

# Ward Petroleum

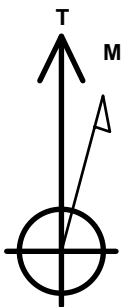
Well Name: **Sharp 23-3-4HN**  
 Surface Location: Sharp 2635-1-15HC Pad Sec.24-T1S-R67W  
 North American Datum 1983 , US State Plane 1983, Colorado Northern Zone  
 Ground Elevation: 5019.0

+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Slot
0.0	0.0	1223149.30	3183377.46	39.944070	-104.845970	

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

## DESIGN TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Shape
SHL 265'FSL & 212'FWL, Sec.24	1.0	0.0	0.0	Point
BHL 460'FNL & 660'FEL, Sec.23	7400.0	4546.3	-871.9	Point
LPL 460'FSL & 660'FWL, Sec.23	7400.0	189.5	-872.0	Point



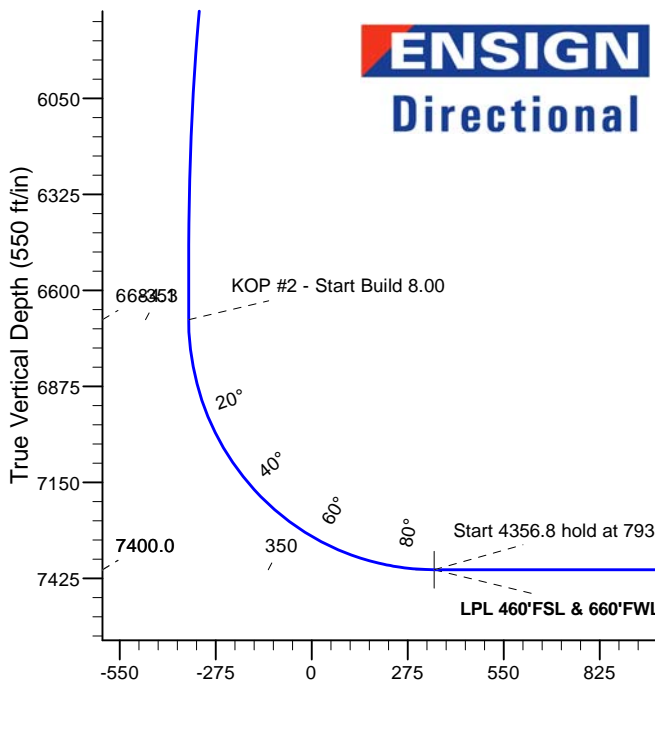
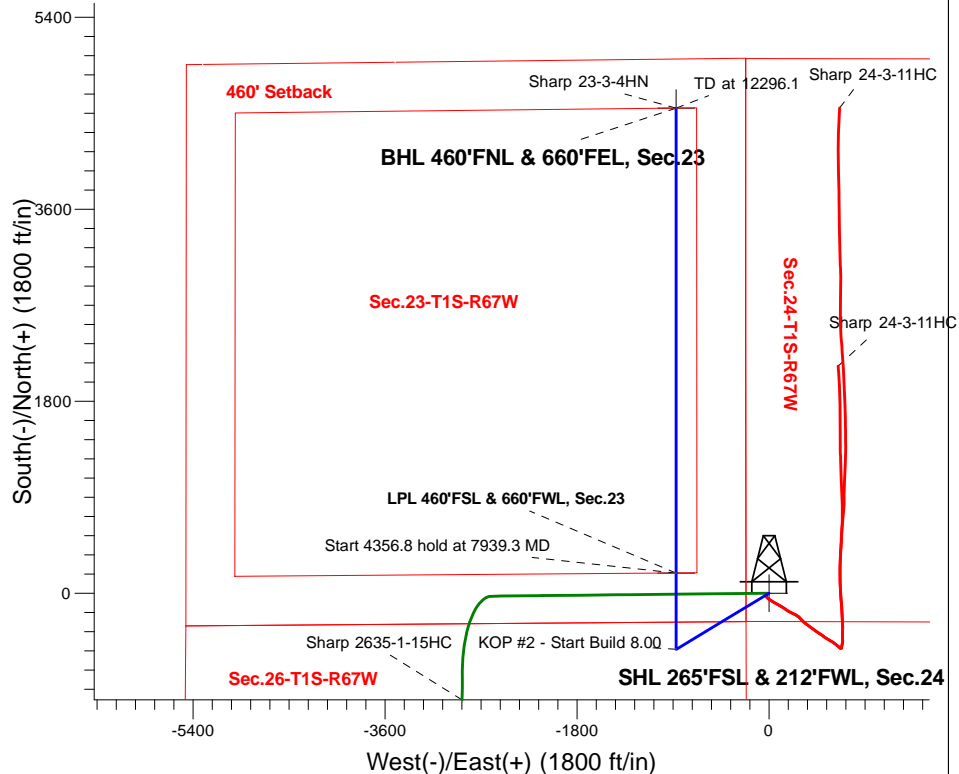
Azimuths to True North  
 Magnetic North: 8.12°

Magnetic Field  
 Strength: 52293.4snT  
 Dip Angle: 66.48°  
 Date: 1/17/2017  
 Model: IGRF2010

Sharp 2635-1-15HC Pad Sec.24-T1S-R67W  
 Sharp 23-3-4HN  
 Plan #1 (1-17-17)  
 16:21, January 17 2017

## ANNOTATIONS

TVD	MD	Annotation
2000.0	2000.0	KOP - Start Build 1.50
5712.6	5832.9	Start Drop -2.00
6684.0	6814.7	KOP #2 - Start Build 8.00
7400.0	7939.3	Start 4356.8 hold at 7939.3 MD
7400.0	12296.1	TD at 12296.1



## 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	2000.0	0.00	0.00	2000.0	0.0	0.0	0.00	0.00	0.0	
3	3063.6	15.95	238.88	3049.9	-76.0	-125.9	1.50	238.88	-51.0	
4	5832.9	15.95	238.88	5712.6	-469.5	-777.6	0.00	0.00	-314.6	
5	6630.6	0.00	0.00	6500.0	-526.5	-872.0	2.00	180.00	-352.8	
6	6814.7	0.00	0.00	6684.0	-526.5	-872.0	0.00	0.00	-352.8	
7	7939.3	90.00	360.00	7400.0	189.5	-872.0	8.00	360.00	350.3	
8	7939.3	90.00	360.00	7400.0	189.5	-872.0	0.00	0.00	350.3	LPL 460'FSL & 660'FWL, Sec.23
9	12296.1	90.00	360.00	7400.0	4546.3	-872.0	0.00	0.00	4629.1	BHL 460'FNL & 660'FEL, Sec.23

Vertical Section at 349.14° (550 ft/in)



## Directional

### **Ward Petroleum**

**SEC.24-T1S-R67W**

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

**Sharp 23-3-4HN**

**Wellbore #1**

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

### **Standard Planning Report**

**17 January, 2017**

<b>Database:</b>	US_EDM	<b>Local Co-ordinate Reference:</b>	Well Sharp 23-3-4HN
<b>Company:</b>	Ward Petroleum	<b>TVD Reference:</b>	WELL @ 5032.0ft (Original Well Elev)
<b>Project:</b>	SEC.24-T1S-R67W	<b>MD Reference:</b>	WELL @ 5032.0ft (Original Well Elev)
<b>Site:</b>	Sharp 2635-1-15HC Pad Sec.24-T1S-R67W	<b>North Reference:</b>	True
<b>Well:</b>	Sharp 23-3-4HN	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Wellbore #1		
<b>Design:</b>	Plan #1 (1-17-17)		

<b>Project</b>	SEC.24-T1S-R67W, Adams County, Colorado		
<b>Map System:</b>	US State Plane 1983	<b>System Datum:</b>	Mean Sea Level
<b>Geo Datum:</b>	North American Datum 1983		Using Well Reference Point
<b>Map Zone:</b>	Colorado Northern Zone		Using geodetic scale factor

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

<b>Well</b>	Sharp 23-3-4HN					
<b>Well Position</b>	<b>+N/-S</b>	0.0 ft	<b>Northing:</b>	1,223,149.30 usft	<b>Latitude:</b>	39.944070
	<b>+E/-W</b>	0.0 ft	<b>Easting:</b>	3,183,377.46 usft	<b>Longitude:</b>	-104.845970
<b>Position Uncertainty</b>		0.0 ft	<b>Wellhead Elevation:</b>	0.0 ft	<b>Ground Level:</b>	5,019.0 ft

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

<b>Design</b>	Plan #1 (1-17-17)			
<b>Audit Notes:</b>				
<b>Version:</b>	<b>Phase:</b>	PROTOTYPE	<b>Tie On Depth:</b>	0.0
<b>Vertical Section:</b>	<b>Depth From (TVD) (ft)</b>	<b>+N/-S (ft)</b>	<b>+E/-W (ft)</b>	<b>Direction (°)</b>
	0.0	0.0	0.0	349.14

<b>Plan Sections</b>										
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	
2,000.0	0.00	0.00	2,000.0	0.0	0.0	0.00	0.00	0.00	0.00	
3,063.6	15.95	238.88	3,049.9	-76.0	-125.9	1.50	1.50	0.00	238.88	
5,832.9	15.95	238.88	5,712.6	-469.5	-777.6	0.00	0.00	0.00	0.00	
6,630.6	0.00	0.00	6,500.0	-526.5	-872.0	2.00	-2.00	0.00	180.00	
6,814.7	0.00	0.00	6,684.0	-526.5	-872.0	0.00	0.00	0.00	0.00	
7,939.3	90.00	360.00	7,400.0	189.5	-872.0	8.00	8.00	0.00	360.00	
7,939.3	90.00	360.00	7,400.0	189.5	-872.0	0.00	0.00	0.00	0.00	LPL 460'FSL & 660'F
12,296.1	90.00	360.00	7,400.0	4,546.3	-872.0	0.00	0.00	0.00	0.00	BHL 460'FNL & 660'F

<b>Database:</b>	US_EDM	<b>Local Co-ordinate Reference:</b>	Well Sharp 23-3-4HN
<b>Company:</b>	Ward Petroleum	<b>TVD Reference:</b>	WELL @ 5032.0ft (Original Well Elev)
<b>Project:</b>	SEC.24-T1S-R67W	<b>MD Reference:</b>	WELL @ 5032.0ft (Original Well Elev)
<b>Site:</b>	Sharp 2635-1-15HC Pad Sec.24-T1S-R67W	<b>North Reference:</b>	True
<b>Well:</b>	Sharp 23-3-4HN	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Wellbore #1		
<b>Design:</b>	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
300.0	0.00	0.00	300.0	0.0	0.0	0.0	0.00	0.00	0.00
400.0	0.00	0.00	400.0	0.0	0.0	0.0	0.00	0.00	0.00
500.0	0.00	0.00	500.0	0.0	0.0	0.0	0.00	0.00	0.00
600.0	0.00	0.00	600.0	0.0	0.0	0.0	0.00	0.00	0.00
700.0	0.00	0.00	700.0	0.0	0.0	0.0	0.00	0.00	0.00
800.0	0.00	0.00	800.0	0.0	0.0	0.0	0.00	0.00	0.00
900.0	0.00	0.00	900.0	0.0	0.0	0.0	0.00	0.00	0.00
1,000.0	0.00	0.00	1,000.0	0.0	0.0	0.0	0.00	0.00	0.00
1,100.0	0.00	0.00	1,100.0	0.0	0.0	0.0	0.00	0.00	0.00
1,200.0	0.00	0.00	1,200.0	0.0	0.0	0.0	0.00	0.00	0.00
1,300.0	0.00	0.00	1,300.0	0.0	0.0	0.0	0.00	0.00	0.00
1,400.0	0.00	0.00	1,400.0	0.0	0.0	0.0	0.00	0.00	0.00
1,500.0	0.00	0.00	1,500.0	0.0	0.0	0.0	0.00	0.00	0.00
1,600.0	0.00	0.00	1,600.0	0.0	0.0	0.0	0.00	0.00	0.00
1,700.0	0.00	0.00	1,700.0	0.0	0.0	0.0	0.00	0.00	0.00
1,800.0	0.00	0.00	1,800.0	0.0	0.0	0.0	0.00	0.00	0.00
1,900.0	0.00	0.00	1,900.0	0.0	0.0	0.0	0.00	0.00	0.00
2,000.0	0.00	0.00	2,000.0	0.0	0.0	0.0	0.00	0.00	0.00
<b>KOP - Start Build 1.50</b>									
2,100.0	1.50	238.88	2,100.0	-0.7	-1.1	-0.5	1.50	1.50	0.00
2,200.0	3.00	238.88	2,199.9	-2.7	-4.5	-1.8	1.50	1.50	0.00
2,300.0	4.50	238.88	2,299.7	-6.1	-10.1	-4.1	1.50	1.50	0.00
2,400.0	6.00	238.88	2,399.3	-10.8	-17.9	-7.2	1.50	1.50	0.00
2,500.0	7.50	238.88	2,498.6	-16.9	-28.0	-11.3	1.50	1.50	0.00
2,600.0	9.00	238.88	2,597.5	-24.3	-40.3	-16.3	1.50	1.50	0.00
2,700.0	10.50	238.88	2,696.1	-33.1	-54.8	-22.2	1.50	1.50	0.00
2,800.0	12.00	238.88	2,794.2	-43.1	-71.5	-28.9	1.50	1.50	0.00
2,900.0	13.50	238.88	2,891.7	-54.5	-90.3	-36.6	1.50	1.50	0.00
3,000.0	15.00	238.88	2,988.6	-67.3	-111.4	-45.1	1.50	1.50	0.00
3,063.6	15.95	238.88	3,049.9	-76.0	-125.9	-51.0	1.50	1.50	0.00
3,100.0	15.95	238.88	3,084.9	-81.2	-134.5	-54.4	0.00	0.00	0.00
3,200.0	15.95	238.88	3,181.1	-95.4	-158.0	-63.9	0.00	0.00	0.00
3,300.0	15.95	238.88	3,277.2	-109.6	-181.6	-73.5	0.00	0.00	0.00
3,400.0	15.95	238.88	3,373.4	-123.8	-205.1	-83.0	0.00	0.00	0.00
3,500.0	15.95	238.88	3,469.5	-138.0	-228.6	-92.5	0.00	0.00	0.00
3,600.0	15.95	238.88	3,565.6	-152.2	-252.2	-102.0	0.00	0.00	0.00
3,700.0	15.95	238.88	3,661.8	-166.5	-275.7	-111.5	0.00	0.00	0.00
3,800.0	15.95	238.88	3,757.9	-180.7	-299.2	-121.1	0.00	0.00	0.00
3,900.0	15.95	238.88	3,854.1	-194.9	-322.7	-130.6	0.00	0.00	0.00
4,000.0	15.95	238.88	3,950.2	-209.1	-346.3	-140.1	0.00	0.00	0.00
4,100.0	15.95	238.88	4,046.4	-223.3	-369.8	-149.6	0.00	0.00	0.00
4,200.0	15.95	238.88	4,142.5	-237.5	-393.3	-159.1	0.00	0.00	0.00
4,300.0	15.95	238.88	4,238.7	-251.7	-416.9	-168.7	0.00	0.00	0.00
4,400.0	15.95	238.88	4,334.8	-265.9	-440.4	-178.2	0.00	0.00	0.00
4,500.0	15.95	238.88	4,431.0	-280.1	-463.9	-187.7	0.00	0.00	0.00
4,600.0	15.95	238.88	4,527.1	-294.3	-487.5	-197.2	0.00	0.00	0.00
4,700.0	15.95	238.88	4,623.3	-308.5	-511.0	-206.7	0.00	0.00	0.00
4,800.0	15.95	238.88	4,719.4	-322.7	-534.5	-216.3	0.00	0.00	0.00
4,900.0	15.95	238.88	4,815.6	-336.9	-558.0	-225.8	0.00	0.00	0.00
5,000.0	15.95	238.88	4,911.7	-351.1	-581.6	-235.3	0.00	0.00	0.00
5,100.0	15.95	238.88	5,007.9	-365.3	-605.1	-244.8	0.00	0.00	0.00

<b>Database:</b>	US_EDM	<b>Local Co-ordinate Reference:</b>	Well Sharp 23-3-4HN
<b>Company:</b>	Ward Petroleum	<b>TVD Reference:</b>	WELL @ 5032.0ft (Original Well Elev)
<b>Project:</b>	SEC.24-T1S-R67W	<b>MD Reference:</b>	WELL @ 5032.0ft (Original Well Elev)
<b>Site:</b>	Sharp 2635-1-15HC Pad Sec.24-T1S-R67W	<b>North Reference:</b>	True
<b>Well:</b>	Sharp 23-3-4HN	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Wellbore #1		
<b>Design:</b>	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)
5,200.0	15.95	238.88	5,104.0	-379.6	-628.6	-254.3	0.00	0.00	0.00
5,300.0	15.95	238.88	5,200.2	-393.8	-652.2	-263.9	0.00	0.00	0.00
5,400.0	15.95	238.88	5,296.3	-408.0	-675.7	-273.4	0.00	0.00	0.00
5,500.0	15.95	238.88	5,392.5	-422.2	-699.2	-282.9	0.00	0.00	0.00
5,600.0	15.95	238.88	5,488.6	-436.4	-722.7	-292.4	0.00	0.00	0.00
5,700.0	15.95	238.88	5,584.8	-450.6	-746.3	-301.9	0.00	0.00	0.00
5,800.0	15.95	238.88	5,680.9	-464.8	-769.8	-311.5	0.00	0.00	0.00
5,832.9	15.95	238.88	5,712.6	-469.5	-777.5	-314.6	0.00	0.00	0.00
<b>Start Drop -2.00</b>									
5,900.0	14.61	238.88	5,777.3	-478.6	-792.7	-320.7	2.00	-2.00	0.00
6,000.0	12.61	238.88	5,874.5	-490.8	-812.8	-328.9	2.00	-2.00	0.00
6,100.0	10.61	238.88	5,972.4	-501.2	-830.1	-335.8	2.00	-2.00	0.00
6,200.0	8.61	238.88	6,071.0	-509.8	-844.4	-341.6	2.00	-2.00	0.00
6,300.0	6.61	238.88	6,170.1	-516.7	-855.7	-346.2	2.00	-2.00	0.00
6,400.0	4.61	238.88	6,269.6	-521.7	-864.1	-349.6	2.00	-2.00	0.00
6,500.0	2.61	238.88	6,369.4	-525.0	-869.5	-351.8	2.00	-2.00	0.00
6,600.0	0.61	238.88	6,469.4	-526.4	-871.9	-352.8	2.00	-2.00	0.00
6,630.6	0.00	0.00	6,500.0	-526.5	-872.0	-352.8	2.00	-2.00	0.00
6,700.0	0.00	0.00	6,569.4	-526.5	-872.0	-352.8	0.00	0.00	0.00
6,800.0	0.00	0.00	6,669.4	-526.5	-872.0	-352.8	0.00	0.00	0.00
6,814.7	0.00	0.00	6,684.1	-526.5	-872.0	-352.8	0.00	0.00	0.00
<b>KOP #2 - Start Build 8.00</b>									
6,900.0	6.83	360.00	6,769.2	-521.4	-872.0	-347.8	8.01	8.01	0.00
7,000.0	14.83	360.00	6,867.3	-502.6	-872.0	-329.4	8.00	8.00	0.00
7,100.0	22.83	360.00	6,961.9	-470.4	-872.0	-297.7	8.00	8.00	0.00
7,200.0	30.84	360.00	7,051.0	-425.3	-872.0	-253.4	8.00	8.00	0.00
7,300.0	38.84	360.00	7,133.1	-368.2	-872.0	-197.3	8.00	8.00	0.00
7,400.0	46.84	360.00	7,206.3	-300.3	-872.0	-130.6	8.00	8.00	0.00
7,500.0	54.85	360.00	7,269.4	-222.8	-872.0	-54.5	8.00	8.00	0.00
7,600.0	62.85	360.00	7,321.1	-137.3	-872.0	29.5	8.00	8.00	0.00
7,700.0	70.85	360.00	7,360.4	-45.4	-872.0	119.7	8.00	8.00	0.00
7,800.0	78.85	360.00	7,386.5	51.0	-872.0	214.4	8.00	8.00	0.00
7,900.0	86.86	360.00	7,398.9	150.2	-872.0	311.8	8.00	8.00	0.00
7,939.3	90.00	360.00	7,400.0	189.5	-872.0	350.3	8.00	8.00	0.00
<b>Start 4356.8 hold at 7939.3 MD</b>									
8,000.0	90.00	360.00	7,400.0	250.2	-872.0	410.0	0.00	0.00	0.00
8,100.0	90.00	360.00	7,400.0	350.2	-872.0	508.2	0.00	0.00	0.00
8,200.0	90.00	360.00	7,400.0	450.2	-872.0	606.4	0.00	0.00	0.00
8,300.0	90.00	360.00	7,400.0	550.2	-872.0	704.6	0.00	0.00	0.00
8,400.0	90.00	360.00	7,400.0	650.2	-872.0	802.8	0.00	0.00	0.00
8,500.0	90.00	360.00	7,400.0	750.2	-872.0	901.0	0.00	0.00	0.00
8,600.0	90.00	360.00	7,400.0	850.2	-872.0	999.2	0.00	0.00	0.00
8,700.0	90.00	360.00	7,400.0	950.2	-872.0	1,097.4	0.00	0.00	0.00
8,800.0	90.00	360.00	7,400.0	1,050.2	-872.0	1,195.6	0.00	0.00	0.00
8,900.0	90.00	360.00	7,400.0	1,150.2	-872.0	1,293.8	0.00	0.00	0.00
9,000.0	90.00	360.00	7,400.0	1,250.2	-872.0	1,392.1	0.00	0.00	0.00
9,100.0	90.00	360.00	7,400.0	1,350.2	-872.0	1,490.3	0.00	0.00	0.00
9,200.0	90.00	360.00	7,400.0	1,450.2	-872.0	1,588.5	0.00	0.00	0.00
9,300.0	90.00	360.00	7,400.0	1,550.2	-872.0	1,686.7	0.00	0.00	0.00
9,400.0	90.00	360.00	7,400.0	1,650.2	-872.0	1,784.9	0.00	0.00	0.00
9,500.0	90.00	360.00	7,400.0	1,750.2	-872.0	1,883.1	0.00	0.00	0.00
9,600.0	90.00	360.00	7,400.0	1,850.2	-872.0	1,981.3	0.00	0.00	0.00
9,700.0	90.00	360.00	7,400.0	1,950.2	-872.0	2,079.5	0.00	0.00	0.00

<b>Database:</b>	US_EDM	<b>Local Co-ordinate Reference:</b>	Well Sharp 23-3-4HN
<b>Company:</b>	Ward Petroleum	<b>TVD Reference:</b>	WELL @ 5032.0ft (Original Well Elev)
<b>Project:</b>	SEC.24-T1S-R67W	<b>MD Reference:</b>	WELL @ 5032.0ft (Original Well Elev)
<b>Site:</b>	Sharp 2635-1-15HC Pad Sec.24-T1S-R67W	<b>North Reference:</b>	True
<b>Well:</b>	Sharp 23-3-4HN	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Wellbore #1		
<b>Design:</b>	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)	
9,800.0	90.00	360.00	7,400.0	2,050.2	-872.0	2,177.7	0.00	0.00	0.00	
9,900.0	90.00	360.00	7,400.0	2,150.2	-872.0	2,275.9	0.00	0.00	0.00	
10,000.0	90.00	360.00	7,400.0	2,250.2	-872.0	2,374.2	0.00	0.00	0.00	
10,100.0	90.00	360.00	7,400.0	2,350.2	-872.0	2,472.4	0.00	0.00	0.00	
10,200.0	90.00	360.00	7,400.0	2,450.2	-872.0	2,570.6	0.00	0.00	0.00	
10,300.0	90.00	360.00	7,400.0	2,550.2	-872.0	2,668.8	0.00	0.00	0.00	
10,400.0	90.00	360.00	7,400.0	2,650.2	-872.0	2,767.0	0.00	0.00	0.00	
10,500.0	90.00	360.00	7,400.0	2,750.2	-872.0	2,865.2	0.00	0.00	0.00	
10,600.0	90.00	360.00	7,400.0	2,850.2	-872.0	2,963.4	0.00	0.00	0.00	
10,700.0	90.00	360.00	7,400.0	2,950.2	-872.0	3,061.6	0.00	0.00	0.00	
10,800.0	90.00	360.00	7,400.0	3,050.2	-872.0	3,159.8	0.00	0.00	0.00	
10,900.0	90.00	360.00	7,400.0	3,150.2	-872.0	3,258.0	0.00	0.00	0.00	
11,000.0	90.00	360.00	7,400.0	3,250.2	-872.0	3,356.2	0.00	0.00	0.00	
11,100.0	90.00	360.00	7,400.0	3,350.2	-872.0	3,454.5	0.00	0.00	0.00	
11,200.0	90.00	360.00	7,400.0	3,450.2	-872.0	3,552.7	0.00	0.00	0.00	
11,300.0	90.00	360.00	7,400.0	3,550.2	-872.0	3,650.9	0.00	0.00	0.00	
11,400.0	90.00	360.00	7,400.0	3,650.2	-872.0	3,749.1	0.00	0.00	0.00	
11,500.0	90.00	360.00	7,400.0	3,750.2	-872.0	3,847.3	0.00	0.00	0.00	
11,600.0	90.00	360.00	7,400.0	3,850.2	-872.0	3,945.5	0.00	0.00	0.00	
11,700.0	90.00	360.00	7,400.0	3,950.2	-872.0	4,043.7	0.00	0.00	0.00	
11,800.0	90.00	360.00	7,400.0	4,050.2	-872.0	4,141.9	0.00	0.00	0.00	
11,900.0	90.00	360.00	7,400.0	4,150.2	-872.0	4,240.1	0.00	0.00	0.00	
12,000.0	90.00	360.00	7,400.0	4,250.2	-872.0	4,338.3	0.00	0.00	0.00	
12,100.0	90.00	360.00	7,400.0	4,350.2	-872.0	4,436.6	0.00	0.00	0.00	
12,200.0	90.00	360.00	7,400.0	4,450.2	-872.0	4,534.8	0.00	0.00	0.00	
12,296.1	90.00	360.00	7,400.0	4,546.3	-872.0	4,629.1	0.00	0.00	0.00	
<b>TD at 12296.1</b>										

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 & 212'FWL - plan hits target center - Point	0.00	0.00	1.0	0.0	0.0	1,223,149.31	3,183,377.46	39.944070	-104.845970	
LPL 460'FSL & 660'FWL - plan hits target center - Point	0.00	0.00	7,400.0	189.5	-872.0	1,223,332.31	3,182,504.10	39.944590	-104.849080	
BHL 460'FNL & 660'FEL - plan misses target center by 0.2ft at 12296.1ft MD (7400.0 TVD, 4546.3 N, -872.0 E) - Point	0.00	0.00	7,400.0	4,546.3	-871.9	1,227,688.88	3,182,472.12	39.956550	-104.849080	

<b>Database:</b>	US_EDM	<b>Local Co-ordinate Reference:</b>	Well Sharp 23-3-4HN
<b>Company:</b>	Ward Petroleum	<b>TVD Reference:</b>	WELL @ 5032.0ft (Original Well Elev)
<b>Project:</b>	SEC.24-T1S-R67W	<b>MD Reference:</b>	WELL @ 5032.0ft (Original Well Elev)
<b>Site:</b>	Sharp 2635-1-15HC Pad Sec.24-T1S-R67W	<b>North Reference:</b>	True
<b>Well:</b>	Sharp 23-3-4HN	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Wellbore #1		
<b>Design:</b>	Plan #1 (1-17-17)		

Plan Annotations				
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
2,000.0	2,000.0	0.0	0.0	KOP - Start Build 1.50
5,832.9	5,712.6	-76.0	-125.9	Start Drop -2.00
6,814.7	6,684.0	-469.5	-777.6	KOP #2 - Start Build 8.00
7,939.3	7,400.0	-526.5	-872.0	Start 4356.8 hold at 7939.3 MD
12,296.1	7,400.0	-526.5	-872.0	TD at 12296.1



# Directional

## Ward Petroleum

SEC.24-T1S-R67W

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

Sharp 23-3-4HN

Wellbore #1

Plan #1 (1-17-17)

## Anticollision Report

17 January, 2017

<b>Company:</b>	Ward Petroleum	<b>Local Co-ordinate Reference:</b>	Well Sharp 23-3-4HN
<b>Project:</b>	SEC.24-T1S-R67W	<b>TVD Reference:</b>	WELL @ 5032.0ft (Original Well Elev)
<b>Reference Site:</b>	Sharp 2635-1-15HC Pad Sec.24-T1S-R67W	<b>MD Reference:</b>	WELL @ 5032.0ft (Original Well Elev)
<b>Site Error:</b>	0.0 ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Sharp 23-3-4HN	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0 ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	US_EDM
<b>Reference Design:</b>	Plan #1 (1-17-17)	<b>Offset TVD Reference:</b>	Offset Datum

<b>Reference</b>	Plan #1 (1-17-17)		
<b>Filter type:</b>	NO GLOBAL FILTER: Using user defined selection & filtering criteria		
<b>Interpolation Method:</b>	MD Interval 100.0ft	<b>Error Model:</b>	ISCWSA
<b>Depth Range:</b>	Unlimited	<b>Scan Method:</b>	Closest Approach 3D
<b>Results Limited by:</b>	Maximum center-center distance of 1,200.0 ft	<b>Error Surface:</b>	Elliptical Conic
<b>Warning Levels Evaluated at:</b>	2.00 Sigma	<b>Casing Method:</b>	Not applied

<b>Survey Tool Program</b>	<b>Date</b>	1/17/2017		
<b>From (ft)</b>	<b>To (ft)</b>	<b>Survey (Wellbore)</b>	<b>Tool Name</b>	<b>Description</b>
0.0	12,296.1	Plan #1 (1-17-17) (Wellbore #1)	MWD	MWD - Standard

<b>Summary</b>						
Site Name	Reference Measured Depth (ft)	Offset Measured Depth (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Separation Factor	Warning
<b>Offset Well - Wellbore - Design</b>						
Sharp 24-3-11HC Pad Sec.24-T1S-R67W						
Sharp 24-3-11HC - Wellbore #1 - Wellbore #1	0.0	12.0	26.8	26.7	1,958.288	CC
Sharp 24-3-11HC - Wellbore #1 - Wellbore #1	100.0	111.9	26.9	26.7	112.638	ES
Sharp 24-3-11HC - Wellbore #1 - Wellbore #1	1,400.0	1,411.1	38.0	32.1	6.442	SF
Sharp 24-3-11HC - Wellbore #2 - Wellbore #2	0.0	12.0	26.8	26.7	1,958.289	CC
Sharp 24-3-11HC - Wellbore #2 - Wellbore #2	100.0	111.9	26.9	26.7	112.638	ES
Sharp 24-3-11HC - Wellbore #2 - Wellbore #2	1,400.0	1,411.1	38.0	32.1	6.442	SF
Sharp 2635-1-15HC Pad Sec.24-T1S-R67W						
Sharp 2635-1-15HC - Wellbore #1 - Plan #1 (1-17-17)	200.0	200.0	14.0	13.3	20.791	CC, ES
Sharp 2635-1-15HC - Wellbore #1 - Plan #1 (1-17-17)	400.0	399.1	19.2	17.7	12.381	SF

<b>Offset Design</b>													Sharp 24-3-11HC Pad Sec.24-T1S-R67W - Sharp 24-3-11HC - Wellbore #1 - Wellbore #1		<b>Offset Site Error:</b> 0.0 ft	
Survey Program: 111-MWD															<b>Offset Well Error:</b> 0.0 ft	
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)	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	-123.02	-14.6	-22.4	26.8	26.7	0.01	1,958.288	CC			
100.0	100.0	111.9	111.9	0.1	0.1	-123.02	-14.7	-22.6	26.9	26.7	0.24	112.638	ES			
200.0	200.0	211.8	211.8	0.3	0.3	-123.04	-15.0	-23.1	27.6	26.9	0.69	40.173				
300.0	300.0	311.9	311.9	0.6	0.6	-123.28	-15.5	-23.5	28.2	27.1	1.11	25.284				
400.0	400.0	411.8	411.8	0.8	0.8	-123.79	-15.9	-23.7	28.6	27.0	1.55	18.480				
500.0	500.0	511.8	511.8	1.0	1.0	-124.34	-16.5	-24.2	29.3	27.3	1.98	14.793				
600.0	600.0	611.8	611.8	1.2	1.2	-123.71	-16.6	-24.9	29.9	27.5	2.41	12.382				
700.0	700.0	711.6	711.6	1.5	1.4	-122.91	-16.8	-25.9	30.9	28.0	2.85	10.842				
800.0	800.0	811.9	811.9	1.7	1.6	-122.10	-16.8	-26.8	31.7	28.4	3.28	9.644				
900.0	900.0	911.8	911.8	1.9	1.8	-120.47	-16.3	-27.8	32.2	28.5	3.71	8.675				
1,000.0	1,000.0	1,011.7	1,011.6	2.1	2.0	-118.08	-15.6	-29.2	33.1	29.0	4.15	7.971				
1,100.0	1,100.0	1,111.7	1,111.7	2.4	2.2	-115.62	-14.8	-30.9	34.2	29.6	4.59	7.456				
1,200.0	1,200.0	1,211.8	1,211.8	2.6	2.4	-114.91	-14.7	-31.7	35.0	29.9	5.02	6.960				
1,300.0	1,300.0	1,311.7	1,311.6	2.8	2.6	-119.37	-17.5	-31.1	35.7	30.2	5.46	6.538				
1,400.0	1,400.0	1,411.1	1,410.6	3.0	2.9	-132.44	-25.6	-28.0	38.0	32.1	5.89	6.442	SF			
1,500.0	1,500.0	1,510.1	1,508.7	3.3	3.1	-149.72	-37.4	-21.8	43.4	37.1	6.34	6.849				
1,600.0	1,600.0	1,611.3	1,608.5	3.5	3.3	-167.92	-50.2	-10.7	51.4	44.6	6.80	7.567				
1,700.0	1,700.0	1,710.0	1,705.7	3.7	3.6	176.95	-59.4	3.2	59.8	52.5	7.25	8.251				

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

<b>Company:</b>	Ward Petroleum	<b>Local Co-ordinate Reference:</b>	Well Sharp 23-3-4HN
<b>Project:</b>	SEC.24-T1S-R67W	<b>TVD Reference:</b>	WELL @ 5032.0ft (Original Well Elev)
<b>Reference Site:</b>	Sharp 2635-1-15HC Pad Sec.24-T1S-R67W	<b>MD Reference:</b>	WELL @ 5032.0ft (Original Well Elev)
<b>Site Error:</b>	0.0 ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Sharp 23-3-4HN	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0 ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	US_EDM
<b>Reference Design:</b>	Plan #1 (1-17-17)	<b>Offset TVD Reference:</b>	Offset Datum

Offset Design													Offset Site Error:	0.0 ft	
Survey Program: 111-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			
1,800.0	1,800.0	1,808.8	1,803.1	3.9	3.9	166.22	-68.8	16.9	71.4	63.7	7.71	9.264			
1,900.0	1,900.0	1,908.4	1,901.4	4.2	4.1	158.74	-77.7	30.2	84.0	75.9	8.18	10.270			
2,000.0	2,000.0	2,008.2	2,000.1	4.4	4.4	153.70	-85.9	42.5	96.6	87.9	8.66	11.153			
2,100.0	2,100.0	2,108.7	2,099.7	4.6	4.7	-89.95	-92.4	54.5	108.0	99.0	8.97	12.041			
2,200.0	2,199.9	2,203.7	2,193.5	4.8	5.0	-95.08	-99.4	67.5	121.9	112.6	9.36	13.027			
2,300.0	2,299.7	2,304.4	2,293.1	5.0	5.3	-100.62	-106.2	81.3	136.8	127.0	9.76	14.009			
2,400.0	2,399.3	2,400.5	2,388.0	5.2	5.6	-105.92	-112.4	94.9	153.6	143.4	10.17	15.107			
2,500.0	2,498.6	2,498.0	2,484.3	5.4	5.9	-110.36	-120.0	107.5	172.2	161.7	10.58	16.272			
2,600.0	2,597.5	2,592.4	2,577.5	5.6	6.2	-114.22	-128.5	120.2	194.0	183.0	11.01	17.617			
2,700.0	2,696.1	2,691.1	2,675.0	5.9	6.5	-117.88	-137.8	133.0	217.5	206.0	11.46	18.973			
2,800.0	2,794.2	2,786.4	2,769.1	6.2	6.8	-121.43	-145.4	144.9	242.2	230.3	11.92	20.316			
2,900.0	2,891.7	2,877.1	2,858.6	6.5	7.1	-124.46	-153.5	157.5	270.7	258.3	12.39	21.849			
3,000.0	2,988.6	2,972.8	2,953.0	6.8	7.5	-127.33	-162.6	170.9	301.7	288.8	12.88	23.423			
3,100.0	3,084.9	3,067.7	3,046.7	7.2	7.8	-130.34	-169.8	183.6	334.0	320.6	13.39	24.942			
3,200.0	3,181.1	3,158.4	3,136.2	7.7	8.1	-132.89	-177.3	196.1	367.9	353.9	13.93	26.410			
3,300.0	3,277.2	3,247.7	3,224.4	8.1	8.4	-135.08	-184.2	208.7	402.6	388.2	14.47	27.823			
3,400.0	3,373.4	3,332.9	3,308.2	8.6	8.7	-136.95	-190.5	222.5	439.6	424.6	15.01	29.286			
3,500.0	3,469.5	3,431.0	3,404.7	9.0	9.0	-138.62	-198.8	237.9	476.7	461.1	15.58	30.587			
3,600.0	3,565.6	3,538.5	3,510.7	9.5	9.4	-140.27	-206.8	253.4	512.9	496.7	16.17	31.711			
3,700.0	3,661.8	3,646.7	3,618.3	10.0	9.7	-141.87	-212.8	264.3	544.8	528.1	16.75	32.518			
3,800.0	3,757.9	3,735.2	3,706.0	10.5	10.0	-142.86	-219.4	273.3	577.4	560.0	17.31	33.346			
3,900.0	3,854.1	3,823.0	3,792.9	11.1	10.3	-143.49	-228.4	282.8	610.8	592.9	17.90	34.127			
4,000.0	3,950.2	3,913.5	3,882.0	11.6	10.6	-143.89	-239.8	293.4	645.4	626.9	18.51	34.875			
4,100.0	4,046.4	4,014.1	3,981.3	12.1	11.0	-144.39	-251.2	304.8	679.6	660.4	19.13	35.517			
4,200.0	4,142.5	4,103.0	4,069.1	12.7	11.3	-144.82	-260.9	314.3	713.1	693.4	19.73	36.141			
4,300.0	4,238.7	4,181.1	4,146.1	13.2	11.5	-145.09	-270.5	324.3	748.8	728.5	20.32	36.857			
4,400.0	4,334.8	4,277.9	4,241.3	13.7	11.9	-145.46	-281.4	337.3	784.9	764.0	20.94	37.479			
4,500.0	4,431.0	4,372.3	4,334.5	14.3	12.2	-145.93	-290.4	349.5	820.7	799.2	21.55	38.084			
4,600.0	4,527.1	4,461.7	4,422.7	14.8	12.5	-146.32	-299.0	361.6	857.0	834.8	22.15	38.695			
4,700.0	4,623.3	4,566.6	4,526.3	15.4	12.9	-146.78	-308.5	374.8	892.4	869.7	22.78	39.176			
4,800.0	4,719.4	4,657.2	4,615.8	16.0	13.2	-147.08	-317.8	385.9	927.7	904.3	23.39	39.668			
4,900.0	4,815.6	4,746.5	4,704.0	16.5	13.5	-147.41	-326.0	397.2	963.3	939.3	23.99	40.155			
5,000.0	4,911.7	4,834.3	4,790.5	17.1	13.8	-147.62	-335.5	408.8	999.4	974.8	24.60	40.632			
5,100.0	5,007.9	4,925.7	4,880.6	17.6	14.1	-147.88	-344.7	421.1	1,035.8	1,010.6	25.21	41.079			
5,200.0	5,104.0	5,000.2	4,953.9	18.2	14.4	-148.09	-351.8	431.8	1,073.1	1,047.3	25.78	41.620			
5,300.0	5,200.2	5,074.1	5,026.5	18.8	14.7	-148.25	-359.6	443.7	1,112.0	1,085.7	26.37	42.177			
5,400.0	5,296.3	5,162.1	5,112.6	19.3	15.1	-148.40	-369.2	459.0	1,152.1	1,125.1	26.99	42.691			
5,500.0	5,392.5	5,259.5	5,208.0	19.9	15.5	-148.58	-379.4	475.5	1,191.9	1,164.2	27.63	43.130			

<b>Company:</b>	Ward Petroleum	<b>Local Co-ordinate Reference:</b>	Well Sharp 23-3-4HN
<b>Project:</b>	SEC.24-T1S-R67W	<b>TVD Reference:</b>	WELL @ 5032.0ft (Original Well Elev)
<b>Reference Site:</b>	Sharp 2635-1-15HC Pad Sec.24-T1S-R67W	<b>MD Reference:</b>	WELL @ 5032.0ft (Original Well Elev)
<b>Site Error:</b>	0.0 ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Sharp 23-3-4HN	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0 ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	US_EDM
<b>Reference Design:</b>	Plan #1 (1-17-17)	<b>Offset TVD Reference:</b>	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	-123.02	-14.6	-22.4	26.8	26.7	0.01	1,958.289	CC		
100.0	100.0	111.9	111.9	0.1	0.1	-123.02	-14.7	-22.6	26.9	26.7	0.24	112.638	ES		
200.0	200.0	211.8	211.8	0.3	0.3	-123.04	-15.0	-23.1	27.6	26.9	0.69	40.173			
300.0	300.0	311.9	311.9	0.6	0.6	-123.28	-15.5	-23.5	28.2	27.1	1.11	25.284			
400.0	400.0	411.8	411.8	0.8	0.8	-123.79	-15.9	-23.7	28.6	27.0	1.55	18.480			
500.0	500.0	511.8	511.8	1.0	1.0	-124.34	-16.5	-24.2	29.3	27.3	1.98	14.793			
600.0	600.0	611.8	611.8	1.2	1.2	-123.71	-16.6	-24.9	29.9	27.5	2.41	12.382			
700.0	700.0	711.6	711.6	1.5	1.4	-122.91	-16.8	-25.9	30.9	28.0	2.85	10.842			
800.0	800.0	811.9	811.9	1.7	1.6	-122.10	-16.8	-26.8	31.7	28.4	3.28	9.644			
900.0	900.0	911.8	911.8	1.9	1.8	-120.47	-16.3	-27.8	32.2	28.5	3.71	8.675			
1,000.0	1,000.0	1,011.7	1,011.6	2.1	2.0	-118.08	-15.6	-29.2	33.1	29.0	4.15	7.971			
1,100.0	1,100.0	1,111.7	1,111.7	2.4	2.2	-115.62	-14.8	-30.9	34.2	29.6	4.59	7.456			
1,200.0	1,200.0	1,211.8	1,211.8	2.6	2.4	-114.91	-14.7	-31.7	35.0	29.9	5.02	6.960			
1,300.0	1,300.0	1,311.7	1,311.6	2.8	2.6	-119.37	-17.5	-31.1	35.7	30.2	5.46	6.538			
1,400.0	1,400.0	1,411.1	1,410.6	3.0	2.9	-132.44	-25.6	-28.0	38.0	32.1	5.89	6.442	SF		
1,500.0	1,500.0	1,510.1	1,508.7	3.3	3.1	-149.72	-37.4	-21.8	43.4	37.1	6.34	6.849			
1,600.0	1,600.0	1,611.3	1,608.5	3.5	3.3	-167.92	-50.2	-10.7	51.4	44.6	6.80	7.567			
1,700.0	1,700.0	1,710.0	1,705.7	3.7	3.6	176.95	-59.4	3.2	59.8	52.5	7.25	8.251			
1,800.0	1,800.0	1,808.8	1,803.1	3.9	3.9	166.22	-68.8	16.9	71.4	63.7	7.71	9.264			
1,900.0	1,900.0	1,908.4	1,901.4	4.2	4.1	158.74	-77.7	30.2	84.0	75.9	8.18	10.270			
2,000.0	2,000.0	2,008.2	2,000.1	4.4	4.4	153.70	-85.9	42.5	96.6	87.9	8.66	11.153			
2,100.0	2,100.0	2,108.7	2,099.7	4.6	4.7	-89.95	-92.4	54.5	108.0	99.0	8.97	12.041			
2,200.0	2,199.9	2,203.7	2,193.5	4.8	5.0	-95.08	-99.4	67.5	121.9	112.6	9.36	13.027			
2,300.0	2,299.7	2,304.4	2,293.1	5.0	5.3	-100.62	-106.2	81.3	136.8	127.0	9.76	14.009			
2,400.0	2,399.3	2,400.5	2,388.0	5.2	5.6	-105.92	-112.4	94.9	153.6	143.4	10.17	15.107			
2,500.0	2,498.6	2,498.0	2,484.3	5.4	5.9	-110.36	-120.0	107.5	172.2	161.7	10.58	16.272			
2,600.0	2,597.5	2,592.4	2,577.5	5.6	6.2	-114.22	-128.5	120.2	194.0	183.0	11.01	17.617			
2,700.0	2,696.1	2,691.1	2,675.0	5.9	6.5	-117.88	-137.8	133.0	217.5	206.0	11.46	18.973			
2,800.0	2,794.2	2,786.4	2,769.1	6.2	6.8	-121.43	-145.4	144.9	242.2	230.3	11.92	20.316			
2,900.0	2,891.7	2,877.1	2,858.6	6.5	7.1	-124.46	-153.5	157.5	270.7	258.3	12.39	21.849			
3,000.0	2,988.6	2,972.8	2,953.0	6.8	7.5	-127.33	-162.6	170.9	301.7	288.8	12.88	23.423			
3,100.0	3,084.9	3,067.7	3,046.7	7.2	7.8	-130.34	-169.8	183.6	334.0	320.6	13.39	24.942			
3,200.0	3,181.1	3,158.4	3,136.2	7.7	8.1	-132.89	-177.3	196.1	367.9	353.9	13.93	26.410			
3,300.0	3,277.2	3,247.7	3,224.4	8.1	8.4	-135.08	-184.2	208.7	402.6	388.2	14.47	27.823			
3,400.0	3,373.4	3,332.9	3,308.2	8.6	8.7	-136.95	-190.5	222.5	439.6	424.6	15.01	29.286			
3,500.0	3,469.5	3,431.0	3,404.7	9.0	9.0	-138.62	-198.8	237.9	476.7	461.1	15.58	30.587			
3,600.0	3,565.6	3,538.5	3,510.7	9.5	9.4	-140.27	-206.8	253.4	512.9	496.7	16.17	31.711			
3,700.0	3,661.8	3,646.7	3,618.3	10.0	9.7	-141.87	-212.8	264.3	544.8	528.1	16.75	32.517			
3,800.0	3,757.9	3,735.2	3,706.0	10.5	10.0	-142.86	-219.4	273.3	577.4	560.0	17.31	33.346			
3,900.0	3,854.1	3,823.0	3,792.9	11.1	10.3	-143.49	-228.4	282.8	610.8	592.9	17.90	34.127			
4,000.0	3,950.2	3,913.5	3,882.0	11.6	10.6	-143.89	-239.8	293.4	645.4	626.9	18.51	34.875			
4,100.0	4,046.4	4,014.1	3,981.3	12.1	11.0	-144.39	-251.2	304.8	679.6	660.4	19.13	35.517			
4,200.0	4,142.5	4,103.0	4,069.1	12.7	11.3	-144.82	-260.9	314.3	713.1	693.4	19.73	36.141			
4,300.0	4,238.7	4,181.1	4,146.1	13.2	11.5	-145.09	-270.5	324.3	748.8	728.5	20.32	36.857			
4,400.0	4,334.8	4,277.9	4,241.3	13.7	11.9	-145.46	-281.4	337.3	784.9	764.0	20.94	37.479			
4,500.0	4,431.0	4,372.3	4,334.5	14.3	12.2	-145.93	-290.4	349.5	820.7	799.2	21.55	38.084			
4,600.0	4,527.1	4,461.7	4,422.7	14.8	12.5	-146.32	-299.0	361.6	857.0	834.8	22.15	38.695			
4,700.0	4,623.3	4,566.6	4,526.3	15.4	12.9	-146.78	-308.5	374.8	892.4	869.7	22.78	39.175			
4,800.0	4,719.4	4,657.2	4,615.8	16.0	13.2	-147.08	-317.8	385.9	927.7	904.3	23.39	39.668			
4,900.0	4,815.6	4,746.5	4,704.0	16.5	13.5	-147.41	-326.0	397.2	963.3	939.3	23.99	40.155			
5,000.0	4,911.7	4,834.3	4,790.5	17.1	13.8	-147.62	-335.5	408.8	999.4	974.8	24.60	40.632			
5,100.0	5,007.9	4,925.7	4,880.6	17.6	14.1	-147.88	-344.7	421.1	1,035.8	1,010.6	25.21	41.079			

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

<b>Company:</b>	Ward Petroleum	<b>Local Co-ordinate Reference:</b>	Well Sharp 23-3-4HN
<b>Project:</b>	SEC.24-T1S-R67W	<b>TVD Reference:</b>	WELL @ 5032.0ft (Original Well Elev)
<b>Reference Site:</b>	Sharp 2635-1-15HC Pad Sec.24-T1S-R67W	<b>MD Reference:</b>	WELL @ 5032.0ft (Original Well Elev)
<b>Site Error:</b>	0.0 ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Sharp 23-3-4HN	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0 ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	US_EDM
<b>Reference Design:</b>	Plan #1 (1-17-17)	<b>Offset TVD Reference:</b>	Offset Datum

<b>Offset Design</b>												<b>Offset Site Error:</b>	0.0 ft	
Survey Program: 111-MWD, 8638-MWD												<b>Offset Well Error:</b>		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	
5,200.0	5,104.0	5,000.2	4,953.9	18.2	14.4	-148.09	-351.8	431.8	1,073.1	1,047.3	25.78	41.620		
5,300.0	5,200.2	5,074.1	5,026.5	18.8	14.7	-148.25	-359.6	443.7	1,112.0	1,085.7	26.37	42.177		
5,400.0	5,296.3	5,162.1	5,112.6	19.3	15.1	-148.40	-369.2	459.0	1,152.1	1,125.1	26.99	42.691		
5,500.0	5,392.5	5,259.5	5,208.0	19.9	15.5	-148.58	-379.4	475.5	1,191.9	1,164.2	27.63	43.130		

<b>Company:</b>	Ward Petroleum	<b>Local Co-ordinate Reference:</b>	Well Sharp 23-3-4HN
<b>Project:</b>	SEC.24-T1S-R67W	<b>TVD Reference:</b>	WELL @ 5032.0ft (Original Well Elev)
<b>Reference Site:</b>	Sharp 2635-1-15HC Pad Sec.24-T1S-R67W	<b>MD Reference:</b>	WELL @ 5032.0ft (Original Well Elev)
<b>Site Error:</b>	0.0 ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Sharp 23-3-4HN	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0 ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	US_EDM
<b>Reference Design:</b>	Plan #1 (1-17-17)	<b>Offset TVD Reference:</b>	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	299.6	299.6	0.6	0.6	-90.05	0.0	-15.3	15.3	14.2	1.11	13.777			
400.0	400.0	399.1	399.0	0.8	0.8	-90.16	-0.1	-19.2	19.2	17.7	1.55	12.381 SF			
500.0	500.0	498.3	498.0	1.0	1.0	-90.28	-0.1	-25.7	25.7	23.7	2.01	12.811			
600.0	600.0	597.1	596.4	1.2	1.3	-90.36	-0.2	-34.6	34.8	32.3	2.48	14.036			
700.0	700.0	695.4	694.0	1.5	1.5	-90.43	-0.3	-46.1	46.5	43.5	2.97	15.636			
800.0	800.0	793.0	790.6	1.7	1.9	-90.47	-0.5	-60.0	60.7	57.2	3.49	17.400			
900.0	900.0	889.8	886.1	1.9	2.2	-90.50	-0.7	-76.1	77.4	73.4	4.03	19.217			
1,000.0	1,000.0	985.8	980.3	2.1	2.6	-90.52	-0.9	-94.6	96.6	92.0	4.60	21.021			
1,100.0	1,100.0	1,080.8	1,073.0	2.4	3.0	-90.54	-1.1	-115.1	118.2	113.1	5.19	22.775			
1,200.0	1,200.0	1,174.6	1,164.1	2.6	3.5	-90.55	-1.3	-137.7	142.3	136.5	5.82	24.459			
1,300.0	1,300.0	1,267.3	1,253.5	2.8	3.9	-90.56	-1.6	-162.2	168.7	162.2	6.47	26.062			
1,400.0	1,400.0	1,358.7	1,341.0	3.0	4.5	-90.57	-1.9	-188.4	197.4	190.3	7.16	27.581			
1,500.0	1,500.0	1,448.8	1,426.6	3.3	5.0	-90.57	-2.2	-216.3	228.4	220.6	7.87	29.019			
1,600.0	1,600.0	1,537.4	1,510.2	3.5	5.6	-90.58	-2.5	-245.8	261.6	253.0	8.61	30.379			
1,700.0	1,700.0	1,624.6	1,591.8	3.7	6.2	-90.58	-2.8	-276.6	297.0	287.6	9.38	31.667			
1,800.0	1,800.0	1,710.2	1,671.2	3.9	6.9	-90.58	-3.1	-308.7	334.5	324.3	10.17	32.895			
1,900.0	1,900.0	1,801.7	1,755.6	4.2	7.6	-90.59	-3.5	-344.1	373.2	362.2	11.02	33.851			
2,000.0	2,000.0	1,893.9	1,840.6	4.4	8.4	-90.59	-3.9	-379.8	411.9	400.0	11.89	34.637			
2,100.0	2,100.0	1,986.6	1,926.0	4.6	9.1	30.31	-4.3	-415.6	449.6	439.9	9.63	46.684			
2,200.0	2,199.9	2,080.0	2,012.1	4.8	9.9	30.27	-4.7	-451.8	485.1	475.0	10.12	47.943			
2,300.0	2,299.7	2,174.2	2,099.0	5.0	10.6	30.37	-5.1	-488.2	518.6	508.0	10.62	48.838			
2,400.0	2,399.3	2,269.1	2,186.5	5.2	11.4	30.59	-5.4	-525.0	549.9	538.8	11.13	49.415			
2,500.0	2,498.6	2,364.5	2,274.5	5.4	12.2	30.91	-5.8	-561.9	579.2	567.5	11.65	49.710			
2,600.0	2,597.5	2,460.6	2,363.1	5.6	13.0	31.33	-6.2	-599.1	606.3	594.1	12.19	49.752			
2,700.0	2,696.1	2,557.1	2,452.1	5.9	13.8	31.84	-6.6	-636.4	631.4	618.6	12.74	49.564			
2,800.0	2,794.2	2,654.0	2,541.4	6.2	14.6	32.43	-7.0	-674.0	654.4	641.0	13.31	49.161			
2,900.0	2,891.7	2,751.3	2,631.1	6.5	15.4	33.11	-7.4	-711.6	675.3	661.4	13.91	48.556			
3,000.0	2,988.6	2,848.9	2,721.1	6.8	16.2	33.87	-7.8	-749.4	694.3	679.8	14.54	47.760			
3,100.0	3,084.9	2,946.7	2,811.3	7.2	17.0	34.76	-8.2	-787.2	711.5	696.3	15.21	46.780			
3,200.0	3,181.1	3,044.5	2,901.5	7.7	17.8	35.72	-8.6	-825.1	728.4	712.5	15.92	45.756			
3,300.0	3,277.2	3,142.3	2,991.7	8.1	18.7	36.64	-9.1	-862.9	745.6	728.9	16.66	44.755			
3,400.0	3,373.4	3,240.1	3,081.9	8.6	19.5	37.52	-9.5	-900.8	762.9	745.5	17.43	43.782			
3,500.0	3,469.5	3,338.0	3,172.1	9.0	20.3	38.35	-9.9	-938.6	780.4	762.2	18.22	42.840			
3,600.0	3,565.6	3,435.8	3,262.2	9.5	21.1	39.16	-10.3	-976.5	798.1	779.0	19.03	41.933			
3,700.0	3,661.8	3,533.6	3,352.4	10.0	21.9	39.92	-10.7	-1,014.4	815.9	796.0	19.87	41.061			
3,800.0	3,757.9	3,631.4	3,442.6	10.5	22.7	40.66	-11.1	-1,052.2	833.8	813.1	20.73	40.227			
3,900.0	3,854.1	3,729.2	3,532.8	11.1	23.5	41.36	-11.5	-1,090.1	851.8	830.2	21.60	39.430			
4,000.0	3,950.2	3,827.1	3,623.0	11.6	24.4	42.04	-11.9	-1,127.9	870.0	847.5	22.50	38.669			
4,100.0	4,046.4	3,924.9	3,713.2	12.1	25.2	42.69	-12.3	-1,165.8	888.3	864.9	23.41	37.944			
4,200.0	4,142.5	4,022.7	3,803.4	12.7	26.0	43.31	-12.7	-1,203.7	906.7	882.4	24.34	37.255			
4,300.0	4,238.7	4,120.5	3,893.6	13.2	26.8	43.91	-13.1	-1,241.5	925.2	900.0	25.28	36.599			
4,400.0	4,334.8	4,218.3	3,983.8	13.7	27.6	44.48	-13.5	-1,279.4	943.8	917.6	26.24	35.976			
4,500.0	4,431.0	4,316.2	4,074.0	14.3	28.4	45.03	-13.9	-1,317.2	962.5	935.3	27.20	35.384			
4,600.0	4,527.1	4,414.0	4,164.2	14.8	29.2	45.56	-14.3	-1,355.1	981.3	953.1	28.18	34.821			
4,700.0	4,623.3	4,511.8	4,254.4	15.4	30.1	46.08	-14.7	-1,393.0	1,000.1	971.0	29.17	34.286			
4,800.0	4,719.4	4,609.6	4,344.6	16.0	30.9	46.57	-15.1	-1,430.8	1,019.1	988.9	30.17	33.777			
4,900.0	4,815.6	4,707.4	4,434.8	16.5	31.7	47.04	-15.5	-1,468.7	1,038.1	1,006.9	31.18	33.293			
5,000.0	4,911.7	4,805.3	4,525.0	17.1	32.5	47.50	-15.9	-1,506.5	1,057.1	1,024.9	32.20	32.833			
5,100.0	5,007.9	4,903.1	4,615.2	17.6	33.3	47.94	-16.3	-1,544.4	1,076.2	1,043.0	33.22	32.396			

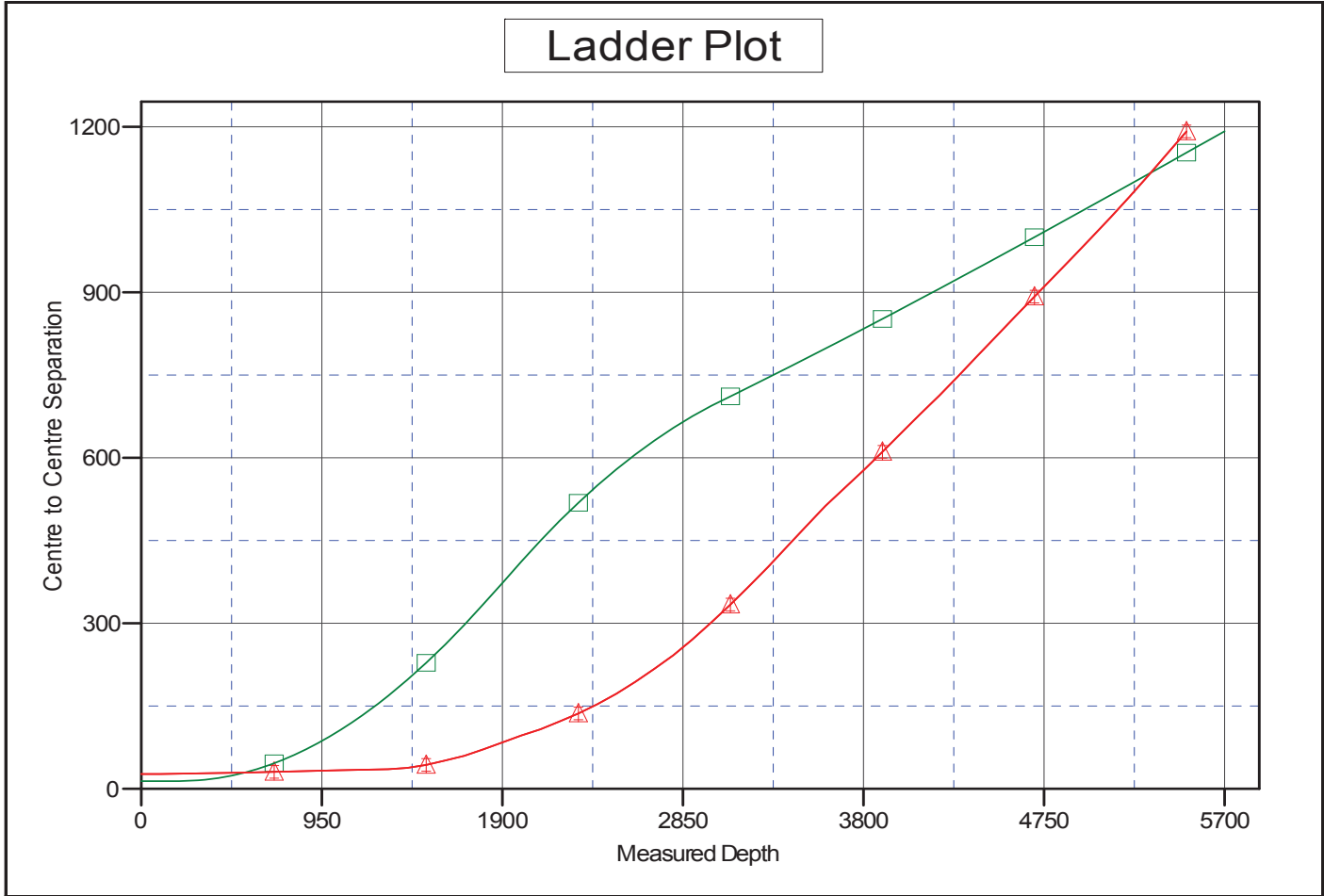
CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation

<b>Company:</b>	Ward Petroleum	<b>Local Co-ordinate Reference:</b>	Well Sharp 23-3-4HN
<b>Project:</b>	SEC.24-T1S-R67W	<b>TVD Reference:</b>	WELL @ 5032.0ft (Original Well Elev)
<b>Reference Site:</b>	Sharp 2635-1-15HC Pad Sec.24-T1S-R67W	<b>MD Reference:</b>	WELL @ 5032.0ft (Original Well Elev)
<b>Site Error:</b>	0.0 ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Sharp 23-3-4HN	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0 ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	US_EDM
<b>Reference Design:</b>	Plan #1 (1-17-17)	<b>Offset TVD Reference:</b>	Offset Datum

Offset Design												Offset Site Error:	0.0 ft		
Survey Program: 0-MWD												Sharp 2635-1-15HC Pad Sec.24-T1S-R67W - Sharp 2635-1-15HC - Wellbore #1 - Plan #1 (1-17-17)		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		
5,200.0	5,104.0	5,000.9	4,705.4	18.2	34.2	48.37	-16.7	-1,582.2	1,095.4	1,061.2	34.25	31.979			
5,300.0	5,200.2	5,098.7	4,795.6	18.8	35.0	48.78	-17.1	-1,620.1	1,114.7	1,079.4	35.29	31.582			
5,400.0	5,296.3	5,196.5	4,885.8	19.3	35.8	49.18	-17.5	-1,658.0	1,134.0	1,097.6	36.34	31.204			
5,500.0	5,392.5	5,294.4	4,976.0	19.9	36.6	49.56	-17.9	-1,695.8	1,153.3	1,115.9	37.39	30.843			
5,600.0	5,488.6	5,392.2	5,066.2	20.5	37.4	49.93	-18.3	-1,733.7	1,172.7	1,134.2	38.45	30.498			
5,700.0	5,584.8	5,490.0	5,156.4	21.0	38.2	50.29	-18.7	-1,771.5	1,192.1	1,152.6	39.51	30.169			

<b>Company:</b>	Ward Petroleum	<b>Local Co-ordinate Reference:</b>	Well Sharp 23-3-4HN
<b>Project:</b>	SEC.24-T1S-R67W	<b>TVD Reference:</b>	WELL @ 5032.0ft (Original Well Elev)
<b>Reference Site:</b>	Sharp 2635-1-15HC Pad Sec.24-T1S-R67W	<b>MD Reference:</b>	WELL @ 5032.0ft (Original Well Elev)
<b>Site Error:</b>	0.0 ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Sharp 23-3-4HN	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0 ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	US_EDM
<b>Reference Design:</b>	Plan #1 (1-17-17)	<b>Offset TVD Reference:</b>	Offset Datum

Reference Depths are relative to WELL @ 5032.0ft (Original Well Elev)      Coordinates are relative to: Sharp 23-3-4HN  
 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°

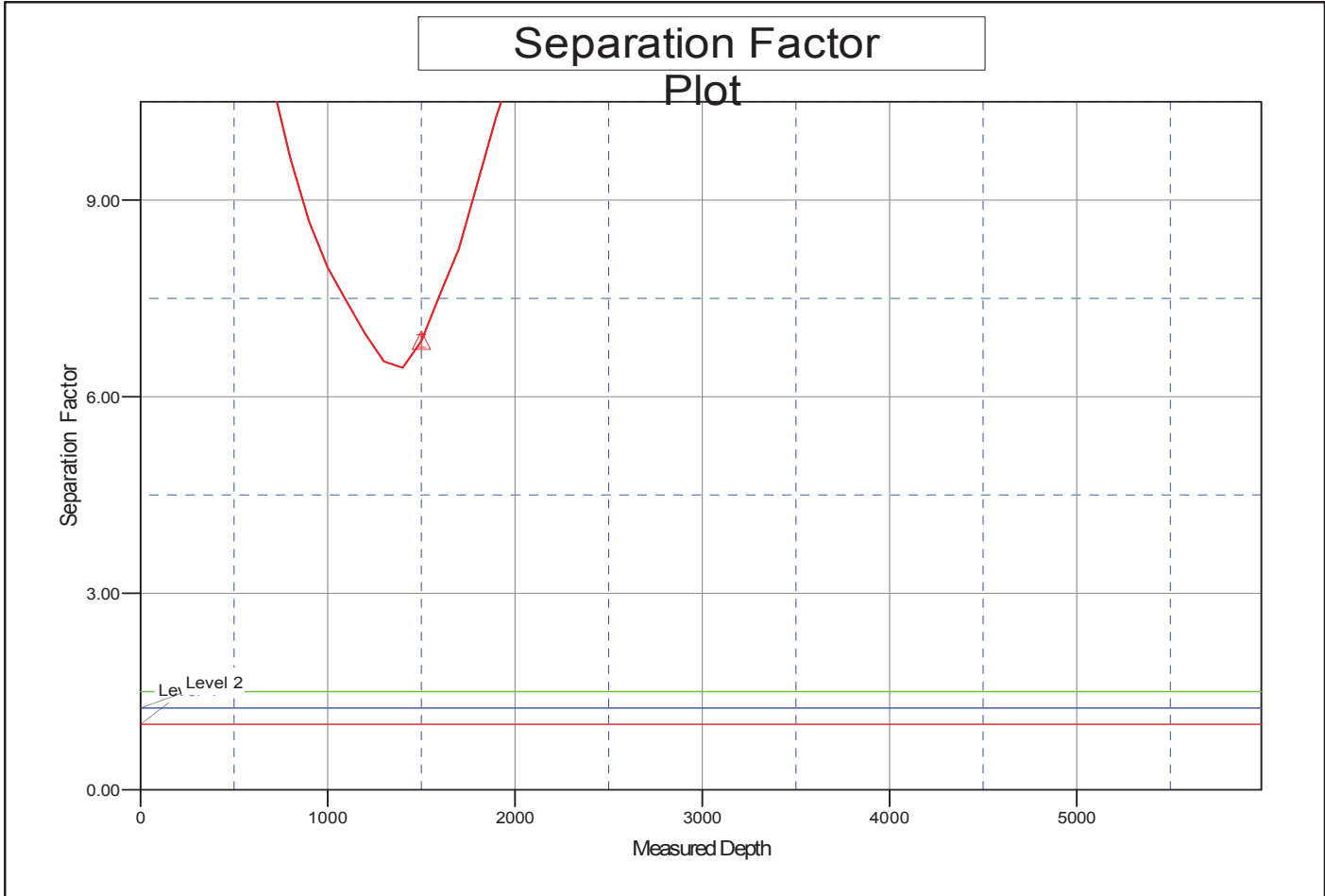


LEGEND

arp 2635-1-15HC, Wellbore #1, Plan #1 (1-17-17) V0      Sharp 24-3-11HC, Wellbore #1, Wellbore #1 V0      Sharp 24-3-11HC, Wellbore #2, Wellbore #2 V0

<b>Company:</b>	Ward Petroleum	<b>Local Co-ordinate Reference:</b>	Well Sharp 23-3-4HN
<b>Project:</b>	SEC.24-T1S-R67W	<b>TVD Reference:</b>	WELL @ 5032.0ft (Original Well Elev)
<b>Reference Site:</b>	Sharp 2635-1-15HC Pad Sec.24-T1S-R67W	<b>MD Reference:</b>	WELL @ 5032.0ft (Original Well Elev)
<b>Site Error:</b>	0.0 ft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Sharp 23-3-4HN	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0 ft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #1	<b>Database:</b>	US_EDM
<b>Reference Design:</b>	Plan #1 (1-17-17)	<b>Offset TVD Reference:</b>	Offset Datum

Reference Depths are relative to WELL @ 5032.0ft (Original Well Elev)      Coordinates are relative to: Sharp 23-3-4HN  
 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°



L E G E N D

arp 2635-1-15HC, Wellbore #1, Plan #1 (1-17-17) V0      Sharp 24-3-11HC, Wellbore #1, Wellbore #1 V0      Sharp 24-3-11HC, Wellbore #2, Wellbore #2 V0