

Ward Petroleum

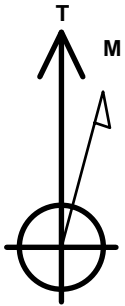
Well Name: **Sharp 2635-1-15HC**
 Surface Location: Sharp 2635-1-15HC Pad Sec.24-T1S-R67W
 North American Datum 1983 , US State Plane 1983, Colorado Northern Zone
 Ground Elevation: 5019.0

+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Slot
0.0	0.0	1223149.20	3183363.44	39.944070	-104.846020	

Original Well Elev WELL @ 5032.0ft (Original Well Elev)

DESIGN TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Shape
SHL 265'FSL & 197'FWL, Sec.24	1.0	0.0	0.0	Point
BHL 850'FSL & 2590'FWL, Sec.35	7785.0	-9992.1	-2889.2	Point
LPL 460'FNL & 2590'FWL, Sec.26	7785.0	-743.0	-2862.9	Point



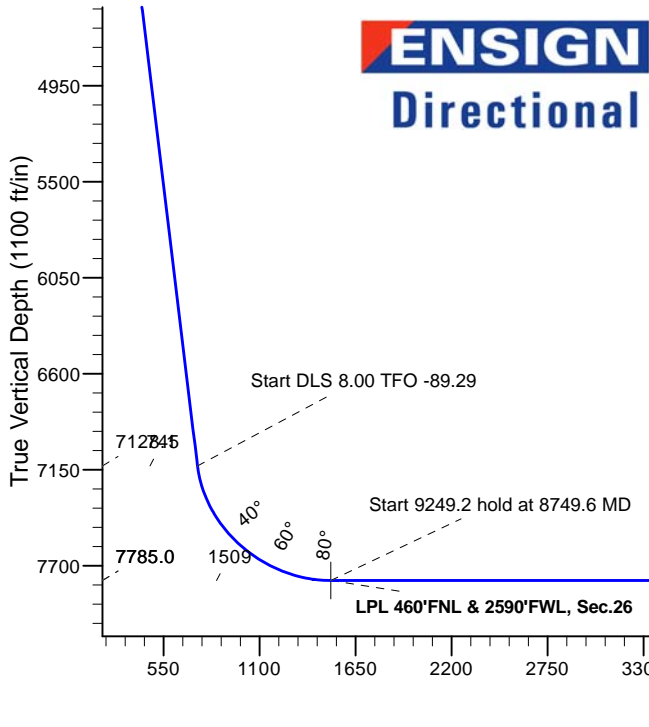
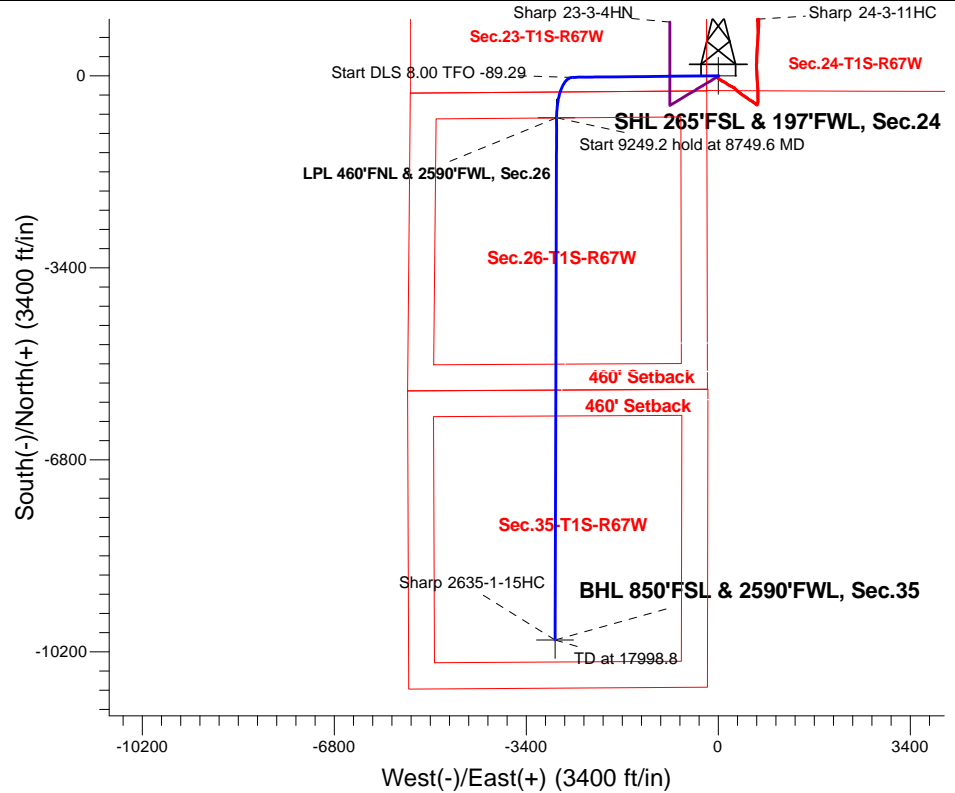
Azimuths to True North
 Magnetic North: 8.12°

Magnetic Field
 Strength: 52293.3snT
 Dip Angle: 66.48°
 Date: 1/17/2017
 Model: IGRF2010

Sharp 2635-1-15HC Pad Sec.24-T1S-R67W
 Sharp 2635-1-15HC
 Plan #1 (1-17-17)
 16:40, January 17 2017

ANNOTATIONS

TVD	MD	Annotation
200.0	200.0	KOP - Start Build 1.50
1678.4	1718.1	Start 5910.3 hold at 1718.1 MD
7128.1	7628.4	Start DLS 8.00 TFO -89.29
7785.0	8749.6	Start 9249.2 hold at 8749.6 MD
7785.0	17998.8	TD at 17998.8



SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSect	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	1718.1	22.77	269.39	1678.4	-3.2	-297.7	1.50	269.39	85.7	
4	7628.4	22.77	269.39	7128.1	-27.6	-2585.1	0.00	0.00	744.5	
5	8749.6	90.00	180.16	7785.0	-743.0	-2862.9	8.00	-89.29	1509.0	LPL 460'FNL & 2590'FWL, Sec.26
6	17998.8	90.00	180.16	7785.0	-9992.1	-2889.2	0.00	0.00	10401.4	BHL 850'FSL & 2590'FWL, Sec.35

BHL 850'FSL & 2590'FWL, Sec.35

TD at 17998.8

Vertical Section at 196.13° (1100 ft/in)



Directional

Ward Petroleum

SEC.24-T1S-R67W

Sharp 2635-1-15HC Pad Sec.24-T1S-R67W

Sharp 2635-1-15HC

Wellbore #1

Plan: Plan #1 (1-17-17)

Standard Planning Report

17 January, 2017

Database:	US_EDM	Local Co-ordinate Reference:	Well Sharp 2635-1-15HC
Company:	Ward Petroleum	TVD Reference:	WELL @ 5032.0ft (Original Well Elev)
Project:	SEC.24-T1S-R67W	MD Reference:	WELL @ 5032.0ft (Original Well Elev)
Site:	Sharp 2635-1-15HC Pad Sec.24-T1S-R67W	North Reference:	True
Well:	Sharp 2635-1-15HC	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #1 (1-17-17)		

Project	SEC.24-T1S-R67W, Adams 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	Sharp 2635-1-15HC Pad Sec.24-T1S-R67W				
Site Position:	Northing:	1,223,149.31 usft	Latitude:	39.944070	
From:	Lat/Long	Easting:	3,183,377.46 usft	Longitude:	-104.845970
Position Uncertainty:	0.0 ft	Slot Radius:	13-3/16 "	Grid Convergence:	0.42 °

Well	Sharp 2635-1-15HC					
Well Position	+N/-S	0.0 ft	Northing:	1,223,149.19 usft	Latitude:	39.944070
	+E/-W	-14.0 ft	Easting:	3,183,363.44 usft	Longitude:	-104.846020
Position Uncertainty		0.0 ft	Wellhead Elevation:	0.0 ft	Ground Level:	5,019.0 ft

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	1/17/2017	8.12	66.48	52,293

Design	Plan #1 (1-17-17)			
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	196.13

Plan Sections										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	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	
1,718.1	22.77	269.39	1,678.4	-3.2	-297.7	1.50	1.50	0.00	269.39	
7,628.4	22.77	269.39	7,128.1	-27.6	-2,585.1	0.00	0.00	0.00	0.00	
8,749.6	90.00	180.16	7,785.0	-743.0	-2,862.9	8.00	6.00	-7.96	-89.29	LPL 460'FNL & 2590'f
17,998.8	90.00	180.16	7,785.0	-9,992.1	-2,889.2	0.00	0.00	0.00	0.00	BHL 850'FSL & 2590'f

Database:	US_EDM	Local Co-ordinate Reference:	Well Sharp 2635-1-15HC
Company:	Ward Petroleum	TVD Reference:	WELL @ 5032.0ft (Original Well Elev)
Project:	SEC.24-T1S-R67W	MD Reference:	WELL @ 5032.0ft (Original Well Elev)
Site:	Sharp 2635-1-15HC Pad Sec.24-T1S-R67W	North Reference:	True
Well:	Sharp 2635-1-15HC	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #1 (1-17-17)		

Planned Survey										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00	0.00	
100.0	0.00	0.00	100.0	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	
KOP - Start Build 1.50										
300.0	1.50	269.39	300.0	0.0	-1.3	0.4	1.50	1.50	0.00	
400.0	3.00	269.39	399.9	-0.1	-5.2	1.5	1.50	1.50	0.00	
500.0	4.50	269.39	499.7	-0.1	-11.8	3.4	1.50	1.50	0.00	
600.0	6.00	269.39	599.3	-0.2	-20.9	6.0	1.50	1.50	0.00	
700.0	7.50	269.39	698.6	-0.3	-32.7	9.4	1.50	1.50	0.00	
800.0	9.00	269.39	797.5	-0.5	-47.0	13.5	1.50	1.50	0.00	
900.0	10.50	269.39	896.1	-0.7	-64.0	18.4	1.50	1.50	0.00	
1,000.0	12.00	269.39	994.2	-0.9	-83.5	24.0	1.50	1.50	0.00	
1,100.0	13.50	269.39	1,091.7	-1.1	-105.5	30.4	1.50	1.50	0.00	
1,200.0	15.00	269.39	1,188.6	-1.4	-130.1	37.5	1.50	1.50	0.00	
1,300.0	16.50	269.39	1,284.9	-1.7	-157.3	45.3	1.50	1.50	0.00	
1,400.0	18.00	269.39	1,380.4	-2.0	-186.9	53.8	1.50	1.50	0.00	
1,500.0	19.50	269.39	1,475.0	-2.3	-219.1	63.1	1.50	1.50	0.00	
1,600.0	21.00	269.39	1,568.9	-2.7	-253.7	73.1	1.50	1.50	0.00	
1,700.0	22.50	269.39	1,661.7	-3.1	-290.7	83.7	1.50	1.50	0.00	
1,718.1	22.77	269.39	1,678.4	-3.2	-297.7	85.7	1.50	1.50	0.00	
Start 5910.3 hold at 1718.1 MD										
1,800.0	22.77	269.39	1,754.0	-3.5	-329.4	94.9	0.00	0.00	0.00	
1,900.0	22.77	269.39	1,846.2	-3.9	-368.1	106.0	0.00	0.00	0.00	
2,000.0	22.77	269.39	1,938.4	-4.3	-406.8	117.2	0.00	0.00	0.00	
2,100.0	22.77	269.39	2,030.6	-4.8	-445.5	128.3	0.00	0.00	0.00	
2,200.0	22.77	269.39	2,122.8	-5.2	-484.2	139.5	0.00	0.00	0.00	
2,300.0	22.77	269.39	2,215.0	-5.6	-522.9	150.6	0.00	0.00	0.00	
2,400.0	22.77	269.39	2,307.2	-6.0	-561.6	161.8	0.00	0.00	0.00	
2,500.0	22.77	269.39	2,399.4	-6.4	-600.3	172.9	0.00	0.00	0.00	
2,600.0	22.77	269.39	2,491.6	-6.8	-639.0	184.0	0.00	0.00	0.00	
2,700.0	22.77	269.39	2,583.8	-7.2	-677.7	195.2	0.00	0.00	0.00	
2,800.0	22.77	269.39	2,676.0	-7.6	-716.4	206.3	0.00	0.00	0.00	
2,900.0	22.77	269.39	2,768.2	-8.1	-755.1	217.5	0.00	0.00	0.00	
3,000.0	22.77	269.39	2,860.4	-8.5	-793.8	228.6	0.00	0.00	0.00	
3,100.0	22.77	269.39	2,952.6	-8.9	-832.5	239.8	0.00	0.00	0.00	
3,200.0	22.77	269.39	3,044.9	-9.3	-871.2	250.9	0.00	0.00	0.00	
3,300.0	22.77	269.39	3,137.1	-9.7	-909.9	262.1	0.00	0.00	0.00	
3,400.0	22.77	269.39	3,229.3	-10.1	-948.6	273.2	0.00	0.00	0.00	
3,500.0	22.77	269.39	3,321.5	-10.5	-987.3	284.4	0.00	0.00	0.00	
3,600.0	22.77	269.39	3,413.7	-10.9	-1,026.0	295.5	0.00	0.00	0.00	
3,700.0	22.77	269.39	3,505.9	-11.4	-1,064.8	306.7	0.00	0.00	0.00	
3,800.0	22.77	269.39	3,598.1	-11.8	-1,103.5	317.8	0.00	0.00	0.00	
3,900.0	22.77	269.39	3,690.3	-12.2	-1,142.2	329.0	0.00	0.00	0.00	
4,000.0	22.77	269.39	3,782.5	-12.6	-1,180.9	340.1	0.00	0.00	0.00	
4,100.0	22.77	269.39	3,874.7	-13.0	-1,219.6	351.2	0.00	0.00	0.00	
4,200.0	22.77	269.39	3,966.9	-13.4	-1,258.3	362.4	0.00	0.00	0.00	
4,300.0	22.77	269.39	4,059.1	-13.8	-1,297.0	373.5	0.00	0.00	0.00	
4,400.0	22.77	269.39	4,151.3	-14.2	-1,335.7	384.7	0.00	0.00	0.00	
4,500.0	22.77	269.39	4,243.5	-14.7	-1,374.4	395.8	0.00	0.00	0.00	
4,600.0	22.77	269.39	4,335.7	-15.1	-1,413.1	407.0	0.00	0.00	0.00	
4,700.0	22.77	269.39	4,427.9	-15.5	-1,451.8	418.1	0.00	0.00	0.00	
4,800.0	22.77	269.39	4,520.1	-15.9	-1,490.5	429.3	0.00	0.00	0.00	
4,900.0	22.77	269.39	4,612.4	-16.3	-1,529.2	440.4	0.00	0.00	0.00	
5,000.0	22.77	269.39	4,704.6	-16.7	-1,567.9	451.6	0.00	0.00	0.00	

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Project:	SEC.24-T1S-R67W	MD Reference:	WELL @ 5032.0ft (Original Well Elev)
Site:	Sharp 2635-1-15HC Pad Sec.24-T1S-R67W	North Reference:	True
Well:	Sharp 2635-1-15HC	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #1 (1-17-17)		

Planned Survey										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	
5,100.0	22.77	269.39	4,796.8	-17.1	-1,606.6	462.7	0.00	0.00	0.00	
5,200.0	22.77	269.39	4,889.0	-17.5	-1,645.3	473.9	0.00	0.00	0.00	
5,300.0	22.77	269.39	4,981.2	-18.0	-1,684.0	485.0	0.00	0.00	0.00	
5,400.0	22.77	269.39	5,073.4	-18.4	-1,722.7	496.2	0.00	0.00	0.00	
5,500.0	22.77	269.39	5,165.6	-18.8	-1,761.4	507.3	0.00	0.00	0.00	
5,600.0	22.77	269.39	5,257.8	-19.2	-1,800.1	518.4	0.00	0.00	0.00	
5,700.0	22.77	269.39	5,350.0	-19.6	-1,838.8	529.6	0.00	0.00	0.00	
5,800.0	22.77	269.39	5,442.2	-20.0	-1,877.5	540.7	0.00	0.00	0.00	
5,900.0	22.77	269.39	5,534.4	-20.4	-1,916.2	551.9	0.00	0.00	0.00	
6,000.0	22.77	269.39	5,626.6	-20.8	-1,954.9	563.0	0.00	0.00	0.00	
6,100.0	22.77	269.39	5,718.8	-21.3	-1,993.6	574.2	0.00	0.00	0.00	
6,200.0	22.77	269.39	5,811.0	-21.7	-2,032.3	585.3	0.00	0.00	0.00	
6,300.0	22.77	269.39	5,903.2	-22.1	-2,071.0	596.5	0.00	0.00	0.00	
6,400.0	22.77	269.39	5,995.4	-22.5	-2,109.7	607.6	0.00	0.00	0.00	
6,500.0	22.77	269.39	6,087.6	-22.9	-2,148.4	618.8	0.00	0.00	0.00	
6,600.0	22.77	269.39	6,179.9	-23.3	-2,187.1	629.9	0.00	0.00	0.00	
6,700.0	22.77	269.39	6,272.1	-23.7	-2,225.8	641.1	0.00	0.00	0.00	
6,800.0	22.77	269.39	6,364.3	-24.1	-2,264.5	652.2	0.00	0.00	0.00	
6,900.0	22.77	269.39	6,456.5	-24.6	-2,303.2	663.4	0.00	0.00	0.00	
7,000.0	22.77	269.39	6,548.7	-25.0	-2,341.9	674.5	0.00	0.00	0.00	
7,100.0	22.77	269.39	6,640.9	-25.4	-2,380.6	685.7	0.00	0.00	0.00	
7,200.0	22.77	269.39	6,733.1	-25.8	-2,419.3	696.8	0.00	0.00	0.00	
7,300.0	22.77	269.39	6,825.3	-26.2	-2,458.0	707.9	0.00	0.00	0.00	
7,400.0	22.77	269.39	6,917.5	-26.6	-2,496.7	719.1	0.00	0.00	0.00	
7,500.0	22.77	269.39	7,009.7	-27.0	-2,535.4	730.2	0.00	0.00	0.00	
7,600.0	22.77	269.39	7,101.9	-27.4	-2,574.1	741.4	0.00	0.00	0.00	
7,628.4	22.77	269.39	7,128.1	-27.6	-2,585.1	744.5	0.00	0.00	0.00	
Start DLS 8.00 TFO -89.29										
7,700.0	23.51	254.89	7,194.0	-31.4	-2,612.8	756.0	8.00	1.04	-20.23	
7,800.0	26.55	237.31	7,284.7	-48.7	-2,650.9	783.2	8.00	3.03	-17.58	
7,900.0	31.27	223.89	7,372.3	-79.6	-2,687.8	823.0	8.00	4.72	-13.43	
8,000.0	37.03	213.97	7,455.1	-123.3	-2,722.7	874.7	8.00	5.76	-9.92	
8,100.0	43.42	206.49	7,531.5	-179.1	-2,754.9	937.3	8.00	6.39	-7.48	
8,200.0	50.20	200.64	7,599.9	-246.0	-2,783.8	1,009.5	8.00	6.77	-5.85	
8,300.0	57.21	195.85	7,659.1	-322.5	-2,808.8	1,090.0	8.00	7.01	-4.78	
8,400.0	64.38	191.78	7,707.9	-407.2	-2,829.6	1,177.1	8.00	7.17	-4.07	
8,500.0	71.64	188.17	7,745.3	-498.4	-2,845.5	1,269.2	8.00	7.27	-3.61	
8,600.0	78.98	184.85	7,770.6	-594.5	-2,856.4	1,364.5	8.00	7.33	-3.31	
8,700.0	86.34	181.70	7,783.4	-693.4	-2,862.1	1,461.1	8.00	7.36	-3.15	
8,749.6	90.00	180.16	7,785.0	-743.0	-2,862.9	1,509.0	8.00	7.38	-3.10	
Start 9249.2 hold at 8749.6 MD										
8,800.0	90.00	180.16	7,785.0	-793.3	-2,863.0	1,557.4	0.00	0.00	0.00	
8,900.0	90.00	180.16	7,785.0	-893.3	-2,863.3	1,653.5	0.00	0.00	0.00	
9,000.0	90.00	180.16	7,785.0	-993.3	-2,863.6	1,749.7	0.00	0.00	0.00	
9,100.0	90.00	180.16	7,785.0	-1,093.3	-2,863.9	1,845.8	0.00	0.00	0.00	
9,200.0	90.00	180.16	7,785.0	-1,193.3	-2,864.2	1,942.0	0.00	0.00	0.00	
9,300.0	90.00	180.16	7,785.0	-1,293.3	-2,864.5	2,038.1	0.00	0.00	0.00	
9,400.0	90.00	180.16	7,785.0	-1,393.3	-2,864.7	2,134.2	0.00	0.00	0.00	
9,500.0	90.00	180.16	7,785.0	-1,493.3	-2,865.0	2,230.4	0.00	0.00	0.00	
9,600.0	90.00	180.16	7,785.0	-1,593.3	-2,865.3	2,326.5	0.00	0.00	0.00	
9,700.0	90.00	180.16	7,785.0	-1,693.3	-2,865.6	2,422.7	0.00	0.00	0.00	
9,800.0	90.00	180.16	7,785.0	-1,793.3	-2,865.9	2,518.8	0.00	0.00	0.00	
9,900.0	90.00	180.16	7,785.0	-1,893.3	-2,866.2	2,615.0	0.00	0.00	0.00	
10,000.0	90.00	180.16	7,785.0	-1,993.3	-2,866.4	2,711.1	0.00	0.00	0.00	

Database:	US_EDM	Local Co-ordinate Reference:	Well Sharp 2635-1-15HC
Company:	Ward Petroleum	TVD Reference:	WELL @ 5032.0ft (Original Well Elev)
Project:	SEC.24-T1S-R67W	MD Reference:	WELL @ 5032.0ft (Original Well Elev)
Site:	Sharp 2635-1-15HC Pad Sec.24-T1S-R67W	North Reference:	True
Well:	Sharp 2635-1-15HC	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #1 (1-17-17)		

Planned Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
10,100.0	90.00	180.16	7,785.0	-2,093.3	-2,866.7	2,807.3	0.00	0.00	0.00
10,200.0	90.00	180.16	7,785.0	-2,193.3	-2,867.0	2,903.4	0.00	0.00	0.00
10,300.0	90.00	180.16	7,785.0	-2,293.3	-2,867.3	2,999.5	0.00	0.00	0.00
10,400.0	90.00	180.16	7,785.0	-2,393.3	-2,867.6	3,095.7	0.00	0.00	0.00
10,500.0	90.00	180.16	7,785.0	-2,493.3	-2,867.9	3,191.8	0.00	0.00	0.00
10,600.0	90.00	180.16	7,785.0	-2,593.3	-2,868.2	3,288.0	0.00	0.00	0.00
10,700.0	90.00	180.16	7,785.0	-2,693.3	-2,868.4	3,384.1	0.00	0.00	0.00
10,800.0	90.00	180.16	7,785.0	-2,793.3	-2,868.7	3,480.3	0.00	0.00	0.00
10,900.0	90.00	180.16	7,785.0	-2,893.3	-2,869.0	3,576.4	0.00	0.00	0.00
11,000.0	90.00	180.16	7,785.0	-2,993.3	-2,869.3	3,672.5	0.00	0.00	0.00
11,100.0	90.00	180.16	7,785.0	-3,093.3	-2,869.6	3,768.7	0.00	0.00	0.00
11,200.0	90.00	180.16	7,785.0	-3,193.3	-2,869.9	3,864.8	0.00	0.00	0.00
11,300.0	90.00	180.16	7,785.0	-3,293.3	-2,870.1	3,961.0	0.00	0.00	0.00
11,400.0	90.00	180.16	7,785.0	-3,393.3	-2,870.4	4,057.1	0.00	0.00	0.00
11,500.0	90.00	180.16	7,785.0	-3,493.3	-2,870.7	4,153.3	0.00	0.00	0.00
11,600.0	90.00	180.16	7,785.0	-3,593.3	-2,871.0	4,249.4	0.00	0.00	0.00
11,700.0	90.00	180.16	7,785.0	-3,693.3	-2,871.3	4,345.5	0.00	0.00	0.00
11,800.0	90.00	180.16	7,785.0	-3,793.3	-2,871.6	4,441.7	0.00	0.00	0.00
11,900.0	90.00	180.16	7,785.0	-3,893.3	-2,871.8	4,537.8	0.00	0.00	0.00
12,000.0	90.00	180.16	7,785.0	-3,993.3	-2,872.1	4,634.0	0.00	0.00	0.00
12,100.0	90.00	180.16	7,785.0	-4,093.3	-2,872.4	4,730.1	0.00	0.00	0.00
12,200.0	90.00	180.16	7,785.0	-4,193.3	-2,872.7	4,826.3	0.00	0.00	0.00
12,300.0	90.00	180.16	7,785.0	-4,293.3	-2,873.0	4,922.4	0.00	0.00	0.00
12,400.0	90.00	180.16	7,785.0	-4,393.3	-2,873.3	5,018.6	0.00	0.00	0.00
12,500.0	90.00	180.16	7,785.0	-4,493.3	-2,873.6	5,114.7	0.00	0.00	0.00
12,600.0	90.00	180.16	7,785.0	-4,593.3	-2,873.8	5,210.8	0.00	0.00	0.00
12,700.0	90.00	180.16	7,785.0	-4,693.3	-2,874.1	5,307.0	0.00	0.00	0.00
12,800.0	90.00	180.16	7,785.0	-4,793.3	-2,874.4	5,403.1	0.00	0.00	0.00
12,900.0	90.00	180.16	7,785.0	-4,893.3	-2,874.7	5,499.3	0.00	0.00	0.00
13,000.0	90.00	180.16	7,785.0	-4,993.3	-2,875.0	5,595.4	0.00	0.00	0.00
13,100.0	90.00	180.16	7,785.0	-5,093.3	-2,875.3	5,691.6	0.00	0.00	0.00
13,200.0	90.00	180.16	7,785.0	-5,193.3	-2,875.5	5,787.7	0.00	0.00	0.00
13,300.0	90.00	180.16	7,785.0	-5,293.3	-2,875.8	5,883.8	0.00	0.00	0.00
13,400.0	90.00	180.16	7,785.0	-5,393.3	-2,876.1	5,980.0	0.00	0.00	0.00
13,500.0	90.00	180.16	7,785.0	-5,493.3	-2,876.4	6,076.1	0.00	0.00	0.00
13,600.0	90.00	180.16	7,785.0	-5,593.3	-2,876.7	6,172.3	0.00	0.00	0.00
13,700.0	90.00	180.16	7,785.0	-5,693.3	-2,877.0	6,268.4	0.00	0.00	0.00
13,800.0	90.00	180.16	7,785.0	-5,793.3	-2,877.3	6,364.6	0.00	0.00	0.00
13,900.0	90.00	180.16	7,785.0	-5,893.3	-2,877.5	6,460.7	0.00	0.00	0.00
14,000.0	90.00	180.16	7,785.0	-5,993.3	-2,877.8	6,556.8	0.00	0.00	0.00
14,100.0	90.00	180.16	7,785.0	-6,093.3	-2,878.1	6,653.0	0.00	0.00	0.00
14,200.0	90.00	180.16	7,785.0	-6,193.3	-2,878.4	6,749.1	0.00	0.00	0.00
14,300.0	90.00	180.16	7,785.0	-6,293.3	-2,878.7	6,845.3	0.00	0.00	0.00
14,400.0	90.00	180.16	7,785.0	-6,393.3	-2,879.0	6,941.4	0.00	0.00	0.00
14,500.0	90.00	180.16	7,785.0	-6,493.3	-2,879.2	7,037.6	0.00	0.00	0.00
14,600.0	90.00	180.16	7,785.0	-6,593.3	-2,879.5	7,133.7	0.00	0.00	0.00
14,700.0	90.00	180.16	7,785.0	-6,693.3	-2,879.8	7,229.9	0.00	0.00	0.00
14,800.0	90.00	180.16	7,785.0	-6,793.3	-2,880.1	7,326.0	0.00	0.00	0.00
14,900.0	90.00	180.16	7,785.0	-6,893.3	-2,880.4	7,422.1	0.00	0.00	0.00
15,000.0	90.00	180.16	7,785.0	-6,993.3	-2,880.7	7,518.3	0.00	0.00	0.00
15,100.0	90.00	180.16	7,785.0	-7,093.3	-2,881.0	7,614.4	0.00	0.00	0.00
15,200.0	90.00	180.16	7,785.0	-7,193.3	-2,881.2	7,710.6	0.00	0.00	0.00
15,300.0	90.00	180.16	7,785.0	-7,293.3	-2,881.5	7,806.7	0.00	0.00	0.00
15,400.0	90.00	180.16	7,785.0	-7,393.3	-2,881.8	7,902.9	0.00	0.00	0.00

Database:	US_EDM	Local Co-ordinate Reference:	Well Sharp 2635-1-15HC
Company:	Ward Petroleum	TVD Reference:	WELL @ 5032.0ft (Original Well Elev)
Project:	SEC.24-T1S-R67W	MD Reference:	WELL @ 5032.0ft (Original Well Elev)
Site:	Sharp 2635-1-15HC Pad Sec.24-T1S-R67W	North Reference:	True
Well:	Sharp 2635-1-15HC	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #1 (1-17-17)		

Planned Survey										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	
15,500.0	90.00	180.16	7,785.0	-7,493.3	-2,882.1	7,999.0	0.00	0.00	0.00	
15,600.0	90.00	180.16	7,785.0	-7,593.3	-2,882.4	8,095.1	0.00	0.00	0.00	
15,700.0	90.00	180.16	7,785.0	-7,693.3	-2,882.7	8,191.3	0.00	0.00	0.00	
15,800.0	90.00	180.16	7,785.0	-7,793.3	-2,882.9	8,287.4	0.00	0.00	0.00	
15,900.0	90.00	180.16	7,785.0	-7,893.3	-2,883.2	8,383.6	0.00	0.00	0.00	
16,000.0	90.00	180.16	7,785.0	-7,993.3	-2,883.5	8,479.7	0.00	0.00	0.00	
16,100.0	90.00	180.16	7,785.0	-8,093.3	-2,883.8	8,575.9	0.00	0.00	0.00	
16,200.0	90.00	180.16	7,785.0	-8,193.3	-2,884.1	8,672.0	0.00	0.00	0.00	
16,300.0	90.00	180.16	7,785.0	-8,293.3	-2,884.4	8,768.1	0.00	0.00	0.00	
16,400.0	90.00	180.16	7,785.0	-8,393.3	-2,884.7	8,864.3	0.00	0.00	0.00	
16,500.0	90.00	180.16	7,785.0	-8,493.3	-2,884.9	8,960.4	0.00	0.00	0.00	
16,600.0	90.00	180.16	7,785.0	-8,593.3	-2,885.2	9,056.6	0.00	0.00	0.00	
16,700.0	90.00	180.16	7,785.0	-8,693.3	-2,885.5	9,152.7	0.00	0.00	0.00	
16,800.0	90.00	180.16	7,785.0	-8,793.3	-2,885.8	9,248.9	0.00	0.00	0.00	
16,900.0	90.00	180.16	7,785.0	-8,893.3	-2,886.1	9,345.0	0.00	0.00	0.00	
17,000.0	90.00	180.16	7,785.0	-8,993.3	-2,886.4	9,441.1	0.00	0.00	0.00	
17,100.0	90.00	180.16	7,785.0	-9,093.3	-2,886.6	9,537.3	0.00	0.00	0.00	
17,200.0	90.00	180.16	7,785.0	-9,193.3	-2,886.9	9,633.4	0.00	0.00	0.00	
17,300.0	90.00	180.16	7,785.0	-9,293.3	-2,887.2	9,729.6	0.00	0.00	0.00	
17,400.0	90.00	180.16	7,785.0	-9,393.3	-2,887.5	9,825.7	0.00	0.00	0.00	
17,500.0	90.00	180.16	7,785.0	-9,493.3	-2,887.8	9,921.9	0.00	0.00	0.00	
17,600.0	90.00	180.16	7,785.0	-9,593.3	-2,888.1	10,018.0	0.00	0.00	0.00	
17,700.0	90.00	180.16	7,785.0	-9,693.3	-2,888.3	10,114.2	0.00	0.00	0.00	
17,800.0	90.00	180.16	7,785.0	-9,793.3	-2,888.6	10,210.3	0.00	0.00	0.00	
17,900.0	90.00	180.16	7,785.0	-9,893.3	-2,888.9	10,306.4	0.00	0.00	0.00	
17,998.8	90.00	180.16	7,785.0	-9,992.1	-2,889.2	10,401.4	0.00	0.00	0.00	
TD at 17998.8										

Design Targets										
Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (usft)	Easting (usft)	Latitude	Longitude	
SHL 265'FSL & 197'FWL - plan hits target center - Point	0.00	0.00	1.0	0.0	0.0	1,223,149.20	3,183,363.44	39.944070	-104.846020	
BHL 850'FSL & 2590'FW - plan hits target center - Point	0.00	0.00	7,785.0	-9,992.1	-2,889.2	1,213,136.36	3,180,548.10	39.916640	-104.856320	
LPL 460'FNL & 2590'FW - plan hits target center - Point	0.00	0.00	7,785.0	-743.0	-2,862.9	1,222,385.16	3,180,506.20	39.942030	-104.856230	

Database:	US_EDM	Local Co-ordinate Reference:	Well Sharp 2635-1-15HC
Company:	Ward Petroleum	TVD Reference:	WELL @ 5032.0ft (Original Well Elev)
Project:	SEC.24-T1S-R67W	MD Reference:	WELL @ 5032.0ft (Original Well Elev)
Site:	Sharp 2635-1-15HC Pad Sec.24-T1S-R67W	North Reference:	True
Well:	Sharp 2635-1-15HC	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #1 (1-17-17)		

Plan Annotations					
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment	
		+N/-S (ft)	+E/-W (ft)		
200.0	200.0	0.0	0.0	KOP - Start Build 1.50	
1,718.1	1,678.4	-3.2	-297.7	Start 5910.3 hold at 1718.1 MD	
7,628.4	7,128.1	-27.6	-2,585.1	Start DLS 8.00 TFO -89.29	
8,749.6	7,785.0	-743.0	-2,862.9	Start 9249.2 hold at 8749.6 MD	
17,998.8	7,785.0	-9,992.1	-2,889.2	TD at 17998.8	



Directional

Ward Petroleum

SEC.24-T1S-R67W

Sharp 2635-1-15HC Pad Sec.24-T1S-R67W

Sharp 2635-1-15HC

Wellbore #1

Plan #1 (1-17-17)

Anticollision Report

17 January, 2017

Company:	Ward Petroleum	Local Co-ordinate Reference:	Well Sharp 2635-1-15HC
Project:	SEC.24-T1S-R67W	TVD Reference:	WELL @ 5032.0ft (Original Well Elev)
Reference Site:	Sharp 2635-1-15HC Pad Sec.24-T1S-R67W	MD Reference:	WELL @ 5032.0ft (Original Well Elev)
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Sharp 2635-1-15HC	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	US_EDM
Reference Design:	Plan #1 (1-17-17)	Offset TVD Reference:	Offset Datum

Reference	Plan #1 (1-17-17)		
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 1,200.0 ft	Error Surface:	Elliptical Conic
Warning Levels Evaluated at:	2.00 Sigma	Casing Method:	Not applied

Survey Tool Program	Date	1/17/2017		
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description
0.0	17,998.8	Plan #1 (1-17-17) (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						
Sharp 24-3-11HC Pad Sec.24-T1S-R67W						
Sharp 24-3-11HC - Wellbore #1 - Wellbore #1	452.5	464.2	16.2	14.4	9.194	CC, ES
Sharp 24-3-11HC - Wellbore #1 - Wellbore #1	600.0	611.4	19.2	16.8	7.872	SF
Sharp 24-3-11HC - Wellbore #2 - Wellbore #2	452.5	464.2	16.2	14.4	9.194	CC, ES
Sharp 24-3-11HC - Wellbore #2 - Wellbore #2	600.0	611.4	19.2	16.8	7.872	SF
Sharp 2635-1-15HC Pad Sec.24-T1S-R67W						
Sharp 23-3-4HN - Wellbore #1 - Plan #1 (1-17-17)	200.0	200.0	14.0	13.3	20.791	CC, ES
Sharp 23-3-4HN - Wellbore #1 - Plan #1 (1-17-17)	400.0	399.9	19.3	17.7	12.212	SF

Offset Design													Offset Site Error:	0.0 ft
Survey Program: 111-MWD													Offset Well Error:	0.0 ft
Reference														
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Semi Major Axis	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
0.0	0.0	12.0	12.0	0.0	0.0	-150.01	-14.6	-8.4	16.8	16.8	0.01	1,230.678		
100.0	100.0	111.9	111.9	0.1	0.1	-149.72	-14.7	-8.6	17.0	16.8	0.24	71.029		
200.0	200.0	211.9	211.9	0.3	0.3	-148.82	-15.0	-9.1	17.6	16.9	0.69	25.586		
300.0	300.0	311.9	311.9	0.6	0.6	-61.37	-15.5	-9.5	17.5	16.4	1.10	15.848		
400.0	399.9	411.8	411.8	0.8	0.8	-73.59	-15.9	-9.7	16.4	14.9	1.53	10.766		
452.5	452.3	464.2	464.2	0.9	0.9	-83.82	-16.2	-9.9	16.2	14.4	1.76	9.194	CC, ES	
500.0	499.7	511.6	511.6	1.0	1.0	-95.04	-16.5	-10.1	16.5	14.5	1.97	8.342		
600.0	599.3	611.4	611.4	1.3	1.2	-120.93	-16.6	-10.8	19.2	16.8	2.44	7.872	SF	
700.0	698.6	710.8	710.7	1.6	1.4	-140.84	-16.8	-11.9	26.5	23.6	2.91	9.115		
800.0	797.5	809.9	809.8	1.9	1.6	-153.65	-16.8	-12.8	37.9	34.6	3.36	11.305		
900.0	896.1	908.8	908.8	2.2	1.8	-161.82	-16.4	-13.7	52.6	48.8	3.80	13.852		
1,000.0	994.2	1,007.5	1,007.4	2.6	2.0	-167.00	-15.6	-15.1	69.9	65.7	4.25	16.449		
1,100.0	1,091.7	1,105.0	1,105.0	3.1	2.2	-170.38	-14.8	-16.8	89.8	85.1	4.70	19.109		
1,200.0	1,188.6	1,201.1	1,201.0	3.6	2.4	-172.42	-14.6	-17.6	113.3	108.1	5.15	21.978		
1,300.0	1,284.9	1,294.4	1,294.3	4.1	2.6	-172.97	-16.6	-17.3	140.8	135.2	5.62	25.061		
1,400.0	1,380.4	1,384.4	1,384.0	4.7	2.8	-171.90	-23.0	-15.1	173.3	167.2	6.10	28.409		
1,500.0	1,475.0	1,470.4	1,469.4	5.4	3.0	-170.41	-32.2	-10.8	211.2	204.5	6.61	31.943		
1,600.0	1,568.9	1,550.9	1,548.9	6.1	3.2	-168.98	-43.1	-4.0	255.0	247.8	7.13	35.749		
1,700.0	1,661.7	1,629.6	1,626.4	6.8	3.4	-168.51	-51.9	5.8	304.3	296.6	7.64	39.805		
1,800.0	1,754.0	1,715.6	1,711.2	7.6	3.6	-168.62	-59.9	18.0	356.1	348.0	8.16	43.621		

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

Company:	Ward Petroleum	Local Co-ordinate Reference:	Well Sharp 2635-1-15HC
Project:	SEC.24-T1S-R67W	TVD Reference:	WELL @ 5032.0ft (Original Well Elev)
Reference Site:	Sharp 2635-1-15HC Pad Sec.24-T1S-R67W	MD Reference:	WELL @ 5032.0ft (Original Well Elev)
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Sharp 2635-1-15HC	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	US_EDM
Reference Design:	Plan #1 (1-17-17)	Offset TVD Reference:	Offset Datum

Offset Design													Offset Site Error:	0.0 ft		
Survey Program: 111-MWD													Sharp 24-3-11HC Pad Sec.24-T1S-R67W - Sharp 24-3-11HC - Wellbore #1 - Wellbore #1		Offset Well Error:	0.0 ft
Measured Depth (ft)	Vertical Depth (ft)	Reference		Offset		Semi Major Axis			Distance				Separation Factor	Warning		
		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)					
1,900.0	1,846.2	1,801.8	1,796.2	8.4	3.8	-168.69	-68.2	29.9	407.9	399.2	8.69	46.958				
2,000.0	1,938.4	1,891.3	1,884.5	9.2	4.1	-168.81	-76.2	42.0	459.3	450.1	9.21	49.852				
2,100.0	2,030.6	1,983.7	1,975.9	10.0	4.4	-168.97	-83.9	53.6	509.8	500.0	9.75	52.296				
2,200.0	2,122.8	2,071.8	2,063.1	10.9	4.6	-169.19	-90.4	64.1	559.5	549.2	10.27	54.452				
2,300.0	2,215.0	2,148.5	2,139.1	11.7	4.8	-169.47	-95.0	73.7	609.7	598.9	10.78	56.536				
2,400.0	2,307.2	2,231.5	2,220.9	12.5	5.1	-169.59	-101.5	85.4	661.4	650.1	11.32	58.446				
2,500.0	2,399.4	2,319.3	2,307.8	13.3	5.4	-169.82	-107.1	97.3	712.4	700.6	11.85	60.121				
2,600.0	2,491.6	2,402.3	2,389.7	14.2	5.6	-170.00	-112.5	109.2	764.2	751.8	12.38	61.751				
2,700.0	2,583.8	2,497.6	2,483.9	15.0	5.9	-170.07	-119.9	121.5	814.8	801.9	12.94	62.977				
2,800.0	2,676.0	2,571.8	2,557.2	15.8	6.1	-170.05	-126.6	131.4	866.1	852.6	13.47	64.298				
2,900.0	2,768.2	2,669.4	2,653.5	16.6	6.5	-170.00	-135.8	144.3	917.2	903.2	14.06	65.244				
3,000.0	2,860.4	2,752.0	2,735.1	17.5	6.7	-170.02	-142.7	154.6	967.7	953.1	14.60	66.264				
3,100.0	2,952.6	2,829.0	2,811.2	18.3	7.0	-170.04	-149.0	164.7	1,018.7	1,003.5	15.14	67.273				
3,200.0	3,044.9	2,912.3	2,893.3	19.1	7.3	-170.01	-156.9	176.5	1,070.6	1,054.9	15.71	68.163				
3,300.0	3,137.1	3,007.4	2,987.1	20.0	7.6	-170.00	-165.4	189.6	1,122.2	1,106.0	16.29	68.894				
3,400.0	3,229.3	3,091.1	3,069.8	20.8	7.9	-170.06	-171.6	200.8	1,173.3	1,156.5	16.84	69.684				

Company:	Ward Petroleum	Local Co-ordinate Reference:	Well Sharp 2635-1-15HC
Project:	SEC.24-T1S-R67W	TVD Reference:	WELL @ 5032.0ft (Original Well Elev)
Reference Site:	Sharp 2635-1-15HC Pad Sec.24-T1S-R67W	MD Reference:	WELL @ 5032.0ft (Original Well Elev)
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Sharp 2635-1-15HC	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	US_EDM
Reference Design:	Plan #1 (1-17-17)	Offset TVD Reference:	Offset Datum

Offset Design													Offset Site Error:	0.0 ft	
Survey Program: 111-MWD, 8638-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	12.0	12.0	0.0	0.0	-150.01	-14.6	-8.4	16.8	16.8	0.01	1,230.679			
100.0	100.0	111.9	111.9	0.1	0.1	-149.72	-14.7	-8.6	17.0	16.8	0.24	71.029			
200.0	200.0	211.9	211.9	0.3	0.3	-148.82	-15.0	-9.1	17.6	16.9	0.69	25.586			
300.0	300.0	311.9	311.9	0.6	0.6	-61.37	-15.5	-9.5	17.5	16.4	1.10	15.848			
400.0	399.9	411.8	411.8	0.8	0.8	-73.59	-15.9	-9.7	16.4	14.9	1.53	10.766			
452.5	452.3	464.2	464.2	0.9	0.9	-83.82	-16.2	-9.9	16.2	14.4	1.76	9.194 CC, ES			
500.0	499.7	511.6	511.6	1.0	1.0	-95.04	-16.5	-10.1	16.5	14.5	1.97	8.342			
600.0	599.3	611.4	611.4	1.3	1.2	-120.93	-16.6	-10.8	19.2	16.8	2.44	7.872 SF			
700.0	698.6	710.8	710.7	1.6	1.4	-140.84	-16.8	-11.9	26.5	23.6	2.91	9.115			
800.0	797.5	809.9	809.8	1.9	1.6	-153.65	-16.8	-12.8	37.9	34.6	3.36	11.305			
900.0	896.1	908.8	908.8	2.2	1.8	-161.82	-16.4	-13.7	52.6	48.8	3.80	13.852			
1,000.0	994.2	1,007.5	1,007.4	2.6	2.0	-167.00	-15.6	-15.1	69.9	65.7	4.25	16.449			
1,100.0	1,091.7	1,105.0	1,105.0	3.1	2.2	-170.38	-14.8	-16.8	89.8	85.1	4.70	19.109			
1,200.0	1,188.6	1,201.1	1,201.0	3.6	2.4	-172.42	-14.6	-17.6	113.3	108.1	5.15	21.978			
1,300.0	1,284.9	1,294.4	1,294.3	4.1	2.6	-172.97	-16.6	-17.3	140.8	135.2	5.62	25.061			
1,400.0	1,380.4	1,384.4	1,384.0	4.7	2.8	-171.90	-23.0	-15.1	173.3	167.2	6.10	28.409			
1,500.0	1,475.0	1,470.4	1,469.4	5.4	3.0	-170.41	-32.2	-10.8	211.2	204.5	6.61	31.943			
1,600.0	1,568.9	1,550.9	1,548.9	6.1	3.2	-168.98	-43.1	-4.0	255.0	247.8	7.13	35.749			
1,700.0	1,661.7	1,629.6	1,626.4	6.8	3.4	-168.51	-51.9	5.8	304.3	296.6	7.64	39.805			
1,800.0	1,754.0	1,715.6	1,711.2	7.6	3.6	-168.62	-59.9	18.0	356.1	348.0	8.16	43.621			
1,900.0	1,846.2	1,801.8	1,796.2	8.4	3.8	-168.69	-68.2	29.9	407.9	399.2	8.69	46.958			
2,000.0	1,938.4	1,891.3	1,884.5	9.2	4.1	-168.81	-76.2	42.0	459.3	450.1	9.21	49.852			
2,100.0	2,030.6	1,983.7	1,975.9	10.0	4.4	-168.97	-83.9	53.6	509.8	500.0	9.75	52.296			
2,200.0	2,122.8	2,071.8	2,063.1	10.9	4.6	-169.19	-90.4	64.1	559.5	549.2	10.27	54.452			
2,300.0	2,215.0	2,148.5	2,139.1	11.7	4.8	-169.47	-95.0	73.7	609.7	598.9	10.78	56.536			
2,400.0	2,307.2	2,231.5	2,220.9	12.5	5.1	-169.59	-101.5	85.4	661.4	650.1	11.32	58.446			
2,500.0	2,399.4	2,319.3	2,307.8	13.3	5.4	-169.82	-107.1	97.3	712.4	700.6	11.85	60.121			
2,600.0	2,491.6	2,402.3	2,389.7	14.2	5.6	-170.00	-112.5	109.2	764.2	751.8	12.38	61.751			
2,700.0	2,583.8	2,497.6	2,483.9	15.0	5.9	-170.07	-119.9	121.5	814.8	801.9	12.94	62.977			
2,800.0	2,676.0	2,571.8	2,557.2	15.8	6.1	-170.05	-126.6	131.4	866.1	852.6	13.47	64.298			
2,900.0	2,768.2	2,669.4	2,653.5	16.6	6.5	-170.00	-135.8	144.3	917.2	903.2	14.06	65.244			
3,000.0	2,860.4	2,752.0	2,735.1	17.5	6.7	-170.02	-142.7	154.6	967.7	953.1	14.60	66.264			
3,100.0	2,952.6	2,829.0	2,811.2	18.3	7.0	-170.04	-149.0	164.7	1,018.7	1,003.5	15.14	67.273			
3,200.0	3,044.9	2,912.3	2,893.3	19.1	7.3	-170.01	-156.9	176.5	1,070.6	1,054.9	15.71	68.163			
3,300.0	3,137.1	3,007.4	2,987.1	20.0	7.6	-170.00	-165.4	189.6	1,122.2	1,106.0	16.29	68.894			
3,400.0	3,229.3	3,091.1	3,069.8	20.8	7.9	-170.06	-171.6	200.8	1,173.3	1,156.5	16.84	69.684			

Company:	Ward Petroleum	Local Co-ordinate Reference:	Well Sharp 2635-1-15HC
Project:	SEC.24-T1S-R67W	TVD Reference:	WELL @ 5032.0ft (Original Well Elev)
Reference Site:	Sharp 2635-1-15HC Pad Sec.24-T1S-R67W	MD Reference:	WELL @ 5032.0ft (Original Well Elev)
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Sharp 2635-1-15HC	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	US_EDM
Reference Design:	Plan #1 (1-17-17)	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			
0.0	0.0	0.0	0.0	0.0	0.0	90.00	0.0	14.0	14.0	14.0	0.00	N/A			
100.0	100.0	100.0	100.0	0.1	0.1	90.00	0.0	14.0	14.0	13.8	0.22	62.374			
200.0	200.0	200.0	200.0	0.3	0.3	90.00	0.0	14.0	14.0	13.3	0.67	20.791 CC, ES			
300.0	300.0	300.0	300.0	0.6	0.6	-179.44	0.0	14.0	15.3	14.2	1.12	13.653			
400.0	399.9	399.9	399.9	0.8	0.8	-179.55	0.0	14.0	19.3	17.7	1.58	12.212 SF			
500.0	499.7	499.7	499.7	1.0	1.0	-179.67	0.0	14.0	25.8	23.8	2.04	12.659			
600.0	599.3	599.3	599.3	1.3	1.2	-179.75	0.0	14.0	34.9	32.4	2.50	13.969			
700.0	698.6	698.6	698.6	1.6	1.5	-179.82	0.0	14.0	46.7	43.7	2.97	15.739			
800.0	797.5	797.5	797.5	1.9	1.7	-179.86	0.0	14.0	61.0	57.6	3.43	17.779			
900.0	896.1	896.1	896.1	2.2	1.9	-179.89	0.0	14.0	78.0	74.1	3.90	19.989			
1,000.0	994.2	994.2	994.2	2.6	2.1	-179.91	0.0	14.0	97.5	93.1	4.37	22.311			
1,100.0	1,091.7	1,091.7	1,091.7	3.1	2.3	-179.93	0.0	14.0	119.6	114.7	4.84	24.707			
1,200.0	1,188.6	1,188.6	1,188.6	3.6	2.6	-179.94	0.0	14.0	144.2	138.9	5.31	27.154			
1,300.0	1,284.9	1,284.9	1,284.9	4.1	2.8	-179.95	0.0	14.0	171.3	165.5	5.78	29.634			
1,400.0	1,380.4	1,380.4	1,380.4	4.7	3.0	-179.96	0.0	14.0	201.0	194.7	6.25	32.137			
1,500.0	1,475.0	1,475.0	1,475.0	5.4	3.2	-179.96	0.0	14.0	233.1	226.4	6.73	34.653			
1,600.0	1,568.9	1,568.9	1,568.9	6.1	3.4	-179.97	0.0	14.0	267.7	260.5	7.20	37.177			
1,700.0	1,661.7	1,661.7	1,661.7	6.8	3.6	-179.97	0.0	14.0	304.8	297.1	7.68	39.704			
1,800.0	1,754.0	1,754.0	1,754.0	7.6	3.8	-179.97	0.0	14.0	343.4	335.3	8.17	42.012			
1,900.0	1,846.2	1,846.2	1,846.2	8.4	4.0	-179.98	0.0	14.0	382.1	373.5	8.68	44.008			
2,000.0	1,938.4	1,938.4	1,938.4	9.2	4.2	-179.98	0.0	14.0	420.9	411.7	9.20	45.760			
2,100.0	2,030.6	2,034.1	2,034.1	10.0	4.5	-179.97	-0.1	13.9	459.4	449.7	9.71	47.297			
2,200.0	2,122.8	2,138.3	2,138.2	10.9	4.7	-179.82	-1.3	11.9	496.3	486.1	10.23	48.538			
2,300.0	2,215.0	2,244.3	2,244.1	11.7	4.9	-179.53	-4.0	7.3	531.1	520.3	10.74	49.468			
2,400.0	2,307.2	2,352.0	2,351.5	12.5	5.1	-179.10	-8.4	0.1	563.5	552.3	11.26	50.046			
2,500.0	2,399.4	2,461.4	2,460.3	13.3	5.3	-178.56	-14.4	-9.8	593.7	581.9	11.80	50.305			
2,600.0	2,491.6	2,572.2	2,570.1	14.2	5.6	-177.91	-22.1	-22.6	621.6	609.2	12.36	50.270			
2,700.0	2,583.8	2,684.3	2,680.7	15.0	5.8	-177.15	-31.6	-38.3	647.2	634.2	12.95	49.959			
2,800.0	2,676.0	2,797.6	2,791.8	15.8	6.2	-176.29	-42.9	-57.0	670.4	656.9	13.57	49.391			
2,900.0	2,768.2	2,911.7	2,903.1	16.6	6.5	-175.33	-56.0	-78.7	691.4	677.2	14.24	48.563			
3,000.0	2,860.4	3,026.7	3,014.4	17.5	6.9	-174.27	-70.9	-103.4	710.1	695.2	14.95	47.500			
3,100.0	2,952.6	3,130.1	3,113.8	18.3	7.4	-173.26	-85.5	-127.6	727.2	711.5	15.68	46.391			
3,200.0	3,044.9	3,227.9	3,207.9	19.1	7.8	-172.34	-99.4	-150.6	744.3	727.9	16.41	45.347			
3,300.0	3,137.1	3,325.7	3,301.9	20.0	8.2	-171.46	-113.3	-173.6	761.6	744.5	17.18	44.332			
3,400.0	3,229.3	3,423.6	3,396.0	20.8	8.7	-170.61	-127.2	-196.6	779.1	761.2	17.97	43.350			
3,500.0	3,321.5	3,521.4	3,490.1	21.6	9.1	-169.81	-141.1	-219.6	796.8	778.0	18.79	42.405			
3,600.0	3,413.7	3,619.2	3,584.1	22.5	9.6	-169.04	-155.0	-242.7	814.6	794.9	19.63	41.498			
3,700.0	3,505.9	3,717.0	3,678.2	23.3	10.1	-168.30	-168.9	-265.7	832.5	812.0	20.49	40.630			
3,800.0	3,598.1	3,814.8	3,772.2	24.1	10.6	-167.60	-182.8	-288.7	850.5	829.2	21.37	39.802			
3,900.0	3,690.3	3,912.7	3,866.3	25.0	11.1	-166.92	-196.7	-311.7	868.7	846.4	22.27	39.012			
4,000.0	3,782.5	4,010.5	3,960.3	25.8	11.6	-166.27	-210.6	-334.7	887.0	863.8	23.18	38.261			
4,100.0	3,874.7	4,108.3	4,054.4	26.6	12.2	-165.64	-224.5	-357.7	905.4	881.3	24.11	37.547			
4,200.0	3,966.9	4,206.1	4,148.4	27.5	12.7	-165.05	-238.4	-380.8	923.9	898.8	25.06	36.868			
4,300.0	4,059.1	4,303.9	4,242.5	28.3	13.2	-164.47	-252.3	-403.8	942.5	916.5	26.02	36.224			
4,400.0	4,151.3	4,401.8	4,336.5	29.1	13.8	-163.92	-266.1	-426.8	961.2	934.2	26.99	35.612			
4,500.0	4,243.5	4,499.6	4,430.6	30.0	14.3	-163.38	-280.0	-449.8	979.9	951.9	27.97	35.031			
4,600.0	4,335.7	4,597.4	4,524.6	30.8	14.8	-162.87	-293.9	-472.8	998.8	969.8	28.97	34.480			
4,700.0	4,427.9	4,695.2	4,618.7	31.6	15.4	-162.38	-307.8	-495.8	1,017.7	987.7	29.97	33.956			
4,800.0	4,520.1	4,793.0	4,712.7	32.5	15.9	-161.90	-321.7	-518.9	1,036.7	1,005.7	30.98	33.459			
4,900.0	4,612.4	4,890.9	4,806.8	33.3	16.5	-161.44	-335.6	-541.9	1,055.7	1,023.7	32.01	32.986			
5,000.0	4,704.6	4,988.7	4,900.8	34.1	17.0	-161.00	-349.5	-564.9	1,074.8	1,041.8	33.03	32.537			
5,100.0	4,796.8	5,086.5	4,994.9	35.0	17.6	-160.57	-363.4	-587.9	1,094.0	1,060.0	34.07	32.109			

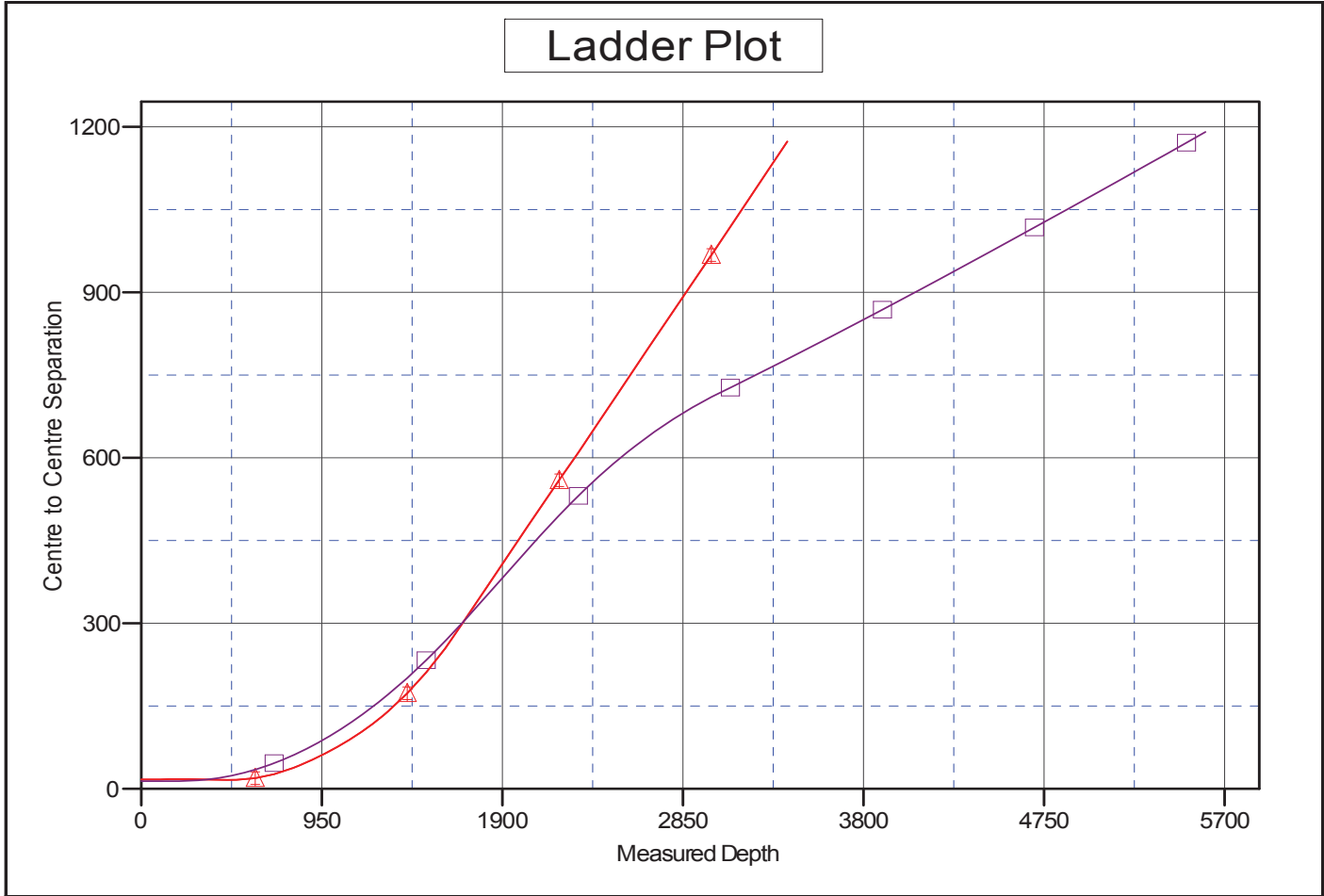
CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation

Company:	Ward Petroleum	Local Co-ordinate Reference:	Well Sharp 2635-1-15HC
Project:	SEC.24-T1S-R67W	TVD Reference:	WELL @ 5032.0ft (Original Well Elev)
Reference Site:	Sharp 2635-1-15HC Pad Sec.24-T1S-R67W	MD Reference:	WELL @ 5032.0ft (Original Well Elev)
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Sharp 2635-1-15HC	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	US_EDM
Reference Design:	Plan #1 (1-17-17)	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	Vertical Depth	Measured Depth	Vertical Depth	Reference	Offset	Highside Toolface	Offset Wellbore Centre		Between Centres	Between Ellipses	Minimum Separation		Separation Factor
(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(°)	+N/-S (ft)	+E/-W (ft)	(ft)	(ft)	(ft)		
5,200.0	4,889.0	5,184.3	5,088.9	35.8	18.1	-160.16	-377.3	-610.9	1,113.3	1,078.1	35.12	31.702	
5,300.0	4,981.2	5,282.1	5,183.0	36.6	18.7	-159.76	-391.2	-633.9	1,132.6	1,096.4	36.17	31.314	
5,400.0	5,073.4	5,379.9	5,277.0	37.5	19.2	-159.37	-405.1	-657.0	1,151.9	1,114.7	37.22	30.945	
5,500.0	5,165.6	5,477.8	5,371.1	38.3	19.8	-159.00	-419.0	-680.0	1,171.3	1,133.0	38.29	30.592	
5,600.0	5,257.8	5,575.6	5,465.2	39.2	20.3	-158.64	-432.9	-703.0	1,190.7	1,151.4	39.35	30.256	

Company:	Ward Petroleum	Local Co-ordinate Reference:	Well Sharp 2635-1-15HC
Project:	SEC.24-T1S-R67W	TVD Reference:	WELL @ 5032.0ft (Original Well Elev)
Reference Site:	Sharp 2635-1-15HC Pad Sec.24-T1S-R67W	MD Reference:	WELL @ 5032.0ft (Original Well Elev)
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Sharp 2635-1-15HC	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	US_EDM
Reference Design:	Plan #1 (1-17-17)	Offset TVD Reference:	Offset Datum

Reference Depths are relative to WELL @ 5032.0ft (Original Well Elev) Coordinates are relative to: Sharp 2635-1-15HC
 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: 0.42°

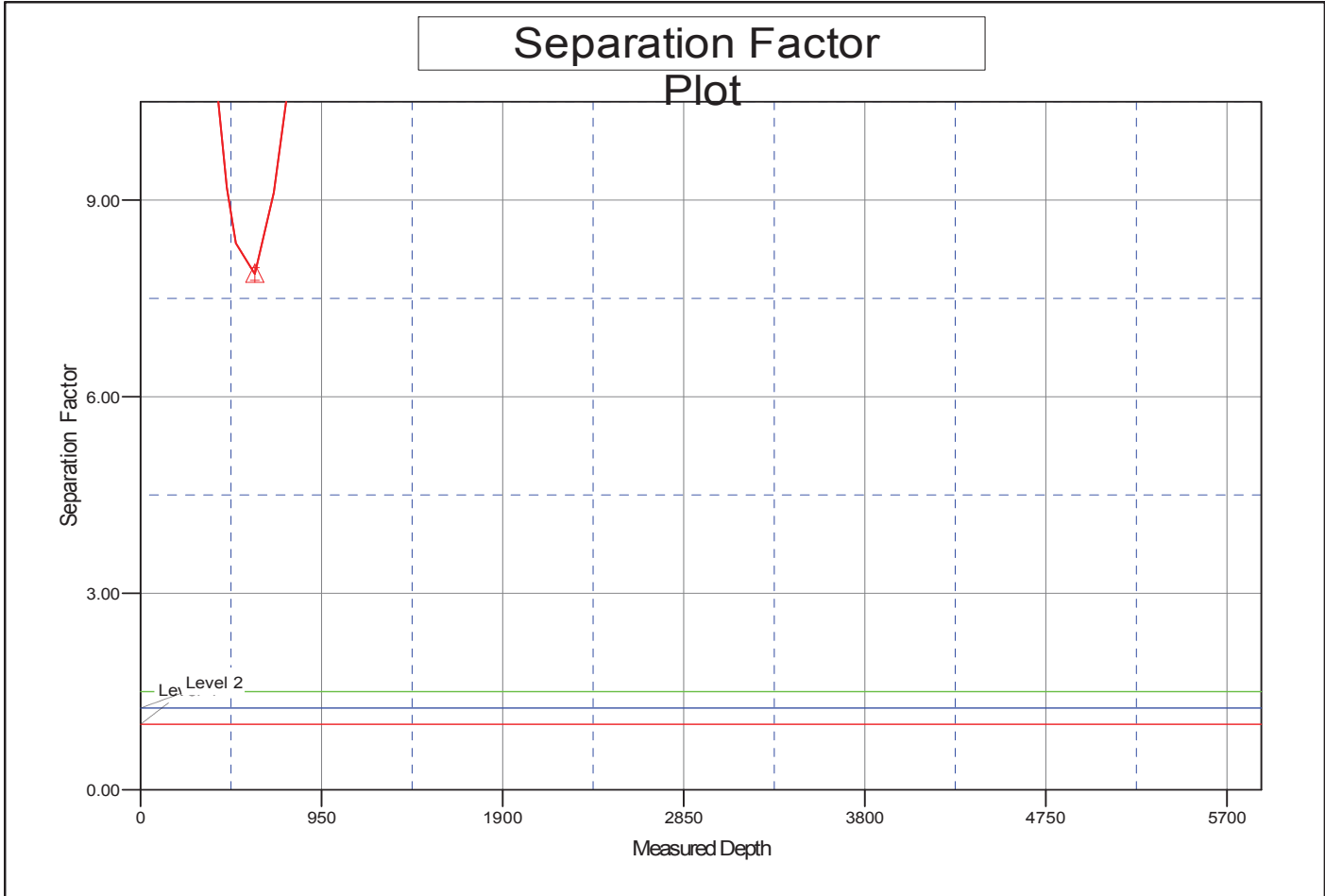


LEGEND

- Sharp 24-3-11HC, Wellbore #1, Wellbore #1 V0
- Sharp 24-3-11HC, Wellbore #2, Wellbore #2 V0
- Sharp 23-3-4HN, Wellbore #1, Plan #1 (1-17-17)

Company:	Ward Petroleum	Local Co-ordinate Reference:	Well Sharp 2635-1-15HC
Project:	SEC.24-T1S-R67W	TVD Reference:	WELL @ 5032.0ft (Original Well Elev)
Reference Site:	Sharp 2635-1-15HC Pad Sec.24-T1S-R67W	MD Reference:	WELL @ 5032.0ft (Original Well Elev)
Site Error:	0.0 ft	North Reference:	True
Reference Well:	Sharp 2635-1-15HC	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	US_EDM
Reference Design:	Plan #1 (1-17-17)	Offset TVD Reference:	Offset Datum

Reference Depths are relative to WELL @ 5032.0ft (Original Well Elev) Coordinates are relative to: Sharp 2635-1-15HC
 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: 0.42°



LEGEND

- Sharp 24-3-11HC, Wellbore #1, Wellbore #1 V0
- ✚ Sharp 24-3-11HC, Wellbore #2, Wellbore #2 V0
- ⊠ Sharp 23-3-4HN, Wellbore #1, Plan #1 (1-17-17)