

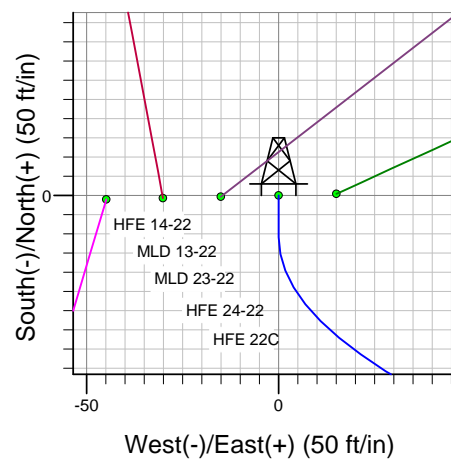
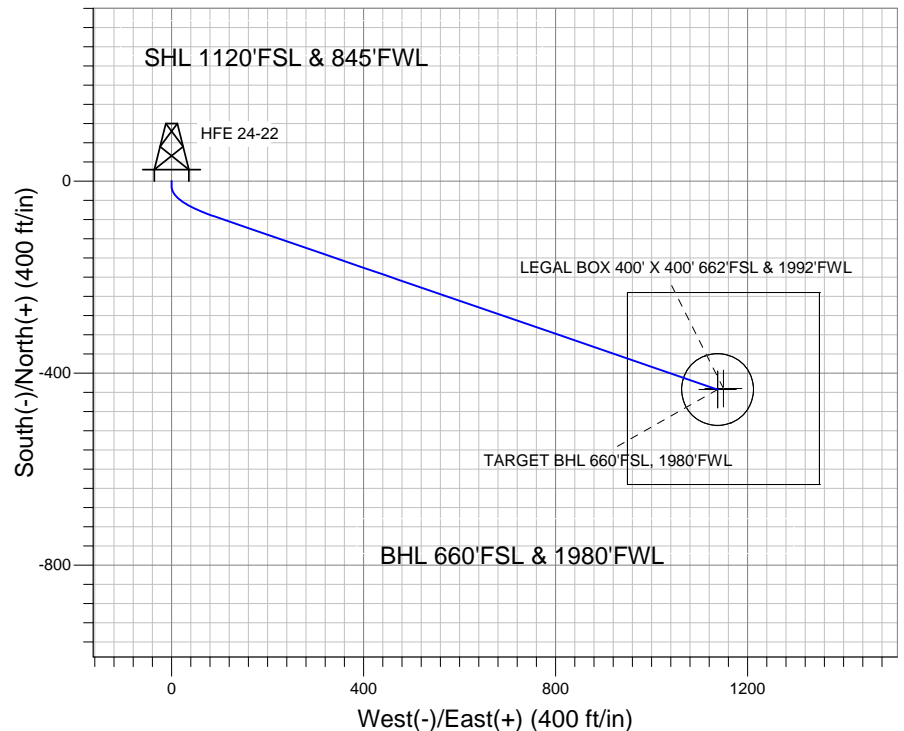
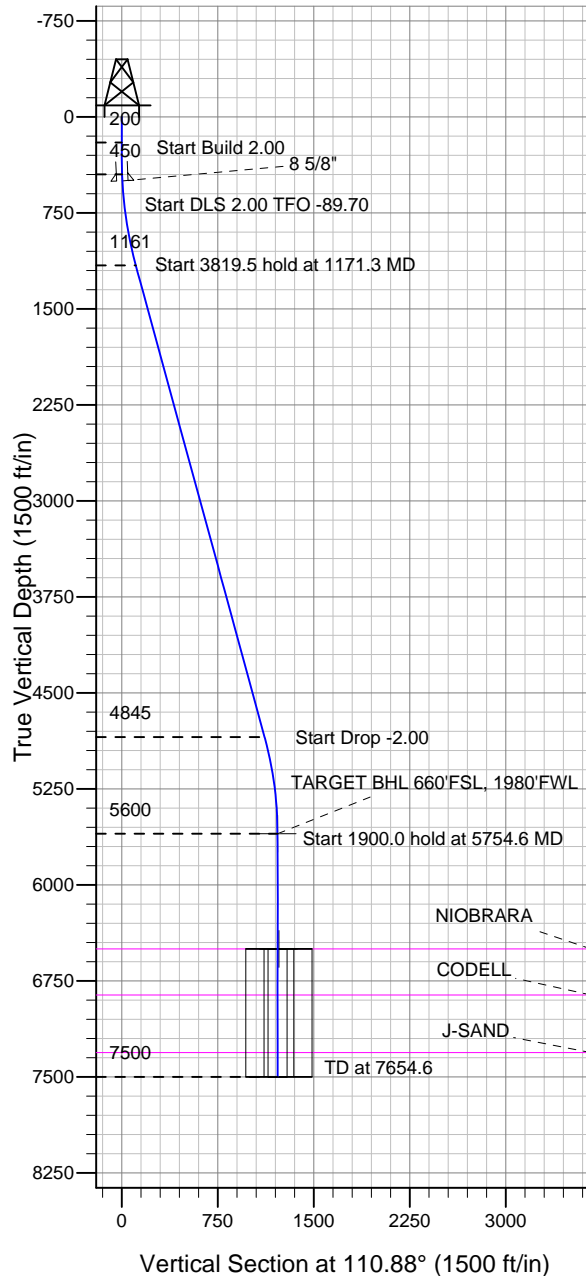
# ENSIGN

## Directional

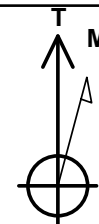
### Well Name: HFE 24-22

Surface Location: HFE 14-22 Pad Sec.22-T4N-R68W  
 North American Datum 1983 US State Plane 1983 Colorado Northern Zone  
 Ground Elevation: 4920.0  
 +N/-S +E/-W Northing Easting Latitude Longitude Slot  
 0.0 0.0 1350598.47 3140661.53 40.294695 -104.995731  
 Original Well Elev WELL @ 4933.0ft (Original Well Elev)

### Sundance Energy, Weld County, CO



HFE 14-22 Pad Sec.22-T4N-R68W  
 HFE 24-22  
 Plan #1 (4-10-12)  
 11:38, April 11 2012



Azimuths to True North  
 Magnetic North: 8.87°

Magnetic Field  
 Strength: 52963.5nT  
 Dip Angle: 66.90°  
 Date: 4/11/2012  
 Model: IGRF2010

### WELLBORE TARGET DETAILS (LAT/LONG)

Name	TVD	+N/-S	+E/-W	Latitude	Longitude	Shape
TARGET BHL 660'FSL, 1980'FWL	5600.0	-433.9	1137.6	40.293504	-104.991653	Point
LEGAL BOX 400' X 400' 662'FSL & 1992'FWL	6500.0	-431.9	1149.6	40.293509	-104.991610	Rectangle (Sides: L400.0 W400.0)
TARGET CIRCLE 660'FSL & 1980'FWL	6500.0	-433.9	1137.6	40.293504	-104.991653	Circle (Radius: 75.0)

### SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	DLeg	TFace	VSec	Target
1	0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.0	
2	200.0	0.00	0.00	200.0	0.0	0.0	0.00	0.00	0.0	
3	450.0	5.00	180.00	449.7	-10.9	0.0	2.00	180.00	3.9	
4	1171.3	15.28	108.98	1160.6	-73.6	90.3	2.00	-89.70	110.6	
5	4990.9	15.28	108.98	4845.2	-400.9	1041.9	0.00	0.00	1116.4	
6	5754.6	0.00	0.00	5600.0	-433.9	1137.6	2.00	180.00	1217.5	TARGET BHL 660'FSL, 1980'FWL
7	7654.6	0.00	0.00	7500.0	-433.9	1137.6	0.00	0.00	1217.5	



## **Directional**

### **Sundance Energy, Weld County, CO**

**SEC.22-T4N-R68W**

**HFE 14-22 Pad Sec.22-T4N-R68W**

**HFE 24-22**

**Wellbore #1**

**Plan: Plan #1 (4-10-12)**

### **Standard Planning Report**

**11 April, 2012**

Plan Sections										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	TFO (°)	Target
0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.00	0.00	
200.0	0.00	0.00	200.0	0.0	0.0	0.00	0.00	0.00	0.00	
450.0	5.00	180.00	449.7	-10.9	0.0	2.00	2.00	0.00	180.00	
1,171.3	15.28	108.98	1,160.6	-73.6	90.3	2.00	1.42	-9.85	-89.70	
4,990.9	15.28	108.98	4,845.2	-400.9	1,041.9	0.00	0.00	0.00	0.00	
5,754.6	0.00	0.00	5,600.0	-433.9	1,137.6	2.00	-2.00	0.00	180.00	TARGET BHL 660°
7,654.6	0.00	0.00	7,500.0	-433.9	1,137.6	0.00	0.00	0.00	0.00	

<b>Database:</b>	Landmark	<b>Local Co-ordinate Reference:</b>	Well HFE 24-22
<b>Company:</b>	Sundance Energy, Weld County, CO	<b>TVD Reference:</b>	WELL @ 4933.0ft (Original Well Elev)
<b>Project:</b>	SEC.22-T4N-R68W	<b>MD Reference:</b>	WELL @ 4933.0ft (Original Well Elev)
<b>Site:</b>	HFE 14-22 Pad Sec.22-T4N-R68W	<b>North Reference:</b>	True
<b>Well:</b>	HFE 24-22	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Wellbore #1		
<b>Design:</b>	Plan #1 (4-10-12)		

Planned Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00	0.00
40.0	0.00	0.00	40.0	0.0	0.0	0.0	0.00	0.00	0.00
80.0	0.00	0.00	80.0	0.0	0.0	0.0	0.00	0.00	0.00
120.0	0.00	0.00	120.0	0.0	0.0	0.0	0.00	0.00	0.00
160.0	0.00	0.00	160.0	0.0	0.0	0.0	0.00	0.00	0.00
200.0	0.00	0.00	200.0	0.0	0.0	0.0	0.00	0.00	0.00
240.0	0.80	180.00	240.0	-0.3	0.0	0.1	2.00	2.00	0.00
280.0	1.60	180.00	280.0	-1.1	0.0	0.4	2.00	2.00	0.00
320.0	2.40	180.00	320.0	-2.5	0.0	0.9	2.00	2.00	0.00
360.0	3.20	180.00	359.9	-4.5	0.0	1.6	2.00	2.00	0.00
400.0	4.00	180.00	399.8	-7.0	0.0	2.5	2.00	2.00	0.00
440.0	4.80	180.00	439.7	-10.0	0.0	3.6	2.00	2.00	0.00
450.0	5.00	180.00	449.7	-10.9	0.0	3.9	2.00	2.00	0.00
480.0	5.04	173.15	479.6	-13.5	0.2	5.0	2.00	0.13	-22.82
500.5	5.11	168.57	500.0	-15.3	0.4	5.9	2.00	0.33	-22.32
8 5/8"									
520.0	5.20	164.36	519.4	-17.0	0.9	6.9	2.00	0.48	-21.63
560.0	5.47	156.26	559.2	-20.5	2.1	9.3	2.00	0.68	-20.24
600.0	5.84	149.06	599.0	-24.0	3.9	12.2	2.00	0.93	-18.00
640.0	6.29	142.80	638.8	-27.5	6.3	15.7	2.00	1.13	-15.65
680.0	6.81	137.43	678.6	-31.0	9.2	19.7	2.00	1.29	-13.43
720.0	7.37	132.84	718.3	-34.5	12.7	24.2	2.00	1.41	-11.47
760.0	7.98	128.92	757.9	-38.0	16.8	29.2	2.00	1.51	-9.79
800.0	8.62	125.57	797.5	-41.4	21.4	34.7	2.00	1.59	-8.39
840.0	9.28	122.68	837.0	-44.9	26.5	40.8	2.00	1.66	-7.22
880.0	9.96	120.18	876.4	-48.4	32.2	47.3	2.00	1.71	-6.25
920.0	10.66	118.00	915.8	-51.9	38.5	54.4	2.00	1.75	-5.45
960.0	11.37	116.09	955.0	-55.4	45.3	62.0	2.00	1.78	-4.78
1,000.0	12.09	114.40	994.2	-58.8	52.6	70.1	2.00	1.81	-4.22
1,040.0	12.83	112.90	1,033.3	-62.3	60.5	78.8	2.00	1.83	-3.75
1,080.0	13.57	111.56	1,072.2	-65.7	69.0	87.9	2.00	1.85	-3.35
1,120.0	14.31	110.36	1,111.0	-69.2	78.0	97.5	2.00	1.86	-3.01
1,160.0	15.06	109.27	1,149.7	-72.6	87.5	107.7	2.00	1.88	-2.71
1,171.3	15.28	108.98	1,160.6	-73.6	90.3	110.6	2.00	1.89	-2.55
1,200.0	15.28	108.98	1,188.3	-76.0	97.5	118.2	0.00	0.00	0.00
1,240.0	15.28	108.98	1,226.9	-79.5	107.4	128.7	0.00	0.00	0.00
1,280.0	15.28	108.98	1,265.5	-82.9	117.4	139.2	0.00	0.00	0.00
1,320.0	15.28	108.98	1,304.1	-86.3	127.4	149.8	0.00	0.00	0.00
1,360.0	15.28	108.98	1,342.7	-89.7	137.3	160.3	0.00	0.00	0.00
1,400.0	15.28	108.98	1,381.2	-93.2	147.3	170.8	0.00	0.00	0.00
1,440.0	15.28	108.98	1,419.8	-96.6	157.3	181.4	0.00	0.00	0.00
1,480.0	15.28	108.98	1,458.4	-100.0	167.2	191.9	0.00	0.00	0.00
1,520.0	15.28	108.98	1,497.0	-103.5	177.2	202.4	0.00	0.00	0.00
1,560.0	15.28	108.98	1,535.6	-106.9	187.2	213.0	0.00	0.00	0.00
1,600.0	15.28	108.98	1,574.2	-110.3	197.1	223.5	0.00	0.00	0.00
1,640.0	15.28	108.98	1,612.8	-113.7	207.1	234.0	0.00	0.00	0.00
1,680.0	15.28	108.98	1,651.4	-117.2	217.1	244.6	0.00	0.00	0.00
1,720.0	15.28	108.98	1,689.9	-120.6	227.0	255.1	0.00	0.00	0.00
1,760.0	15.28	108.98	1,728.5	-124.0	237.0	265.6	0.00	0.00	0.00
1,800.0	15.28	108.98	1,767.1	-127.5	247.0	276.2	0.00	0.00	0.00
1,840.0	15.28	108.98	1,805.7	-130.9	256.9	286.7	0.00	0.00	0.00
1,880.0	15.28	108.98	1,844.3	-134.3	266.9	297.2	0.00	0.00	0.00
1,920.0	15.28	108.98	1,882.9	-137.7	276.8	307.8	0.00	0.00	0.00
1,960.0	15.28	108.98	1,921.5	-141.2	286.8	318.3	0.00	0.00	0.00

<b>Database:</b>	Landmark	<b>Local Co-ordinate Reference:</b>	Well HFE 24-22
<b>Company:</b>	Sundance Energy, Weld County, CO	<b>TVD Reference:</b>	WELL @ 4933.0ft (Original Well Elev)
<b>Project:</b>	SEC.22-T4N-R68W	<b>MD Reference:</b>	WELL @ 4933.0ft (Original Well Elev)
<b>Site:</b>	HFE 14-22 Pad Sec.22-T4N-R68W	<b>North Reference:</b>	True
<b>Well:</b>	HFE 24-22	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Wellbore #1		
<b>Design:</b>	Plan #1 (4-10-12)		

Planned Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
2,000.0	15.28	108.98	1,960.1	-144.6	296.8	328.8	0.00	0.00	0.00
2,040.0	15.28	108.98	1,998.6	-148.0	306.7	339.4	0.00	0.00	0.00
2,080.0	15.28	108.98	2,037.2	-151.5	316.7	349.9	0.00	0.00	0.00
2,120.0	15.28	108.98	2,075.8	-154.9	326.7	360.4	0.00	0.00	0.00
2,160.0	15.28	108.98	2,114.4	-158.3	336.6	371.0	0.00	0.00	0.00
2,200.0	15.28	108.98	2,153.0	-161.7	346.6	381.5	0.00	0.00	0.00
2,240.0	15.28	108.98	2,191.6	-165.2	356.6	392.0	0.00	0.00	0.00
2,280.0	15.28	108.98	2,230.2	-168.6	366.5	402.6	0.00	0.00	0.00
2,320.0	15.28	108.98	2,268.7	-172.0	376.5	413.1	0.00	0.00	0.00
2,360.0	15.28	108.98	2,307.3	-175.5	386.5	423.6	0.00	0.00	0.00
2,400.0	15.28	108.98	2,345.9	-178.9	396.4	434.2	0.00	0.00	0.00
2,440.0	15.28	108.98	2,384.5	-182.3	406.4	444.7	0.00	0.00	0.00
2,480.0	15.28	108.98	2,423.1	-185.7	416.4	455.2	0.00	0.00	0.00
2,520.0	15.28	108.98	2,461.7	-189.2	426.3	465.7	0.00	0.00	0.00
2,560.0	15.28	108.98	2,500.3	-192.6	436.3	476.3	0.00	0.00	0.00
2,600.0	15.28	108.98	2,538.9	-196.0	446.3	486.8	0.00	0.00	0.00
2,640.0	15.28	108.98	2,577.4	-199.4	456.2	497.3	0.00	0.00	0.00
2,680.0	15.28	108.98	2,616.0	-202.9	466.2	507.9	0.00	0.00	0.00
2,720.0	15.28	108.98	2,654.6	-206.3	476.2	518.4	0.00	0.00	0.00
2,760.0	15.28	108.98	2,693.2	-209.7	486.1	528.9	0.00	0.00	0.00
2,800.0	15.28	108.98	2,731.8	-213.2	496.1	539.5	0.00	0.00	0.00
2,840.0	15.28	108.98	2,770.4	-216.6	506.0	550.0	0.00	0.00	0.00
2,880.0	15.28	108.98	2,809.0	-220.0	516.0	560.5	0.00	0.00	0.00
2,920.0	15.28	108.98	2,847.5	-223.4	526.0	571.1	0.00	0.00	0.00
2,960.0	15.28	108.98	2,886.1	-226.9	535.9	581.6	0.00	0.00	0.00
3,000.0	15.28	108.98	2,924.7	-230.3	545.9	592.1	0.00	0.00	0.00
3,040.0	15.28	108.98	2,963.3	-233.7	555.9	602.7	0.00	0.00	0.00
3,080.0	15.28	108.98	3,001.9	-237.2	565.8	613.2	0.00	0.00	0.00
3,120.0	15.28	108.98	3,040.5	-240.6	575.8	623.7	0.00	0.00	0.00
3,160.0	15.28	108.98	3,079.1	-244.0	585.8	634.3	0.00	0.00	0.00
3,200.0	15.28	108.98	3,117.7	-247.4	595.7	644.8	0.00	0.00	0.00
3,240.0	15.28	108.98	3,156.2	-250.9	605.7	655.3	0.00	0.00	0.00
3,280.0	15.28	108.98	3,194.8	-254.3	615.7	665.9	0.00	0.00	0.00
3,320.0	15.28	108.98	3,233.4	-257.7	625.6	676.4	0.00	0.00	0.00
3,360.0	15.28	108.98	3,272.0	-261.2	635.6	686.9	0.00	0.00	0.00
3,400.0	15.28	108.98	3,310.6	-264.6	645.6	697.5	0.00	0.00	0.00
3,440.0	15.28	108.98	3,349.2	-268.0	655.5	708.0	0.00	0.00	0.00
3,480.0	15.28	108.98	3,387.8	-271.4	665.5	718.5	0.00	0.00	0.00
3,520.0	15.28	108.98	3,426.3	-274.9	675.5	729.1	0.00	0.00	0.00
3,560.0	15.28	108.98	3,464.9	-278.3	685.4	739.6	0.00	0.00	0.00
3,600.0	15.28	108.98	3,503.5	-281.7	695.4	750.1	0.00	0.00	0.00
3,640.0	15.28	108.98	3,542.1	-285.2	705.4	760.7	0.00	0.00	0.00
3,680.0	15.28	108.98	3,580.7	-288.6	715.3	771.2	0.00	0.00	0.00
3,720.0	15.28	108.98	3,619.3	-292.0	725.3	781.7	0.00	0.00	0.00
3,760.0	15.28	108.98	3,657.9	-295.4	735.2	792.3	0.00	0.00	0.00
3,800.0	15.28	108.98	3,696.5	-298.9	745.2	802.8	0.00	0.00	0.00
3,840.0	15.28	108.98	3,735.0	-302.3	755.2	813.3	0.00	0.00	0.00
3,880.0	15.28	108.98	3,773.6	-305.7	765.1	823.9	0.00	0.00	0.00
3,920.0	15.28	108.98	3,812.2	-309.2	775.1	834.4	0.00	0.00	0.00
3,960.0	15.28	108.98	3,850.8	-312.6	785.1	844.9	0.00	0.00	0.00
4,000.0	15.28	108.98	3,889.4	-316.0	795.0	855.5	0.00	0.00	0.00
4,040.0	15.28	108.98	3,928.0	-319.4	805.0	866.0	0.00	0.00	0.00
4,080.0	15.28	108.98	3,966.6	-322.9	815.0	876.5	0.00	0.00	0.00
4,120.0	15.28	108.98	4,005.2	-326.3	824.9	887.1	0.00	0.00	0.00

<b>Database:</b>	Landmark	<b>Local Co-ordinate Reference:</b>	Well HFE 24-22
<b>Company:</b>	Sundance Energy, Weld County, CO	<b>TVD Reference:</b>	WELL @ 4933.0ft (Original Well Elev)
<b>Project:</b>	SEC.22-T4N-R68W	<b>MD Reference:</b>	WELL @ 4933.0ft (Original Well Elev)
<b>Site:</b>	HFE 14-22 Pad Sec.22-T4N-R68W	<b>North Reference:</b>	True
<b>Well:</b>	HFE 24-22	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Wellbore #1		
<b>Design:</b>	Plan #1 (4-10-12)		

Planned Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
4,160.0	15.28	108.98	4,043.7	-329.7	834.9	897.6	0.00	0.00	0.00
4,200.0	15.28	108.98	4,082.3	-333.1	844.9	908.1	0.00	0.00	0.00
4,240.0	15.28	108.98	4,120.9	-336.6	854.8	918.7	0.00	0.00	0.00
4,280.0	15.28	108.98	4,159.5	-340.0	864.8	929.2	0.00	0.00	0.00
4,320.0	15.28	108.98	4,198.1	-343.4	874.8	939.7	0.00	0.00	0.00
4,360.0	15.28	108.98	4,236.7	-346.9	884.7	950.3	0.00	0.00	0.00
4,400.0	15.28	108.98	4,275.3	-350.3	894.7	960.8	0.00	0.00	0.00
4,440.0	15.28	108.98	4,313.8	-353.7	904.7	971.3	0.00	0.00	0.00
4,480.0	15.28	108.98	4,352.4	-357.1	914.6	981.8	0.00	0.00	0.00
4,520.0	15.28	108.98	4,391.0	-360.6	924.6	992.4	0.00	0.00	0.00
4,560.0	15.28	108.98	4,429.6	-364.0	934.6	1,002.9	0.00	0.00	0.00
4,600.0	15.28	108.98	4,468.2	-367.4	944.5	1,013.4	0.00	0.00	0.00
4,640.0	15.28	108.98	4,506.8	-370.9	954.5	1,024.0	0.00	0.00	0.00
4,680.0	15.28	108.98	4,545.4	-374.3	964.4	1,034.5	0.00	0.00	0.00
4,720.0	15.28	108.98	4,584.0	-377.7	974.4	1,045.0	0.00	0.00	0.00
4,760.0	15.28	108.98	4,622.5	-381.1	984.4	1,055.6	0.00	0.00	0.00
4,800.0	15.28	108.98	4,661.1	-384.6	994.3	1,066.1	0.00	0.00	0.00
4,840.0	15.28	108.98	4,699.7	-388.0	1,004.3	1,076.6	0.00	0.00	0.00
4,880.0	15.28	108.98	4,738.3	-391.4	1,014.3	1,087.2	0.00	0.00	0.00
4,920.0	15.28	108.98	4,776.9	-394.9	1,024.2	1,097.7	0.00	0.00	0.00
4,960.0	15.28	108.98	4,815.5	-398.3	1,034.2	1,108.2	0.00	0.00	0.00
4,990.9	15.28	108.98	4,845.2	-400.9	1,041.9	1,116.4	0.00	0.00	0.00
5,000.0	15.09	108.98	4,854.1	-401.7	1,044.2	1,118.8	2.00	-2.00	0.00
5,040.0	14.29	108.98	4,892.8	-405.0	1,053.8	1,128.9	2.00	-2.00	0.00
5,080.0	13.49	108.98	4,931.6	-408.1	1,062.8	1,138.5	2.00	-2.00	0.00
5,120.0	12.69	108.98	4,970.5	-411.1	1,071.4	1,147.6	2.00	-2.00	0.00
5,160.0	11.89	108.98	5,009.6	-413.9	1,079.5	1,156.1	2.00	-2.00	0.00
5,200.0	11.09	108.98	5,048.8	-416.4	1,087.0	1,164.0	2.00	-2.00	0.00
5,240.0	10.29	108.98	5,088.1	-418.9	1,094.0	1,171.4	2.00	-2.00	0.00
5,280.0	9.49	108.98	5,127.5	-421.1	1,100.5	1,178.3	2.00	-2.00	0.00
5,320.0	8.69	108.98	5,167.0	-423.1	1,106.5	1,184.6	2.00	-2.00	0.00
5,360.0	7.89	108.98	5,206.6	-425.0	1,111.9	1,190.4	2.00	-2.00	0.00
5,400.0	7.09	108.98	5,246.3	-426.7	1,116.9	1,195.6	2.00	-2.00	0.00
5,440.0	6.29	108.98	5,286.0	-428.2	1,121.3	1,200.3	2.00	-2.00	0.00
5,480.0	5.49	108.98	5,325.8	-429.6	1,125.2	1,204.4	2.00	-2.00	0.00
5,520.0	4.69	108.98	5,365.6	-430.7	1,128.5	1,207.9	2.00	-2.00	0.00
5,560.0	3.89	108.98	5,405.5	-431.7	1,131.4	1,210.9	2.00	-2.00	0.00
5,600.0	3.09	108.98	5,445.4	-432.5	1,133.7	1,213.4	2.00	-2.00	0.00
5,640.0	2.29	108.98	5,485.4	-433.1	1,135.4	1,215.2	2.00	-2.00	0.00
5,680.0	1.49	108.98	5,525.4	-433.5	1,136.7	1,216.6	2.00	-2.00	0.00
5,720.0	0.69	108.98	5,565.4	-433.8	1,137.4	1,217.3	2.00	-2.00	0.00
5,754.6	0.00	0.00	5,600.0	-433.9	1,137.6	1,217.5	2.00	-2.00	0.00
<b>TARGET BHL 660'FSL, 1980'FWL</b>									
5,760.0	0.00	0.00	5,605.4	-433.9	1,137.6	1,217.5	0.00	0.00	0.00
5,800.0	0.00	0.00	5,645.4	-433.9	1,137.6	1,217.5	0.00	0.00	0.00
5,840.0	0.00	0.00	5,685.4	-433.9	1,137.6	1,217.5	0.00	0.00	0.00
5,880.0	0.00	0.00	5,725.4	-433.9	1,137.6	1,217.5	0.00	0.00	0.00
5,920.0	0.00	0.00	5,765.4	-433.9	1,137.6	1,217.5	0.00	0.00	0.00
5,960.0	0.00	0.00	5,805.4	-433.9	1,137.6	1,217.5	0.00	0.00	0.00
6,000.0	0.00	0.00	5,845.4	-433.9	1,137.6	1,217.5	0.00	0.00	0.00
6,040.0	0.00	0.00	5,885.4	-433.9	1,137.6	1,217.5	0.00	0.00	0.00
6,080.0	0.00	0.00	5,925.4	-433.9	1,137.6	1,217.5	0.00	0.00	0.00
6,120.0	0.00	0.00	5,965.4	-433.9	1,137.6	1,217.5	0.00	0.00	0.00
6,160.0	0.00	0.00	6,005.4	-433.9	1,137.6	1,217.5	0.00	0.00	0.00

<b>Database:</b>	Landmark	<b>Local Co-ordinate Reference:</b>	Well HFE 24-22
<b>Company:</b>	Sundance Energy, Weld County, CO	<b>TVD Reference:</b>	WELL @ 4933.0ft (Original Well Elev)
<b>Project:</b>	SEC.22-T4N-R68W	<b>MD Reference:</b>	WELL @ 4933.0ft (Original Well Elev)
<b>Site:</b>	HFE 14-22 Pad Sec.22-T4N-R68W	<b>North Reference:</b>	True
<b>Well:</b>	HFE 24-22	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Wellbore #1		
<b>Design:</b>	Plan #1 (4-10-12)		

Planned Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
6,200.0	0.00	0.00	6,045.4	-433.9	1,137.6	1,217.5	0.00	0.00	0.00
6,240.0	0.00	0.00	6,085.4	-433.9	1,137.6	1,217.5	0.00	0.00	0.00
6,280.0	0.00	0.00	6,125.4	-433.9	1,137.6	1,217.5	0.00	0.00	0.00
6,320.0	0.00	0.00	6,165.4	-433.9	1,137.6	1,217.5	0.00	0.00	0.00
6,360.0	0.00	0.00	6,205.4	-433.9	1,137.6	1,217.5	0.00	0.00	0.00
6,400.0	0.00	0.00	6,245.4	-433.9	1,137.6	1,217.5	0.00	0.00	0.00
6,440.0	0.00	0.00	6,285.4	-433.9	1,137.6	1,217.5	0.00	0.00	0.00
6,480.0	0.00	0.00	6,325.4	-433.9	1,137.6	1,217.5	0.00	0.00	0.00
6,520.0	0.00	0.00	6,365.4	-433.9	1,137.6	1,217.5	0.00	0.00	0.00
6,560.0	0.00	0.00	6,405.4	-433.9	1,137.6	1,217.5	0.00	0.00	0.00
6,600.0	0.00	0.00	6,445.4	-433.9	1,137.6	1,217.5	0.00	0.00	0.00
6,640.0	0.00	0.00	6,485.4	-433.9	1,137.6	1,217.5	0.00	0.00	0.00
6,654.6	0.00	0.00	6,500.0	-433.9	1,137.6	1,217.5	0.00	0.00	0.00
<b>NIORARA - TARGET CIRCLE 660'FSL &amp; 1980'FWL - LEGAL BOX 400' X 400' 662'FSL &amp; 1992'FWL</b>									
6,680.0	0.00	0.00	6,525.4	-433.9	1,137.6	1,217.5	0.00	0.00	0.00
6,720.0	0.00	0.00	6,565.4	-433.9	1,137.6	1,217.5	0.00	0.00	0.00
6,760.0	0.00	0.00	6,605.4	-433.9	1,137.6	1,217.5	0.00	0.00	0.00
6,800.0	0.00	0.00	6,645.4	-433.9	1,137.6	1,217.5	0.00	0.00	0.00
6,840.0	0.00	0.00	6,685.4	-433.9	1,137.6	1,217.5	0.00	0.00	0.00
6,880.0	0.00	0.00	6,725.4	-433.9	1,137.6	1,217.5	0.00	0.00	0.00
6,920.0	0.00	0.00	6,765.4	-433.9	1,137.6	1,217.5	0.00	0.00	0.00
6,960.0	0.00	0.00	6,805.4	-433.9	1,137.6	1,217.5	0.00	0.00	0.00
7,000.0	0.00	0.00	6,845.4	-433.9	1,137.6	1,217.5	0.00	0.00	0.00
7,014.6	0.00	0.00	6,860.0	-433.9	1,137.6	1,217.5	0.00	0.00	0.00
<b>CODELL</b>									
7,040.0	0.00	0.00	6,885.4	-433.9	1,137.6	1,217.5	0.00	0.00	0.00
7,080.0	0.00	0.00	6,925.4	-433.9	1,137.6	1,217.5	0.00	0.00	0.00
7,120.0	0.00	0.00	6,965.4	-433.9	1,137.6	1,217.5	0.00	0.00	0.00
7,160.0	0.00	0.00	7,005.4	-433.9	1,137.6	1,217.5	0.00	0.00	0.00
7,200.0	0.00	0.00	7,045.4	-433.9	1,137.6	1,217.5	0.00	0.00	0.00
7,240.0	0.00	0.00	7,085.4	-433.9	1,137.6	1,217.5	0.00	0.00	0.00
7,280.0	0.00	0.00	7,125.4	-433.9	1,137.6	1,217.5	0.00	0.00	0.00
7,320.0	0.00	0.00	7,165.4	-433.9	1,137.6	1,217.5	0.00	0.00	0.00
7,360.0	0.00	0.00	7,205.4	-433.9	1,137.6	1,217.5	0.00	0.00	0.00
7,400.0	0.00	0.00	7,245.4	-433.9	1,137.6	1,217.5	0.00	0.00	0.00
7,440.0	0.00	0.00	7,285.4	-433.9	1,137.6	1,217.5	0.00	0.00	0.00
7,464.6	0.00	0.00	7,310.0	-433.9	1,137.6	1,217.5	0.00	0.00	0.00
<b>J-SAND</b>									
7,480.0	0.00	0.00	7,325.4	-433.9	1,137.6	1,217.5	0.00	0.00	0.00
7,520.0	0.00	0.00	7,365.4	-433.9	1,137.6	1,217.5	0.00	0.00	0.00
7,560.0	0.00	0.00	7,405.4	-433.9	1,137.6	1,217.5	0.00	0.00	0.00
7,600.0	0.00	0.00	7,445.4	-433.9	1,137.6	1,217.5	0.00	0.00	0.00
7,640.0	0.00	0.00	7,485.4	-433.9	1,137.6	1,217.5	0.00	0.00	0.00
7,654.6	0.00	0.00	7,500.0	-433.9	1,137.6	1,217.5	0.00	0.00	0.00

Casing Points					
Measured Depth (ft)	Vertical Depth (ft)	Name		Casing Diameter (")	Hole Diameter (")
500.5	500.0	8 5/8"		8-5/8	12-1/4

<b>Database:</b>	Landmark	<b>Local Co-ordinate Reference:</b>	Well HFE 24-22
<b>Company:</b>	Sundance Energy, Weld County, CO	<b>TVD Reference:</b>	WELL @ 4933.0ft (Original Well Elev)
<b>Project:</b>	SEC.22-T4N-R68W	<b>MD Reference:</b>	WELL @ 4933.0ft (Original Well Elev)
<b>Site:</b>	HFE 14-22 Pad Sec.22-T4N-R68W	<b>North Reference:</b>	True
<b>Well:</b>	HFE 24-22	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Wellbore #1		
<b>Design:</b>	Plan #1 (4-10-12)		

Formations						
	Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)
	6,654.6	6,500.0	NIOBRARA		0.00	
	7,014.6	6,860.0	CODELL		0.00	
	7,464.6	7,310.0	J-SAND		0.00	





## **Directional**

### **Sundance Energy, Weld County, CO**

**SEC.22-T4N-R68W**

**HFE 14-22 Pad Sec.22-T4N-R68W**

**HFE 24-22**

**Wellbore #1**

**Plan #1 (4-10-12)**

### **Anticollision Report**

**11 April, 2012**



HFE 14-22 Pad Sec.22-T4N-R68W - HFE 22C - Wellbore #1 - Plan #1 (4-10-12)													Offset Site Error: 0.0 ft	
Survey Program: 0-MWD													Offset Well Error: 0.0 ft	
Reference		Offset		Semi Major Axis			Distance							
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning	
1,800.0	1,767.1	1,785.2	1,777.7	6.6	4.2	-149.14	40.6	102.7	221.8	213.0	8.80	25.212		
1,900.0	1,863.6	1,883.5	1,874.3	7.2	4.6	-148.08	48.2	119.3	239.5	230.0	9.54	25.117		
2,000.0	1,960.1	1,981.8	1,970.9	7.7	4.9	-147.17	55.9	136.0	257.3	247.0	10.29	25.000		
2,100.0	2,056.5	2,080.2	2,067.5	8.3	5.3	-146.37	63.5	152.6	275.1	264.1	11.06	24.872		
2,200.0	2,153.0	2,178.5	2,164.1	8.8	5.7	-145.67	71.2	169.3	293.0	281.1	11.84	24.740		
2,300.0	2,249.5	2,276.8	2,260.7	9.4	6.1	-145.06	78.8	185.9	310.9	298.3	12.63	24.609		
2,400.0	2,345.9	2,375.1	2,357.3	10.0	6.4	-144.51	86.5	202.6	328.9	315.4	13.43	24.483		
2,500.0	2,442.4	2,473.5	2,453.9	10.5	6.8	-144.01	94.1	219.2	346.8	332.6	14.24	24.361		
2,600.0	2,538.9	2,571.8	2,550.5	11.1	7.2	-143.57	101.7	235.8	364.8	349.8	15.05	24.246		
2,700.0	2,635.3	2,670.1	2,647.2	11.7	7.6	-143.16	109.4	252.5	382.8	367.0	15.86	24.136		
2,800.0	2,731.8	2,768.5	2,743.8	12.2	8.0	-142.80	117.0	269.1	400.9	384.2	16.68	24.033		
2,900.0	2,828.3	2,866.8	2,840.4	12.8	8.4	-142.46	124.7	285.8	418.9	401.4	17.50	23.936		
3,000.0	2,924.7	2,965.1	2,937.0	13.4	8.8	-142.15	132.3	302.4	437.0	418.7	18.33	23.845		
3,100.0	3,021.2	3,063.4	3,033.6	13.9	9.2	-141.87	140.0	319.1	455.1	435.9	19.15	23.758		
3,200.0	3,117.7	3,161.8	3,130.2	14.5	9.6	-141.61	147.6	335.7	473.1	453.2	19.98	23.678		
3,300.0	3,214.1	3,260.1	3,226.8	15.0	10.0	-141.37	155.2	352.4	491.2	470.4	20.81	23.601		
3,400.0	3,310.6	3,358.4	3,323.4	15.6	10.4	-141.14	162.9	369.0	509.3	487.7	21.65	23.529		
3,500.0	3,407.1	3,456.8	3,420.0	16.2	10.8	-140.93	170.5	385.7	527.4	504.9	22.48	23.462		
3,600.0	3,503.5	3,555.1	3,516.6	16.7	11.2	-140.74	178.2	402.3	545.5	522.2	23.32	23.398		
3,700.0	3,600.0	3,653.4	3,613.2	17.3	11.6	-140.55	185.8	418.9	563.7	539.5	24.15	23.337		
3,800.0	3,696.5	3,750.6	3,708.8	17.9	12.0	-140.42	193.2	435.1	581.8	556.9	24.95	23.315		
3,900.0	3,792.9	3,846.2	3,803.2	18.5	12.3	-140.55	199.4	448.6	600.4	574.7	25.64	23.412		
4,000.0	3,889.4	3,941.4	3,897.7	19.0	12.5	-140.97	204.3	459.1	619.4	593.1	26.23	23.612		
4,100.0	3,985.9	4,036.1	3,992.0	19.6	12.7	-141.65	207.8	466.8	638.9	612.2	26.74	23.895		
4,200.0	4,082.3	4,130.0	4,085.8	20.2	12.9	-142.56	210.0	471.6	659.1	631.9	27.17	24.261		
4,300.0	4,178.8	4,223.0	4,178.8	20.7	13.0	-143.66	210.9	473.6	680.0	652.5	27.52	24.710		
4,400.0	4,275.3	4,318.5	4,274.3	21.3	13.2	-144.90	210.9	473.7	701.6	673.8	27.82	25.216		
4,500.0	4,371.7	4,415.0	4,370.7	21.9	13.3	-146.08	210.9	473.7	723.6	695.4	28.14	25.713		
4,600.0	4,468.2	4,511.5	4,467.2	22.4	13.5	-147.20	210.9	473.7	745.8	717.3	28.46	26.206		
4,700.0	4,564.7	4,607.9	4,563.7	23.0	13.6	-148.26	210.9	473.7	768.3	739.5	28.78	26.692		
4,800.0	4,661.1	4,704.4	4,660.1	23.6	13.8	-149.25	210.9	473.7	791.0	761.9	29.11	27.171		
4,900.0	4,757.6	4,800.9	4,756.6	24.1	13.9	-150.19	210.9	473.7	814.0	784.6	29.45	27.642		
4,990.9	4,845.2	4,888.5	4,844.2	24.6	14.1	-151.00	210.9	473.7	835.0	805.3	29.76	28.062		
5,000.0	4,854.1	4,897.3	4,853.1	24.7	14.1	-151.10	210.9	473.7	837.1	807.4	29.79	28.104		
5,100.0	4,951.1	4,994.3	4,950.1	25.1	14.2	-152.09	210.9	473.7	858.7	828.6	30.10	28.529		
5,200.0	5,048.8	5,092.1	5,047.8	25.5	14.4	-152.90	210.9	473.7	877.4	847.0	30.41	28.854		
5,300.0	5,147.3	5,190.5	5,146.3	25.8	14.6	-153.55	210.9	473.7	893.1	862.4	30.71	29.084		
5,400.0	5,246.3	5,289.5	5,245.3	26.0	14.7	-154.06	210.9	473.7	905.7	874.7	31.00	29.221		
5,500.0	5,345.7	5,389.0	5,344.7	26.2	14.9	-154.43	210.9	473.7	915.3	884.0	31.27	29.271		
5,600.0	5,445.4	5,488.7	5,444.4	26.4	15.1	-154.68	210.9	473.7	921.7	890.2	31.53	29.235		
5,700.0	5,545.4	5,588.6	5,544.4	26.5	15.3	-154.80	210.9	473.7	925.0	893.3	31.77	29.116		
5,754.6	5,600.0	5,643.3	5,599.0	26.6	15.3	-45.84	210.9	473.7	925.5	893.6	31.90	29.014		
5,800.0	5,645.4	5,688.6	5,644.4	26.6	15.4	-45.84	210.9	473.7	925.5	893.5	32.04	28.883		
5,900.0	5,745.4	5,788.6	5,744.4	26.7	15.6	-45.84	210.9	473.7	925.5	893.2	32.36	28.597		
6,000.0	5,845.4	5,888.6	5,844.4	26.8	15.8	-45.84	210.9	473.7	925.5	892.8	32.69	28.315		
6,100.0	5,945.4	5,988.6	5,944.4	26.9	16.0	-45.84	210.9	473.7	925.5	892.5	33.01	28.035		
6,200.0	6,045.4	6,088.6	6,044.4	27.0	16.1	-45.84	210.9	473.7	925.5	892.2	33.34	27.758		
6,300.0	6,145.4	6,188.6	6,144.4	27.1	16.3	-45.84	210.9	473.7	925.5	891.8	33.67	27.485		
6,400.0	6,245.4	6,288.6	6,244.4	27.2	16.5	-45.84	210.9	473.7	925.5	891.5	34.01	27.215		
6,500.0	6,345.4	6,388.6	6,344.4	27.3	16.7	-45.84	210.9	473.7	925.5	891.2	34.34	26.948		
6,600.0	6,445.4	6,488.6	6,444.4	27.4	16.9	-45.84	210.9	473.7	925.5	890.8	34.68	26.685		
6,700.0	6,545.4	6,588.6	6,544.4	27.5	17.1	-45.84	210.9	473.7	925.5	890.5	35.03	26.424		

<b>Company:</b>	Sundance Energy, Weld County, CO	<b>Local Co-ordinate Reference:</b>	Well HFE 24-22
<b>Project:</b>	SEC.22-T4N-R68W	<b>TVD Reference:</b>	WELL @ 4933.0ft (Original Well Elev)
<b>Reference Site:</b>	HFE 14-22 Pad Sec.22-T4N-R68W	<b>MD Reference:</b>	WELL @ 4933.0ft (Original Well Elev)
<b>Site Error:</b>	0.0ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	HFE 24-22	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	Landmark
<b>Reference Design:</b>	Plan #1 (4-10-12)	<b>Offset TVD Reference:</b>	Offset Datum

<b>Offset Design</b> HFE 14-22 Pad Sec.22-T4N-R68W - HFE 22C - Wellbore #1 - Plan #1 (4-10-12)												<b>Offset Site Error:</b>	0.0 ft
Survey Program: 0-MWD												<b>Offset Well Error:</b>	0.0 ft
Reference	Offset	Semi Major Axis		Distance									
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
6,800.0	6,645.4	6,688.6	6,644.4	27.6	17.2	-45.84	210.9	473.7	925.5	890.1	35.37	26.167	
6,900.0	6,745.4	6,788.6	6,744.4	27.8	17.4	-45.84	210.9	473.7	925.5	889.8	35.72	25.914	
7,000.0	6,845.4	6,888.6	6,844.4	27.9	17.6	-45.84	210.9	473.7	925.5	889.5	36.06	25.663	
7,100.0	6,945.4	6,988.6	6,944.4	28.0	17.8	-45.84	210.9	473.7	925.5	889.1	36.41	25.416	
7,200.0	7,045.4	7,088.6	7,044.4	28.1	18.0	-45.84	210.9	473.7	925.5	888.7	36.77	25.172	
7,300.0	7,145.4	7,188.6	7,144.4	28.2	18.2	-45.84	210.9	473.7	925.5	888.4	37.12	24.931	
7,400.0	7,245.4	7,288.6	7,244.4	28.3	18.4	-45.84	210.9	473.7	925.5	888.0	37.48	24.694	
7,500.0	7,345.4	7,388.6	7,344.4	28.4	18.6	-45.84	210.9	473.7	925.5	887.7	37.84	24.460	
7,600.0	7,445.4	7,488.6	7,444.4	28.6	18.8	-45.84	210.9	473.7	925.5	887.3	38.20	24.229	
7,654.6	7,500.0	7,543.3	7,499.0	28.6	18.9	-45.84	210.9	473.7	925.5	887.1	38.40	24.104	

<b>Company:</b>	Sundance Energy, Weld County, CO	<b>Local Co-ordinate Reference:</b>	Well HFE 24-22
<b>Project:</b>	SEC.22-T4N-R68W	<b>TVD Reference:</b>	WELL @ 4933.0ft (Original Well Elev)
<b>Reference Site:</b>	HFE 14-22 Pad Sec.22-T4N-R68W	<b>MD Reference:</b>	WELL @ 4933.0ft (Original Well Elev)
<b>Site Error:</b>	0.0ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	HFE 24-22	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	Landmark
<b>Reference Design:</b>	Plan #1 (4-10-12)	<b>Offset TVD Reference:</b>	Offset Datum

Offset Design HFE 14-22 Pad Sec.22-T4N-R68W - MLD 23-22 - Wellbore #1 - Plan #1 (4-10-12)													Offset Site Error:	0.0ft
Survey Program: 0-MWD													Offset Well Error:	0.0ft
Reference	Offset	Semi Major Axis			Distance								Warning	
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor		
0.0	0.0	0.0	0.0	0.0	0.0	-91.39	-0.4	-15.1	15.1	15.1	0.00	N/A		
100.0	100.0	100.0	100.0	0.1	0.1	-91.39	-0.4	-15.1	15.1	14.8	0.22	67.039		
200.0	200.0	200.0	200.0	0.3	0.3	-91.39	-0.4	-15.1	15.1	14.4	0.67	22.346		
245.7	245.7	245.7	245.7	0.4	0.4	90.00	-0.4	-15.1	15.1	14.2	0.87	17.340 CC		
300.0	300.0	300.0	300.0	0.5	0.6	95.23	-0.4	-15.1	15.1	14.0	1.10	13.754 ES		
400.0	399.8	399.8	399.8	0.8	0.8	113.65	-0.4	-15.1	16.5	14.9	1.53	10.733		
450.0	449.7	449.8	449.8	0.9	0.9	126.18	-0.1	-14.7	18.3	16.5	1.76	10.379 SF		
500.0	499.5	499.6	499.5	1.0	1.0	149.69	0.7	-13.7	21.3	19.3	1.98	10.744		
600.0	599.0	598.8	598.6	1.2	1.2	-174.96	3.9	-9.6	31.0	28.5	2.42	12.773		
700.0	698.4	697.4	696.9	1.5	1.5	-152.98	9.1	-2.9	44.0	41.2	2.88	15.269		
800.0	797.5	795.5	794.2	1.8	1.7	-139.37	16.3	6.5	59.7	56.3	3.38	17.650		
900.0	896.1	892.8	890.4	2.2	2.0	-130.60	25.5	18.4	77.7	73.8	3.94	19.716		
1,000.0	994.2	989.4	985.3	2.5	2.4	-124.67	36.6	32.7	97.9	93.3	4.58	21.397		
1,100.0	1,091.6	1,085.3	1,078.8	3.0	2.8	-120.46	49.6	49.4	120.2	114.9	5.30	22.688		
1,171.3	1,160.6	1,153.2	1,144.5	3.3	3.1	-118.17	59.9	62.8	137.2	131.4	5.87	23.378		
1,200.0	1,188.3	1,180.3	1,170.7	3.4	3.2	-118.12	64.3	68.5	144.4	138.3	6.11	23.626		
1,300.0	1,284.8	1,274.6	1,261.0	3.9	3.7	-117.38	80.7	89.7	170.2	163.2	7.00	24.298		
1,400.0	1,381.2	1,368.7	1,350.4	4.5	4.2	-116.05	98.9	113.1	197.5	189.5	7.96	24.801		
1,500.0	1,477.7	1,464.7	1,441.3	5.0	4.8	-114.84	117.8	137.6	225.2	216.3	8.96	25.128		
1,600.0	1,574.2	1,560.7	1,532.1	5.5	5.4	-113.90	136.8	162.0	253.1	243.1	9.98	25.370		
1,700.0	1,670.7	1,656.6	1,623.0	6.1	6.0	-113.14	155.7	186.5	281.0	270.0	11.00	25.543		
1,800.0	1,767.1	1,752.6	1,713.8	6.6	6.6	-112.52	174.6	211.0	308.9	296.8	12.03	25.673		
1,900.0	1,863.6	1,848.6	1,804.7	7.2	7.2	-112.00	193.6	235.4	336.8	323.8	13.07	25.772		
2,000.0	1,960.1	1,944.6	1,895.5	7.7	7.9	-111.56	212.5	259.9	364.8	350.7	14.11	25.850		
2,100.0	2,056.5	2,040.6	1,986.4	8.3	8.5	-111.19	231.5	284.4	392.8	377.6	15.16	25.912		
2,200.0	2,153.0	2,136.5	2,077.2	8.8	9.1	-110.86	250.4	308.8	420.8	404.6	16.21	25.963		
2,300.0	2,249.5	2,232.5	2,168.1	9.4	9.7	-110.57	269.4	333.3	448.8	431.5	17.26	26.004		
2,400.0	2,345.9	2,328.5	2,258.9	10.0	10.3	-110.32	288.3	357.8	476.8	458.5	18.31	26.038		
2,500.0	2,442.4	2,424.5	2,349.8	10.5	11.0	-110.10	307.3	382.2	504.8	485.4	19.37	26.067		
2,600.0	2,538.9	2,520.4	2,440.6	11.1	11.6	-109.90	326.2	406.7	532.8	512.4	20.42	26.092		
2,700.0	2,635.3	2,616.4	2,531.5	11.7	12.2	-109.72	345.1	431.2	560.9	539.4	21.48	26.113		
2,800.0	2,731.8	2,712.4	2,622.3	12.2	12.9	-109.56	364.1	455.6	588.9	566.4	22.54	26.131		
2,900.0	2,828.3	2,808.4	2,713.2	12.8	13.5	-109.41	383.0	480.1	617.0	593.4	23.60	26.146		
3,000.0	2,924.7	2,904.3	2,804.0	13.4	14.1	-109.27	402.0	504.6	645.0	620.4	24.66	26.160		
3,100.0	3,021.2	3,000.3	2,894.9	13.9	14.7	-109.15	420.9	529.0	673.1	647.3	25.72	26.172		
3,200.0	3,117.7	3,096.3	2,985.7	14.5	15.4	-109.03	439.9	553.5	701.1	674.3	26.78	26.183		
3,300.0	3,214.1	3,192.3	3,076.6	15.0	16.0	-108.93	458.8	578.0	729.2	701.3	27.84	26.192		
3,400.0	3,310.6	3,288.2	3,167.4	15.6	16.6	-108.83	477.7	602.4	757.2	728.3	28.90	26.200		
3,500.0	3,407.1	3,384.2	3,258.3	16.2	17.3	-108.74	496.7	626.9	785.3	755.3	29.96	26.208		
3,600.0	3,503.5	3,480.2	3,349.1	16.7	17.9	-108.65	515.6	651.4	813.4	782.3	31.03	26.215		
3,700.0	3,600.0	3,576.2	3,440.0	17.3	18.5	-108.58	534.6	675.8	841.4	809.3	32.09	26.221		
3,800.0	3,696.5	3,672.1	3,530.8	17.9	19.2	-108.50	553.5	700.3	869.5	836.3	33.15	26.226		
3,900.0	3,792.9	3,768.1	3,621.7	18.5	19.8	-108.43	572.5	724.7	897.6	863.3	34.22	26.231		
4,000.0	3,889.4	3,864.1	3,712.5	19.0	20.4	-108.37	591.4	749.2	925.6	890.3	35.28	26.235		
4,100.0	3,985.9	3,960.1	3,803.4	19.6	21.1	-108.31	610.3	773.7	953.7	917.3	36.35	26.239		
4,200.0	4,082.3	4,056.0	3,894.2	20.2	21.7	-108.25	629.3	798.1	981.8	944.3	37.41	26.243		
4,300.0	4,178.8	4,152.0	3,985.1	20.7	22.3	-108.20	648.2	822.6	1,009.8	971.4	38.47	26.247		
4,400.0	4,275.3	4,248.0	4,075.9	21.3	23.0	-108.14	667.2	847.1	1,037.9	998.4	39.54	26.250		
4,500.0	4,371.7	4,344.0	4,166.8	21.9	23.6	-108.10	686.1	871.5	1,066.0	1,025.4	40.60	26.253		
4,600.0	4,468.2	4,439.9	4,257.6	22.4	24.2	-108.05	705.1	896.0	1,094.0	1,052.4	41.67	26.255		
4,700.0	4,564.7	4,535.9	4,348.5	23.0	24.9	-108.01	724.0	920.5	1,122.1	1,079.4	42.73	26.258		
4,800.0	4,661.1	4,631.9	4,439.3	23.6	25.5	-107.96	742.9	944.9	1,150.2	1,106.4	43.80	26.260		

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation

<b>Company:</b>	Sundance Energy, Weld County, CO	<b>Local Co-ordinate Reference:</b>	Well HFE 24-22
<b>Project:</b>	SEC.22-T4N-R68W	<b>TVD Reference:</b>	WELL @ 4933.0ft (Original Well Elev)
<b>Reference Site:</b>	HFE 14-22 Pad Sec.22-T4N-R68W	<b>MD Reference:</b>	WELL @ 4933.0ft (Original Well Elev)
<b>Site Error:</b>	0.0ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	HFE 24-22	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	Landmark
<b>Reference Design:</b>	Plan #1 (4-10-12)	<b>Offset TVD Reference:</b>	Offset Datum

<b>Offset Design</b>												<b>Offset Site Error:</b>	0.0 ft
Survey Program: 0-MWD												<b>Offset Well Error:</b>	0.0 ft
Reference		Offset		Semi Major Axis			Distance						
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
4,900.0	4,757.6	4,727.9	4,530.2	24.1	26.2	-107.92	761.9	969.4	1,178.3	1,133.4	44.87	26.262	
4,990.9	4,845.2	4,815.1	4,612.7	24.6	26.7	-107.89	779.1	991.6	1,203.8	1,157.9	45.83	26.264	
5,000.0	4,854.1	4,823.8	4,621.0	24.7	26.8	-107.94	780.8	993.9	1,206.3	1,160.4	45.94	26.261	
5,100.0	4,951.1	4,933.1	4,724.6	25.1	27.4	-108.34	802.1	1,021.4	1,233.6	1,186.6	46.96	26.267	
5,200.0	5,048.8	5,064.5	4,850.6	25.5	28.0	-108.63	825.0	1,050.9	1,257.6	1,209.7	47.90	26.253	
5,300.0	5,147.3	5,198.0	4,980.3	25.8	28.6	-108.86	844.5	1,076.1	1,277.9	1,229.2	48.74	26.219	
5,400.0	5,246.3	5,333.4	5,113.1	26.0	29.0	-109.05	860.5	1,096.8	1,294.3	1,244.8	49.45	26.172	
5,500.0	5,345.7	5,470.3	5,248.5	26.2	29.4	-109.18	872.8	1,112.6	1,306.6	1,256.6	50.05	26.107	
5,600.0	5,445.4	5,608.3	5,385.7	26.4	29.7	-109.27	881.1	1,123.4	1,315.0	1,264.5	50.52	26.028	
5,700.0	5,545.4	5,746.9	5,524.2	26.5	29.9	-109.32	885.4	1,128.9	1,319.3	1,268.4	50.87	25.936	
5,754.6	5,600.0	5,822.7	5,600.0	26.6	30.0	-0.34	886.0	1,129.7	1,319.9	1,268.9	51.01	25.876	
5,800.0	5,645.4	5,868.1	5,645.4	26.6	30.0	-0.34	886.0	1,129.7	1,319.9	1,268.8	51.10	25.832	
5,900.0	5,745.4	5,968.1	5,745.4	26.7	30.1	-0.34	886.0	1,129.7	1,319.9	1,268.6	51.30	25.731	
6,000.0	5,845.4	6,068.1	5,845.4	26.8	30.2	-0.34	886.0	1,129.7	1,319.9	1,268.4	51.50	25.627	
6,100.0	5,945.4	6,168.1	5,945.4	26.9	30.3	-0.34	886.0	1,129.7	1,319.9	1,268.2	51.72	25.522	
6,200.0	6,045.4	6,268.1	6,045.4	27.0	30.4	-0.34	886.0	1,129.7	1,319.9	1,268.0	51.93	25.417	
6,300.0	6,145.4	6,368.1	6,145.4	27.1	30.5	-0.34	886.0	1,129.7	1,319.9	1,267.8	52.15	25.312	
6,400.0	6,245.4	6,468.1	6,245.4	27.2	30.6	-0.34	886.0	1,129.7	1,319.9	1,267.5	52.37	25.205	
6,500.0	6,345.4	6,568.1	6,345.4	27.3	30.7	-0.34	886.0	1,129.7	1,319.9	1,267.3	52.59	25.099	
6,600.0	6,445.4	6,668.1	6,445.4	27.4	30.8	-0.34	886.0	1,129.7	1,319.9	1,267.1	52.81	24.992	
6,700.0	6,545.4	6,768.1	6,545.4	27.5	30.9	-0.34	886.0	1,129.7	1,319.9	1,266.9	53.04	24.884	
6,800.0	6,645.4	6,868.1	6,645.4	27.6	31.0	-0.34	886.0	1,129.7	1,319.9	1,266.6	53.27	24.776	
6,900.0	6,745.4	6,968.1	6,745.4	27.8	31.1	-0.34	886.0	1,129.7	1,319.9	1,266.4	53.51	24.668	
7,000.0	6,845.4	7,068.1	6,845.4	27.9	31.2	-0.34	886.0	1,129.7	1,319.9	1,266.2	53.74	24.559	
7,100.0	6,945.4	7,168.1	6,945.4	28.0	31.3	-0.34	886.0	1,129.7	1,319.9	1,265.9	53.98	24.450	
7,200.0	7,045.4	7,268.1	7,045.4	28.1	31.4	-0.34	886.0	1,129.7	1,319.9	1,265.7	54.23	24.341	
7,300.0	7,145.4	7,368.1	7,145.4	28.2	31.5	-0.34	886.0	1,129.7	1,319.9	1,265.4	54.47	24.231	
7,400.0	7,245.4	7,468.1	7,245.4	28.3	31.6	-0.34	886.0	1,129.7	1,319.9	1,265.2	54.72	24.122	
7,500.0	7,345.4	7,568.1	7,345.4	28.4	31.7	-0.34	886.0	1,129.7	1,319.9	1,264.9	54.97	24.012	
7,600.0	7,445.4	7,668.1	7,445.4	28.6	31.8	-0.34	886.0	1,129.7	1,319.9	1,264.7	55.22	23.903	
7,654.6	7,500.0	7,722.7	7,500.0	28.6	31.9	-0.34	886.0	1,129.7	1,319.9	1,264.5	55.36	23.843	

<b>Company:</b>	Sundance Energy, Weld County, CO	<b>Local Co-ordinate Reference:</b>	Well HFE 24-22
<b>Project:</b>	SEC.22-T4N-R68W	<b>TVD Reference:</b>	WELL @ 4933.0ft (Original Well Elev)
<b>Reference Site:</b>	HFE 14-22 Pad Sec.22-T4N-R68W	<b>MD Reference:</b>	WELL @ 4933.0ft (Original Well Elev)
<b>Site Error:</b>	0.0ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	HFE 24-22	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	Landmark
<b>Reference Design:</b>	Plan #1 (4-10-12)	<b>Offset TVD Reference:</b>	Offset Datum

Reference Depths are relative to WELL @ 4933.0ft (Original Well Elev) Coordinates are relative to: HFE 24-22  
Offset Depths are relative to Offset Datum  
Central Meridian is -105.500000 °  
Coordinate System is US State Plane 1983, Colorado Northern Zone  
Grid Convergence at Surface is: 0.33°



<b>Company:</b>	Sundance Energy, Weld County, CO	<b>Local Co-ordinate Reference:</b>	Well HFE 24-22
<b>Project:</b>	SEC.22-T4N-R68W	<b>TVD Reference:</b>	WELL @ 4933.0ft (Original Well Elev)
<b>Reference Site:</b>	HFE 14-22 Pad Sec.22-T4N-R68W	<b>MD Reference:</b>	WELL @ 4933.0ft (Original Well Elev)
<b>Site Error:</b>	0.0ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	HFE 24-22	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	Landmark
<b>Reference Design:</b>	Plan #1 (4-10-12)	<b>Offset TVD Reference:</b>	Offset Datum

Reference Depths are relative to WELL @ 4933.0ft (Original Well Elev) Coordinates are relative to: HFE 24-22  
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