

ENSIGN

Directional

Well Name: MLD 43-22

Surface Location: HFE 5 Pad Sec.22-T4N-R68W
North American Datum 1983 , US State Plane 1983Colorado Northern Zone
Ground Elevation: 4943.0

+N/-S
0.0

+E/-W
0.0

Northing
1350662.23
Original Well Elev

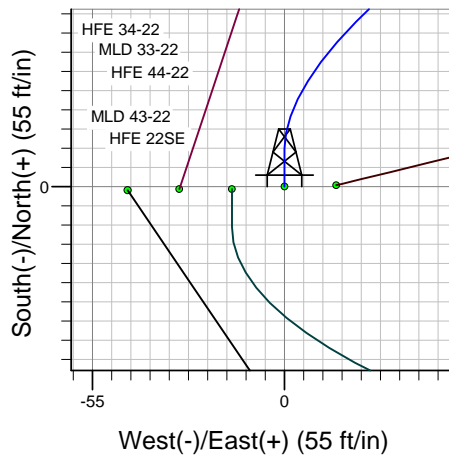
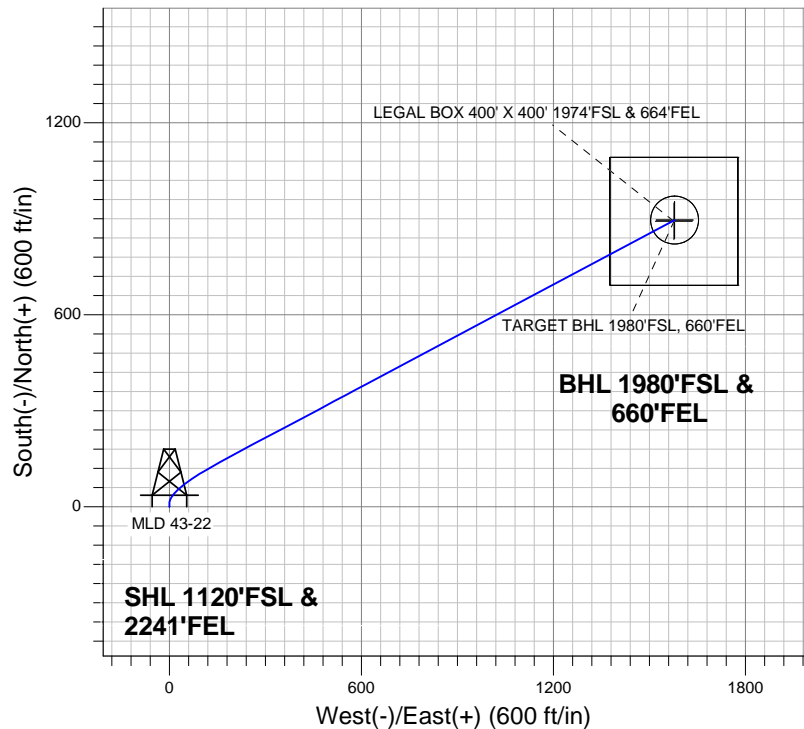
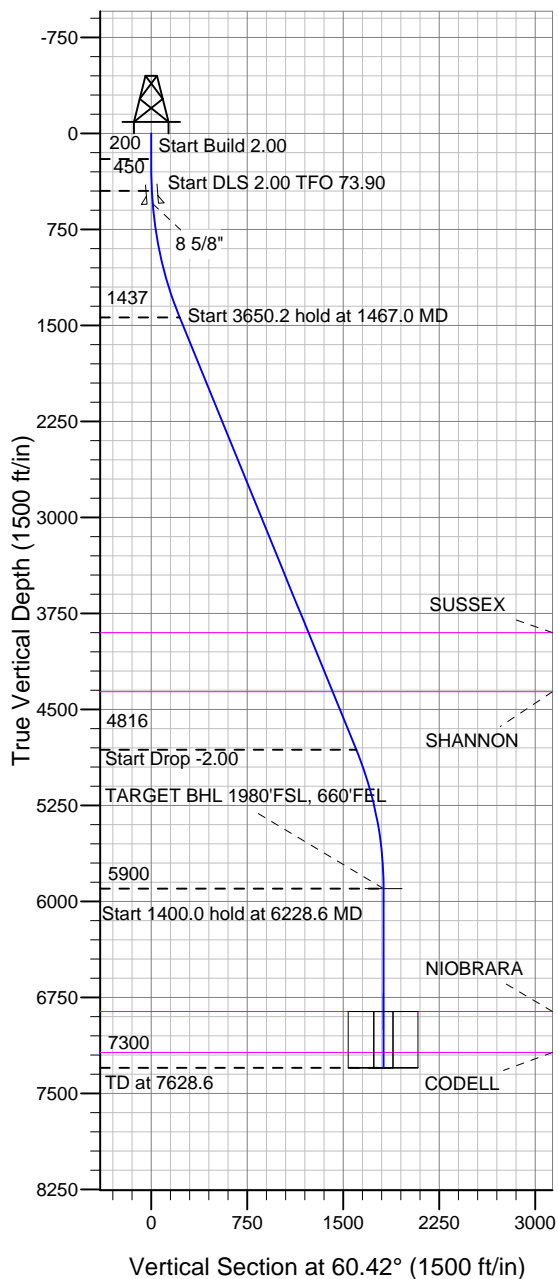
Easting
3142886.89
WELL @ 4956.0ft (Original Well Elev)

Latitude
40.294835

Longitude
-104.987752

Slot

Sundance Energy, Weld County, CO



HFE 5 Pad Sec.22-T4N-R68W
MLD 43-22
Plan #1 (8-02-12)
12:25, August 07 2012



Azimuths to True North
Magnetic North: 8.82°
Magnetic Field
Strength: 52930.4snT
Dip Angle: 66.89°
Date: 8/7/2012
Model: IGRF2010

WELLBORE TARGET DETAILS (LAT/LONG)

Name	TVD	+N/-S	+E/-W	Latitude	Longitude	Shape
TARGET BHL 1980'FSL, 660'FEL	5900.0	895.9	1578.5	40.297294	-104.982093	Point
LEGAL BOX 400' X 400' 1974'FSL & 664'FEL	6860.0	891.9	1576.5	40.297283	-104.982100	Rectangle (Sides: L400.0 W400.0)
TARGET CIRCLE 1980'FSL & 660'FEL	6860.0	895.9	1578.5	40.297294	-104.982093	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	0.00	449.7	10.9	0.0	2.00	0.00	5.4	
4	1467.0	22.23	61.98	1437.3	147.0	171.6	2.00	73.90	221.8	
5	5117.2	22.23	61.98	4816.2	795.8	1390.6	0.00	0.00	1602.2	
6	6228.6	0.00	0.00	5900.0	895.9	1578.5	2.00	180.00	1815.1	TARGET BHL 1980'FSL, 660'FEL
7	7628.6	0.00	0.00	7300.0	895.9	1578.5	0.00	0.00	1815.1	



Sundance Energy, Weld County, CO

SEC.22-T4N-R68W

HFE 5 Pad Sec.22-T4N-R68W

MLD 43-22

Wellbore #1

Plan: Plan #1 (8-02-12)

Standard Planning Report

07 August, 2012

Database:	Landmark	Local Co-ordinate Reference:	Well MLD 43-22
Company:	Sundance Energy, Weld County, CO	TVD Reference:	WELL @ 4956.0ft (Original Well Elev)
Project:	SEC.22-T4N-R68W	MD Reference:	WELL @ 4956.0ft (Original Well Elev)
Site:	HFE 5 Pad Sec.22-T4N-R68W	North Reference:	True
Well:	MLD 43-22	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #1 (8-02-12)		

Project	SEC.22-T4N-R68W, Weld County, Colorado		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		Using Well Reference Point
Map Zone:	Colorado Northern Zone		Using geodetic scale factor

Site						HFE 5 Pad Sec.22-T4N-R68W											
Site Position:						Northing:			1,350,660.89ft			Latitude:			40.294832		
From:			Lat/Long			Easting:			3,142,841.99ft			Longitude:			-104.987913		
Position Uncertainty:			0.0 ft			Slot Radius:			"			Grid Convergence:			0.33 °		

Well	MLD 43-22					
Well Position	+N-S	1.1 ft	Northing:	1,350,662.23 ft	Latitude:	40.294835
	+E-W	44.9 ft	Easting:	3,142,886.89 ft	Longitude:	-104.987752
Position Uncertainty		0.0 ft	Wellhead Elevation:	ft	Ground Level:	4,943.0 ft

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	8/7/2012	8.82	66.89	52,930

Design	Plan #1 (8-02-12)			
Audit Notes:				
Version:	Phase:	PROTOTYPE	Tie On Depth:	0.0
Vertical Section:	Depth From (TVD) (ft)	+N/-S (ft)	+E/-W (ft)	Direction (°)
	0.0	0.0	0.0	60.42

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	0.00	449.7	10.9	0.0	2.00	2.00	0.00	0.00	
1,467.0	22.23	61.98	1,437.3	147.0	171.6	2.00	1.69	6.09	73.90	
5,117.2	22.23	61.98	4,816.2	795.8	1,390.6	0.00	0.00	0.00	0.00	
6,228.6	0.00	0.00	5,900.0	895.9	1,578.5	2.00	-2.00	0.00	180.00	TARGET BHL 198C
7,628.6	0.00	0.00	7,300.0	895.9	1,578.5	0.00	0.00	0.00	0.00	

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Project:	SEC.22-T4N-R68W	MD Reference:	WELL @ 4956.0ft (Original Well Elev)
Site:	HFE 5 Pad Sec.22-T4N-R68W	North Reference:	True
Well:	MLD 43-22	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #1 (8-02-12)		

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	0.00	240.0	0.3	0.0	0.1	2.00	2.00	0.00
280.0	1.60	0.00	280.0	1.1	0.0	0.6	2.00	2.00	0.00
320.0	2.40	0.00	320.0	2.5	0.0	1.2	2.00	2.00	0.00
360.0	3.20	0.00	359.9	4.5	0.0	2.2	2.00	2.00	0.00
400.0	4.00	0.00	399.8	7.0	0.0	3.4	2.00	2.00	0.00
440.0	4.80	0.00	439.7	10.0	0.0	5.0	2.00	2.00	0.00
450.0	5.00	0.00	449.7	10.9	0.0	5.4	2.00	2.00	0.00
480.0	5.20	6.38	479.6	13.6	0.2	6.8	2.00	0.66	21.25
520.0	5.55	14.04	519.4	17.2	0.8	9.2	2.00	0.89	19.16
550.8	5.89	19.24	550.0	20.2	1.7	11.4	2.00	1.08	16.90
8 5/8"									
560.0	5.99	20.68	559.2	21.1	2.0	12.2	2.00	1.17	15.64
600.0	6.50	26.35	598.9	25.1	3.8	15.6	2.00	1.27	14.18
640.0	7.07	31.17	638.7	29.2	6.1	19.7	2.00	1.41	12.03
680.0	7.67	35.25	678.3	33.5	8.9	24.2	2.00	1.51	10.20
720.0	8.31	38.72	718.0	37.9	12.2	29.3	2.00	1.60	8.68
760.0	8.97	41.69	757.5	42.5	16.1	35.0	2.00	1.66	7.43
800.0	9.66	44.25	797.0	47.2	20.5	41.2	2.00	1.71	6.40
840.0	10.36	46.48	836.4	52.1	25.5	47.9	2.00	1.75	5.55
880.0	11.07	48.42	875.7	57.1	30.9	55.1	2.00	1.79	4.85
920.0	11.80	50.12	914.9	62.3	37.0	62.9	2.00	1.81	4.26
960.0	12.53	51.63	954.0	67.6	43.5	71.2	2.00	1.84	3.77
1,000.0	13.27	52.98	993.0	73.1	50.6	80.1	2.00	1.85	3.36
1,040.0	14.02	54.18	1,031.8	78.7	58.2	89.4	2.00	1.87	3.01
1,080.0	14.78	55.26	1,070.6	84.4	66.3	99.3	2.00	1.88	2.71
1,120.0	15.53	56.24	1,109.2	90.3	74.9	109.7	2.00	1.89	2.45
1,160.0	16.30	57.14	1,147.6	96.3	84.1	120.7	2.00	1.90	2.23
1,200.0	17.06	57.95	1,186.0	102.5	93.8	132.2	2.00	1.91	2.03
1,240.0	17.83	58.70	1,224.1	108.8	104.0	144.1	2.00	1.92	1.86
1,280.0	18.60	59.38	1,262.1	115.2	114.7	156.6	2.00	1.93	1.71
1,320.0	19.37	60.01	1,299.9	121.8	125.9	169.6	2.00	1.93	1.58
1,360.0	20.15	60.60	1,337.6	128.5	137.7	183.2	2.00	1.94	1.47
1,400.0	20.92	61.15	1,375.0	135.3	150.0	197.2	2.00	1.94	1.36
1,440.0	21.70	61.65	1,412.3	142.3	162.7	211.7	2.00	1.95	1.27
1,467.0	22.23	61.98	1,437.3	147.0	171.6	221.8	2.00	1.95	1.20
1,480.0	22.23	61.98	1,449.4	149.3	176.0	226.8	0.00	0.00	0.00
1,520.0	22.23	61.98	1,486.4	156.5	189.3	241.9	0.00	0.00	0.00
1,560.0	22.23	61.98	1,523.4	163.6	202.7	257.0	0.00	0.00	0.00
1,600.0	22.23	61.98	1,560.5	170.7	216.0	272.1	0.00	0.00	0.00
1,640.0	22.23	61.98	1,597.5	177.8	229.4	287.3	0.00	0.00	0.00
1,680.0	22.23	61.98	1,634.5	184.9	242.8	302.4	0.00	0.00	0.00
1,720.0	22.23	61.98	1,671.5	192.0	256.1	317.5	0.00	0.00	0.00
1,760.0	22.23	61.98	1,708.6	199.1	269.5	332.6	0.00	0.00	0.00
1,800.0	22.23	61.98	1,745.6	206.2	282.8	347.8	0.00	0.00	0.00
1,840.0	22.23	61.98	1,782.6	213.3	296.2	362.9	0.00	0.00	0.00
1,880.0	22.23	61.98	1,819.7	220.4	309.5	378.0	0.00	0.00	0.00
1,920.0	22.23	61.98	1,856.7	227.6	322.9	393.1	0.00	0.00	0.00
1,960.0	22.23	61.98	1,893.7	234.7	336.3	408.3	0.00	0.00	0.00

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Site:	HFE 5 Pad Sec.22-T4N-R68W	North Reference:	True
Well:	MLD 43-22	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #1 (8-02-12)		

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	22.23	61.98	1,930.7	241.8	349.6	423.4	0.00	0.00	0.00
2,040.0	22.23	61.98	1,967.8	248.9	363.0	438.5	0.00	0.00	0.00
2,080.0	22.23	61.98	2,004.8	256.0	376.3	453.7	0.00	0.00	0.00
2,120.0	22.23	61.98	2,041.8	263.1	389.7	468.8	0.00	0.00	0.00
2,160.0	22.23	61.98	2,078.8	270.2	403.1	483.9	0.00	0.00	0.00
2,200.0	22.23	61.98	2,115.9	277.3	416.4	499.0	0.00	0.00	0.00
2,240.0	22.23	61.98	2,152.9	284.4	429.8	514.2	0.00	0.00	0.00
2,280.0	22.23	61.98	2,189.9	291.5	443.1	529.3	0.00	0.00	0.00
2,320.0	22.23	61.98	2,227.0	298.7	456.5	544.4	0.00	0.00	0.00
2,360.0	22.23	61.98	2,264.0	305.8	469.8	559.5	0.00	0.00	0.00
2,400.0	22.23	61.98	2,301.0	312.9	483.2	574.7	0.00	0.00	0.00
2,440.0	22.23	61.98	2,338.0	320.0	496.6	589.8	0.00	0.00	0.00
2,480.0	22.23	61.98	2,375.1	327.1	509.9	604.9	0.00	0.00	0.00
2,520.0	22.23	61.98	2,412.1	334.2	523.3	620.1	0.00	0.00	0.00
2,560.0	22.23	61.98	2,449.1	341.3	536.6	635.2	0.00	0.00	0.00
2,600.0	22.23	61.98	2,486.1	348.4	550.0	650.3	0.00	0.00	0.00
2,640.0	22.23	61.98	2,523.2	355.5	563.3	665.4	0.00	0.00	0.00
2,680.0	22.23	61.98	2,560.2	362.6	576.7	680.6	0.00	0.00	0.00
2,720.0	22.23	61.98	2,597.2	369.8	590.1	695.7	0.00	0.00	0.00
2,760.0	22.23	61.98	2,634.3	376.9	603.4	710.8	0.00	0.00	0.00
2,800.0	22.23	61.98	2,671.3	384.0	616.8	725.9	0.00	0.00	0.00
2,840.0	22.23	61.98	2,708.3	391.1	630.1	741.1	0.00	0.00	0.00
2,880.0	22.23	61.98	2,745.3	398.2	643.5	756.2	0.00	0.00	0.00
2,920.0	22.23	61.98	2,782.4	405.3	656.9	771.3	0.00	0.00	0.00
2,960.0	22.23	61.98	2,819.4	412.4	670.2	786.4	0.00	0.00	0.00
3,000.0	22.23	61.98	2,856.4	419.5	683.6	801.6	0.00	0.00	0.00
3,040.0	22.23	61.98	2,893.4	426.6	696.9	816.7	0.00	0.00	0.00
3,080.0	22.23	61.98	2,930.5	433.7	710.3	831.8	0.00	0.00	0.00
3,120.0	22.23	61.98	2,967.5	440.9	723.6	847.0	0.00	0.00	0.00
3,160.0	22.23	61.98	3,004.5	448.0	737.0	862.1	0.00	0.00	0.00
3,200.0	22.23	61.98	3,041.6	455.1	750.4	877.2	0.00	0.00	0.00
3,240.0	22.23	61.98	3,078.6	462.2	763.7	892.3	0.00	0.00	0.00
3,280.0	22.23	61.98	3,115.6	469.3	777.1	907.5	0.00	0.00	0.00
3,320.0	22.23	61.98	3,152.6	476.4	790.4	922.6	0.00	0.00	0.00
3,360.0	22.23	61.98	3,189.7	483.5	803.8	937.7	0.00	0.00	0.00
3,400.0	22.23	61.98	3,226.7	490.6	817.2	952.8	0.00	0.00	0.00
3,440.0	22.23	61.98	3,263.7	497.7	830.5	968.0	0.00	0.00	0.00
3,480.0	22.23	61.98	3,300.7	504.8	843.9	983.1	0.00	0.00	0.00
3,520.0	22.23	61.98	3,337.8	512.0	857.2	998.2	0.00	0.00	0.00
3,560.0	22.23	61.98	3,374.8	519.1	870.6	1,013.3	0.00	0.00	0.00
3,600.0	22.23	61.98	3,411.8	526.2	883.9	1,028.5	0.00	0.00	0.00
3,640.0	22.23	61.98	3,448.8	533.3	897.3	1,043.6	0.00	0.00	0.00
3,680.0	22.23	61.98	3,485.9	540.4	910.7	1,058.7	0.00	0.00	0.00
3,720.0	22.23	61.98	3,522.9	547.5	924.0	1,073.9	0.00	0.00	0.00
3,760.0	22.23	61.98	3,559.9	554.6	937.4	1,089.0	0.00	0.00	0.00
3,800.0	22.23	61.98	3,597.0	561.7	950.7	1,104.1	0.00	0.00	0.00
3,840.0	22.23	61.98	3,634.0	568.8	964.1	1,119.2	0.00	0.00	0.00
3,880.0	22.23	61.98	3,671.0	575.9	977.4	1,134.4	0.00	0.00	0.00
3,920.0	22.23	61.98	3,708.0	583.1	990.8	1,149.5	0.00	0.00	0.00
3,960.0	22.23	61.98	3,745.1	590.2	1,004.2	1,164.6	0.00	0.00	0.00
4,000.0	22.23	61.98	3,782.1	597.3	1,017.5	1,179.7	0.00	0.00	0.00
4,040.0	22.23	61.98	3,819.1	604.4	1,030.9	1,194.9	0.00	0.00	0.00
4,080.0	22.23	61.98	3,856.1	611.5	1,044.2	1,210.0	0.00	0.00	0.00
4,120.0	22.23	61.98	3,893.2	618.6	1,057.6	1,225.1	0.00	0.00	0.00

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Site:	HFE 5 Pad Sec.22-T4N-R68W	North Reference:	True
Well:	MLD 43-22	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #1 (8-02-12)		

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)
4,127.4	22.23	61.98	3,900.0	619.9	1,060.1	1,227.9	0.00	0.00	0.00
SUSSEX									
4,160.0	22.23	61.98	3,930.2	625.7	1,071.0	1,240.3	0.00	0.00	0.00
4,200.0	22.23	61.98	3,967.2	632.8	1,084.3	1,255.4	0.00	0.00	0.00
4,240.0	22.23	61.98	4,004.3	639.9	1,097.7	1,270.5	0.00	0.00	0.00
4,280.0	22.23	61.98	4,041.3	647.0	1,111.0	1,285.6	0.00	0.00	0.00
4,320.0	22.23	61.98	4,078.3	654.2	1,124.4	1,300.8	0.00	0.00	0.00
4,360.0	22.23	61.98	4,115.3	661.3	1,137.7	1,315.9	0.00	0.00	0.00
4,400.0	22.23	61.98	4,152.4	668.4	1,151.1	1,331.0	0.00	0.00	0.00
4,440.0	22.23	61.98	4,189.4	675.5	1,164.5	1,346.1	0.00	0.00	0.00
4,480.0	22.23	61.98	4,226.4	682.6	1,177.8	1,361.3	0.00	0.00	0.00
4,520.0	22.23	61.98	4,263.4	689.7	1,191.2	1,376.4	0.00	0.00	0.00
4,560.0	22.23	61.98	4,300.5	696.8	1,204.5	1,391.5	0.00	0.00	0.00
4,600.0	22.23	61.98	4,337.5	703.9	1,217.9	1,406.6	0.00	0.00	0.00
4,625.4	22.23	61.98	4,361.0	708.4	1,226.4	1,416.2	0.00	0.00	0.00
SHANNON									
4,640.0	22.23	61.98	4,374.5	711.0	1,231.3	1,421.8	0.00	0.00	0.00
4,680.0	22.23	61.98	4,411.6	718.1	1,244.6	1,436.9	0.00	0.00	0.00
4,720.0	22.23	61.98	4,448.6	725.3	1,258.0	1,452.0	0.00	0.00	0.00
4,760.0	22.23	61.98	4,485.6	732.4	1,271.3	1,467.2	0.00	0.00	0.00
4,800.0	22.23	61.98	4,522.6	739.5	1,284.7	1,482.3	0.00	0.00	0.00
4,840.0	22.23	61.98	4,559.7	746.6	1,298.0	1,497.4	0.00	0.00	0.00
4,880.0	22.23	61.98	4,596.7	753.7	1,311.4	1,512.5	0.00	0.00	0.00
4,920.0	22.23	61.98	4,633.7	760.8	1,324.8	1,527.7	0.00	0.00	0.00
4,960.0	22.23	61.98	4,670.7	767.9	1,338.1	1,542.8	0.00	0.00	0.00
5,000.0	22.23	61.98	4,707.8	775.0	1,351.5	1,557.9	0.00	0.00	0.00
5,040.0	22.23	61.98	4,744.8	782.1	1,364.8	1,573.0	0.00	0.00	0.00
5,080.0	22.23	61.98	4,781.8	789.2	1,378.2	1,588.2	0.00	0.00	0.00
5,117.2	22.23	61.98	4,816.2	795.8	1,390.6	1,602.2	0.00	0.00	0.00
5,120.0	22.17	61.98	4,818.9	796.4	1,391.5	1,603.3	2.00	-2.00	0.00
5,160.0	21.37	61.98	4,856.0	803.3	1,404.6	1,618.1	2.00	-2.00	0.00
5,200.0	20.57	61.98	4,893.4	810.1	1,417.3	1,632.4	2.00	-2.00	0.00
5,240.0	19.77	61.98	4,930.9	816.5	1,429.5	1,646.2	2.00	-2.00	0.00
5,280.0	18.97	61.98	4,968.6	822.8	1,441.2	1,659.5	2.00	-2.00	0.00
5,320.0	18.17	61.98	5,006.5	828.8	1,452.4	1,672.2	2.00	-2.00	0.00
5,360.0	17.37	61.98	5,044.6	834.5	1,463.2	1,684.4	2.00	-2.00	0.00
5,400.0	16.57	61.98	5,082.9	840.0	1,473.5	1,696.1	2.00	-2.00	0.00
5,440.0	15.77	61.98	5,121.3	845.2	1,483.3	1,707.2	2.00	-2.00	0.00
5,480.0	14.97	61.98	5,159.9	850.2	1,492.7	1,717.8	2.00	-2.00	0.00
5,520.0	14.17	61.98	5,198.6	854.9	1,501.6	1,727.9	2.00	-2.00	0.00
5,560.0	13.37	61.98	5,237.4	859.4	1,510.0	1,737.4	2.00	-2.00	0.00
5,600.0	12.57	61.98	5,276.4	863.6	1,517.9	1,746.4	2.00	-2.00	0.00
5,640.0	11.77	61.98	5,315.5	867.6	1,525.4	1,754.8	2.00	-2.00	0.00
5,680.0	10.97	61.98	5,354.7	871.3	1,532.3	1,762.7	2.00	-2.00	0.00
5,720.0	10.17	61.98	5,394.1	874.7	1,538.8	1,770.0	2.00	-2.00	0.00
5,760.0	9.37	61.98	5,433.5	877.9	1,544.8	1,776.8	2.00	-2.00	0.00
5,800.0	8.57	61.98	5,473.0	880.8	1,550.3	1,783.1	2.00	-2.00	0.00
5,840.0	7.77	61.98	5,512.6	883.5	1,555.3	1,788.7	2.00	-2.00	0.00
5,880.0	6.97	61.98	5,552.3	885.9	1,559.8	1,793.9	2.00	-2.00	0.00
5,920.0	6.17	61.98	5,592.0	888.1	1,563.9	1,798.5	2.00	-2.00	0.00
5,960.0	5.37	61.98	5,631.8	890.0	1,567.4	1,802.5	2.00	-2.00	0.00
6,000.0	4.57	61.98	5,671.6	891.6	1,570.5	1,805.9	2.00	-2.00	0.00
6,040.0	3.77	61.98	5,711.5	893.0	1,573.1	1,808.9	2.00	-2.00	0.00
6,080.0	2.97	61.98	5,751.5	894.1	1,575.1	1,811.2	2.00	-2.00	0.00

Database:	Landmark	Local Co-ordinate Reference:	Well MLD 43-22
Company:	Sundance Energy, Weld County, CO	TVD Reference:	WELL @ 4956.0ft (Original Well Elev)
Project:	SEC.22-T4N-R68W	MD Reference:	WELL @ 4956.0ft (Original Well Elev)
Site:	HFE 5 Pad Sec.22-T4N-R68W	North Reference:	True
Well:	MLD 43-22	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #1 (8-02-12)		

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)
6,120.0	2.17	61.98	5,791.4	894.9	1,576.7	1,813.0	2.00	-2.00	0.00
6,160.0	1.37	61.98	5,831.4	895.5	1,577.8	1,814.2	2.00	-2.00	0.00
6,200.0	0.57	61.98	5,871.4	895.8	1,578.4	1,814.9	2.00	-2.00	0.00
6,228.6	0.00	0.00	5,900.0	895.9	1,578.5	1,815.1	2.00	-2.00	0.00
TARGET BHL 1980'FSL, 660'FEL									
6,240.0	0.00	0.00	5,911.4	895.9	1,578.5	1,815.1	0.00	0.00	0.00
6,280.0	0.00	0.00	5,951.4	895.9	1,578.5	1,815.1	0.00	0.00	0.00
6,320.0	0.00	0.00	5,991.4	895.9	1,578.5	1,815.1	0.00	0.00	0.00
6,360.0	0.00	0.00	6,031.4	895.9	1,578.5	1,815.1	0.00	0.00	0.00
6,400.0	0.00	0.00	6,071.4	895.9	1,578.5	1,815.1	0.00	0.00	0.00
6,440.0	0.00	0.00	6,111.4	895.9	1,578.5	1,815.1	0.00	0.00	0.00
6,480.0	0.00	0.00	6,151.4	895.9	1,578.5	1,815.1	0.00	0.00	0.00
6,520.0	0.00	0.00	6,191.4	895.9	1,578.5	1,815.1	0.00	0.00	0.00
6,560.0	0.00	0.00	6,231.4	895.9	1,578.5	1,815.1	0.00	0.00	0.00
6,600.0	0.00	0.00	6,271.4	895.9	1,578.5	1,815.1	0.00	0.00	0.00
6,640.0	0.00	0.00	6,311.4	895.9	1,578.5	1,815.1	0.00	0.00	0.00
6,680.0	0.00	0.00	6,351.4	895.9	1,578.5	1,815.1	0.00	0.00	0.00
6,720.0	0.00	0.00	6,391.4	895.9	1,578.5	1,815.1	0.00	0.00	0.00
6,760.0	0.00	0.00	6,431.4	895.9	1,578.5	1,815.1	0.00	0.00	0.00
6,800.0	0.00	0.00	6,471.4	895.9	1,578.5	1,815.1	0.00	0.00	0.00
6,840.0	0.00	0.00	6,511.4	895.9	1,578.5	1,815.1	0.00	0.00	0.00
6,880.0	0.00	0.00	6,551.4	895.9	1,578.5	1,815.1	0.00	0.00	0.00
6,920.0	0.00	0.00	6,591.4	895.9	1,578.5	1,815.1	0.00	0.00	0.00
6,960.0	0.00	0.00	6,631.4	895.9	1,578.5	1,815.1	0.00	0.00	0.00
7,000.0	0.00	0.00	6,671.4	895.9	1,578.5	1,815.1	0.00	0.00	0.00
7,040.0	0.00	0.00	6,711.4	895.9	1,578.5	1,815.1	0.00	0.00	0.00
7,080.0	0.00	0.00	6,751.4	895.9	1,578.5	1,815.1	0.00	0.00	0.00
7,120.0	0.00	0.00	6,791.4	895.9	1,578.5	1,815.1	0.00	0.00	0.00
7,160.0	0.00	0.00	6,831.4	895.9	1,578.5	1,815.1	0.00	0.00	0.00
7,188.6	0.00	0.00	6,860.0	895.9	1,578.5	1,815.1	0.00	0.00	0.00
NIOBRARA - LEGAL BOX 400' X 400' 1974'FSL & 664'FEL - TARGET CIRCLE 1980'FSL & 660'FEL									
7,200.0	0.00	0.00	6,871.4	895.9	1,578.5	1,815.1	0.00	0.00	0.00
7,240.0	0.00	0.00	6,911.4	895.9	1,578.5	1,815.1	0.00	0.00	0.00
7,280.0	0.00	0.00	6,951.4	895.9	1,578.5	1,815.1	0.00	0.00	0.00
7,320.0	0.00	0.00	6,991.4	895.9	1,578.5	1,815.1	0.00	0.00	0.00
7,360.0	0.00	0.00	7,031.4	895.9	1,578.5	1,815.1	0.00	0.00	0.00
7,400.0	0.00	0.00	7,071.4	895.9	1,578.5	1,815.1	0.00	0.00	0.00
7,440.0	0.00	0.00	7,111.4	895.9	1,578.5	1,815.1	0.00	0.00	0.00
7,480.0	0.00	0.00	7,151.4	895.9	1,578.5	1,815.1	0.00	0.00	0.00
7,508.6	0.00	0.00	7,180.0	895.9	1,578.5	1,815.1	0.00	0.00	0.00
CODELL									
7,520.0	0.00	0.00	7,191.4	895.9	1,578.5	1,815.1	0.00	0.00	0.00
7,560.0	0.00	0.00	7,231.4	895.9	1,578.5	1,815.1	0.00	0.00	0.00
7,600.0	0.00	0.00	7,271.4	895.9	1,578.5	1,815.1	0.00	0.00	0.00
7,628.6	0.00	0.00	7,300.0	895.9	1,578.5	1,815.1	0.00	0.00	0.00

Database:	Landmark	Local Co-ordinate Reference:	Well MLD 43-22
Company:	Sundance Energy, Weld County, CO	TVD Reference:	WELL @ 4956.0ft (Original Well Elev)
Project:	SEC.22-T4N-R68W	MD Reference:	WELL @ 4956.0ft (Original Well Elev)
Site:	HFE 5 Pad Sec.22-T4N-R68W	North Reference:	True
Well:	MLD 43-22	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #1 (8-02-12)		

Targets									
Target Name									
- hit/miss target	Dip Angle	Dip Dir.	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
- Shape	(°)	(°)	(ft)	(ft)	(ft)	(ft)	(ft)		
LEGAL BOX 400' X 400'	0.00	0.00	6,860.0	891.9	1,576.5	1,351,563.18	3,144,458.14	40.297283	-104.982100
- plan misses target center by 4.5ft at 7188.6ft MD (6860.0 TVD, 895.9 N, 1578.5 E)									
- Rectangle (sides W400.0 H400.0 D440.0)									
TARGET CIRCLE 198'	0.00	0.00	6,860.0	895.9	1,578.5	1,351,567.18	3,144,460.17	40.297294	-104.982093
- plan hits target center									
- Circle (radius 75.0)									
TARGET BHL 1980'F	0.00	0.00	5,900.0	895.9	1,578.5	1,351,567.18	3,144,460.17	40.297294	-104.982093
- plan hits target center									
- Point									

Casing Points					
Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (")	Hole Diameter (")	
550.8	550.0	8 5/8"	8-5/8	12-1/4	

Formations						
Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)	
4,127.4	3,900.0	SUSSEX		0.00		
4,625.4	4,361.0	SHANNON		0.00		
7,188.6	6,860.0	NIOBRARA		0.00		
7,508.6	7,180.0	CODELL		0.00		



Sundance Energy, Weld County, CO

SEC.22-T4N-R68W

HFE 5 Pad Sec.22-T4N-R68W

MLD 43-22

Wellbore #1

Plan #1 (8-02-12)

Anticollision Report

07 August, 2012

Company:	Sundance Energy, Weld County, CO	Local Co-ordinate Reference:	Well MLD 43-22
Project:	SEC.22-T4N-R68W	TVD Reference:	WELL @ 4956.0ft (Original Well Elev)
Reference Site:	HFE 5 Pad Sec.22-T4N-R68W	MD Reference:	WELL @ 4956.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	MLD 43-22	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	Landmark
Reference Design:	Plan #1 (8-02-12)	Offset TVD Reference:	Offset Datum

Reference	Plan #1 (8-02-12)		
Filter type:	NO GLOBAL FILTER: Using user defined selection & filtering criteria		
Interpolation Method:	MD Interval 100.0ft	Error Model:	ISCWSA
Depth Range:	Unlimited	Scan Method:	Closest Approach 3D
Results Limited by:	Maximum center-center distance of 10,000.0ft	Error Surface:	Elliptical Conic
Warning Levels Evaluated at:	2.00 Sigma		

Survey Tool Program	Date 8/2/2012			
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description
0.0	7,628.6	Plan #1 (8-02-12) (Wellbore #1)	MWD	MWD - Standard

Summary						
Site Name	Reference Measured Depth (ft)	Offset Measured Depth (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Separation Factor	Warning
Offset Well - Wellbore - Design						
HFE 5 Pad Sec.22-T4N-R68W						
HFE 22SE - Wellbore #1 - Plan #1 (8-02-12)	245.7	246.7	14.8	13.9	16.767	CC
HFE 22SE - Wellbore #1 - Plan #1 (8-02-12)	300.0	301.0	14.8	13.7	13.190	ES
HFE 22SE - Wellbore #1 - Plan #1 (8-02-12)	500.0	500.5	20.8	18.7	10.159	SF
HFE 44-22 - Wellbore #1 - Plan #1 (8-02-12)	200.0	200.0	15.1	14.4	22.366	CC
HFE 44-22 - Wellbore #1 - Plan #1 (8-02-12)	300.0	300.0	15.3	14.1	13.584	ES
HFE 44-22 - Wellbore #1 - Plan #1 (8-02-12)	400.0	399.8	16.9	15.3	10.694	SF
MLD 33-22 - Wellbore #1 - plan #1 (8-02-12)	200.0	199.0	30.1	29.5	44.842	CC
MLD 33-22 - Wellbore #1 - plan #1 (8-02-12)	300.0	299.0	30.2	29.1	26.959	ES
MLD 33-22 - Wellbore #1 - plan #1 (8-02-12)	500.0	498.5	34.5	32.5	16.874	SF

Offset Design HFE 5 Pad Sec.22-T4N-R68W - HFE 22SE - Wellbore #1 - Plan #1 (8-02-12)													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)	Offset Wellbore Centre +E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning	
0.0	0.0	1.0	1.0	0.0	0.0	88.59	0.4	14.8	14.8	14.8	0.00	N/A		
100.0	100.0	101.0	101.0	0.1	0.1	88.59	0.4	14.8	14.8	14.6	0.23	65.146		
200.0	200.0	201.0	201.0	0.3	0.3	88.59	0.4	14.8	14.8	14.1	0.68	21.860		
245.7	245.7	246.7	246.7	0.4	0.4	90.00	0.4	14.8	14.8	13.9	0.88	16.767	CC	
300.0	300.0	301.0	301.0	0.6	0.6	95.33	0.4	14.8	14.8	13.7	1.13	13.190	ES	
400.0	399.8	400.8	400.8	0.8	0.8	114.05	0.4	14.8	16.2	14.6	1.58	10.230		
500.0	499.5	500.5	500.5	1.0	1.0	125.81	0.4	14.8	20.8	18.7	2.05	10.159	SF	
600.0	598.9	599.9	599.9	1.3	1.2	129.42	0.4	14.8	27.0	24.5	2.50	10.831		
700.0	698.2	699.2	699.2	1.6	1.5	135.71	0.4	14.8	35.6	32.6	2.95	12.060		
800.0	797.0	798.0	798.0	1.9	1.7	142.32	0.4	14.8	47.2	43.8	3.40	13.866		
900.0	895.3	897.3	897.3	2.2	1.9	146.82	0.8	16.4	61.5	57.6	3.86	15.951		
1,000.0	993.0	997.2	997.1	2.6	2.1	148.94	2.0	21.4	76.9	72.6	4.31	17.847		
1,100.0	1,089.9	1,097.6	1,097.1	3.1	2.3	149.93	4.0	29.8	93.0	88.2	4.79	19.404		
1,200.0	1,186.0	1,198.5	1,197.2	3.6	2.6	150.35	6.9	41.7	109.3	104.0	5.31	20.608		
1,300.0	1,281.1	1,299.9	1,297.4	4.2	2.9	150.46	10.7	57.1	125.9	120.1	5.86	21.473		
1,400.0	1,375.0	1,401.8	1,397.4	4.8	3.2	150.40	15.3	76.0	142.6	136.1	6.48	22.023		
1,500.0	1,467.9	1,500.6	1,494.0	5.5	3.6	150.92	20.2	96.4	160.2	153.1	7.13	22.476		
1,600.0	1,560.5	1,598.9	1,590.0	6.3	3.9	152.23	25.2	116.7	178.5	170.7	7.81	22.856		

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

Company:	Sundance Energy, Weld County, CO	Local Co-ordinate Reference:	Well MLD 43-22
Project:	SEC.22-T4N-R68W	TVD Reference:	WELL @ 4956.0ft (Original Well Elev)
Reference Site:	HFE 5 Pad Sec.22-T4N-R68W	MD Reference:	WELL @ 4956.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	MLD 43-22	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	Landmark
Reference Design:	Plan #1 (8-02-12)	Offset TVD Reference:	Offset Datum

Offset Design													Offset Site Error:	0.0 ft
Survey Program: 0-MWD													Offset Well Error:	0.0 ft
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		
1,700.0	1,653.0	1,697.1	1,686.0	7.0	4.3	153.30	30.1	136.9	196.8	188.3	8.50	23.155		
1,800.0	1,745.6	1,795.4	1,782.0	7.8	4.8	154.19	35.0	157.2	215.2	206.0	9.20	23.396		
1,900.0	1,838.2	1,893.6	1,878.0	8.5	5.2	154.94	40.0	177.5	233.7	223.8	9.91	23.591		
2,000.0	1,930.7	1,991.8	1,974.0	9.3	5.6	155.58	44.9	197.8	252.1	241.5	10.61	23.755		
2,100.0	2,023.3	2,090.1	2,069.9	10.0	6.0	156.13	49.9	218.1	270.6	259.3	11.33	23.893		
2,200.0	2,115.9	2,188.3	2,165.9	10.8	6.4	156.61	54.8	238.4	289.2	277.1	12.04	24.012		
2,300.0	2,208.4	2,286.6	2,261.9	11.6	6.9	157.04	59.7	258.7	307.7	294.9	12.76	24.115		
2,400.0	2,301.0	2,384.8	2,357.9	12.4	7.3	157.41	64.7	279.0	326.2	312.8	13.48	24.205		
2,500.0	2,393.6	2,483.1	2,453.9	13.1	7.8	157.75	69.6	299.3	344.8	330.6	14.20	24.284		
2,600.0	2,486.1	2,581.3	2,549.9	13.9	8.2	158.05	74.6	319.6	363.4	348.5	14.92	24.354		
2,700.0	2,578.7	2,679.5	2,645.9	14.7	8.6	158.32	79.5	339.8	382.0	366.3	15.64	24.416		
2,800.0	2,671.3	2,777.8	2,741.9	15.5	9.1	158.56	84.4	360.1	400.6	384.2	16.37	24.473		
2,900.0	2,763.8	2,876.0	2,837.9	16.3	9.5	158.79	89.4	380.4	419.1	402.1	17.09	24.523		
3,000.0	2,856.4	2,974.3	2,933.9	17.0	10.0	158.99	94.3	400.7	437.7	419.9	17.82	24.569		
3,100.0	2,949.0	3,072.5	3,029.9	17.8	10.4	159.18	99.3	421.0	456.4	437.8	18.54	24.611		
3,200.0	3,041.6	3,170.8	3,125.9	18.6	10.9	159.36	104.2	441.3	475.0	455.7	19.27	24.650		
3,300.0	3,134.1	3,269.0	3,221.9	19.4	11.3	159.52	109.1	461.6	493.6	473.6	19.99	24.685		
3,400.0	3,226.7	3,367.3	3,317.9	20.2	11.8	159.67	114.1	481.9	512.2	491.5	20.72	24.718		
3,500.0	3,319.3	3,465.5	3,413.9	20.9	12.2	159.80	119.0	502.2	530.8	509.4	21.45	24.748		
3,600.0	3,411.8	3,563.7	3,509.9	21.7	12.7	159.93	124.0	522.5	549.4	527.3	22.18	24.775		
3,700.0	3,504.4	3,662.0	3,605.9	22.5	13.1	160.05	128.9	542.8	568.1	545.2	22.90	24.801		
3,800.0	3,597.0	3,760.2	3,701.9	23.3	13.6	160.17	133.8	563.0	586.7	563.1	23.63	24.825		
3,900.0	3,689.5	3,858.5	3,797.9	24.1	14.0	160.27	138.8	583.3	605.3	581.0	24.36	24.848		
4,000.0	3,782.1	3,956.7	3,893.9	24.9	14.5	160.37	143.7	603.6	624.0	598.9	25.09	24.869		
4,100.0	3,874.7	4,055.0	3,989.9	25.7	14.9	160.47	148.7	623.9	642.6	616.8	25.82	24.889		
4,200.0	3,967.2	4,153.2	4,085.9	26.4	15.4	160.56	153.6	644.2	661.2	634.7	26.55	24.907		
4,300.0	4,059.8	4,251.4	4,181.9	27.2	15.8	160.64	158.5	664.5	679.9	652.6	27.28	24.924		
4,400.0	4,152.4	4,349.7	4,277.9	28.0	16.3	160.72	163.5	684.8	698.5	670.5	28.01	24.941		
4,500.0	4,244.9	4,447.9	4,373.9	28.8	16.8	160.79	168.4	705.1	717.1	688.4	28.74	24.956		
4,600.0	4,337.5	4,546.2	4,469.9	29.6	17.2	160.87	173.3	725.4	735.8	706.3	29.47	24.971		
4,700.0	4,430.1	4,644.4	4,565.9	30.4	17.7	160.93	178.3	745.7	754.4	724.2	30.19	24.985		
4,800.0	4,522.6	4,742.7	4,661.9	31.1	18.1	161.00	183.2	765.9	773.1	742.1	30.92	24.998		
4,900.0	4,615.2	4,840.9	4,757.9	31.9	18.6	161.06	188.2	786.2	791.7	760.0	31.65	25.010		
5,000.0	4,707.8	4,939.1	4,853.9	32.7	19.0	161.12	193.1	806.5	810.3	778.0	32.39	25.022		
5,100.0	4,800.3	5,037.4	4,949.9	33.5	19.5	161.17	198.0	826.8	829.0	795.9	33.12	25.033		
5,200.0	4,893.4	5,135.8	5,046.1	34.2	19.9	161.29	203.0	847.2	846.5	812.7	33.86	25.000		
5,300.0	4,987.6	5,224.1	5,132.4	34.8	20.3	161.36	207.4	865.1	861.2	826.7	34.50	24.965		
5,400.0	5,082.9	5,300.0	5,207.0	35.3	20.6	161.43	210.7	878.7	874.6	839.6	35.00	24.990		
5,500.0	5,179.2	5,381.8	5,287.8	35.7	20.8	161.51	213.7	891.3	887.0	851.6	35.44	25.026		
5,600.0	5,276.4	5,460.5	5,365.8	36.1	21.0	161.61	216.2	901.3	898.5	862.7	35.82	25.085		
5,700.0	5,374.4	5,539.1	5,443.9	36.5	21.2	161.71	218.1	909.1	908.9	872.8	36.12	25.163		
5,800.0	5,473.0	5,617.5	5,522.1	36.8	21.3	161.83	219.5	914.9	918.4	882.0	36.36	25.258		
5,900.0	5,572.1	5,700.0	5,604.5	37.0	21.5	161.96	220.4	918.7	926.9	890.3	36.54	25.369		
6,000.0	5,671.6	5,774.0	5,678.6	37.2	21.5	162.09	220.8	920.2	934.3	897.7	36.63	25.504		
6,100.0	5,771.4	5,867.9	5,772.4	37.4	21.7	162.23	220.8	920.3	940.2	903.4	36.72	25.606		
6,200.0	5,871.4	5,967.9	5,872.4	37.5	21.8	162.30	220.8	920.3	942.8	906.0	36.79	25.623		
6,300.0	5,971.4	6,067.9	5,972.4	37.5	21.9	-135.72	220.8	920.3	942.9	905.9	37.02	25.472		
6,400.0	6,071.4	6,167.9	6,072.4	37.6	22.0	-135.72	220.8	920.3	942.9	905.6	37.31	25.271		
6,500.0	6,171.4	6,267.9	6,172.4	37.7	22.2	-135.72	220.8	920.3	942.9	905.3	37.61	25.070		
6,600.0	6,271.4	6,367.9	6,272.4	37.8	22.3	-135.72	220.8	920.3	942.9	905.0	37.91	24.871		
6,700.0	6,371.4	6,467.9	6,372.4	37.8	22.4	-135.72	220.8	920.3	942.9	904.7	38.22	24.673		
6,800.0	6,471.4	6,567.9	6,472.4	37.9	22.6	-135.72	220.8	920.3	942.9	904.4	38.52	24.476		

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

Company:	Sundance Energy, Weld County, CO	Local Co-ordinate Reference:	Well MLD 43-22
Project:	SEC.22-T4N-R68W	TVD Reference:	WELL @ 4956.0ft (Original Well Elev)
Reference Site:	HFE 5 Pad Sec.22-T4N-R68W	MD Reference:	WELL @ 4956.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	MLD 43-22	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	Landmark
Reference Design:	Plan #1 (8-02-12)	Offset TVD Reference:	Offset Datum

Offset Design HFE 5 Pad Sec.22-T4N-R68W - HFE 22SE - Wellbore #1 - Plan #1 (8-02-12)												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
6,900.0	6,571.4	6,667.9	6,572.4	38.0	22.7	-135.72	220.8	920.3	942.9	904.1	38.83	24.281	
7,000.0	6,671.4	6,767.9	6,672.4	38.1	22.9	-135.72	220.8	920.3	942.9	903.8	39.15	24.088	
7,100.0	6,771.4	6,867.9	6,772.4	38.2	23.0	-135.72	220.8	920.3	942.9	903.5	39.46	23.895	
7,200.0	6,871.4	6,967.9	6,872.4	38.3	23.1	-135.72	220.8	920.3	942.9	903.1	39.78	23.705	
7,300.0	6,971.4	7,067.9	6,972.4	38.3	23.3	-135.72	220.8	920.3	942.9	902.8	40.10	23.515	
7,400.0	7,071.4	7,167.9	7,072.4	38.4	23.4	-135.72	220.8	920.3	942.9	902.5	40.42	23.328	
7,500.0	7,171.4	7,267.9	7,172.4	38.5	23.6	-135.72	220.8	920.3	942.9	902.2	40.74	23.142	
7,600.0	7,271.4	7,367.9	7,272.4	38.6	23.7	-135.72	220.8	920.3	942.9	901.8	41.07	22.958	
7,618.7	7,290.1	7,386.6	7,291.1	38.6	23.7	-135.72	220.8	920.3	942.9	901.8	41.13	22.923	
7,628.6	7,300.0	7,395.5	7,300.0	38.6	23.8	-135.72	220.8	920.3	942.9	901.8	41.16	22.906	

Company:	Sundance Energy, Weld County, CO	Local Co-ordinate Reference:	Well MLD 43-22
Project:	SEC.22-T4N-R68W	TVD Reference:	WELL @ 4956.0ft (Original Well Elev)
Reference Site:	HFE 5 Pad Sec.22-T4N-R68W	MD Reference:	WELL @ 4956.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	MLD 43-22	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	Landmark
Reference Design:	Plan #1 (8-02-12)	Offset TVD Reference:	Offset Datum

Offset Design												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
0.0	0.0	0.0	0.0	0.0	0.0	-92.77	-0.7	-15.1	15.1	15.1	0.00	N/A	
100.0	100.0	100.0	100.0	0.1	0.1	-92.77	-0.7	-15.1	15.1	14.9	0.22	67.097	
200.0	200.0	200.0	200.0	0.3	0.3	-92.77	-0.7	-15.1	15.1	14.4	0.67	22.366 CC	
200.0	200.0	200.0	200.0	0.3	0.3	-92.77	-0.7	-15.1	15.1	14.4	0.67	22.364	
300.0	300.0	300.0	300.0	0.6	0.6	-99.32	-0.7	-15.1	15.3	14.1	1.12	13.584 ES	
400.0	399.8	399.8	399.8	0.8	0.8	-117.04	-0.7	-15.1	16.9	15.3	1.58	10.694 SF	
500.0	499.5	498.9	498.9	1.0	1.0	-149.16	-2.4	-15.1	23.6	21.6	2.03	11.648	
600.0	598.9	596.9	596.7	1.3	1.2	-176.24	-7.5	-15.1	37.7	35.2	2.45	15.367	
700.0	698.2	694.6	694.1	1.6	1.4	168.94	-15.5	-14.7	57.2	54.3	2.89	19.779	
800.0	797.0	793.3	792.4	1.9	1.6	159.44	-24.1	-11.5	78.3	75.0	3.33	23.495	
900.0	895.3	892.1	890.5	2.2	1.9	152.75	-32.6	-4.8	100.3	96.4	3.81	26.331	
1,000.0	993.0	990.9	988.5	2.6	2.2	147.73	-41.2	5.2	123.0	118.7	4.33	28.378	
1,100.0	1,089.9	1,089.8	1,086.1	3.1	2.5	143.80	-49.6	18.6	146.5	141.6	4.93	29.709	
1,200.0	1,186.0	1,188.7	1,183.2	3.6	2.8	140.59	-58.0	35.4	170.8	165.2	5.62	30.409	
1,300.0	1,281.1	1,287.8	1,279.8	4.2	3.2	137.90	-66.3	55.6	195.8	189.4	6.40	30.576	
1,400.0	1,375.0	1,386.8	1,375.7	4.8	3.7	135.58	-74.6	79.2	221.5	214.2	7.31	30.315	
1,500.0	1,467.9	1,486.0	1,470.8	5.5	4.2	134.01	-82.8	106.0	247.8	239.5	8.33	29.734	
1,600.0	1,560.5	1,585.5	1,565.2	6.3	4.8	133.05	-90.8	136.3	273.4	264.0	9.48	28.834	
1,700.0	1,653.0	1,684.5	1,658.1	7.0	5.4	131.64	-98.8	169.6	298.2	287.4	10.74	27.764	
1,800.0	1,745.6	1,781.1	1,748.4	7.8	6.1	130.30	-106.5	203.0	322.7	310.7	12.05	26.793	
1,900.0	1,838.2	1,877.8	1,838.8	8.5	6.7	129.14	-114.2	236.5	347.5	334.1	13.38	25.971	
2,000.0	1,930.7	1,974.5	1,929.2	9.3	7.4	128.14	-121.9	269.9	372.3	357.6	14.73	25.272	
2,100.0	2,023.3	2,071.1	2,019.6	10.0	8.1	127.27	-129.6	303.4	397.2	381.1	16.10	24.673	
2,200.0	2,115.9	2,167.8	2,109.9	10.8	8.8	126.49	-137.3	336.8	422.3	404.8	17.48	24.156	
2,300.0	2,208.4	2,264.5	2,200.3	11.6	9.5	125.81	-145.0	370.3	447.3	428.5	18.87	23.708	
2,400.0	2,301.0	2,361.2	2,290.7	12.4	10.2	125.19	-152.7	403.7	472.5	452.2	20.26	23.316	
2,500.0	2,393.6	2,457.8	2,381.1	13.1	11.0	124.64	-160.5	437.2	497.6	476.0	21.66	22.971	
2,600.0	2,486.1	2,554.5	2,471.4	13.9	11.7	124.14	-168.2	470.6	522.9	499.8	23.07	22.665	
2,700.0	2,578.7	2,651.2	2,561.8	14.7	12.4	123.69	-175.9	504.1	548.1	523.6	24.48	22.393	
2,800.0	2,671.3	2,747.9	2,652.2	15.5	13.1	123.28	-183.6	537.5	573.4	547.5	25.89	22.149	
2,900.0	2,763.8	2,844.5	2,742.6	16.3	13.8	122.90	-191.3	571.0	598.7	571.4	27.30	21.929	
3,000.0	2,856.4	2,941.2	2,832.9	17.0	14.6	122.55	-199.0	604.4	624.0	595.3	28.72	21.730	
3,100.0	2,949.0	3,037.9	2,923.3	17.8	15.3	122.23	-206.7	637.9	649.4	619.2	30.13	21.549	
3,200.0	3,041.6	3,134.5	3,013.7	18.6	16.0	121.94	-214.4	671.3	674.7	643.2	31.55	21.384	
3,300.0	3,134.1	3,231.2	3,104.1	19.4	16.8	121.66	-222.1	704.8	700.1	667.1	32.97	21.233	
3,400.0	3,226.7	3,327.9	3,194.4	20.2	17.5	121.41	-229.8	738.2	725.5	691.1	34.39	21.094	
3,500.0	3,319.3	3,424.6	3,284.8	20.9	18.2	121.17	-237.6	771.7	750.9	715.1	35.82	20.965	
3,600.0	3,411.8	3,521.2	3,375.2	21.7	18.9	120.95	-245.3	805.1	776.3	739.1	37.24	20.847	
3,700.0	3,504.4	3,617.9	3,465.6	22.5	19.7	120.74	-253.0	838.5	801.8	763.1	38.66	20.737	
3,800.0	3,597.0	3,714.6	3,555.9	23.3	20.4	120.54	-260.7	872.0	827.2	787.1	40.09	20.635	
3,900.0	3,689.5	3,811.3	3,646.3	24.1	21.1	120.36	-268.4	905.4	852.6	811.1	41.51	20.540	
4,000.0	3,782.1	3,907.9	3,736.7	24.9	21.9	120.18	-276.1	938.9	878.1	835.2	42.94	20.451	
4,100.0	3,874.7	4,004.6	3,827.1	25.7	22.6	120.02	-283.8	972.3	903.6	859.2	44.36	20.368	
4,200.0	3,967.2	4,101.3	3,917.4	26.4	23.3	119.87	-291.5	1,005.8	929.0	883.2	45.79	20.289	
4,300.0	4,059.8	4,198.0	4,007.8	27.2	24.1	119.72	-299.2	1,039.2	954.5	907.3	47.21	20.216	
4,400.0	4,152.4	4,294.6	4,098.2	28.0	24.8	119.58	-307.0	1,072.7	980.0	931.3	48.64	20.147	
4,500.0	4,244.9	4,391.3	4,188.6	28.8	25.5	119.45	-314.7	1,106.1	1,005.5	955.4	50.07	20.082	
4,600.0	4,337.5	4,488.0	4,278.9	29.6	26.3	119.32	-322.4	1,139.6	1,030.9	979.5	51.50	20.020	
4,700.0	4,430.1	4,584.6	4,369.3	30.4	27.0	119.20	-330.1	1,173.0	1,056.4	1,003.5	52.92	19.962	
4,800.0	4,522.6	4,681.3	4,459.7	31.1	27.8	119.09	-337.8	1,206.5	1,081.9	1,027.6	54.35	19.907	
4,900.0	4,615.2	4,778.0	4,550.0	31.9	28.5	118.98	-345.5	1,239.9	1,107.4	1,051.7	55.78	19.854	
5,000.0	4,707.8	4,874.7	4,640.4	32.7	29.2	118.88	-353.2	1,273.4	1,132.9	1,075.7	57.21	19.804	

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

Company:	Sundance Energy, Weld County, CO	Local Co-ordinate Reference:	Well MLD 43-22
Project:	SEC.22-T4N-R68W	TVD Reference:	WELL @ 4956.0ft (Original Well Elev)
Reference Site:	HFE 5 Pad Sec.22-T4N-R68W	MD Reference:	WELL @ 4956.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	MLD 43-22	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	Landmark
Reference Design:	Plan #1 (8-02-12)	Offset TVD Reference:	Offset Datum

Offset Design HFE 5 Pad Sec.22-T4N-R68W - HFE 44-22 - Wellbore #1 - Plan #1 (8-02-12)												Offset Site Error:	0.0 ft
Survey Program: 0-MWD												Offset Well Error:	0.0 ft
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	
5,100.0	4,800.3	4,971.3	4,730.8	33.5	30.0	118.78	-360.9	1,306.8	1,158.4	1,099.8	58.64	19.757	
5,200.0	4,893.4	5,068.1	4,821.3	34.2	30.7	119.00	-368.6	1,340.3	1,183.4	1,123.4	60.04	19.709	
5,300.0	4,987.6	5,165.2	4,912.0	34.8	31.4	119.14	-376.4	1,373.9	1,206.8	1,145.4	61.35	19.670	
5,400.0	5,082.9	5,264.2	5,004.6	35.3	32.2	119.10	-384.3	1,408.1	1,228.5	1,165.9	62.62	19.618	
5,500.0	5,179.2	5,370.4	5,104.9	35.7	32.8	118.98	-392.1	1,442.2	1,248.2	1,184.4	63.74	19.582	
5,600.0	5,276.4	5,477.7	5,207.3	36.1	33.3	118.86	-399.2	1,473.0	1,265.5	1,200.8	64.72	19.553	
5,700.0	5,374.4	5,585.8	5,311.8	36.5	33.8	118.74	-405.5	1,500.2	1,280.6	1,215.0	65.59	19.522	
5,800.0	5,473.0	5,694.9	5,418.2	36.8	34.2	118.61	-410.9	1,523.8	1,293.2	1,226.9	66.35	19.491	
5,900.0	5,572.1	5,804.6	5,526.0	37.0	34.6	118.47	-415.5	1,543.5	1,303.5	1,236.5	66.99	19.459	
6,000.0	5,671.6	5,915.0	5,635.2	37.2	34.9	118.33	-419.1	1,559.3	1,311.3	1,243.8	67.50	19.425	
6,100.0	5,771.4	6,026.0	5,745.5	37.4	35.1	118.18	-421.8	1,570.9	1,316.6	1,248.7	67.91	19.389	
6,200.0	5,871.4	6,137.3	5,856.5	37.5	35.3	118.02	-423.5	1,578.5	1,319.5	1,251.3	68.20	19.348	
6,300.0	5,971.4	6,248.8	5,968.0	37.5	35.4	179.86	-424.3	1,581.8	1,320.2	1,251.8	68.40	19.300	
6,400.0	6,071.4	6,352.2	6,071.4	37.6	35.5	179.85	-424.4	1,582.0	1,320.2	1,251.7	68.57	19.253	
6,500.0	6,171.4	6,452.2	6,171.4	37.7	35.6	179.85	-424.4	1,582.0	1,320.2	1,251.5	68.74	19.206	
6,600.0	6,271.4	6,552.2	6,271.4	37.8	35.6	179.85	-424.4	1,582.0	1,320.2	1,251.3	68.91	19.159	
6,700.0	6,371.4	6,652.2	6,371.4	37.8	35.7	179.85	-424.4	1,582.0	1,320.2	1,251.2	69.08	19.111	
6,800.0	6,471.4	6,752.2	6,471.4	37.9	35.8	179.85	-424.4	1,582.0	1,320.2	1,251.0	69.26	19.063	
6,900.0	6,571.4	6,852.2	6,571.4	38.0	35.9	179.85	-424.4	1,582.0	1,320.2	1,250.8	69.43	19.015	
7,000.0	6,671.4	6,952.2	6,671.4	38.1	36.0	179.85	-424.4	1,582.0	1,320.2	1,250.6	69.61	18.966	
7,100.0	6,771.4	7,052.2	6,771.4	38.2	36.1	179.85	-424.4	1,582.0	1,320.2	1,250.5	69.79	18.916	
7,200.0	6,871.4	7,152.2	6,871.4	38.3	36.2	179.85	-424.4	1,582.0	1,320.2	1,250.3	69.98	18.867	
7,300.0	6,971.4	7,252.2	6,971.4	38.3	36.2	179.85	-424.4	1,582.0	1,320.2	1,250.1	70.16	18.817	
7,400.0	7,071.4	7,352.2	7,071.4	38.4	36.3	179.85	-424.4	1,582.0	1,320.2	1,249.9	70.35	18.766	
7,500.0	7,171.4	7,452.2	7,171.4	38.5	36.4	179.85	-424.4	1,582.0	1,320.2	1,249.7	70.54	18.715	
7,600.0	7,271.4	7,552.2	7,271.4	38.6	36.5	179.85	-424.4	1,582.0	1,320.2	1,249.5	70.74	18.664	
7,628.6	7,300.0	7,580.8	7,300.0	38.6	36.5	179.85	-424.4	1,582.0	1,320.2	1,249.5	70.79	18.649	

Company:	Sundance Energy, Weld County, CO	Local Co-ordinate Reference:	Well MLD 43-22
Project:	SEC.22-T4N-R68W	TVD Reference:	WELL @ 4956.0ft (Original Well Elev)
Reference Site:	HFE 5 Pad Sec.22-T4N-R68W	MD Reference:	WELL @ 4956.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	MLD 43-22	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	Landmark
Reference Design:	Plan #1 (8-02-12)	Offset TVD Reference:	Offset Datum

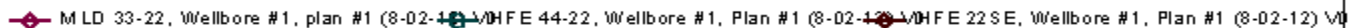
Offset Design HFE 5 Pad Sec.22-T4N-R68W - MLD 33-22 - Wellbore #1 - plan #1 (8-02-12)													Offset Site Error:	0.0 ft
Survey Program: 0-MWD													Offset Well Error:	0.0 ft
Reference		Offset		Semi Major Axis			Distance							Warning
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	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	-91.40	-0.7	-30.1	30.2					
100.0	100.0	99.0	99.0	0.1	0.1	-91.40	-0.7	-30.1	30.1	29.9	0.22	134.750		
200.0	200.0	199.0	199.0	0.3	0.3	-91.40	-0.7	-30.1	30.1	29.5	0.67	44.842 CC		
200.3	200.3	199.3	199.3	0.3	0.3	-91.40	-0.7	-30.1	30.1	29.5	0.67	44.738		
300.0	300.0	299.0	299.0	0.6	0.6	-94.71	-0.7	-30.1	30.2	29.1	1.12	26.959 ES		
400.0	399.8	398.8	398.8	0.8	0.8	-104.33	-0.7	-30.1	31.1	29.5	1.58	19.712		
500.0	499.5	498.5	498.5	1.0	1.0	-128.03	-0.7	-30.1	34.5	32.5	2.05	16.874 SF		
600.0	598.9	597.9	597.9	1.3	1.2	-153.47	-0.7	-30.1	42.6	40.1	2.50	17.009		
700.0	698.2	697.2	697.2	1.6	1.5	-168.83	-0.7	-30.1	54.5	51.6	2.96	18.452		
800.0	797.0	797.0	797.0	1.9	1.7	-177.52	-0.4	-30.0	69.4	66.0	3.40	20.401		
900.0	895.3	898.2	898.1	2.2	1.9	178.56	2.9	-28.9	84.8	80.9	3.85	22.021		
1,000.0	993.0	999.7	999.4	2.6	2.1	177.58	9.6	-26.7	100.3	96.0	4.30	23.299		
1,100.0	1,089.9	1,101.3	1,100.5	3.1	2.4	178.43	19.7	-23.3	116.3	111.5	4.78	24.349		
1,200.0	1,186.0	1,203.0	1,201.1	3.6	2.6	-179.56	33.2	-18.8	133.2	128.0	5.28	25.243		
1,300.0	1,281.1	1,304.5	1,301.0	4.2	3.0	-176.83	50.0	-13.2	151.5	145.7	5.83	26.005		
1,400.0	1,375.0	1,403.1	1,397.6	4.8	3.3	-173.96	69.0	-6.9	171.9	165.5	6.43	26.751		
1,500.0	1,467.9	1,499.6	1,492.0	5.5	3.6	-171.32	87.8	-0.7	196.2	189.1	7.09	27.666		
1,600.0	1,560.5	1,595.8	1,586.2	6.3	4.0	-168.62	106.5	5.6	221.6	213.8	7.82	28.330		
1,700.0	1,653.0	1,692.0	1,680.3	7.0	4.4	-166.48	125.3	11.8	247.5	238.9	8.59	28.826		
1,800.0	1,745.6	1,788.2	1,774.5	7.8	4.7	-164.75	144.0	18.0	273.6	264.3	9.37	29.196		
1,900.0	1,838.2	1,884.4	1,868.7	8.5	5.1	-163.31	162.7	24.3	300.0	289.8	10.18	29.476		
2,000.0	1,930.7	1,980.7	1,962.9	9.3	5.5	-162.11	181.5	30.5	326.4	315.4	11.00	29.690		
2,100.0	2,023.3	2,076.9	2,057.0	10.0	5.9	-161.08	200.2	36.7	353.0	341.2	11.82	29.855		
2,200.0	2,115.9	2,173.1	2,151.2	10.8	6.3	-160.20	219.0	43.0	379.7	367.0	12.66	29.984		
2,300.0	2,208.4	2,269.3	2,245.4	11.6	6.7	-159.44	237.7	49.2	406.5	392.9	13.51	30.086		
2,400.0	2,301.0	2,365.6	2,339.6	12.4	7.1	-158.77	256.4	55.5	433.3	418.9	14.36	30.167		
2,500.0	2,393.6	2,461.8	2,433.7	13.1	7.5	-158.18	275.2	61.7	460.1	444.9	15.22	30.231		
2,600.0	2,486.1	2,558.0	2,527.9	13.9	8.0	-157.65	293.9	67.9	487.0	470.9	16.08	30.283		
2,700.0	2,578.7	2,654.2	2,622.1	14.7	8.4	-157.18	312.6	74.2	514.0	497.0	16.95	30.325		
2,800.0	2,671.3	2,750.5	2,716.3	15.5	8.8	-156.75	331.4	80.4	540.9	523.1	17.82	30.359		
2,900.0	2,763.8	2,846.7	2,810.4	16.3	9.2	-156.37	350.1	86.6	567.9	549.2	18.69	30.387		
3,000.0	2,856.4	2,942.9	2,904.6	17.0	9.6	-156.02	368.9	92.9	594.9	575.3	19.56	30.410		
3,100.0	2,949.0	3,039.1	2,998.8	17.8	10.0	-155.70	387.6	99.1	621.9	601.5	20.44	30.428		
3,200.0	3,041.6	3,135.3	3,093.0	18.6	10.4	-155.40	406.3	105.3	649.0	627.7	21.32	30.443		
3,300.0	3,134.1	3,231.6	3,187.1	19.4	10.8	-155.14	425.1	111.6	676.0	653.8	22.20	30.456		
3,400.0	3,226.7	3,327.8	3,281.3	20.2	11.3	-154.89	443.8	117.8	703.1	680.0	23.08	30.466		
3,500.0	3,319.3	3,424.0	3,375.5	20.9	11.7	-154.66	462.6	124.1	730.2	706.2	23.96	30.474		
3,600.0	3,411.8	3,520.2	3,469.7	21.7	12.1	-154.44	481.3	130.3	757.3	732.4	24.84	30.480		
3,700.0	3,504.4	3,616.5	3,563.8	22.5	12.5	-154.24	500.0	136.5	784.4	758.6	25.73	30.486		
3,800.0	3,597.0	3,712.7	3,658.0	23.3	12.9	-154.06	518.8	142.8	811.5	784.9	26.62	30.490		
3,900.0	3,689.5	3,808.9	3,752.2	24.1	13.4	-153.88	537.5	149.0	838.6	811.1	27.50	30.493		
4,000.0	3,782.1	3,905.1	3,846.4	24.9	13.8	-153.72	556.3	155.2	865.7	837.3	28.39	30.495		
4,100.0	3,874.7	4,001.4	3,940.5	25.7	14.2	-153.57	575.0	161.5	892.9	863.6	29.28	30.497		
4,200.0	3,967.2	4,097.6	4,034.7	26.4	14.6	-153.42	593.7	167.7	920.0	889.8	30.17	30.498		
4,300.0	4,059.8	4,193.8	4,128.9	27.2	15.0	-153.29	612.5	173.9	947.1	916.1	31.05	30.499		
4,400.0	4,152.4	4,290.0	4,223.1	28.0	15.4	-153.16	631.2	180.2	974.3	942.3	31.94	30.499		
4,500.0	4,244.9	4,386.2	4,317.2	28.8	15.9	-153.04	649.9	186.4	1,001.4	968.6	32.84	30.499		
4,600.0	4,337.5	4,482.5	4,411.4	29.6	16.3	-152.92	668.7	192.7	1,028.6	994.9	33.73	30.498		
4,700.0	4,430.1	4,578.7	4,505.6	30.4	16.7	-152.81	687.4	198.9	1,055.7	1,021.1	34.62	30.497		
4,800.0	4,522.6	4,674.9	4,599.8	31.1	17.1	-152.71	706.2	205.1	1,082.9	1,047.4	35.51	30.496		
4,900.0	4,615.2	4,771.1	4,693.9	31.9	17.5	-152.61	724.9	211.4	1,110.1	1,073.7	36.40	30.495		
5,000.0	4,707.8	4,867.4	4,788.1	32.7	18.0	-152.52	743.6	217.6	1,137.2	1,099.9	37.29	30.494		

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

Company:	Sundance Energy, Weld County, CO	Local Co-ordinate Reference:	Well MLD 43-22
Project:	SEC.22-T4N-R68W	TVD Reference:	WELL @ 4956.0ft (Original Well Elev)
Reference Site:	HFE 5 Pad Sec.22-T4N-R68W	MD Reference:	WELL @ 4956.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	MLD 43-22	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	Landmark
Reference Design:	Plan #1 (8-02-12)	Offset TVD Reference:	Offset Datum

Offset Design												Offset Site Error:	0.0 ft
Survey Program: 0-MWD												Offset Well Error:	0.0 ft
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	
5,100.0	4,800.3	4,963.6	4,882.3	33.5	18.4	-152.43	762.4	223.8	1,164.4	1,126.2	38.19	30.493	
5,200.0	4,893.4	5,060.1	4,976.7	34.2	18.8	-152.52	781.2	230.1	1,190.5	1,151.4	39.11	30.442	
5,300.0	4,987.6	5,157.3	5,071.8	34.8	19.2	-152.56	800.1	236.4	1,213.7	1,173.7	40.00	30.344	
5,400.0	5,082.9	5,247.8	5,160.6	35.3	19.6	-152.53	817.3	242.1	1,234.1	1,193.3	40.79	30.257	
5,500.0	5,179.2	5,333.5	5,245.0	35.7	19.8	-152.54	831.5	246.8	1,252.3	1,210.9	41.44	30.219	
5,600.0	5,276.4	5,419.5	5,330.1	36.1	20.1	-152.58	843.2	250.7	1,268.5	1,226.5	42.01	30.198	
5,700.0	5,374.4	5,500.0	5,410.0	36.5	20.3	-152.66	852.0	253.7	1,282.7	1,240.2	42.47	30.203	
5,800.0	5,473.0	5,592.1	5,501.7	36.8	20.5	-152.75	859.4	256.1	1,294.7	1,251.8	42.86	30.208	
5,900.0	5,572.1	5,678.6	5,588.1	37.0	20.6	-152.88	863.9	257.6	1,304.6	1,261.5	43.14	30.242	
6,000.0	5,671.6	5,765.0	5,674.5	37.2	20.7	-153.03	865.9	258.3	1,312.5	1,269.2	43.33	30.291	
6,100.0	5,771.4	5,860.9	5,770.4	37.4	20.9	-153.19	866.0	258.3	1,318.0	1,274.5	43.46	30.324	
6,200.0	5,871.4	5,960.9	5,870.4	37.5	21.0	-153.27	866.0	258.3	1,320.5	1,276.9	43.59	30.295	
6,300.0	5,971.4	6,060.9	5,970.4	37.5	21.1	-91.30	866.0	258.3	1,320.6	1,276.8	43.79	30.156	
6,400.0	6,071.4	6,160.9	6,070.4	37.6	21.3	-91.30	866.0	258.3	1,320.6	1,276.5	44.04	29.987	
6,500.0	6,171.4	6,260.9	6,170.4	37.7	21.4	-91.30	866.0	258.3	1,320.6	1,276.3	44.29	29.818	
6,600.0	6,271.4	6,360.9	6,270.4	37.8	21.5	-91.30	866.0	258.3	1,320.6	1,276.0	44.54	29.649	
6,700.0	6,371.4	6,460.9	6,370.4	37.8	21.7	-91.30	866.0	258.3	1,320.6	1,275.8	44.80	29.479	
6,800.0	6,471.4	6,560.9	6,470.4	37.9	21.8	-91.30	866.0	258.3	1,320.6	1,275.5	45.06	29.310	
6,900.0	6,571.4	6,660.9	6,570.4	38.0	22.0	-91.30	866.0	258.3	1,320.6	1,275.3	45.32	29.140	
7,000.0	6,671.4	6,760.9	6,670.4	38.1	22.1	-91.30	866.0	258.3	1,320.6	1,275.0	45.58	28.971	
7,100.0	6,771.4	6,860.9	6,770.4	38.2	22.2	-91.30	866.0	258.3	1,320.6	1,274.7	45.85	28.802	
7,200.0	6,871.4	6,960.9	6,870.4	38.3	22.4	-91.30	866.0	258.3	1,320.6	1,274.5	46.12	28.633	
7,300.0	6,971.4	7,060.9	6,970.4	38.3	22.5	-91.30	866.0	258.3	1,320.6	1,274.2	46.39	28.464	
7,400.0	7,071.4	7,160.9	7,070.4	38.4	22.7	-91.30	866.0	258.3	1,320.6	1,273.9	46.67	28.296	
7,500.0	7,171.4	7,260.9	7,170.4	38.5	22.8	-91.30	866.0	258.3	1,320.6	1,273.6	46.95	28.128	
7,600.0	7,271.4	7,360.9	7,270.4	38.6	23.0	-91.30	866.0	258.3	1,320.6	1,273.4	47.23	27.960	
7,628.6	7,300.0	7,389.5	7,299.0	38.6	23.0	-91.30	866.0	258.3	1,320.6	1,273.3	47.31	27.913	

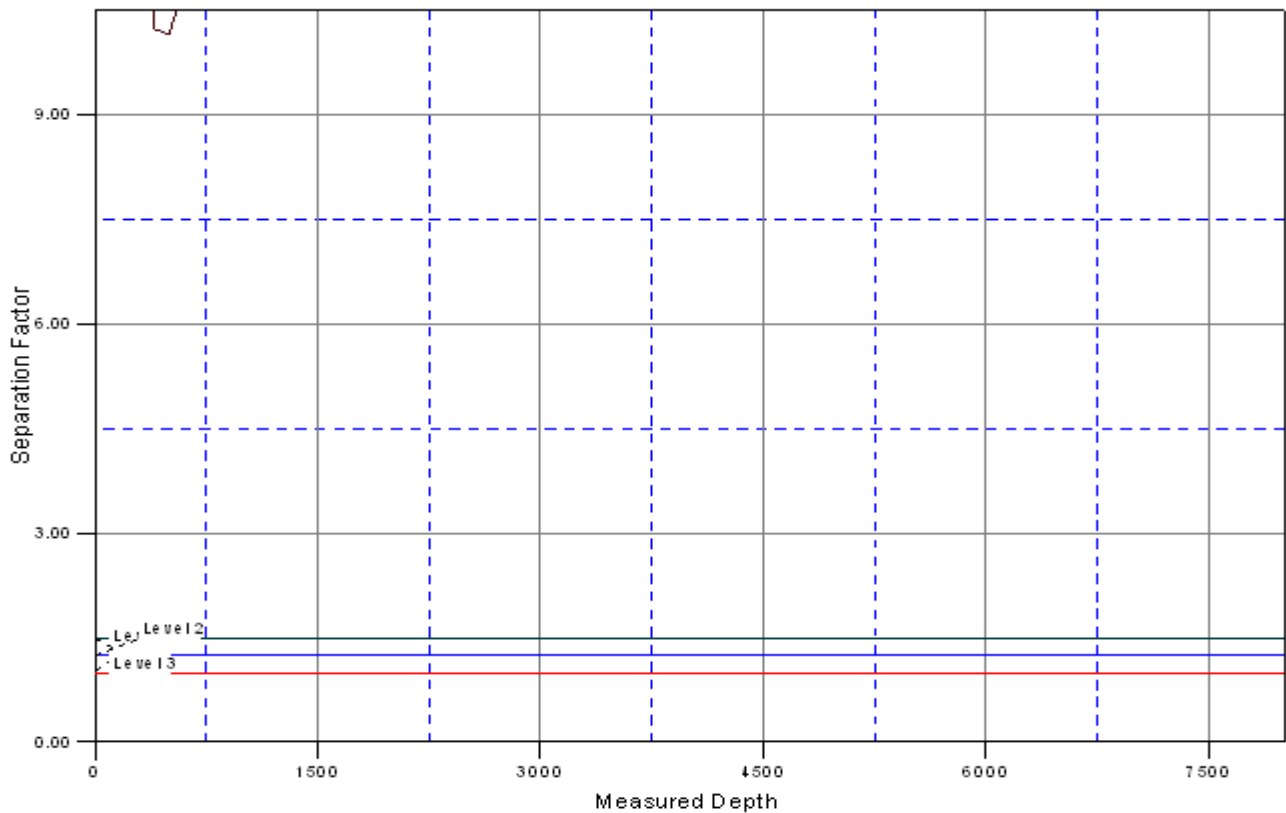
Reference Depths are relative to WELL @ 4956.0ft (Original Well Elev) Coordinates are relative to: MLD 43-22
Offset Depths are relative to Offset Datum Coordinate System is US State Plane 1983, Colorado Northern Zone
Central Meridian is -105.500000 ° Grid Convergence at Surface is: 0.33°



Company:	Sundance Energy, Weld County, CO	Local Co-ordinate Reference:	Well MLD 43-22
Project:	SEC.22-T4N-R68W	TVD Reference:	WELL @ 4956.0ft (Original Well Elev)
Reference Site:	HFE 5 Pad Sec.22-T4N-R68W	MD Reference:	WELL @ 4956.0ft (Original Well Elev)
Site Error:	0.0ft	North Reference:	True
Reference Well:	MLD 43-22	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	Landmark
Reference Design:	Plan #1 (8-02-12)	Offset TVD Reference:	Offset Datum

Reference Depths are relative to WELL @ 4956.0ft (Original Well Elev) Coordinates are relative to: MLD 43-22
Offset Depths are relative to Offset Datum Coordinate System is US State Plane 1983, Colorado Northern Zone
Central Meridian is -105.500000 ° Grid Convergence at Surface is: 0.33°

Separation Factor Plot



LEGEND

MLD 33-22, Wellbore #1, plan #1 (8-02-12) HFE 44-22, Wellbore #1, Plan #1 (8-02-12) HFE 22 SE, Wellbore #1, Plan #1 (8-02-12)