00
<b>Sharon Springs</b>										
7,700.00	37.90	270.24	7,668.05	190.31	-120.87	125.30	10.00	10.00	0.00	0.00
7,775.00	45.40	270.24	7,724.04	190.52	-170.69	175.10	10.00	10.00	0.00	0.00
<b>Build Rate 10.00 °/100 ft</b>										
7,800.00	47.90	270.24	7,741.20	190.59	-188.87	193.28	10.00	10.00	0.00	0.00
7,835.23	51.43	270.24	7,764.00	190.70	-215.71	220.12	10.00	10.00	0.00	0.00
<b>Niobrara</b>										
7,900.00	57.90	270.24	7,801.44	190.92	-268.53	272.93	10.00	10.00	0.00	0.00
7,970.18	64.92	270.24	7,835.00	191.17	-330.11	334.50	10.00	10.00	0.00	0.00
<b>Niobrara B</b>										
8,000.00	67.90	270.24	7,846.93	191.29	-357.44	361.82	10.00	10.00	0.00	0.00
8,100.00	77.90	270.24	7,876.29	191.68	-452.90	457.26	10.00	10.00	0.00	0.00
8,113.71	79.28	270.24	7,879.00	191.74	-466.33	470.70	10.00	10.00	0.00	0.00
<b>Niobrara C</b>										
8,200.00	87.90	270.24	7,888.62	192.09	-552.01	556.35	10.00	10.00	0.00	0.00
8,217.98	89.70	270.24	7,889.00	192.17	-569.99	574.33	10.00	10.00	0.00	0.00
<b>End Build @ 8217.98 ft</b>										
8,300.00	89.70	270.24	7,889.42	192.50	-652.00	656.33	0.00	0.00	0.00	0.00
8,400.00	89.70	270.24	7,889.94	192.92	-752.00	756.31	0.00	0.00	0.00	0.00
8,500.00	89.70	270.24	7,890.46	193.33	-851.99	856.29	0.00	0.00	0.00	0.00
8,600.00	89.70	270.24	7,890.98	193.74	-951.99	956.27	0.00	0.00	0.00	0.00
8,700.00	89.70	270.24	7,891.50	194.16	-1,051.99	1,056.25	0.00	0.00	0.00	0.00



## Plan Report for Eastern Hills 4-65 17-18 1H - Rev A0

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 (°)
8,800.00	89.70	270.24	7,892.02	194.57	-1,151.99	1,156.23	0.00	0.00	0.00	0.00
8,900.00	89.70	270.24	7,892.53	194.98	-1,251.99	1,256.21	0.00	0.00	0.00	0.00
9,000.00	89.70	270.24	7,893.05	195.40	-1,351.98	1,356.19	0.00	0.00	0.00	0.00
9,100.00	89.70	270.24	7,893.57	195.81	-1,451.98	1,456.17	0.00	0.00	0.00	0.00
9,200.00	89.70	270.24	7,894.09	196.22	-1,551.98	1,556.15	0.00	0.00	0.00	0.00
9,300.00	89.70	270.24	7,894.61	196.64	-1,651.98	1,656.13	0.00	0.00	0.00	0.00
9,400.00	89.70	270.24	7,895.12	197.05	-1,751.98	1,756.11	0.00	0.00	0.00	0.00
9,500.00	89.70	270.24	7,895.64	197.46	-1,851.97	1,856.09	0.00	0.00	0.00	0.00
9,600.00	89.70	270.24	7,896.16	197.88	-1,951.97	1,956.07	0.00	0.00	0.00	0.00
9,700.00	89.70	270.24	7,896.68	198.29	-2,051.97	2,056.05	0.00	0.00	0.00	0.00
9,800.00	89.70	270.24	7,897.20	198.70	-2,151.97	2,156.03	0.00	0.00	0.00	0.00
9,900.00	89.70	270.24	7,897.71	199.12	-2,251.96	2,256.01	0.00	0.00	0.00	0.00
10,000.00	89.70	270.24	7,898.23	199.53	-2,351.96	2,355.99	0.00	0.00	0.00	0.00
10,100.00	89.70	270.24	7,898.75	199.94	-2,451.96	2,455.97	0.00	0.00	0.00	0.00
10,200.00	89.70	270.24	7,899.27	200.36	-2,551.96	2,555.95	0.00	0.00	0.00	0.00
10,300.00	89.70	270.24	7,899.79	200.77	-2,651.96	2,655.93	0.00	0.00	0.00	0.00
10,400.00	89.70	270.24	7,900.30	201.18	-2,751.95	2,755.91	0.00	0.00	0.00	0.00
10,500.00	89.70	270.24	7,900.82	201.60	-2,851.95	2,855.89	0.00	0.00	0.00	0.00
10,600.00	89.70	270.24	7,901.34	202.01	-2,951.95	2,955.87	0.00	0.00	0.00	0.00
10,700.00	89.70	270.24	7,901.86	202.42	-3,051.95	3,055.85	0.00	0.00	0.00	0.00
10,800.00	89.70	270.24	7,902.38	202.84	-3,151.94	3,155.83	0.00	0.00	0.00	0.00
10,900.00	89.70	270.24	7,902.89	203.25	-3,251.94	3,255.81	0.00	0.00	0.00	0.00
11,000.00	89.70	270.24	7,903.41	203.66	-3,351.94	3,355.79	0.00	0.00	0.00	0.00
11,100.00	89.70	270.24	7,903.93	204.08	-3,451.94	3,455.77	0.00	0.00	0.00	0.00
11,200.00	89.70	270.24	7,904.45	204.49	-3,551.94	3,555.75	0.00	0.00	0.00	0.00
11,300.00	89.70	270.24	7,904.97	204.90	-3,651.93	3,655.73	0.00	0.00	0.00	0.00
11,400.00	89.70	270.24	7,905.48	205.32	-3,751.93	3,755.71	0.00	0.00	0.00	0.00
11,500.00	89.70	270.24	7,906.00	205.73	-3,851.93	3,855.69	0.00	0.00	0.00	0.00
11,600.00	89.70	270.24	7,906.52	206.14	-3,951.93	3,955.67	0.00	0.00	0.00	0.00
11,700.00	89.70	270.24	7,907.04	206.56	-4,051.92	4,055.65	0.00	0.00	0.00	0.00
11,800.00	89.70	270.24	7,907.56	206.97	-4,151.92	4,155.63	0.00	0.00	0.00	0.00
11,900.00	89.70	270.24	7,908.07	207.38	-4,251.92	4,255.61	0.00	0.00	0.00	0.00
12,000.00	89.70	270.24	7,908.59	207.80	-4,351.92	4,355.59	0.00	0.00	0.00	0.00
12,100.00	89.70	270.24	7,909.11	208.21	-4,451.92	4,455.57	0.00	0.00	0.00	0.00
12,200.00	89.70	270.24	7,909.63	208.62	-4,551.91	4,555.55	0.00	0.00	0.00	0.00
12,300.00	89.70	270.24	7,910.15	209.04	-4,651.91	4,655.53	0.00	0.00	0.00	0.00
12,400.00	89.70	270.24	7,910.66	209.45	-4,751.91	4,755.51	0.00	0.00	0.00	0.00
12,500.00	89.70	270.24	7,911.18	209.86	-4,851.91	4,855.49	0.00	0.00	0.00	0.00
12,600.00	89.70	270.24	7,911.70	210.28	-4,951.90	4,955.47	0.00	0.00	0.00	0.00
12,700.00	89.70	270.24	7,912.22	210.69	-5,051.90	5,055.45	0.00	0.00	0.00	0.00
12,800.00	89.70	270.24	7,912.74	211.10	-5,151.90	5,155.43	0.00	0.00	0.00	0.00
12,900.00	89.70	270.24	7,913.25	211.52	-5,251.90	5,255.41	0.00	0.00	0.00	0.00
13,000.00	89.70	270.24	7,913.77	211.93	-5,351.90	5,355.39	0.00	0.00	0.00	0.00
13,100.00	89.70	270.24	7,914.29	212.34	-5,451.89	5,455.37	0.00	0.00	0.00	0.00
13,200.00	89.70	270.24	7,914.81	212.75	-5,551.89	5,555.35	0.00	0.00	0.00	0.00
13,300.00	89.70	270.24	7,915.33	213.17	-5,651.89	5,655.33	0.00	0.00	0.00	0.00
13,400.00	89.70	270.24	7,915.84	213.58	-5,751.89	5,755.31	0.00	0.00	0.00	0.00
13,500.00	89.70	270.24	7,916.36	213.99	-5,851.89	5,855.29	0.00	0.00	0.00	0.00
13,600.00	89.70	270.24	7,916.88	214.41	-5,951.88	5,955.27	0.00	0.00	0.00	0.00
13,700.00	89.70	270.24	7,917.40	214.82	-6,051.88	6,055.25	0.00	0.00	0.00	0.00
13,800.00	89.70	270.24	7,917.92	215.23	-6,151.88	6,155.23	0.00	0.00	0.00	0.00
13,900.00	89.70	270.24	7,918.43	215.65	-6,251.88	6,255.21	0.00	0.00	0.00	0.00
14,000.00	89.70	270.24	7,918.95	216.06	-6,351.87	6,355.19	0.00	0.00	0.00	0.00
14,100.00	89.70	270.24	7,919.47	216.47	-6,451.87	6,455.17	0.00	0.00	0.00	0.00
14,200.00	89.70	270.24	7,919.99	216.89	-6,551.87	6,555.15	0.00	0.00	0.00	0.00
14,300.00	89.70	270.24	7,920.51	217.30	-6,651.87	6,655.13	0.00	0.00	0.00	0.00
14,400.00	89.70	270.24	7,921.02	217.71	-6,751.87	6,755.11	0.00	0.00	0.00	0.00
14,500.00	89.70	270.24	7,921.54	218.13	-6,851.86	6,855.09	0.00	0.00	0.00	0.00
14,600.00	89.70	270.24	7,922.06	218.54	-6,951.86	6,955.07	0.00	0.00	0.00	0.00
14,700.00	89.70	270.24	7,922.58	218.95	-7,051.86	7,055.05	0.00	0.00	0.00	0.00

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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 (°)
14,800.00	89.70	270.24	7,923.10	219.37	-7,151.86	7,155.03	0.00	0.00	0.00	0.00
14,900.00	89.70	270.24	7,923.61	219.78	-7,251.85	7,255.01	0.00	0.00	0.00	0.00
15,000.00	89.70	270.24	7,924.13	220.19	-7,351.85	7,354.99	0.00	0.00	0.00	0.00
15,100.00	89.70	270.24	7,924.65	220.61	-7,451.85	7,454.97	0.00	0.00	0.00	0.00
15,200.00	89.70	270.24	7,925.17	221.02	-7,551.85	7,554.95	0.00	0.00	0.00	0.00
15,300.00	89.70	270.24	7,925.69	221.43	-7,651.85	7,654.93	0.00	0.00	0.00	0.00
15,400.00	89.70	270.24	7,926.20	221.85	-7,751.84	7,754.91	0.00	0.00	0.00	0.00
15,500.00	89.70	270.24	7,926.72	222.26	-7,851.84	7,854.89	0.00	0.00	0.00	0.00
15,600.00	89.70	270.24	7,927.24	222.67	-7,951.84	7,954.87	0.00	0.00	0.00	0.00
15,700.00	89.70	270.24	7,927.76	223.09	-8,051.84	8,054.85	0.00	0.00	0.00	0.00
15,800.00	89.70	270.24	7,928.28	223.50	-8,151.83	8,154.83	0.00	0.00	0.00	0.00
15,900.00	89.70	270.24	7,928.79	223.91	-8,251.83	8,254.81	0.00	0.00	0.00	0.00
16,000.00	89.70	270.24	7,929.31	224.33	-8,351.83	8,354.79	0.00	0.00	0.00	0.00
16,100.00	89.70	270.24	7,929.83	224.74	-8,451.83	8,454.77	0.00	0.00	0.00	0.00
16,200.00	89.70	270.24	7,930.35	225.15	-8,551.83	8,554.75	0.00	0.00	0.00	0.00
16,300.00	89.70	270.24	7,930.87	225.57	-8,651.82	8,654.73	0.00	0.00	0.00	0.00
16,400.00	89.70	270.24	7,931.38	225.98	-8,751.82	8,754.71	0.00	0.00	0.00	0.00
16,500.00	89.70	270.24	7,931.90	226.39	-8,851.82	8,854.69	0.00	0.00	0.00	0.00
16,600.00	89.70	270.24	7,932.42	226.81	-8,951.82	8,954.67	0.00	0.00	0.00	0.00
16,700.00	89.70	270.24	7,932.94	227.22	-9,051.81	9,054.65	0.00	0.00	0.00	0.00
16,800.00	89.70	270.24	7,933.46	227.63	-9,151.81	9,154.63	0.00	0.00	0.00	0.00
16,900.00	89.70	270.24	7,933.97	228.05	-9,251.81	9,254.61	0.00	0.00	0.00	0.00
17,000.00	89.70	270.24	7,934.49	228.46	-9,351.81	9,354.59	0.00	0.00	0.00	0.00
17,100.00	89.70	270.24	7,935.01	228.87	-9,451.81	9,454.57	0.00	0.00	0.00	0.00
17,200.00	89.70	270.24	7,935.53	229.29	-9,551.80	9,554.55	0.00	0.00	0.00	0.00
17,300.00	89.70	270.24	7,936.05	229.70	-9,651.80	9,654.53	0.00	0.00	0.00	0.00
17,400.00	89.70	270.24	7,936.57	230.11	-9,751.80	9,754.51	0.00	0.00	0.00	0.00
17,483.95	89.70	270.24	7,937.00	230.46	-9,835.75	9,838.45	0.00	0.00	0.00	0.00
Total Depth 17483.95 ft										

Plan Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
2,225.00	2,225.00	0.00	0.00	Begin Nudge @ 2225.00 ft
2,375.00	2,374.93	3.93	0.00	End Nudge @ 2375.00 ft
5,851.73	5,846.90	185.88	0.00	Begin Drop @ 5851.73 ft
6,001.73	5,996.83	189.81	0.00	End Drop @ 6001.73 ft
7,320.95	7,316.05	189.81	0.00	Kick Off Point @ 7320.95 ft
7,775.00	7,724.04	190.52	-170.69	Build Rate 10.00 °/100 ft
8,217.98	7,889.00	192.17	-569.99	End Build @ 8217.98 ft
17,483.95	7,937.00	230.46	-9,835.75	Total Depth 17483.95 ft

Vertical Section Information

Angle Type	Target	Azimuth (°)	Origin Type	Origin		Start TVD (usft)
				+N/_S (usft)	+E/-W (usft)	
Target	Eastern Hills 4-65 17-18 1H_RevA0(Lateral)_BHL Tgt	271.34	Slot	0.00	0.00	0.00

Survey tool program

From (usft)	To (usft)	Survey/Plan	Survey Tool
0.00	2,143.00	Rev A0	NS-GYRO-MS
2,143.00	17,483.95	Rev A0	MWD

## Plan Report for Eastern Hills 4-65 17-18 1H - Rev A0

### Casing Details

Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")
2,143.00	2,143.00	9 5/8" Casing Pt.	9-5/8	13-1/2

### Formation Details

Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
1,717.00	1,717.00	Fox Hills			
1,943.00	1,943.00	Pierre Shale			
2,143.00	2,143.00	Surface casing			
7,689.87	7,660.00	Sharon Springs			
7,835.23	7,764.00	Niobrara			
7,970.18	7,835.00	Niobrara B			
8,113.71	7,879.00	Niobrara C			

### Targets associated with this wellbore

Target Name	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Shape
Eastern Hills 4-65 17-18 1H_RevA0(Lateral)_EI	0.00	229.68	-9,699.00	Point
State-Smith 1-16_(500 ft Radius)	0.00	51.92	1,105.79	Circle
Eastern Hills 4-65 17-18 1H_SL	0.00	0.01	0.00	Polygon
Eastern Hills 4-65 17-18 1H_SB	0.00	0.01	0.00	Polygon
Eastern Hills 4-65 17-18 1H_RevA0(Lateral)_BI	7,937.00	230.46	-9,835.75	Point

### Directional Difficulty Index

Average Dogleg over Survey:	0.55 °/100usft	Maximum Dogleg over Survey:	10.00 °/100usft at 8,217.98 usft
Net Tortousity applicable to Plans:	0.55 °/100usft	Directional Difficulty Index:	6.461

### Audit Info

**North Reference Sheet for Sec. 17-T4S-R65W - Eastern Hills 4-65 17-18 1H - Plan A**  
**(Lateral)**

All data is in US Feet unless otherwise stated. Directions and Coordinates are relative to True North Reference .  
 Vertical Depths are relative to KB 24' @ 5642.70usft (H&P 280). Northing and Easting are relative to Eastern Hills 4-65 17-18 1H  
 Coordinate System is US State Plane 1983, Colorado Central 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° 0' 0.000 E°, Latitude Origin:39° 45' 0.000 N°  
 False Easting: 3,000,000.00usft, False Northing: 1,000,000.00usft, Scale Reduction: 0.99999213

Grid Coordinates of Well: 1,684,148.42 usft N, 3,230,705.87 usft E  
 Geographical Coordinates of Well: 39° 42' 32.15" N, 104° 40' 47.94" W  
 Grid Convergence at Surface is: 0.52°

Based upon Minimum Curvature type calculations, at a Measured Depth of 17,483.95usft  
 the Bottom Hole Displacement is 9,838.45usft in the Direction of 271.34° ( True).  
 Magnetic Convergence at surface is: -7.88° (24 July 2014, , BGGM2013)

