

Noble Energy Inc.- Weld County, CO (Grid North)

Well Name: **Heartland State H01-74-1HN**

Surface Location: Heartland State G36-75-1HN Pad Sec.25-T4N-R65W
North American Datum 1983 , US State Plane 1983 , Colorado Northern Zone

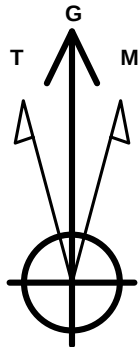
Ground Elevation: 4834.0

+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Slot
0.0	0.0	1344913.85	3249673.92	40.276730	-104.605150	

Precision 829 - RKB 16' WELL @ 4850.0ft (Precision 829 - RKB 16')

WELLBORE TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Shape
Heartland State H01-74-1HN BHL 75'FSL & 1650'FEL	6937.9	-10751.9	-804.4	Circle (Radius: 35.0)
WP1	6996.0	-4080.6	-845.0	Point



Azimuths to Grid North
True North: -0.58°
Magnetic North: 7.76°

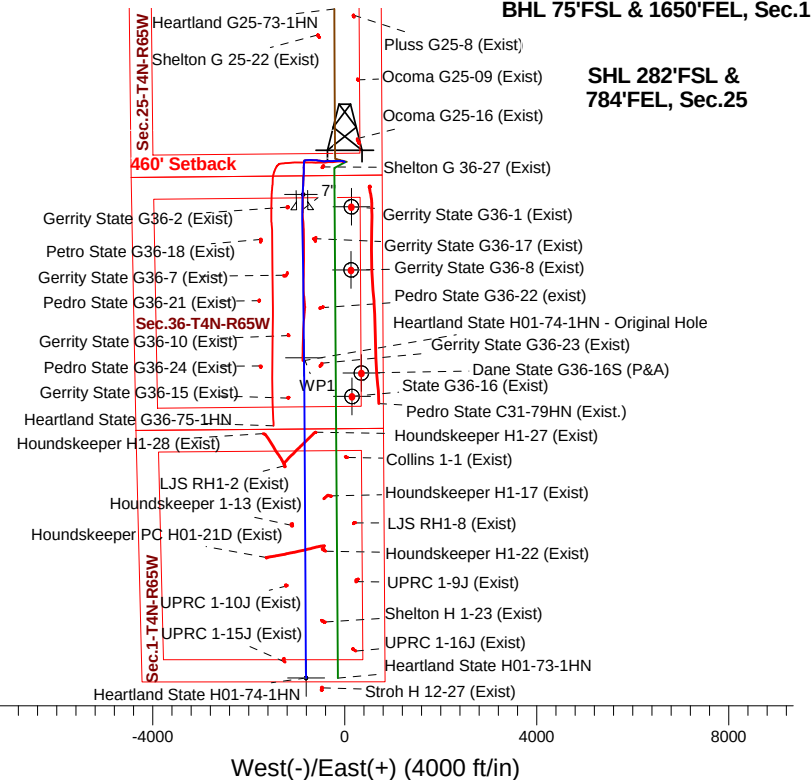
Magnetic Field
Strength: 52750.2snT
Dip Angle: 66.87°
Date: 8/13/2014
Model: IGRF2010

ANNOTATIONS

TVD	MD	Annotation
6887.5	7158.0	Tie-On Pt. - End of Rathole
6887.5	7158.0	KOP - Start DLS 5.00 TFO 60.00
6897.8	7188.0	Start 155.4 hold at 7188.0 MD
6953.9	7354.2	Start DLS 5.00 TFO -12.83
6996.0	10850.1	Start DLS 2.00 TFO 90.16
6937.9	17521.8	TD at 17521.8

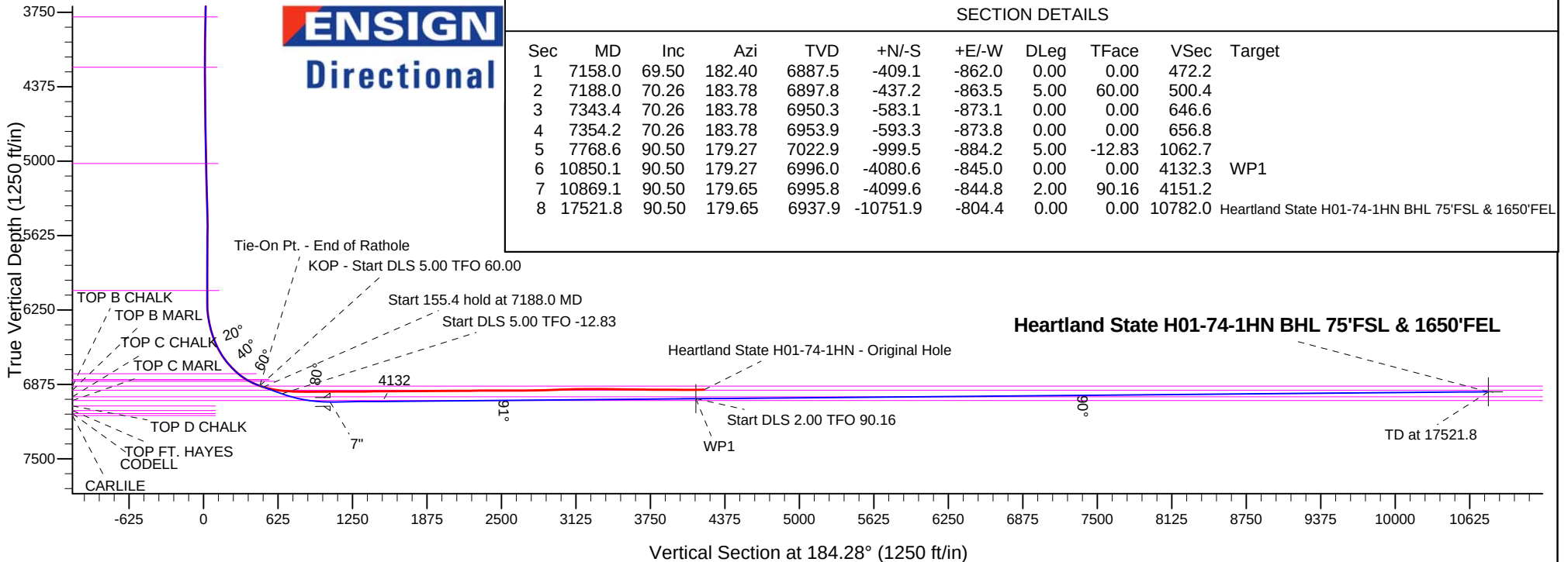
Heartland State G36-75-1HN Pad Sec.25-T4N-R65W
Heartland State H01-74-1HN
Sidetrack Plan D - Rev 0

South(-)/North(+) (4000 ft/in)



BHL 75'FSL & 1650'FEL, Sec.1

SHL 282'FSL & 784'FEL, Sec.25





Noble Energy Inc.- Weld County, CO (Grid North)

Sec.25-T4N-R65W

Heartland State G36-75-1HN Pad Sec.25-T4N-R65W

Heartland State H01-74-1HN

Wellbore #2 sidetrack

Plan: Sidetrack Plan D - Rev 0

Standard Planning Report

15 August, 2014

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
7,158.0	69.50	182.40	6,887.5	-409.1	-862.0	0.00	0.00	0.00	0.00	
7,188.0	70.26	183.78	6,897.8	-437.2	-863.5	5.00	2.52	4.60	60.00	
7,343.4	70.26	183.78	6,950.3	-583.1	-873.1	0.00	0.00	0.00	0.00	
7,354.2	70.26	183.78	6,953.9	-593.3	-873.8	0.00	0.00	0.00	0.00	
7,768.6	90.50	179.27	7,022.9	-999.5	-884.2	5.00	4.88	-1.09	-12.83	
10,850.1	90.50	179.27	6,996.0	-4,080.6	-845.0	0.00	0.00	0.00	0.00	WP1
10,869.1	90.50	179.65	6,995.8	-4,099.6	-844.8	2.00	-0.01	2.00	90.16	
17,521.8	90.50	179.65	6,937.9	-10,751.9	-804.4	0.00	0.00	0.00	0.00	Heartland State H0

Database:	Landmark	Local Co-ordinate Reference:	Well Heartland State H01-74-1HN
Company:	Noble Energy Inc.- Weld County, CO (Grid North)	TVD Reference:	WELL @ 4850.0ft (Precision 829 - RKB 16')
Project:	Sec.25-T4N-R65W	MD Reference:	WELL @ 4850.0ft (Precision 829 - RKB 16')
Site:	Heartland State G36-75-1HN Pad Sec.25-T4N-R65W	North Reference:	Grid
Well:	Heartland State H01-74-1HN	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #2 sidetrack		
Design:	Sidetrack Plan D - Rev 0		

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)
7,158.0	69.50	182.40	6,887.5	-409.1	-862.0	472.2	0.00	0.00	0.00
Tie-On Pt. - End of Rathole - KOP - Start DLS 5.00 TFO 60.00									
7,168.1	69.75	182.87	6,891.0	-418.5	-862.4	481.7	5.00	2.51	4.62
TOP B CHALK									
7,188.0	70.26	183.78	6,897.8	-437.2	-863.5	500.4	5.00	2.52	4.59
Start 155.4 hold at 7188.0 MD									
7,200.0	70.26	183.78	6,901.9	-448.5	-864.2	511.7	0.00	0.00	0.00
7,265.6	70.26	183.78	6,924.0	-510.0	-868.3	573.4	0.00	0.00	0.00
TOP B MARL									
7,300.0	70.26	183.78	6,935.6	-542.4	-870.5	605.8	0.00	0.00	0.00
7,343.4	70.26	183.78	6,950.3	-583.1	-873.1	646.6	0.00	0.00	0.00
7,354.2	70.26	183.78	6,953.9	-593.3	-873.8	656.8	0.00	0.00	0.00
Start DLS 5.00 TFO -12.83									
7,400.0	72.49	183.25	6,968.6	-636.6	-876.5	700.2	5.00	4.88	-1.16
7,436.5	74.27	182.83	6,979.0	-671.5	-878.3	735.1	5.00	4.88	-1.14
TOP C CHALK									
7,500.0	77.37	182.12	6,994.6	-733.0	-881.0	796.7	5.00	4.88	-1.11
7,584.1	81.48	181.21	7,010.0	-815.7	-883.4	879.3	5.00	4.89	-1.08
TOP C MARL									
7,600.0	82.26	181.04	7,012.2	-831.4	-883.7	895.0	5.00	4.89	-1.07
7,700.0	87.14	179.99	7,021.5	-930.9	-884.6	994.3	5.00	4.89	-1.06
7,768.6	90.50	179.27	7,022.9	-999.5	-884.2	1,062.7	5.00	4.89	-1.05
7"									
7,800.0	90.50	179.27	7,022.6	-1,030.9	-883.8	1,093.9	0.00	0.00	0.00
7,900.0	90.50	179.27	7,021.7	-1,130.9	-882.5	1,193.6	0.00	0.00	0.00
8,000.0	90.50	179.27	7,020.9	-1,230.9	-881.2	1,293.2	0.00	0.00	0.00
8,100.0	90.50	179.27	7,020.0	-1,330.8	-879.9	1,392.8	0.00	0.00	0.00
8,200.0	90.50	179.27	7,019.1	-1,430.8	-878.7	1,492.4	0.00	0.00	0.00
8,300.0	90.50	179.27	7,018.3	-1,530.8	-877.4	1,592.0	0.00	0.00	0.00
8,400.0	90.50	179.27	7,017.4	-1,630.8	-876.1	1,691.6	0.00	0.00	0.00
8,500.0	90.50	179.27	7,016.5	-1,730.8	-874.9	1,791.2	0.00	0.00	0.00
8,600.0	90.50	179.27	7,015.6	-1,830.8	-873.6	1,890.9	0.00	0.00	0.00
8,700.0	90.50	179.27	7,014.8	-1,930.8	-872.3	1,990.5	0.00	0.00	0.00
8,800.0	90.50	179.27	7,013.9	-2,030.8	-871.0	2,090.1	0.00	0.00	0.00
8,900.0	90.50	179.27	7,013.0	-2,130.7	-869.8	2,189.7	0.00	0.00	0.00
9,000.0	90.50	179.27	7,012.1	-2,230.7	-868.5	2,289.3	0.00	0.00	0.00
9,100.0	90.50	179.27	7,011.3	-2,330.7	-867.2	2,388.9	0.00	0.00	0.00
9,200.0	90.50	179.27	7,010.4	-2,430.7	-866.0	2,488.5	0.00	0.00	0.00
9,300.0	90.50	179.27	7,009.5	-2,530.7	-864.7	2,588.2	0.00	0.00	0.00
9,400.0	90.50	179.27	7,008.7	-2,630.7	-863.4	2,687.8	0.00	0.00	0.00
9,500.0	90.50	179.27	7,007.8	-2,730.7	-862.2	2,787.4	0.00	0.00	0.00
9,600.0	90.50	179.27	7,006.9	-2,830.7	-860.9	2,887.0	0.00	0.00	0.00
9,700.0	90.50	179.27	7,006.0	-2,930.7	-859.6	2,986.6	0.00	0.00	0.00
9,800.0	90.50	179.27	7,005.2	-3,030.6	-858.3	3,086.2	0.00	0.00	0.00
9,900.0	90.50	179.27	7,004.3	-3,130.6	-857.1	3,185.8	0.00	0.00	0.00
10,000.0	90.50	179.27	7,003.4	-3,230.6	-855.8	3,285.5	0.00	0.00	0.00
10,100.0	90.50	179.27	7,002.5	-3,330.6	-854.5	3,385.1	0.00	0.00	0.00
10,200.0	90.50	179.27	7,001.7	-3,430.6	-853.3	3,484.7	0.00	0.00	0.00
10,300.0	90.50	179.27	7,000.8	-3,530.6	-852.0	3,584.3	0.00	0.00	0.00
10,400.0	90.50	179.27	6,999.9	-3,630.6	-850.7	3,683.9	0.00	0.00	0.00
10,500.0	90.50	179.27	6,999.1	-3,730.6	-849.4	3,783.5	0.00	0.00	0.00
10,600.0	90.50	179.27	6,998.2	-3,830.5	-848.2	3,883.1	0.00	0.00	0.00

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Project:	Sec.25-T4N-R65W	MD Reference:	WELL @ 4850.0ft (Precision 829 - RKB 16')
Site:	Heartland State G36-75-1HN Pad Sec.25-T4N-R65W	North Reference:	Grid
Well:	Heartland State H01-74-1HN	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #2 sidetrack		
Design:	Sidetrack Plan D - Rev 0		

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)
10,700.0	90.50	179.27	6,997.3	-3,930.5	-846.9	3,982.8	0.00	0.00	0.00
10,800.0	90.50	179.27	6,996.4	-4,030.5	-845.6	4,082.4	0.00	0.00	0.00
10,850.1	90.50	179.27	6,996.0	-4,080.6	-845.0	4,132.3	0.00	0.00	0.00
Start DLS 2.00 TFO 90.16									
10,869.1	90.50	179.65	6,995.8	-4,099.6	-844.8	4,151.2	2.00	-0.01	2.00
10,900.0	90.50	179.65	6,995.6	-4,130.5	-844.6	4,182.0	0.00	0.00	0.00
11,000.0	90.50	179.65	6,994.7	-4,230.5	-844.0	4,281.7	0.00	0.00	0.00
11,100.0	90.50	179.65	6,993.8	-4,330.5	-843.4	4,381.4	0.00	0.00	0.00
11,200.0	90.50	179.65	6,993.0	-4,430.5	-842.8	4,481.0	0.00	0.00	0.00
11,300.0	90.50	179.65	6,992.1	-4,530.5	-842.2	4,580.7	0.00	0.00	0.00
11,400.0	90.50	179.65	6,991.2	-4,630.5	-841.6	4,680.4	0.00	0.00	0.00
11,500.0	90.50	179.65	6,990.3	-4,730.5	-841.0	4,780.0	0.00	0.00	0.00
11,600.0	90.50	179.65	6,989.5	-4,830.5	-840.4	4,879.7	0.00	0.00	0.00
11,700.0	90.50	179.65	6,988.6	-4,930.5	-839.8	4,979.4	0.00	0.00	0.00
11,800.0	90.50	179.65	6,987.7	-5,030.5	-839.2	5,079.0	0.00	0.00	0.00
11,900.0	90.50	179.65	6,986.9	-5,130.5	-838.6	5,178.7	0.00	0.00	0.00
12,000.0	90.50	179.65	6,986.0	-5,230.5	-837.9	5,278.4	0.00	0.00	0.00
12,100.0	90.50	179.65	6,985.1	-5,330.4	-837.3	5,378.1	0.00	0.00	0.00
12,200.0	90.50	179.65	6,984.2	-5,430.4	-836.7	5,477.7	0.00	0.00	0.00
12,300.0	90.50	179.65	6,983.4	-5,530.4	-836.1	5,577.4	0.00	0.00	0.00
12,400.0	90.50	179.65	6,982.5	-5,630.4	-835.5	5,677.1	0.00	0.00	0.00
12,500.0	90.50	179.65	6,981.6	-5,730.4	-834.9	5,776.7	0.00	0.00	0.00
12,600.0	90.50	179.65	6,980.8	-5,830.4	-834.3	5,876.4	0.00	0.00	0.00
12,700.0	90.50	179.65	6,979.9	-5,930.4	-833.7	5,976.1	0.00	0.00	0.00
12,800.0	90.50	179.65	6,979.0	-6,030.4	-833.1	6,075.8	0.00	0.00	0.00
12,900.0	90.50	179.65	6,978.1	-6,130.4	-832.5	6,175.4	0.00	0.00	0.00
13,000.0	90.50	179.65	6,977.3	-6,230.4	-831.9	6,275.1	0.00	0.00	0.00
13,100.0	90.50	179.65	6,976.4	-6,330.4	-831.3	6,374.8	0.00	0.00	0.00
13,200.0	90.50	179.65	6,975.5	-6,430.4	-830.6	6,474.4	0.00	0.00	0.00
13,300.0	90.50	179.65	6,974.7	-6,530.4	-830.0	6,574.1	0.00	0.00	0.00
13,400.0	90.50	179.65	6,973.8	-6,630.4	-829.4	6,673.8	0.00	0.00	0.00
13,500.0	90.50	179.65	6,972.9	-6,730.4	-828.8	6,773.4	0.00	0.00	0.00
13,600.0	90.50	179.65	6,972.1	-6,830.4	-828.2	6,873.1	0.00	0.00	0.00
13,700.0	90.50	179.65	6,971.2	-6,930.4	-827.6	6,972.8	0.00	0.00	0.00
13,800.0	90.50	179.65	6,970.3	-7,030.4	-827.0	7,072.5	0.00	0.00	0.00
13,900.0	90.50	179.65	6,969.4	-7,130.3	-826.4	7,172.1	0.00	0.00	0.00
14,000.0	90.50	179.65	6,968.6	-7,230.3	-825.8	7,271.8	0.00	0.00	0.00
14,100.0	90.50	179.65	6,967.7	-7,330.3	-825.2	7,371.5	0.00	0.00	0.00
14,200.0	90.50	179.65	6,966.8	-7,430.3	-824.6	7,471.1	0.00	0.00	0.00
14,300.0	90.50	179.65	6,966.0	-7,530.3	-824.0	7,570.8	0.00	0.00	0.00
14,400.0	90.50	179.65	6,965.1	-7,630.3	-823.3	7,670.5	0.00	0.00	0.00
14,500.0	90.50	179.65	6,964.2	-7,730.3	-822.7	7,770.1	0.00	0.00	0.00
14,600.0	90.50	179.65	6,963.3	-7,830.3	-822.1	7,869.8	0.00	0.00	0.00
14,700.0	90.50	179.65	6,962.5	-7,930.3	-821.5	7,969.5	0.00	0.00	0.00
14,800.0	90.50	179.65	6,961.6	-8,030.3	-820.9	8,069.2	0.00	0.00	0.00
14,900.0	90.50	179.65	6,960.7	-8,130.3	-820.3	8,168.8	0.00	0.00	0.00
15,000.0	90.50	179.65	6,959.9	-8,230.3	-819.7	8,268.5	0.00	0.00	0.00
15,100.0	90.50	179.65	6,959.0	-8,330.3	-819.1	8,368.2	0.00	0.00	0.00
15,200.0	90.50	179.65	6,958.1	-8,430.3	-818.5	8,467.8	0.00	0.00	0.00
15,300.0	90.50	179.65	6,957.2	-8,530.3	-817.9	8,567.5	0.00	0.00	0.00
15,400.0	90.50	179.65	6,956.4	-8,630.3	-817.3	8,667.2	0.00	0.00	0.00
15,500.0	90.50	179.65	6,955.5	-8,730.3	-816.7	8,766.9	0.00	0.00	0.00

Casing Points						
Measured Depth (ft)	Vertical Depth (ft)		Name	Casing Diameter (")	Hole Diameter (")	
7,768.6	7,022.9	7"		7	7-1/2	

Database:	Landmark	Local Co-ordinate Reference:	Well Heartland State H01-74-1HN
Company:	Noble Energy Inc.- Weld County, CO (Grid North)	TVD Reference:	WELL @ 4850.0ft (Precision 829 - RKB 16')
Project:	Sec.25-T4N-R65W	MD Reference:	WELL @ 4850.0ft (Precision 829 - RKB 16')
Site:	Heartland State G36-75-1HN Pad Sec.25-T4N-R65W	North Reference:	Grid
Well:	Heartland State H01-74-1HN	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #2 sidetrack		
Design:	Sidetrack Plan D - Rev 0		

Formations						
Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)	
1,077.0	1,077.0	PIERRE		0.00		
3,841.2	3,789.0	PARKMAN		0.00		
4,276.9	4,212.0	SUSSEX		0.00		
5,105.9	5,021.0	SHANNON		0.00		
6,175.0	6,087.0	TEEPEE BUTTES		0.00		
6,948.5	6,785.0	SHARON SPRINGS		0.00		
7,032.8	6,835.0	TOP NIOBRARA		0.00		
7,032.8	6,835.0	TOP A CHALK		0.00		
7,061.2	6,849.0	TOP A MARL		0.00		
7,168.1	6,891.0	TOP B CHALK		0.00		
7,265.6	6,924.0	TOP B MARL		0.00		
7,436.5	6,979.0	TOP C CHALK		0.00		
7,584.1	7,010.0	TOP C MARL		0.00		
	7,057.0	TOP D CHALK		0.00		
	7,095.0	TOP FT. HAYES		0.00		
	7,120.0	CODELL		0.00		
	7,137.0	CARLILE		0.00		

Plan Annotations					
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates			
		+N/-S (ft)	+E/-W (ft)	Comment	
7,158.0	6,887.5	-409.1	-862.0	Tie-On Pt. - End of Rathole	
7,158.0	6,887.5	-437.2	-863.5	KOP - Start DLS 5.00 TFO 60.00	
7,188.0	6,897.8	-583.1	-873.1	Start 155.4 hold at 7188.0 MD	
7,354.2	6,953.9	-593.3	-873.8	Start DLS 5.00 TFO -12.83	
10,850.1	6,996.0	-999.5	-884.2	Start DLS 2.00 TFO 90.16	
17,521.8	6,937.9	-4,080.6	-845.0	TD at 17521.8	



Noble Energy Inc.- Weld County, CO (Grid North)

Sec.25-T4N-R65W

Heartland State G36-75-1HN Pad Sec.25-T4N-R65W

Heartland State H01-74-1HN

Wellbore #2 sidetrack

Sidetrack Plan D - Rev 0

Anticollision Report

15 August, 2014

Offset Design												Offset Site Error:	0.0 ft
Survey Program: 100-NS-GYRO-MS												Offset Well Error:	0.0 ft
Reference		Offset		Semi Major Axis			Distance					Warning	
Measured	Vertical	Measured	Vertical	Reference	Offset	Highside	Offset Wellbore Centre		Between	Between	Minimum		Separation
Depth	Depth	Depth	Depth			Toolface	+N/-S	+E/-W	Centres	Ellipses	Separation		Factor
(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(°)	(ft)	(ft)	(ft)	(ft)	(ft)		
12,500.0	6,981.6	6,996.6	6,995.6	111.7	12.7	-89.73	-6,155.3	63.2	993.5	870.1	123.48	8.046	
12,600.0	6,980.8	6,996.5	6,995.5	113.6	12.7	-89.72	-6,155.3	63.2	954.5	829.1	125.38	7.613	
12,700.0	6,979.9	6,996.5	6,995.5	115.5	12.7	-89.72	-6,155.3	63.2	924.7	797.4	127.28	7.265	

Company:	Noble Energy Inc.- Weld County, CO (Grid North)	Local Co-ordinate Reference:	Well Heartland State H01-74-1HN
Project:	Sec.25-T4N-R65W	TVD Reference:	WELL @ 4850.0ft (Precision 829 - RKB 16')
Reference Site:	Heartland State G36-75-1HN Pad Sec.25-T4N-R65W	MD Reference:	WELL @ 4850.0ft (Precision 829 - RKB 16')
Site Error:	0.0ft	North Reference:	Grid
Reference Well:	Heartland State H01-74-1HN	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #2 sidetrack	Database:	Landmark
Reference Design:	Sidetrack Plan D - Rev 0	Offset TVD Reference:	Offset Datum

Offset Design Existing Wells Sec.25-T4N-R65W - Collins 1-1 (Exist) - Wellbore #1 - Wellbore #1													Offset Site Error:	0.0 ft
Survey Program: 100-NS-GYRO-MS													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		
12,800.0	6,979.0	6,996.4	6,995.4	117.3	12.7	-89.71	-6,155.3	63.2	904.9	775.8	129.18	7.005		
12,900.0	6,978.1	6,996.3	6,995.3	119.2	12.7	-89.71	-6,155.3	63.2	896.0	764.9	131.08	6.836		
12,930.4	6,977.9	6,996.3	6,995.3	119.8	12.7	-89.71	-6,155.3	63.2	895.5	763.9	131.65	6.802	CC, ES	
13,000.0	6,977.3	6,996.2	6,995.2	121.1	12.7	-89.70	-6,155.3	63.2	898.2	765.2	132.98	6.755	SF	
13,100.0	6,976.4	6,996.2	6,995.2	123.0	12.7	-89.70	-6,155.3	63.2	911.4	776.6	134.88	6.757		
13,200.0	6,975.5	6,996.1	6,995.1	124.9	12.7	-89.69	-6,155.3	63.2	935.2	798.4	136.78	6.837		
13,300.0	6,974.7	6,996.0	6,995.0	126.8	12.7	-89.69	-6,155.3	63.2	968.8	830.1	138.68	6.986		

Existing Wells Sec.25-T4N-R65W - Gerrity State G36-10 (Exist) - Wellbore #1 - Wellbore #1													Offset Site Error:	0.0 ft
Survey Program: 100-NS-GYRO-MS													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	
9,500.0	7,007.8	7,009.7	7,009.4	56.2	12.3	92.86	-3,623.7	-1,158.6	941.0	874.5	66.49	14.153		
9,600.0	7,006.9	7,007.6	7,007.3	58.0	12.3	92.46	-3,623.7	-1,158.6	847.1	778.8	68.36	12.392		
9,700.0	7,006.0	7,005.6	7,005.2	59.8	12.3	92.09	-3,623.8	-1,158.5	754.8	684.6	70.24	10.747		
9,800.0	7,005.2	7,003.6	7,003.3	61.6	12.2	91.72	-3,623.8	-1,158.5	664.8	592.7	72.11	9.219		
9,900.0	7,004.3	7,001.8	7,001.4	63.4	12.2	91.37	-3,623.8	-1,158.5	578.0	504.0	73.99	7.812		
10,000.0	7,003.4	6,999.9	6,999.6	65.2	12.2	91.04	-3,623.8	-1,158.5	496.2	420.4	75.87	6.540		
10,100.0	7,002.5	6,998.2	6,997.9	67.1	12.2	90.72	-3,623.8	-1,158.5	422.4	344.6	77.75	5.432		
10,200.0	7,001.7	6,996.6	6,996.2	68.9	12.2	90.41	-3,623.8	-1,158.5	361.3	281.6	79.63	4.537		
10,300.0	7,000.8	6,994.9	6,994.6	70.7	12.2	90.10	-3,623.9	-1,158.5	320.4	238.9	81.52	3.930		
10,389.4	7,000.0	6,993.5	6,993.1	72.4	12.2	89.83	-3,623.9	-1,158.5	307.7	224.5	83.20	3.698	CC	
10,400.0	6,999.9	6,993.3	6,992.9	72.6	12.2	89.80	-3,623.9	-1,158.5	307.9	224.5	83.40	3.691	ES, SF	
10,500.0	6,999.1	6,991.7	6,991.4	74.4	12.2	89.50	-3,623.9	-1,158.5	327.0	241.7	85.28	3.834		
10,600.0	6,998.2	6,990.2	6,989.8	76.2	12.2	89.21	-3,623.9	-1,158.5	372.8	285.7	87.17	4.277		
10,700.0	6,997.3	6,988.6	6,988.3	78.1	12.2	88.93	-3,623.9	-1,158.5	437.2	348.1	89.05	4.909		
10,800.0	6,996.4	6,987.1	6,986.8	79.9	12.2	88.65	-3,623.9	-1,158.5	513.1	422.1	90.93	5.642		
10,900.0	6,995.6	6,985.6	6,985.3	81.7	12.2	88.39	-3,623.9	-1,158.5	596.0	503.1	92.84	6.419		
11,000.0	6,994.7	6,984.2	6,983.8	83.6	12.2	88.13	-3,623.9	-1,158.5	683.3	588.5	94.72	7.214		
11,100.0	6,993.8	6,982.8	6,982.4	85.4	12.2	87.86	-3,623.9	-1,158.5	773.6	677.0	96.60	8.009		
11,200.0	6,993.0	6,981.4	6,981.0	87.3	12.2	87.60	-3,623.9	-1,158.5	866.1	767.7	98.48	8.795		
11,300.0	6,992.1	6,980.0	6,979.6	89.2	12.2	87.35	-3,624.0	-1,158.5	960.1	859.8	100.36	9.567		

Company:	Noble Energy Inc.- Weld County, CO (Grid North)	Local Co-ordinate Reference:	Well Heartland State H01-74-1HN
Project:	Sec.25-T4N-R65W	TVD Reference:	WELL @ 4850.0ft (Precision 829 - RKB 16')
Reference Site:	Heartland State G36-75-1HN Pad Sec.25-T4N-R65W	MD Reference:	WELL @ 4850.0ft (Precision 829 - RKB 16')
Site Error:	0.0ft	North Reference:	Grid
Reference Well:	Heartland State H01-74-1HN	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #2 sidetrack	Database:	Landmark
Reference Design:	Sidetrack Plan D - Rev 0	Offset TVD Reference:	Offset Datum

Offset Design Existing Wells Sec.25-T4N-R65W - Gerrity State G36-15 (Exist) - Wellbore #1 - Wellbore #1													Offset Site Error: 0.0 ft
Survey Program: 100-NS-GYRO-MS													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	
10,800.0	6,996.4	6,973.2	6,972.7	79.9	12.8	88.51	-4,910.3	-1,185.0	943.1	851.6	91.56	10.301	
10,900.0	6,995.6	6,975.1	6,974.6	81.7	12.8	88.80	-4,910.4	-1,185.0	851.0	757.5	93.46	9.105	
11,000.0	6,994.7	6,977.0	6,976.5	83.6	12.9	89.12	-4,910.4	-1,184.9	760.7	665.3	95.34	7.979	
11,100.0	6,993.8	6,979.1	6,978.6	85.4	12.9	89.47	-4,910.5	-1,184.9	673.1	575.9	97.22	6.924	
11,200.0	6,993.0	6,981.3	6,980.8	87.3	12.9	89.83	-4,910.6	-1,184.8	589.5	490.4	99.09	5.949	
11,300.0	6,992.1	6,983.6	6,983.1	89.2	12.9	90.22	-4,910.6	-1,184.8	511.7	410.8	100.96	5.068	
11,400.0	6,991.2	6,986.1	6,985.6	91.0	12.9	90.63	-4,910.7	-1,184.7	443.0	340.2	102.83	4.308	
11,500.0	6,990.3	6,988.7	6,988.2	92.9	12.9	91.07	-4,910.8	-1,184.6	388.1	283.4	104.69	3.707	
11,600.0	6,989.5	6,991.5	6,991.0	94.8	12.9	91.53	-4,910.9	-1,184.5	353.5	247.0	106.55	3.318	
11,678.3	6,988.8	6,993.9	6,993.3	96.2	12.9	91.92	-4,911.0	-1,184.4	344.7	236.7	108.00	3.192 CC, ES	
11,700.0	6,988.6	6,994.5	6,994.0	96.7	12.9	92.03	-4,911.0	-1,184.4	345.4	237.0	108.40	3.187 SF	
11,800.0	6,987.7	6,997.8	6,997.2	98.5	12.9	92.57	-4,911.1	-1,184.3	365.6	255.3	110.23	3.316	
11,900.0	6,986.9	7,001.0	7,000.5	100.4	12.9	93.11	-4,911.2	-1,184.2	409.8	297.8	112.06	3.657	
12,000.0	6,986.0	7,004.0	7,003.5	102.3	12.9	93.61	-4,911.3	-1,184.1	471.4	357.5	113.88	4.140	
12,100.0	6,985.1	7,007.1	7,006.5	104.2	12.9	94.11	-4,911.4	-1,184.0	544.5	428.8	115.69	4.707	
12,200.0	6,984.2	7,010.2	7,009.6	106.0	12.9	94.63	-4,911.6	-1,183.8	625.1	507.6	117.50	5.320	
12,300.0	6,983.4	7,013.3	7,012.8	107.9	12.9	95.15	-4,911.7	-1,183.7	710.6	591.4	119.29	5.957	
12,400.0	6,982.5	7,016.5	7,016.0	109.8	12.9	95.68	-4,911.8	-1,183.6	799.5	678.5	121.06	6.604	
12,500.0	6,981.6	7,019.8	7,019.3	111.7	12.9	96.22	-4,911.9	-1,183.5	890.8	767.9	122.83	7.252	
12,600.0	6,980.8	7,023.1	7,022.6	113.6	12.9	96.78	-4,912.0	-1,183.3	983.7	859.1	124.58	7.896	

Offset Design Existing Wells Sec.25-T4N-R65W - Gerrity State G36-17 (Exist) - Wellbore #1 - Wellbore #1													Offset Site Error:	0.0 ft
Survey Program: 100-NS-GYRO-MS													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)	Offset Wellbore Centre +E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor		
7,400.0	6,968.6	6,950.5	6,946.9	24.2	13.1	-43.55	-1,597.8	-655.5	986.3	960.4	25.88	38.112		
7,500.0	6,994.6	6,975.2	6,971.7	25.2	13.2	-53.17	-1,597.9	-655.4	893.9	865.2	28.69	31.156		
7,600.0	7,012.2	6,992.4	6,988.8	26.3	13.2	-65.76	-1,598.0	-655.2	800.0	767.5	32.46	24.648		
7,700.0	7,021.5	7,001.7	6,998.2	27.5	13.2	-80.21	-1,598.1	-655.2	705.5	669.5	36.04	19.579		
7,800.0	7,022.6	7,003.5	6,999.9	28.8	13.2	-89.81	-1,598.1	-655.1	611.6	573.3	38.23	15.997		
7,900.0	7,021.7	7,003.2	6,999.7	30.1	13.2	-89.75	-1,598.1	-655.2	519.6	479.9	39.75	13.072		
8,000.0	7,020.9	7,003.0	6,999.4	31.5	13.2	-89.69	-1,598.1	-655.2	431.3	389.9	41.32	10.437		
8,100.0	7,020.0	7,002.8	6,999.2	32.9	13.2	-89.63	-1,598.1	-655.2	349.2	306.3	42.93	8.135		
8,200.0	7,019.1	7,002.5	6,999.0	34.4	13.2	-89.57	-1,598.1	-655.2	279.2	234.6	44.57	6.263		
8,300.0	7,018.3	7,002.3	6,998.7	35.9	13.2	-89.50	-1,598.1	-655.2	232.2	186.0	46.25	5.021		
8,370.1	7,017.6	7,002.1	6,998.6	37.0	13.2	-89.46	-1,598.1	-655.2	221.4	173.9	47.44	4.667 CC, ES		
8,400.0	7,017.4	7,002.0	6,998.5	37.5	13.2	-89.44	-1,598.1	-655.2	223.4	175.4	47.95	4.659 SF		
8,500.0	7,016.5	7,001.8	6,998.2	39.1	13.2	-89.38	-1,598.1	-655.2	256.7	207.0	49.67	5.168		
8,600.0	7,015.6	7,001.6	6,998.0	40.7	13.2	-89.32	-1,598.1	-655.2	319.2	267.8	51.40	6.209		
8,700.0	7,014.8	7,001.3	6,997.8	42.4	13.2	-89.26	-1,598.1	-655.2	397.3	344.1	53.16	7.474		
8,800.0	7,013.9	7,001.1	6,997.5	44.1	13.2	-89.19	-1,598.1	-655.2	483.5	428.6	54.93	8.803		
8,900.0	7,013.0	7,000.9	6,997.3	45.8	13.2	-89.13	-1,598.1	-655.2	574.3	517.6	56.71	10.127		
9,000.0	7,012.1	7,000.6	6,997.1	47.5	13.2	-89.07	-1,598.1	-655.2	667.7	609.2	58.50	11.413		
9,100.0	7,011.3	7,000.4	6,996.8	49.2	13.2	-89.01	-1,598.1	-655.2	762.7	702.4	60.30	12.648		
9,200.0	7,010.4	7,000.1	6,996.6	51.0	13.2	-88.95	-1,598.1	-655.2	858.9	796.8	62.11	13.828		
9,300.0	7,009.5	6,999.9	6,996.3	52.7	13.2	-88.88	-1,598.1	-655.2	955.9	892.0	63.93	14.952		

Company:	Noble Energy Inc.- Weld County, CO (Grid North)	Local Co-ordinate Reference:	Well Heartland State H01-74-1HN
Project:	Sec.25-T4N-R65W	TVD Reference:	WELL @ 4850.0ft (Precision 829 - RKB 16')
Reference Site:	Heartland State G36-75-1HN Pad Sec.25-T4N-R65W	MD Reference:	WELL @ 4850.0ft (Precision 829 - RKB 16')
Site Error:	0.0ft	North Reference:	Grid
Reference Well:	Heartland State H01-74-1HN	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #2 sidetrack	Database:	Landmark
Reference Design:	Sidetrack Plan D - Rev 0	Offset TVD Reference:	Offset Datum

Offset Design Existing Wells Sec.25-T4N-R65W - Gerrity State G36-2 (Exist) - Wellbore #1 - Wellbore #1													Offset Site Error:	0.0 ft
Survey Program: 100-NS-GYRO-MS													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		Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor		
							+N/-S (ft)	+E/-W (ft)						
6,600.0	6,504.6	6,475.4	6,475.3	20.4	11.8	18.27	-941.6	-1,185.5	974.6	944.8	29.82	32.678		
6,700.0	6,595.2	6,565.2	6,565.1	20.6	11.9	18.36	-942.1	-1,185.4	934.6	906.1	28.43	32.878		
6,800.0	6,678.3	6,647.4	6,647.3	20.8	12.0	27.88	-942.7	-1,185.3	882.6	856.0	26.69	33.076		
6,900.0	6,752.1	6,721.5	6,721.3	21.0	12.1	32.68	-943.3	-1,185.3	821.7	796.6	25.16	32.658		
7,000.0	6,816.9	6,788.3	6,788.2	21.4	12.2	35.52	-943.7	-1,185.4	752.1	728.4	23.64	31.810		
7,100.0	6,865.8	6,838.1	6,838.0	21.9	12.3	49.80	-944.0	-1,185.4	672.9	647.9	24.95	26.968		
7,200.0	6,901.9	6,875.0	6,874.9	22.5	12.3	58.53	-944.2	-1,185.3	590.6	563.4	27.19	21.719		
7,300.0	6,935.6	6,910.2	6,910.1	23.3	12.3	63.55	-944.4	-1,185.2	510.6	481.6	28.97	17.621		
7,400.0	6,968.6	6,945.6	6,945.4	24.2	12.4	71.72	-944.5	-1,185.0	435.9	404.6	31.29	13.929		
7,500.0	6,994.6	6,973.0	6,972.9	25.2	12.4	81.27	-944.5	-1,184.7	370.1	336.7	33.45	11.066		
7,600.0	7,012.2	6,991.4	6,991.2	26.3	12.5	87.69	-944.5	-1,184.5	321.4	286.5	34.91	9.208		
7,700.0	7,021.5	7,000.7	7,000.5	27.5	12.5	90.65	-944.5	-1,184.4	300.1	264.0	36.11	8.312		
7,713.2	7,022.1	7,001.3	7,001.1	27.7	12.5	90.77	-944.5	-1,184.4	299.8	263.6	36.28	8.264 CC, ES, SF		
7,800.0	7,022.6	7,001.6	7,001.4	28.8	12.5	90.58	-944.5	-1,184.4	312.8	275.4	37.45	8.352		
7,900.0	7,021.7	7,000.5	7,000.3	30.1	12.5	90.37	-944.5	-1,184.4	354.8	315.8	38.99	9.101		
8,000.0	7,020.9	6,999.4	6,999.2	31.5	12.5	90.16	-944.5	-1,184.4	417.1	376.5	40.57	10.280		
8,100.0	7,020.0	6,998.3	6,998.1	32.9	12.5	89.95	-944.5	-1,184.4	491.9	449.7	42.19	11.659		
8,200.0	7,019.1	6,997.2	6,997.1	34.4	12.5	89.74	-944.5	-1,184.4	574.5	530.6	43.85	13.102		
8,300.0	7,018.3	6,996.1	6,996.0	35.9	12.5	89.54	-944.5	-1,184.5	661.9	616.3	45.53	14.536		
8,400.0	7,017.4	6,995.1	6,995.0	37.5	12.5	89.34	-944.5	-1,184.5	752.4	705.2	47.24	15.926		
8,500.0	7,016.5	6,994.1	6,993.9	39.1	12.5	89.15	-944.5	-1,184.5	845.1	796.1	48.97	17.256		
8,600.0	7,015.6	6,993.1	6,992.9	40.7	12.5	88.95	-944.5	-1,184.5	939.2	888.5	50.72	18.517		

Company:	Noble Energy Inc.- Weld County, CO (Grid North)	Local Co-ordinate Reference:	Well Heartland State H01-74-1HN
Project:	Sec.25-T4N-R65W	TVD Reference:	WELL @ 4850.0ft (Precision 829 - RKB 16')
Reference Site:	Heartland State G36-75-1HN Pad Sec.25-T4N-R65W	MD Reference:	WELL @ 4850.0ft (Precision 829 - RKB 16')
Site Error:	0.0ft	North Reference:	Grid
Reference Well:	Heartland State H01-74-1HN	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #2 sidetrack	Database:	Landmark
Reference Design:	Sidetrack Plan D - Rev 0	Offset TVD Reference:	Offset Datum

Offset Design Existing Wells Sec.25-T4N-R65W - Gerrity State G36-23 (Exist) - Wellbore #1 - Wellbore #1													Offset Site Error: 0.0 ft
Survey Program: 100-NS-GYRO-MS													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	
10,100.0	7,002.5	7,019.9	7,018.7	67.1	14.5	-92.75	-4,194.2	-475.6	943.1	863.0	80.09	11.775	
10,200.0	7,001.7	7,018.9	7,017.7	68.9	14.5	-92.60	-4,194.2	-475.6	851.9	770.0	81.96	10.395	
10,300.0	7,000.8	7,018.0	7,016.7	70.7	14.5	-92.45	-4,194.2	-475.6	763.0	679.2	83.82	9.102	
10,400.0	6,999.9	7,017.0	7,015.7	72.6	14.5	-92.29	-4,194.2	-475.6	677.1	591.4	85.69	7.902	
10,500.0	6,999.1	7,016.0	7,014.7	74.4	14.5	-92.14	-4,194.2	-475.5	595.7	508.1	87.57	6.803	
10,600.0	6,998.2	7,015.0	7,013.7	76.2	14.5	-91.99	-4,194.2	-475.5	520.8	431.3	89.44	5.823	
10,700.0	6,997.3	7,014.0	7,012.7	78.1	14.5	-91.83	-4,194.2	-475.5	455.6	364.3	91.32	4.989	
10,800.0	6,996.4	7,013.0	7,011.8	79.9	14.5	-91.68	-4,194.2	-475.5	404.9	311.7	93.19	4.344	
10,900.0	6,995.6	7,012.1	7,010.8	81.7	14.5	-91.52	-4,194.2	-475.4	374.8	279.7	95.10	3.941	
10,965.9	6,995.0	7,011.5	7,010.2	83.0	14.5	-91.43	-4,194.2	-475.4	368.9	272.6	96.34	3.830 CC, ES	
11,000.0	6,994.7	7,011.1	7,009.9	83.6	14.5	-91.38	-4,194.2	-475.4	370.5	273.5	96.98	3.821 SF	
11,100.0	6,993.8	7,010.2	7,008.9	85.4	14.5	-91.23	-4,194.2	-475.4	392.6	293.7	98.86	3.971	
11,200.0	6,993.0	7,009.2	7,008.0	87.3	14.5	-91.08	-4,194.2	-475.4	437.0	336.2	100.74	4.337	
11,300.0	6,992.1	7,008.3	7,007.0	89.2	14.5	-90.94	-4,194.2	-475.3	497.7	395.1	102.62	4.850	
11,400.0	6,991.2	7,007.4	7,006.1	91.0	14.5	-90.79	-4,194.2	-475.3	569.7	465.2	104.50	5.452	
11,500.0	6,990.3	7,006.4	7,005.1	92.9	14.5	-90.65	-4,194.2	-475.3	649.1	542.8	106.39	6.102	
11,600.0	6,989.5	7,005.5	7,004.2	94.8	14.5	-90.50	-4,194.2	-475.3	733.6	625.4	108.27	6.776	
11,700.0	6,988.6	7,004.6	7,003.3	96.7	14.5	-90.36	-4,194.2	-475.2	821.6	711.4	110.16	7.458	
11,800.0	6,987.7	7,003.6	7,002.4	98.5	14.5	-90.21	-4,194.2	-475.2	912.0	800.0	112.04	8.140	

Company:	Noble Energy Inc.- Weld County, CO (Grid North)	Local Co-ordinate Reference:	Well Heartland State H01-74-1HN
Project:	Sec.25-T4N-R65W	TVD Reference:	WELL @ 4850.0ft (Precision 829 - RKB 16')
Reference Site:	Heartland State G36-75-1HN Pad Sec.25-T4N-R65W	MD Reference:	WELL @ 4850.0ft (Precision 829 - RKB 16')
Site Error:	0.0ft	North Reference:	Grid
Reference Well:	Heartland State H01-74-1HN	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #2 sidetrack	Database:	Landmark
Reference Design:	Sidetrack Plan D - Rev 0	Offset TVD Reference:	Offset Datum

Offset Design Existing Wells Sec.25-T4N-R65W - Gerrity State G36-7 (Exist) - Wellbore #1 - Wellbore #1														Offset Site Error:	0.0 ft
Survey Program: 100-NS-GYRO-MS														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		
8,300.0	7,018.3	7,004.8	7,002.3	35.9	13.8	91.73	-2,362.2	-1,272.5	920.5	873.8	46.70	19.712			
8,400.0	7,017.4	7,003.4	7,000.9	37.5	13.8	91.53	-2,362.3	-1,272.5	831.9	783.5	48.41	17.184			
8,500.0	7,016.5	7,001.9	6,999.4	39.1	13.8	91.33	-2,362.3	-1,272.5	746.2	696.1	50.15	14.880			
8,600.0	7,015.6	7,000.5	6,998.0	40.7	13.8	91.12	-2,362.3	-1,272.5	664.5	612.6	51.91	12.802			
8,700.0	7,014.8	6,999.0	6,996.5	42.4	13.8	90.92	-2,362.3	-1,272.5	588.5	534.8	53.68	10.964			
8,800.0	7,013.9	6,997.6	6,995.1	44.1	13.8	90.71	-2,362.3	-1,272.5	520.6	465.2	55.46	9.387			
8,900.0	7,013.0	6,996.1	6,993.6	45.8	13.8	90.51	-2,362.3	-1,272.5	464.5	407.3	57.26	8.113			
9,000.0	7,012.1	6,994.7	6,992.2	47.5	13.8	90.30	-2,362.3	-1,272.5	424.9	365.8	59.07	7.193			
9,100.0	7,011.3	6,993.2	6,990.7	49.2	13.8	90.09	-2,362.3	-1,272.5	406.5	345.6	60.88	6.676			
9,126.4	7,011.0	6,992.8	6,990.3	49.7	13.8	90.04	-2,362.3	-1,272.5	405.6	344.3	61.37	6.610 CC, ES			
9,200.0	7,010.4	6,991.7	6,989.2	51.0	13.8	89.89	-2,362.3	-1,272.5	412.2	349.5	62.71	6.574 SF			
9,300.0	7,009.5	6,990.2	6,987.7	52.7	13.8	89.68	-2,362.3	-1,272.5	441.2	376.6	64.54	6.836			
9,400.0	7,008.7	6,988.7	6,986.2	54.5	13.8	89.46	-2,362.3	-1,272.5	489.2	422.9	66.38	7.370			
9,500.0	7,007.8	6,987.2	6,984.7	56.2	13.8	89.25	-2,362.3	-1,272.5	551.4	483.2	68.22	8.083			
9,600.0	7,006.9	6,985.7	6,983.2	58.0	13.8	89.04	-2,362.4	-1,272.5	623.5	553.4	70.07	8.898			
9,700.0	7,006.0	6,984.2	6,981.7	59.8	13.8	88.82	-2,362.4	-1,272.5	702.4	630.5	71.92	9.767			
9,800.0	7,005.2	6,982.7	6,980.2	61.6	13.8	88.61	-2,362.4	-1,272.5	786.2	712.4	73.77	10.657			
9,900.0	7,004.3	6,981.1	6,978.6	63.4	13.8	88.39	-2,362.4	-1,272.5	873.4	797.7	75.63	11.548			
10,000.0	7,003.4	6,979.6	6,977.1	65.2	13.8	88.17	-2,362.4	-1,272.5	963.1	885.6	77.49	12.428			

Company:	Noble Energy Inc.- Weld County, CO (Grid North)	Local Co-ordinate Reference:	Well Heartland State H01-74-1HN
Project:	Sec.25-T4N-R65W	TVD Reference:	WELL @ 4850.0ft (Precision 829 - RKB 16')
Reference Site:	Heartland State G36-75-1HN Pad Sec.25-T4N-R65W	MD Reference:	WELL @ 4850.0ft (Precision 829 - RKB 16')
Site Error:	0.0ft	North Reference:	Grid
Reference Well:	Heartland State H01-74-1HN	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #2 sidetrack	Database:	Landmark
Reference Design:	Sidetrack Plan D - Rev 0	Offset TVD Reference:	Offset Datum

Offset Design Existing Wells Sec.25-T4N-R65W - Houndskeeper 1-13 (Exist) - Wellbore #1 - Wellbore #1												Offset Site Error:	0.0 ft	
Survey Program: 100-NS-GYRO-MS												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)			
13,400.0	6,973.8	7,007.1	7,005.7	128.7	12.2	93.49	-7,574.5	-1,088.2	978.9	839.2	139.74	7.005		
13,500.0	6,972.9	7,005.4	7,003.9	130.6	12.2	93.10	-7,574.5	-1,088.1	883.1	741.4	141.70	6.232		
13,600.0	6,972.1	7,003.6	7,002.1	132.5	12.2	92.72	-7,574.5	-1,088.1	788.3	644.6	143.66	5.487		
13,700.0	6,971.2	7,001.8	7,000.4	134.4	12.2	92.33	-7,574.5	-1,088.1	694.9	549.3	145.61	4.772		
13,800.0	6,970.3	7,000.0	6,998.6	136.3	12.2	91.94	-7,574.6	-1,088.1	603.6	456.1	147.56	4.091		
13,900.0	6,969.4	6,998.1	6,996.7	138.2	12.2	91.54	-7,574.6	-1,088.1	515.6	366.1	149.51	3.449		
14,000.0	6,968.6	6,996.3	6,994.8	140.1	12.2	91.14	-7,574.6	-1,088.1	432.8	281.4	151.45	2.858		
14,100.0	6,967.7	6,994.4	6,993.0	142.0	12.1	90.73	-7,574.6	-1,088.1	358.9	205.5	153.39	2.340		
14,200.0	6,966.8	6,992.5	6,991.1	143.8	12.1	90.33	-7,574.6	-1,088.1	300.4	145.1	155.32	1.934		
14,300.0	6,966.0	6,990.6	6,989.2	145.7	12.1	89.91	-7,574.6	-1,088.1	267.8	110.6	157.24	1.703		
14,342.7	6,965.6	6,989.8	6,988.4	146.6	12.1	89.74	-7,574.7	-1,088.1	264.4	106.3	158.06	1.673 CC, ES, SF		
14,400.0	6,965.1	6,988.7	6,987.3	147.6	12.1	89.50	-7,574.7	-1,088.1	270.5	111.4	159.16	1.700		
14,500.0	6,964.2	6,986.8	6,985.4	149.5	12.1	89.09	-7,574.7	-1,088.1	307.6	146.5	161.07	1.910		
14,600.0	6,963.3	6,984.9	6,983.4	151.4	12.1	88.67	-7,574.7	-1,088.1	368.9	205.9	162.97	2.263		
14,700.0	6,962.5	6,982.9	6,981.5	153.3	12.1	88.25	-7,574.7	-1,088.0	444.4	279.5	164.87	2.696		
14,800.0	6,961.6	6,981.0	6,979.5	155.2	12.1	87.83	-7,574.7	-1,088.0	528.1	361.4	166.75	3.167		
14,900.0	6,960.7	6,979.0	6,977.6	157.1	12.1	87.40	-7,574.8	-1,088.0	616.7	448.1	168.63	3.657		
15,000.0	6,959.9	6,977.0	6,975.6	159.0	12.1	86.97	-7,574.8	-1,088.0	708.3	537.8	170.50	4.154		
15,100.0	6,959.0	6,975.1	6,973.6	160.9	12.1	86.54	-7,574.8	-1,088.0	802.0	629.6	172.36	4.653		
15,200.0	6,958.1	6,973.1	6,971.6	162.8	12.1	86.11	-7,574.8	-1,088.0	897.0	722.7	174.21	5.149		
15,300.0	6,957.2	6,971.0	6,969.6	164.7	12.1	85.68	-7,574.8	-1,088.0	992.9	816.9	176.05	5.640		

Company:	Noble Energy Inc.- Weld County, CO (Grid North)	Local Co-ordinate Reference:	Well Heartland State H01-74-1HN
Project:	Sec.25-T4N-R65W	TVD Reference:	WELL @ 4850.0ft (Precision 829 - RKB 16')
Reference Site:	Heartland State G36-75-1HN Pad Sec.25-T4N-R65W	MD Reference:	WELL @ 4850.0ft (Precision 829 - RKB 16')
Site Error:	0.0ft	North Reference:	Grid
Reference Well:	Heartland State H01-74-1HN	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #2 sidetrack	Database:	Landmark
Reference Design:	Sidetrack Plan D - Rev 0	Offset TVD Reference:	Offset Datum

Offset Design Existing Wells Sec.25-T4N-R65W - Houndskeeper H1-17 (Exist) - Wellbore #1 - Wellbore #1												Offset Site Error:		0.0 ft	
Survey Program: 100-NS-GYRO-MS												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)				
12,900.0	6,978.1	7,022.6	7,018.8	119.2	15.8	-93.35	-6,963.1	-282.7	998.1	864.0	134.15	7.440	3.631 CC, ES 3.626 SF		
13,000.0	6,977.3	7,019.5	7,015.7	121.1	15.8	-93.03	-6,963.2	-282.7	916.0	779.9	136.07	6.732			
13,100.0	6,976.4	7,016.5	7,012.7	123.0	15.8	-92.71	-6,963.2	-282.6	837.8	699.8	137.98	6.072			
13,200.0	6,975.5	7,013.5	7,009.7	124.9	15.8	-92.40	-6,963.3	-282.6	764.6	624.8	139.90	5.466			
13,300.0	6,974.7	7,010.5	7,006.8	126.8	15.8	-92.09	-6,963.3	-282.5	698.2	556.4	141.81	4.923			
13,400.0	6,973.8	7,007.6	7,003.9	128.7	15.8	-91.79	-6,963.4	-282.5	640.5	496.8	143.72	4.457			
13,500.0	6,972.9	7,004.8	7,001.0	130.6	15.8	-91.49	-6,963.5	-282.5	594.1	448.5	145.63	4.080			
13,600.0	6,972.1	7,001.9	6,998.2	132.5	15.8	-91.19	-6,963.5	-282.4	561.9	414.4	147.53	3.809			
13,700.0	6,971.2	6,999.2	6,995.4	134.4	15.8	-90.90	-6,963.6	-282.4	546.3	396.9	149.43	3.656			
13,736.5	6,970.9	6,998.2	6,994.4	135.1	15.8	-90.79	-6,963.6	-282.4	545.1	394.9	150.13				
13,800.0	6,970.3	6,996.5	6,992.7	136.3	15.8	-90.62	-6,963.6	-282.3	548.8	397.4	151.33				
13,900.0	6,969.4	6,993.9	6,990.1	138.2	15.8	-90.34	-6,963.7	-282.3	569.1	415.8	153.23	3.714			
14,000.0	6,968.6	6,991.3	6,987.6	140.1	15.8	-90.07	-6,963.7	-282.3	605.4	450.3	155.13	3.903			
14,100.0	6,967.7	6,988.8	6,985.1	142.0	15.8	-89.81	-6,963.7	-282.2	655.1	498.1	157.02	4.172			
14,200.0	6,966.8	6,986.4	6,982.6	143.8	15.8	-89.56	-6,963.8	-282.2	715.4	556.5	158.91	4.502			
14,300.0	6,966.0	6,984.0	6,980.3	145.7	15.8	-89.31	-6,963.8	-282.2	783.9	623.1	160.80	4.875			
14,400.0	6,965.1	6,981.7	6,977.9	147.6	15.8	-89.06	-6,963.9	-282.1	858.5	695.8	162.69	5.277			
14,500.0	6,964.2	6,979.4	6,975.7	149.5	15.8	-88.82	-6,963.9	-282.1	937.9	773.3	164.57	5.699			

Company:	Noble Energy Inc.- Weld County, CO (Grid North)	Local Co-ordinate Reference:	Well Heartland State H01-74-1HN
Project:	Sec.25-T4N-R65W	TVD Reference:	WELL @ 4850.0ft (Precision 829 - RKB 16')
Reference Site:	Heartland State G36-75-1HN Pad Sec.25-T4N-R65W	MD Reference:	WELL @ 4850.0ft (Precision 829 - RKB 16')
Site Error:	0.0ft	North Reference:	Grid
Reference Well:	Heartland State H01-74-1HN	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #2 sidetrack	Database:	Landmark
Reference Design:	Sidetrack Plan D - Rev 0	Offset TVD Reference:	Offset Datum

Offset Design Existing Wells Sec.25-T4N-R65W - Houndskeeper H1-22 (Exist) - Wellbore #1 - Wellbore #1												Offset Site Error:	0.0 ft
Survey Program: 100-NS-GYRO-MS												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	
14,000.0	6,968.6	6,982.3	6,980.4	140.1	13.7	-89.93	-8,107.1	-404.6	972.7	819.6	153.11	6.353	
14,100.0	6,967.7	6,981.7	6,979.8	142.0	13.7	-89.85	-8,107.1	-404.6	883.4	728.3	155.01	5.699	
14,200.0	6,966.8	6,981.2	6,979.3	143.8	13.7	-89.77	-8,107.1	-404.7	796.5	639.6	156.91	5.076	
14,300.0	6,966.0	6,980.6	6,978.7	145.7	13.7	-89.70	-8,107.1	-404.7	713.1	554.3	158.81	4.490	
14,400.0	6,965.1	6,980.1	6,978.2	147.6	13.7	-89.62	-8,107.1	-404.7	634.6	473.9	160.71	3.948	
14,500.0	6,964.2	6,979.6	6,977.6	149.5	13.7	-89.55	-8,107.1	-404.7	562.9	400.2	162.62	3.461	
14,600.0	6,963.3	6,979.0	6,977.1	151.4	13.7	-89.48	-8,107.1	-404.7	500.9	336.4	164.52	3.045	
14,700.0	6,962.5	6,978.5	6,976.6	153.3	13.7	-89.41	-8,107.1	-404.7	452.8	286.4	166.42	2.721	
14,800.0	6,961.6	6,978.0	6,976.1	155.2	13.7	-89.33	-8,107.1	-404.7	423.3	255.0	168.32	2.515	
14,879.4	6,960.9	6,977.6	6,975.7	156.8	13.7	-89.28	-8,107.1	-404.7	415.8	245.9	169.83	2.448 CC, ES	
14,900.0	6,960.7	6,977.5	6,975.6	157.1	13.7	-89.26	-8,107.1	-404.7	416.3	246.1	170.22	2.446 SF	
15,000.0	6,959.9	6,977.0	6,975.1	159.0	13.7	-89.20	-8,107.1	-404.7	432.9	260.8	172.12	2.515	
15,100.0	6,959.0	6,976.5	6,974.6	160.9	13.7	-89.13	-8,107.1	-404.7	470.7	296.6	174.03	2.705	
15,200.0	6,958.1	6,976.0	6,974.1	162.8	13.7	-89.06	-8,107.1	-404.7	525.0	349.1	175.93	2.984	
15,300.0	6,957.2	6,975.5	6,973.6	164.7	13.7	-88.99	-8,107.1	-404.7	591.4	413.6	177.83	3.326	
15,400.0	6,956.4	6,975.0	6,973.1	166.7	13.7	-88.93	-8,107.1	-404.7	666.2	486.5	179.73	3.707	
15,500.0	6,955.5	6,974.5	6,972.6	168.6	13.7	-88.86	-8,107.1	-404.7	747.0	565.4	181.63	4.113	
15,600.0	6,954.6	6,974.1	6,972.2	170.5	13.7	-88.80	-8,107.1	-404.7	831.9	648.4	183.53	4.533	
15,700.0	6,953.8	6,973.6	6,971.7	172.4	13.7	-88.73	-8,107.1	-404.7	919.9	734.5	185.44	4.961	

Company:	Noble Energy Inc.- Weld County, CO (Grid North)	Local Co-ordinate Reference:	Well Heartland State H01-74-1HN
Project:	Sec.25-T4N-R65W	TVD Reference:	WELL @ 4850.0ft (Precision 829 - RKB 16')
Reference Site:	Heartland State G36-75-1HN Pad Sec.25-T4N-R65W	MD Reference:	WELL @ 4850.0ft (Precision 829 - RKB 16')
Site Error:	0.0ft	North Reference:	Grid
Reference Well:	Heartland State H01-74-1HN	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #2 sidetrack	Database:	Landmark
Reference Design:	Sidetrack Plan D - Rev 0	Offset TVD Reference:	Offset Datum

Offset Design Existing Wells Sec.25-T4N-R65W - Houndskeeper H1-27 (Exist) - Wellbore #1 - Wellbore #1														Offset Site Error:	0.0 ft
Survey Program: 100-NS-GYRO-MS														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		
11,500.0	6,990.3	7,101.9	6,999.2	92.9	17.3	-92.95	-5,631.4	-608.5	930.5	822.2	108.31	8.591			
11,600.0	6,989.5	7,100.8	6,998.1	94.8	17.3	-92.67	-5,631.4	-608.5	833.9	723.7	110.22	7.566			
11,700.0	6,988.6	7,100.0	6,997.3	96.7	17.3	-92.47	-5,631.4	-608.5	738.2	626.0	112.12	6.584			
11,800.0	6,987.7	7,098.5	6,995.8	98.5	17.3	-92.09	-5,631.5	-608.5	643.8	529.7	114.02	5.646			
11,900.0	6,986.9	7,097.4	6,994.6	100.4	17.3	-91.80	-5,631.5	-608.4	551.3	435.4	115.92	4.756			
12,000.0	6,986.0	7,096.2	6,993.5	102.3	17.3	-91.51	-5,631.5	-608.4	462.0	344.2	117.82	3.921			
12,100.0	6,985.1	7,095.1	6,992.3	104.2	17.3	-91.22	-5,631.5	-608.4	378.2	258.4	119.72	3.159			
12,200.0	6,984.2	7,093.9	6,991.2	106.0	17.3	-90.93	-5,631.5	-608.4	304.2	182.6	121.62	2.501			
12,300.0	6,983.4	7,092.8	6,990.0	107.9	17.3	-90.64	-5,631.5	-608.4	249.1	125.6	123.52	2.017			
12,400.0	6,982.5	7,091.6	6,988.9	109.8	17.3	-90.35	-5,631.5	-608.4	227.1	101.7	125.41	1.811			
12,402.4	6,982.5	7,091.6	6,988.8	109.8	17.3	-90.34	-5,631.5	-608.4	227.1	101.6	125.46	1.810 CC, ES, SF			
12,500.0	6,981.6	7,090.4	6,987.7	111.7	17.3	-90.06	-5,631.5	-608.4	247.2	119.9	127.30	1.942			
12,600.0	6,980.8	7,089.3	6,986.5	113.6	17.3	-89.76	-5,631.5	-608.4	301.0	171.8	129.19	2.330			
12,700.0	6,979.9	7,088.1	6,985.4	115.5	17.3	-89.47	-5,631.5	-608.4	374.3	243.2	131.08	2.856			
12,800.0	6,979.0	7,087.0	6,984.2	117.3	17.3	-89.18	-5,631.5	-608.4	457.8	324.9	132.97	3.443			
12,900.0	6,978.1	7,085.8	6,983.1	119.2	17.3	-88.88	-5,631.5	-608.4	546.9	412.1	134.85	4.056			
13,000.0	6,977.3	7,084.6	6,981.9	121.1	17.3	-88.59	-5,631.5	-608.4	639.2	502.5	136.73	4.675			
13,100.0	6,976.4	7,083.5	6,980.7	123.0	17.3	-88.30	-5,631.5	-608.4	733.6	595.0	138.60	5.293			
13,200.0	6,975.5	7,082.3	6,979.6	124.9	17.3	-88.00	-5,631.5	-608.4	829.2	688.8	140.48	5.903			
13,300.0	6,974.7	7,081.1	6,978.4	126.8	17.3	-87.71	-5,631.5	-608.4	925.8	783.5	142.35	6.504			

Company:	Noble Energy Inc.- Weld County, CO (Grid North)	Local Co-ordinate Reference:	Well Heartland State H01-74-1HN
Project:	Sec.25-T4N-R65W	TVD Reference:	WELL @ 4850.0ft (Precision 829 - RKB 16')
Reference Site:	Heartland State G36-75-1HN Pad Sec.25-T4N-R65W	MD Reference:	WELL @ 4850.0ft (Precision 829 - RKB 16')
Site Error:	0.0ft	North Reference:	Grid
Reference Well:	Heartland State H01-74-1HN	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #2 sidetrack	Database:	Landmark
Reference Design:	Sidetrack Plan D - Rev 0	Offset TVD Reference:	Offset Datum

Offset Design		Existing Wells Sec.25-T4N-R65W - Houndskeeper H1-28 (Exist) - Wellbore #1 - Wellbore #1											Offset Site Error:	0.0 ft
Survey Program:		100-NS-GYRO-MS											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)			
12,000.0	6,986.0	7,032.6	6,958.2	102.3	18.4	87.97	-5,666.9	-1,682.5	951.2	831.7	119.48	7.961	6.641 CC, ES	
12,100.0	6,985.1	7,030.4	6,955.9	104.2	18.4	87.82	-5,666.9	-1,682.4	910.2	788.8	121.37	7.500		
12,200.0	6,984.2	7,028.1	6,953.7	106.0	18.4	87.66	-5,666.9	-1,682.3	878.7	755.5	123.26	7.129		
12,300.0	6,983.4	7,025.9	6,951.4	107.9	18.4	87.51	-5,666.9	-1,682.1	857.8	732.7	125.15	6.854		
12,400.0	6,982.5	7,023.6	6,949.2	109.8	18.4	87.36	-5,667.0	-1,682.0	848.2	721.2	127.03	6.677		
12,431.8	6,982.2	7,022.9	6,948.5	110.4	18.4	87.31	-5,667.0	-1,682.0	847.6	720.0	127.63			
12,500.0	6,981.6	7,021.4	6,947.0	111.7	18.4	87.21	-5,667.0	-1,681.9	850.4	721.5	128.92	6.596 SF		
12,600.0	6,980.8	7,019.2	6,944.8	113.6	18.4	87.06	-5,667.0	-1,681.8	864.2	733.4	130.81	6.606		
12,700.0	6,979.9	7,017.0	6,942.6	115.5	18.4	86.92	-5,667.1	-1,681.7	889.0	756.4	132.69	6.700		
12,800.0	6,979.0	7,014.9	6,940.5	117.3	18.4	86.77	-5,667.1	-1,681.6	924.1	789.6	134.58	6.867		
12,900.0	6,978.1	7,012.7	6,938.3	119.2	18.4	86.62	-5,667.1	-1,681.5	968.3	831.8	136.47	7.096		

Company:	Noble Energy Inc.- Weld County, CO (Grid North)	Local Co-ordinate Reference:	Well Heartland State H01-74-1HN
Project:	Sec.25-T4N-R65W	TVD Reference:	WELL @ 4850.0ft (Precision 829 - RKB 16')
Reference Site:	Heartland State G36-75-1HN Pad Sec.25-T4N-R65W	MD Reference:	WELL @ 4850.0ft (Precision 829 - RKB 16')
Site Error:	0.0ft	North Reference:	Grid
Reference Well:	Heartland State H01-74-1HN	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #2 sidetrack	Database:	Landmark
Reference Design:	Sidetrack Plan D - Rev 0	Offset TVD Reference:	Offset Datum

Offset Design												Existing Wells Sec.25-T4N-R65W - Houndskeeper PC H01-21D (Exist) - Wellbore #1 - Wellbore #1		Offset Site Error:		0.0 ft	
Survey Program: 100-NS-GYRO-MS														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					
14,500.0	6,964.2	7,158.1	6,984.1	149.5	18.2	90.31	-8,248.3	-1,619.0	949.9	785.8	164.12	5.788					
14,600.0	6,963.3	7,157.1	6,983.0	151.4	18.2	90.24	-8,248.3	-1,619.0	899.8	733.8	166.03	5.420					
14,700.0	6,962.5	7,156.0	6,982.0	153.3	18.2	90.16	-8,248.3	-1,619.0	858.5	690.6	167.95	5.112					
14,800.0	6,961.6	7,155.0	6,981.0	155.2	18.2	90.09	-8,248.3	-1,619.0	827.3	657.5	169.86	4.871					
14,900.0	6,960.7	7,154.0	6,980.0	157.1	18.1	90.01	-8,248.3	-1,619.0	807.4	635.6	171.77	4.700					
15,000.0	6,959.9	7,153.0	6,978.9	159.0	18.1	89.94	-8,248.3	-1,619.0	799.5	625.8	173.69	4.603					
15,013.2	6,959.7	7,152.8	6,978.8	159.3	18.1	89.93	-8,248.3	-1,619.0	799.4	625.5	173.94	4.596 CC, ES					
15,100.0	6,959.0	7,152.0	6,977.9	160.9	18.1	89.87	-8,248.3	-1,619.0	804.1	628.5	175.60	4.579 SF					
15,200.0	6,958.1	7,150.9	6,976.9	162.8	18.1	89.80	-8,248.3	-1,619.0	820.9	643.4	177.51	4.625					
15,300.0	6,957.2	7,149.9	6,975.9	164.7	18.1	89.73	-8,248.3	-1,619.0	849.3	669.9	179.43	4.733					
15,400.0	6,956.4	7,149.0	6,974.9	166.7	18.1	89.65	-8,248.3	-1,619.0	888.1	706.7	181.34	4.897					
15,500.0	6,955.5	7,148.0	6,973.9	168.6	18.1	89.58	-8,248.3	-1,619.0	936.0	752.7	183.25	5.107					
15,600.0	6,954.6	7,147.0	6,972.9	170.5	18.1	89.51	-8,248.3	-1,619.0	991.7	806.5	185.17	5.355					

Company:	Noble Energy Inc.- Weld County, CO (Grid North)	Local Co-ordinate Reference:	Well Heartland State H01-74-1HN
Project:	Sec.25-T4N-R65W	TVD Reference:	WELL @ 4850.0ft (Precision 829 - RKB 16')
Reference Site:	Heartland State G36-75-1HN Pad Sec.25-T4N-R65W	MD Reference:	WELL @ 4850.0ft (Precision 829 - RKB 16')
Site Error:	0.0ft	North Reference:	Grid
Reference Well:	Heartland State H01-74-1HN	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #2 sidetrack	Database:	Landmark
Reference Design:	Sidetrack Plan D - Rev 0	Offset TVD Reference:	Offset Datum

Offset Design Existing Wells Sec.25-T4N-R65W - LJS RH1-2 (Exist) - Wellbore #1 - Wellbore #1													Offset Site Error: 0.0 ft
Survey Program: 100-UNKNOWN													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	
12,200.0	6,984.2	6,980.3	6,979.9	106.0	83.4	89.65	-6,327.2	-1,251.9	988.2	799.7	188.51	5.242	
12,300.0	6,983.4	6,980.2	6,979.8	107.9	83.4	89.63	-6,327.2	-1,251.9	898.8	708.3	190.41	4.720	
12,400.0	6,982.5	6,980.0	6,979.6	109.8	83.4	89.61	-6,327.2	-1,251.9	811.7	619.4	192.32	4.221	
12,500.0	6,981.6	6,979.9	6,979.5	111.7	83.4	89.59	-6,327.2	-1,251.9	728.1	533.8	194.22	3.749	
12,600.0	6,980.8	6,979.7	6,979.3	113.6	83.4	89.57	-6,327.2	-1,251.9	649.0	452.9	196.12	3.309	
12,700.0	6,979.9	6,979.6	6,979.2	115.5	83.4	89.55	-6,327.2	-1,251.9	576.5	378.5	198.02	2.911	
12,800.0	6,979.0	6,979.4	6,979.0	117.3	83.4	89.53	-6,327.2	-1,251.9	513.3	313.4	199.93	2.568	
12,900.0	6,978.1	6,979.3	6,978.9	119.2	83.4	89.51	-6,327.2	-1,251.9	463.3	261.5	201.83	2.296	
13,000.0	6,977.3	6,979.1	6,978.7	121.1	83.4	89.49	-6,327.2	-1,251.9	431.0	227.3	203.73	2.116	
13,094.3	6,976.5	6,979.0	6,978.6	122.9	83.4	89.47	-6,327.2	-1,251.9	420.6	215.1	205.53	2.046 CC	
13,100.0	6,976.4	6,979.0	6,978.6	123.0	83.4	89.47	-6,327.2	-1,251.9	420.7	215.0	205.64	2.046 ES, SF	
13,200.0	6,975.5	6,978.8	6,978.4	124.9	83.4	89.45	-6,327.2	-1,251.9	433.7	226.2	207.54	2.090	
13,300.0	6,974.7	6,978.7	6,978.2	126.8	83.4	89.43	-6,327.2	-1,251.9	468.2	258.8	209.45	2.236	
13,400.0	6,973.8	6,978.5	6,978.1	128.7	83.4	89.41	-6,327.2	-1,251.9	520.0	308.6	211.36	2.460	
13,500.0	6,972.9	6,978.4	6,977.9	130.6	83.4	89.38	-6,327.2	-1,251.9	584.4	371.2	213.26	2.740	
13,600.0	6,972.1	6,978.2	6,977.8	132.5	83.4	89.36	-6,327.2	-1,251.9	657.8	442.6	215.17	3.057	
13,700.0	6,971.2	6,978.0	6,977.6	134.4	83.4	89.34	-6,327.2	-1,251.9	737.5	520.4	217.08	3.397	
13,800.0	6,970.3	6,977.9	6,977.5	136.3	83.4	89.32	-6,327.2	-1,251.9	821.6	602.6	218.98	3.752	
13,900.0	6,969.4	6,977.7	6,977.3	138.2	83.4	89.30	-6,327.2	-1,251.9	908.9	688.0	220.89	4.115	
14,000.0	6,968.6	6,977.6	6,977.2	140.1	83.4	89.28	-6,327.2	-1,251.9	998.6	775.8	222.80	4.482	

Company:	Noble Energy Inc.- Weld County, CO (Grid North)	Local Co-ordinate Reference:	Well Heartland State H01-74-1HN
Project:	Sec.25-T4N-R65W	TVD Reference:	WELL @ 4850.0ft (Precision 829 - RKB 16')
Reference Site:	Heartland State G36-75-1HN Pad Sec.25-T4N-R65W	MD Reference:	WELL @ 4850.0ft (Precision 829 - RKB 16')
Site Error:	0.0ft	North Reference:	Grid
Reference Well:	Heartland State H01-74-1HN	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #2 sidetrack	Database:	Landmark
Reference Design:	Sidetrack Plan D - Rev 0	Offset TVD Reference:	Offset Datum

Offset Design Existing Wells Sec.25-T4N-R65W - Ocoma G25-16 (Exist) - Wellbore #1 - Wellbore #1												Offset Site Error: 0.0 ft	
Survey Program: 100-NS-GYRO-MS												Offset Well Error: 0.0 ft	
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Offset Wellbore Centre		Distance		Minimum Separation (ft)	Separation Factor	Warning
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)		+N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)			
0.0	0.0	0.0	0.0	0.0	0.0	37.92	381.9	297.5	484.2				
100.0	100.0	89.6	89.6	0.1	0.1	172.14	382.0	297.8	484.5	484.3	0.23	2,091.984	
200.0	200.0	187.0	187.0	0.2	0.4	172.19	382.6	298.7	485.8	485.2	0.59	828.284	
300.0	300.0	289.5	289.4	0.3	0.6	172.18	383.5	299.3	487.4	486.4	0.93	522.093	
400.0	400.0	392.4	392.4	0.5	0.8	168.04	384.2	299.1	488.4	487.1	1.29	378.043	
500.0	500.0	489.1	489.1	0.7	1.0	152.94	384.6	299.2	489.3	487.6	1.71	285.878	
600.0	600.0	593.4	593.4	0.9	1.2	115.18	385.2	299.3	490.0	487.8	2.13	230.202	
700.0	700.0	696.1	696.1	1.1	1.4	65.28	385.2	298.6	489.6	487.1	2.47	198.415	
750.8	750.8	744.6	744.6	1.2	1.4	134.09	385.1	298.4	489.4	486.7	2.65	184.451	
800.0	800.0	791.2	791.1	1.3	1.5	166.36	385.2	298.4	489.5	486.7	2.83	172.730	
900.0	900.0	890.2	890.1	1.5	1.7	142.06	385.7	298.5	490.5	487.2	3.28	149.529	
1,000.0	1,000.0	994.7	994.6	1.7	2.0	149.42	386.2	298.1	491.2	487.5	3.70	132.668	
1,100.0	1,100.0	1,092.2	1,092.2	2.0	2.2	145.57	386.4	297.8	491.7	487.6	4.11	119.656	
1,200.0	1,200.0	1,191.1	1,191.1	2.2	2.4	111.90	386.8	297.7	492.4	487.8	4.56	107.902	
1,300.0	1,299.9	1,294.4	1,294.4	2.4	2.6	94.98	387.2	297.3	493.0	488.0	5.01	98.467	
1,353.0	1,352.9	1,346.0	1,345.9	2.5	2.7	91.30	387.2	297.1	493.0	487.8	5.23	94.223	
1,400.0	1,399.8	1,391.2	1,391.2	2.6	2.8	89.78	387.4	297.0	493.1	487.6	5.43	90.780	
1,500.0	1,499.3	1,492.9	1,492.9	2.8	3.1	96.06	387.6	297.0	493.5	487.7	5.88	83.883	
1,600.0	1,598.4	1,590.3	1,590.2	3.1	3.3	108.96	387.9	296.7	496.3	489.9	6.35	78.103	
1,700.0	1,697.4	1,687.8	1,687.8	3.4	3.5	123.96	388.5	296.6	503.2	496.3	6.85	73.503	
1,800.0	1,796.0	1,784.8	1,784.8	3.6	3.8	130.10	389.3	296.7	514.0	506.7	7.34	70.028	
1,900.0	1,894.3	1,883.0	1,883.0	4.0	4.0	135.01	390.1	297.1	527.4	519.5	7.83	67.339	
2,000.0	1,992.5	1,980.0	1,980.0	4.3	4.2	138.68	390.8	297.6	542.5	534.2	8.31	65.267	
2,100.0	2,090.1	2,077.5	2,077.5	4.7	4.4	139.62	391.7	298.2	559.9	551.1	8.81	63.531	
2,200.0	2,187.5	2,173.7	2,173.7	5.1	4.7	140.13	392.8	298.6	578.7	569.4	9.34	61.929	
2,300.0	2,284.7	2,269.7	2,269.6	5.5	4.9	139.44	394.5	298.8	598.0	588.1	9.89	60.450	
2,400.0	2,381.8	2,366.1	2,366.0	5.9	5.2	142.86	396.1	299.2	618.2	607.8	10.42	59.311	
2,500.0	2,478.9	2,460.0	2,459.9	6.4	5.4	144.97	397.6	299.9	639.3	628.3	10.95	58.400	
2,600.0	2,576.0	2,553.9	2,553.7	6.8	5.6	147.95	399.8	300.9	661.7	650.2	11.46	57.719	
2,700.0	2,673.1	2,650.2	2,650.0	7.2	5.9	145.46	402.6	301.7	684.2	672.2	12.01	56.992	
2,800.0	2,770.2	2,749.1	2,748.9	7.7	6.1	144.18	404.6	303.0	705.9	693.4	12.54	56.296	
2,900.0	2,867.1	2,848.5	2,848.3	8.1	6.4	144.46	406.5	303.9	727.9	714.8	13.07	55.681	
3,000.0	2,963.9	2,946.7	2,946.5	8.6	6.6	147.07	408.1	304.6	750.4	736.8	13.61	55.148	
3,100.0	3,060.7	3,043.9	3,043.7	9.1	6.8	150.18	409.3	305.4	773.2	759.1	14.12	54.761	
3,200.0	3,158.0	3,142.1	3,141.9	9.5	7.0	155.41	409.8	306.6	795.2	780.6	14.58	54.547	
3,300.0	3,255.7	3,245.5	3,245.2	9.9	7.2	156.52	409.7	307.6	815.7	800.7	14.98	54.442	
3,400.0	3,353.7	3,348.7	3,348.5	10.3	7.2	150.97	408.2	308.5	833.3	817.9	15.34	54.315	
3,500.0	3,452.2	3,452.7	3,452.4	10.7	7.3	148.76	407.1	308.6	847.9	832.2	15.65	54.167	
3,600.0	3,551.1	3,560.0	3,559.7	11.0	7.4	141.93	406.7	307.1	859.0	843.0	16.01	53.656	
3,700.0	3,649.9	3,661.9	3,661.6	11.3	7.5	143.36	407.0	304.6	869.2	852.8	16.40	53.017	
3,800.0	3,748.5	3,758.2	3,757.8	11.7	7.7	144.42	408.1	301.9	880.4	863.6	16.81	52.376	
3,900.0	3,846.6	3,856.0	3,855.6	12.1	7.9	146.79	409.2	299.4	895.0	877.8	17.23	51.954	
4,000.0	3,944.0	3,952.6	3,952.1	12.6	8.1	145.45	409.9	297.2	912.3	894.6	17.66	51.644	
4,100.0	4,040.7	4,047.6	4,047.1	13.1	8.2	146.74	410.5	295.3	931.8	913.7	18.10	51.478	
4,200.0	4,137.4	4,144.3	4,143.8	13.6	8.4	150.24	411.3	293.4	952.4	933.8	18.58	51.266	
4,300.0	4,234.4	4,238.7	4,238.2	14.1	8.6	153.39	411.9	291.8	972.9	953.8	19.02	51.147	
4,400.0	4,331.3	4,333.9	4,333.3	14.6	8.8	155.23	412.9	290.5	994.2	974.8	19.49	51.005 SF	

Company:	Noble Energy Inc.- Weld County, CO (Grid North)	Local Co-ordinate Reference:	Well Heartland State H01-74-1HN
Project:	Sec.25-T4N-R65W	TVD Reference:	WELL @ 4850.0ft (Precision 829 - RKB 16')
Reference Site:	Heartland State G36-75-1HN Pad Sec.25-T4N-R65W	MD Reference:	WELL @ 4850.0ft (Precision 829 - RKB 16')
Site Error:	0.0ft	North Reference:	Grid
Reference Well:	Heartland State H01-74-1HN	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #2 sidetrack	Database:	Landmark
Reference Design:	Sidetrack Plan D - Rev 0	Offset TVD Reference:	Offset Datum

Offset Design Existing Wells Sec.25-T4N-R65W - Pedro State C31-79HN (Exist.) - Wellbore #1 - Wellbore #1													Offset Site Error:	0.0 ft
Survey Program: 791-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	19.9	19.9	0.0	0.0	134.23	-504.8	518.5	723.7	723.7	0.02	N/A CC		
100.0	100.0	119.6	119.6	0.1	0.1	-91.59	-504.7	518.6	723.7	723.5	0.25	2,923.349		
200.0	200.0	219.3	219.3	0.2	0.2	-91.63	-504.6	518.9	723.8	723.3	0.47	1,531.879		
300.0	300.0	318.9	318.9	0.3	0.4	-91.70	-504.5	519.2	723.9	723.2	0.70	1,038.032		
400.0	400.0	418.6	418.6	0.5	0.5	-95.87	-504.2	519.7	724.1	723.2	0.97	747.611 ES		
500.0	500.0	518.2	518.2	0.7	0.6	-111.05	-503.9	520.3	724.5	723.2	1.29	563.297		
600.0	600.0	617.9	617.9	0.9	0.7	-148.89	-503.5	521.0	724.9	723.3	1.60	452.040		
700.0	700.0	717.5	717.5	1.1	0.8	161.16	-503.1	521.9	725.5	723.6	1.92	377.621		
800.0	800.0	817.3	817.3	1.3	0.9	-97.85	-502.6	522.9	726.0	723.8	2.26	320.667		
900.0	900.0	917.2	917.2	1.5	1.1	-122.26	-502.2	523.8	726.6	723.9	2.68	271.307		
1,000.0	1,000.0	1,017.2	1,017.2	1.7	1.3	-114.97	-501.9	524.6	727.3	724.2	3.09	235.112		
1,100.0	1,100.0	1,117.1	1,117.1	2.0	1.5	-118.92	-501.7	525.3	728.0	724.5	3.50	207.811		
1,200.0	1,200.0	1,216.9	1,216.9	2.2	1.7	-152.67	-501.7	525.8	728.8	724.9	3.91	186.511		
1,300.0	1,299.9	1,316.8	1,316.7	2.4	1.9	-169.91	-501.8	526.3	731.8	727.5	4.32	169.461		
1,400.0	1,399.8	1,417.3	1,417.2	2.6	2.2	-175.75	-502.1	526.7	737.8	733.0	4.74	155.671		
1,500.0	1,499.3	1,517.8	1,517.7	2.8	2.4	-170.60	-502.1	527.0	747.8	742.7	5.16	144.877		
1,600.0	1,598.4	1,618.0	1,617.9	3.1	2.6	-159.13	-502.1	527.2	760.6	755.0	5.59	136.162		
1,700.0	1,697.4	1,714.6	1,714.6	3.4	2.8	-145.74	-502.1	527.5	773.5	767.5	6.02	128.569		
1,800.0	1,796.0	1,810.5	1,810.5	3.6	3.0	-141.38	-502.4	527.9	787.0	780.6	6.45	121.986		
1,900.0	1,894.3	1,906.0	1,906.0	4.0	3.2	-138.63	-503.0	528.5	802.1	795.2	6.91	116.149		
2,000.0	1,992.5	2,006.4	2,006.3	4.3	3.4	-137.01	-503.8	529.0	817.4	810.0	7.38	110.781		
2,100.0	2,090.1	2,106.8	2,106.7	4.7	3.6	-138.19	-504.4	529.2	834.0	826.1	7.87	106.009		
2,200.0	2,187.5	2,206.3	2,206.2	5.1	3.8	-139.98	-505.0	529.1	851.7	843.3	8.37	101.800		
2,300.0	2,284.7	2,299.3	2,299.3	5.5	4.0	-142.80	-505.6	529.1	870.6	861.8	8.85	98.388		
2,400.0	2,381.8	2,392.2	2,392.1	5.9	4.2	-141.50	-506.6	529.3	890.4	881.1	9.34	95.297		
2,500.0	2,478.9	2,487.0	2,486.9	6.4	4.4	-141.41	-507.9	529.9	910.7	900.9	9.85	92.466		
2,600.0	2,576.0	2,581.8	2,581.7	6.8	4.6	-140.32	-509.4	530.7	931.0	920.7	10.36	89.873		
2,700.0	2,673.1	2,678.9	2,678.8	7.2	4.8	-144.61	-510.8	531.5	951.8	941.0	10.84	87.802		
2,800.0	2,770.2	2,776.1	2,776.0	7.7	5.0	-147.67	-512.3	532.3	973.1	961.7	11.31	86.005		
2,900.0	2,867.1	2,873.0	2,872.9	8.1	5.2	-149.01	-513.7	533.1	995.8	984.0	11.80	84.386 SF		

Company:	Noble Energy Inc.- Weld County, CO (Grid North)	Local Co-ordinate Reference:	Well Heartland State H01-74-1HN
Project:	Sec.25-T4N-R65W	TVD Reference:	WELL @ 4850.0ft (Precision 829 - RKB 16')
Reference Site:	Heartland State G36-75-1HN Pad Sec.25-T4N-R65W	MD Reference:	WELL @ 4850.0ft (Precision 829 - RKB 16')
Site Error:	0.0ft	North Reference:	Grid
Reference Well:	Heartland State H01-74-1HN	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #2 sidetrack	Database:	Landmark
Reference Design:	Sidetrack Plan D - Rev 0	Offset TVD Reference:	Offset Datum

Offset Design Existing Wells Sec.25-T4N-R65W - Pedro State G36-21 (Exist) - Wellbore #1 - Wellbore #1														Offset Site Error:	0.0 ft
Survey Program: 100-NS-GYRO-MS														Offset Well Error:	0.0 ft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Distance		Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning		
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)		Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)							
9,300.0	7,009.5	6,988.1	6,987.3	52.7	12.6	90.55	-2,880.4	-1,777.9	977.9	914.5	63.38	15.429			
9,400.0	7,008.7	6,988.4	6,987.6	54.5	12.6	90.56	-2,880.4	-1,777.9	948.0	882.8	65.21	14.538			
9,500.0	7,007.8	6,988.7	6,987.9	56.2	12.6	90.58	-2,880.4	-1,777.9	927.9	860.9	67.04	13.841			
9,600.0	7,006.9	6,989.0	6,988.2	58.0	12.6	90.60	-2,880.4	-1,777.9	918.4	849.5	68.88	13.332			
9,638.0	7,006.6	6,989.2	6,988.4	58.7	12.6	90.61	-2,880.4	-1,777.9	917.6	848.0	69.59	13.187 CC, ES			
9,700.0	7,006.0	6,989.3	6,988.5	59.8	12.6	90.62	-2,880.4	-1,777.9	919.7	849.0	70.73	13.003			
9,800.0	7,005.2	6,989.6	6,988.8	61.6	12.6	90.64	-2,880.4	-1,777.9	931.8	859.2	72.58	12.838			
9,900.0	7,004.3	6,989.9	6,989.1	63.4	12.6	90.66	-2,880.4	-1,777.9	954.3	879.8	74.43	12.820 SF			
10,000.0	7,003.4	6,990.2	6,989.4	65.2	12.6	90.68	-2,880.4	-1,777.9	986.4	910.1	76.29	12.929			

Company:	Noble Energy Inc.- Weld County, CO (Grid North)	Local Co-ordinate Reference:	Well Heartland State H01-74-1HN
Project:	Sec.25-T4N-R65W	TVD Reference:	WELL @ 4850.0ft (Precision 829 - RKB 16')
Reference Site:	Heartland State G36-75-1HN Pad Sec.25-T4N-R65W	MD Reference:	WELL @ 4850.0ft (Precision 829 - RKB 16')
Site Error:	0.0ft	North Reference:	Grid
Reference Well:	Heartland State H01-74-1HN	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #2 sidetrack	Database:	Landmark
Reference Design:	Sidetrack Plan D - Rev 0	Offset TVD Reference:	Offset Datum

Offset Design Existing Wells Sec.25-T4N-R65W - Pedro State G36-22 (exist) - Wellbore #1 - Wellbore #1												Offset Site Error: 0.0 ft	
Survey Program: 100-NS-GYRO-MS												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
8,900.0	7,013.0	7,023.6	7,022.5	45.8	13.7	-95.47	-3,047.2	-518.9	981.7	924.4	57.27	17.140	
9,000.0	7,012.1	7,020.4	7,019.3	47.5	13.7	-94.94	-3,047.3	-518.9	888.6	829.5	59.07	15.041	
9,100.0	7,011.3	7,017.2	7,016.1	49.2	13.7	-94.40	-3,047.4	-518.9	797.1	736.2	60.88	13.092	
9,200.0	7,010.4	7,013.9	7,012.8	51.0	13.7	-93.85	-3,047.5	-518.9	707.9	645.2	62.70	11.291	
9,300.0	7,009.5	7,010.7	7,009.5	52.7	13.7	-93.30	-3,047.6	-518.9	622.1	557.6	64.52	9.642	
9,400.0	7,008.7	7,007.3	7,006.2	54.5	13.7	-92.74	-3,047.7	-518.9	541.1	474.7	66.34	8.156	
9,500.0	7,007.8	7,000.0	6,998.9	56.2	13.7	-91.50	-3,047.9	-518.9	467.4	399.3	68.15	6.859	
9,600.0	7,006.9	7,000.0	6,998.9	58.0	13.7	-91.50	-3,047.9	-518.9	405.2	335.2	69.99	5.790	
9,700.0	7,006.0	6,997.0	6,995.9	59.8	13.7	-91.00	-3,048.0	-518.9	360.4	288.6	71.82	5.018	
9,800.0	7,005.2	6,993.4	6,992.3	61.6	13.7	-90.39	-3,048.1	-518.9	339.9	266.3	73.64	4.616	
9,821.8	7,005.0	6,992.6	6,991.5	62.0	13.7	-90.26	-3,048.1	-518.9	339.2	265.2	74.04	4.582 CC, ES, SF	
9,900.0	7,004.3	6,989.9	6,988.8	63.4	13.7	-89.80	-3,048.2	-518.8	348.1	272.7	75.46	4.613	
10,000.0	7,003.4	6,986.5	6,985.4	65.2	13.6	-89.23	-3,048.3	-518.8	383.1	305.9	77.28	4.958	
10,100.0	7,002.5	6,983.2	6,982.1	67.1	13.6	-88.67	-3,048.4	-518.8	438.6	359.5	79.09	5.546	
10,200.0	7,001.7	6,980.0	6,978.9	68.9	13.6	-88.13	-3,048.5	-518.8	507.9	427.0	80.91	6.277	
10,300.0	7,000.8	6,976.9	6,975.8	70.7	13.6	-87.60	-3,048.6	-518.8	586.1	503.4	82.72	7.085	
10,400.0	6,999.9	6,973.8	6,972.7	72.6	13.6	-87.09	-3,048.6	-518.7	670.1	585.6	84.53	7.927	
10,500.0	6,999.1	6,970.9	6,969.8	74.4	13.6	-86.59	-3,048.7	-518.7	758.0	671.6	86.34	8.779	
10,600.0	6,998.2	6,968.0	6,966.9	76.2	13.6	-86.11	-3,048.8	-518.7	848.5	760.4	88.14	9.627	
10,700.0	6,997.3	6,965.2	6,964.1	78.1	13.6	-85.64	-3,048.8	-518.7	941.0	851.0	89.94	10.462	

Company:	Noble Energy Inc.- Weld County, CO (Grid North)	Local Co-ordinate Reference:	Well Heartland State H01-74-1HN
Project:	Sec.25-T4N-R65W	TVD Reference:	WELL @ 4850.0ft (Precision 829 - RKB 16')
Reference Site:	Heartland State G36-75-1HN Pad Sec.25-T4N-R65W	MD Reference:	WELL @ 4850.0ft (Precision 829 - RKB 16')
Site Error:	0.0ft	North Reference:	Grid
Reference Well:	Heartland State H01-74-1HN	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #2 sidetrack	Database:	Landmark
Reference Design:	Sidetrack Plan D - Rev 0	Offset TVD Reference:	Offset Datum

Offset Design		Existing Wells Sec.25-T4N-R65W - Pedro State G36-24 (Exist) - Wellbore #1 - Wellbore #1											Offset Site Error:	0.0 ft	
Survey Program: 100-NS-GYRO-MS														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			
10,600.0	6,998.2	6,993.7	6,992.9	76.2	12.5	91.42	-4,266.4	-1,745.1	997.3	910.0	87.31	11.423			
10,700.0	6,997.3	6,991.9	6,991.2	78.1	12.5	91.31	-4,266.4	-1,745.1	959.1	869.9	89.20	10.752			
10,800.0	6,996.4	6,990.2	6,989.5	79.9	12.5	91.21	-4,266.4	-1,745.1	930.1	839.0	91.08	10.211			
10,900.0	6,995.6	6,988.6	6,987.8	81.7	12.5	91.10	-4,266.4	-1,745.2	910.9	817.9	93.00	9.795			
11,000.0	6,994.7	6,986.9	6,986.2	83.6	12.5	91.00	-4,266.4	-1,745.2	902.0	807.1	94.88	9.506			
11,030.3	6,994.4	6,986.5	6,985.7	84.2	12.5	90.97	-4,266.4	-1,745.2	901.5	806.0	95.46	9.444 CC, ES			
11,100.0	6,993.8	6,985.4	6,984.6	85.4	12.5	90.90	-4,266.4	-1,745.2	904.2	807.4	96.77	9.343			
11,200.0	6,993.0	6,983.8	6,983.1	87.3	12.5	90.80	-4,266.4	-1,745.2	917.3	818.7	98.66	9.298 SF			
11,300.0	6,992.1	6,982.3	6,981.6	89.2	12.5	90.71	-4,266.5	-1,745.3	941.0	840.4	100.55	9.358			
11,400.0	6,991.2	6,980.9	6,980.1	91.0	12.5	90.62	-4,266.5	-1,745.3	974.3	871.9	102.44	9.511			

Company:	Noble Energy Inc.- Weld County, CO (Grid North)	Local Co-ordinate Reference:	Well Heartland State H01-74-1HN
Project:	Sec.25-T4N-R65W	TVD Reference:	WELL @ 4850.0ft (Precision 829 - RKB 16')
Reference Site:	Heartland State G36-75-1HN Pad Sec.25-T4N-R65W	MD Reference:	WELL @ 4850.0ft (Precision 829 - RKB 16')
Site Error:	0.0ft	North Reference:	Grid
Reference Well:	Heartland State H01-74-1HN	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #2 sidetrack	Database:	Landmark
Reference Design:	Sidetrack Plan D - Rev 0	Offset TVD Reference:	Offset Datum

Offset Design Existing Wells Sec.25-T4N-R65W - Petro State G36-18 (Exist) - Wellbore #1 - Wellbore #1												Offset Site Error:	0.0 ft
Survey Program: 100-NS-GYRO-MS												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)		
7,900.0	7,021.7	7,003.2	7,000.0	30.1	12.8	90.49	-1,618.5	-1,739.3	985.8	946.5	39.35	25.053	
8,000.0	7,020.9	7,001.9	6,998.7	31.5	12.8	90.41	-1,618.5	-1,739.3	941.5	900.6	40.92	23.008	
8,100.0	7,020.0	7,000.6	6,997.4	32.9	12.8	90.32	-1,618.5	-1,739.3	906.2	863.7	42.54	21.303	
8,200.0	7,019.1	7,000.0	6,996.8	34.4	12.8	90.28	-1,618.5	-1,739.3	880.8	836.6	44.19	19.934	
8,300.0	7,018.3	6,998.0	6,994.8	35.9	12.8	90.15	-1,618.5	-1,739.3	866.3	820.5	45.87	18.888	
8,376.7	7,017.6	6,997.0	6,993.8	37.1	12.8	90.08	-1,618.5	-1,739.3	862.9	815.7	47.17	18.293 CC	
8,400.0	7,017.4	6,996.7	6,993.5	37.5	12.8	90.06	-1,618.5	-1,739.3	863.2	815.7	47.57	18.147 ES	
8,500.0	7,016.5	6,995.5	6,992.3	39.1	12.8	89.98	-1,618.5	-1,739.3	871.7	822.4	49.30	17.683	
8,600.0	7,015.6	6,994.2	6,991.0	40.7	12.8	89.90	-1,618.5	-1,739.3	891.3	840.3	51.04	17.464	
8,700.0	7,014.8	6,993.0	6,989.8	42.4	12.8	89.82	-1,618.5	-1,739.3	921.5	868.7	52.80	17.452 SF	
8,800.0	7,013.9	6,991.8	6,988.6	44.1	12.8	89.73	-1,618.5	-1,739.3	961.1	906.6	54.57	17.612	

Company:	Noble Energy Inc.- Weld County, CO (Grid North)	Local Co-ordinate Reference:	Well Heartland State H01-74-1HN
Project:	Sec.25-T4N-R65W	TVD Reference:	WELL @ 4850.0ft (Precision 829 - RKB 16')
Reference Site:	Heartland State G36-75-1HN Pad Sec.25-T4N-R65W	MD Reference:	WELL @ 4850.0ft (Precision 829 - RKB 16')
Site Error:	0.0ft	North Reference:	Grid
Reference Well:	Heartland State H01-74-1HN	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #2 sidetrack	Database:	Landmark
Reference Design:	Sidetrack Plan D - Rev 0	Offset TVD Reference:	Offset Datum

Offset Design Existing Wells Sec.25-T4N-R65W - Shelton G 36-27 (Exist) - Wellbore #1 - Wellbore #1													Offset Site Error:	0.0 ft
Survey Program: 100-NS-GYRO-MS													Offset Well Error:	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)	+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	-100.94	-84.5	-437.2	445.8					
100.0	100.0	80.3	80.3	0.1	0.1	33.28	-84.4	-437.2	445.2	445.0	0.22	2,030.660		
200.0	200.0	181.8	181.8	0.2	0.3	33.32	-84.2	-437.1	444.8	444.2	0.52	849.113		
300.0	300.0	281.7	281.7	0.3	0.5	33.34	-84.3	-436.6	443.9	443.1	0.85	523.358		
400.0	400.0	381.0	381.0	0.5	0.7	29.27	-84.4	-436.3	443.1	441.8	1.23	359.425		
500.0	500.0	479.9	479.9	0.7	0.9	14.20	-84.4	-436.2	442.5	440.9	1.62	273.736		
600.0	600.0	580.7	580.7	0.9	1.1	-23.52	-84.1	-436.2	442.2	440.2	2.01	219.812		
685.2	685.2	664.7	664.7	1.1	1.2	-67.73	-84.1	-436.1	442.0	439.7	2.33	189.768		
700.0	700.0	679.2	679.2	1.1	1.3	-73.42	-84.2	-436.1	442.0	439.6	2.38	185.471		
800.0	800.0	779.4	779.3	1.3	1.4	27.59	-84.6	-436.3	442.0	439.3	2.72	162.472		
894.7	894.6	872.2	872.2	1.5	1.5	4.44	-85.0	-436.5	441.8	438.7	3.04	145.166		
900.0	900.0	877.4	877.4	1.5	1.5	3.26	-85.0	-436.5	441.8	438.7	3.06	144.298		
1,000.0	1,000.0	979.2	979.2	1.7	1.7	10.66	-85.2	-437.0	441.6	438.2	3.41	129.472		
1,100.0	1,100.0	1,079.7	1,079.7	2.0	1.8	6.84	-85.0	-437.1	441.0	437.2	3.78	116.762		
1,200.0	1,200.0	1,179.4	1,179.4	2.2	2.0	-26.83	-84.9	-437.2	440.5	436.3	4.14	106.281		
1,300.0	1,299.9	1,278.5	1,278.5	2.4	2.1	-44.23	-85.0	-437.4	438.6	434.1	4.52	97.102		
1,400.0	1,399.8	1,378.2	1,378.2	2.6	2.3	-50.62	-85.0	-437.8	435.3	430.4	4.91	88.661		
1,500.0	1,499.3	1,476.6	1,476.6	2.8	2.5	-46.51	-85.0	-438.3	429.4	424.1	5.32	80.759		
1,600.0	1,598.4	1,574.9	1,574.9	3.1	2.7	-36.08	-84.9	-439.0	420.4	414.7	5.74	73.247		
1,700.0	1,697.4	1,674.4	1,674.3	3.4	2.9	-23.24	-84.7	-439.9	408.7	402.6	6.17	66.260		
1,800.0	1,796.0	1,771.9	1,771.9	3.6	3.1	-19.07	-84.5	-440.8	394.2	387.6	6.60	59.713		
1,900.0	1,894.3	1,869.3	1,869.3	4.0	3.4	-16.32	-84.4	-442.1	377.9	370.8	7.05	53.585		
2,000.0	1,992.5	1,969.6	1,969.6	4.3	3.6	-14.64	-84.2	-443.4	360.4	352.9	7.50	48.038		
2,100.0	2,090.1	2,068.6	2,068.5	4.7	3.8	-15.81	-83.6	-444.2	340.3	332.3	7.96	42.741		
2,200.0	2,187.5	2,166.1	2,166.1	5.1	4.1	-17.76	-83.3	-444.7	318.7	310.3	8.45	37.706		
2,300.0	2,284.7	2,262.9	2,262.8	5.5	4.3	-21.20	-83.3	-445.3	297.1	288.1	8.96	33.139		
2,400.0	2,381.8	2,359.9	2,359.9	5.9	4.5	-20.69	-83.4	-446.0	275.5	266.0	9.48	29.051		
2,500.0	2,478.9	2,456.7	2,456.6	6.4	4.7	-21.56	-83.5	-446.7	253.8	243.8	10.01	25.348		
2,600.0	2,576.0	2,554.1	2,554.0	6.8	5.0	-21.69	-84.1	-447.5	232.3	221.7	10.55	22.008		
2,700.0	2,673.1	2,651.8	2,651.7	7.2	5.2	-27.71	-84.3	-448.1	211.0	199.9	11.15	18.925		
2,800.0	2,770.2	2,748.9	2,748.8	7.7	5.4	-33.42	-84.5	-448.7	191.2	179.4	11.80	16.205		
2,900.0	2,867.1	2,845.7	2,845.6	8.1	5.7	-38.65	-84.6	-449.6	171.9	159.3	12.53	13.720		
3,000.0	2,963.9	2,942.2	2,942.2	8.6	5.9	-42.63	-84.8	-450.7	153.5	140.2	13.35	11.500		
3,100.0	3,060.7	3,039.2	3,039.2	9.1	6.1	-47.09	-85.2	-452.0	136.7	122.4	14.23	9.603		
3,200.0	3,158.0	3,136.8	3,136.7	9.5	6.3	-50.50	-86.1	-452.5	122.2	107.1	15.12	8.085		
3,300.0	3,255.7	3,234.7	3,234.6	9.9	6.5	-58.53	-87.0	-452.9	110.5	94.5	16.01	6.906		
3,400.0	3,353.7	3,333.3	3,333.2	10.3	6.7	-74.03	-87.6	-453.4	103.3	86.4	16.85	6.130		
3,500.0	3,452.2	3,432.1	3,432.0	10.7	6.8	-86.56	-88.0	-453.1	100.4	83.0	17.48	5.748		
3,515.7	3,467.7	3,447.6	3,447.5	10.7	6.8	-89.15	-88.0	-452.9	100.4	82.8	17.55	5.720 CC, ES, SF		
3,600.0	3,551.1	3,530.4	3,530.3	11.0	6.9	-103.38	-88.4	-451.3	102.5	84.6	17.88	5.730		
3,700.0	3,649.9	3,627.9	3,627.7	11.3	7.0	-111.41	-89.4	-449.0	108.4	90.2	18.16	5.967		
3,800.0	3,748.5	3,725.2	3,725.0	11.7	7.1	-118.80	-91.4	-446.8	118.2	99.8	18.37	6.435		
3,900.0	3,846.6	3,823.0	3,822.7	12.1	7.2	-124.26	-93.9	-445.5	131.5	113.0	18.55	7.089		
4,000.0	3,944.0	3,919.5	3,919.2	12.6	7.4	-132.44	-97.3	-445.1	148.9	130.1	18.73	7.948		
4,100.0	4,040.7	4,017.3	4,016.9	13.1	7.6	-136.93	-101.3	-445.8	169.8	150.8	18.97	8.952		
4,200.0	4,137.4	4,115.7	4,115.2	13.6	7.8	-138.66	-105.1	-447.5	190.8	171.5	19.29	9.888		
4,300.0	4,234.4	4,215.3	4,214.7	14.1	8.1	-139.44	-108.8	-450.5	210.0	190.3	19.65	10.685		
4,400.0	4,331.3	4,313.5	4,312.9	14.6	8.3	-141.11	-111.8	-453.7	228.7	208.7	20.03	11.421		
4,500.0	4,428.6	4,412.2	4,411.4	15.0	8.5	-142.56	-114.2	-456.8	246.0	225.6	20.41	12.052		
4,600.0	4,525.9	4,510.7	4,509.8	15.5	8.8	-145.87	-116.3	-460.0	263.7	242.9	20.79	12.687		
4,700.0	4,623.3	4,608.5	4,607.6	15.9	9.0	-148.43	-118.2	-463.1	281.4	260.2	21.17	13.288		

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

Company:	Noble Energy Inc.- Weld County, CO (Grid North)	Local Co-ordinate Reference:	Well Heartland State H01-74-1HN
Project:	Sec.25-T4N-R65W	TVD Reference:	WELL @ 4850.0ft (Precision 829 - RKB 16')
Reference Site:	Heartland State G36-75-1HN Pad Sec.25-T4N-R65W	MD Reference:	WELL @ 4850.0ft (Precision 829 - RKB 16')
Site Error:	0.0ft	North Reference:	Grid
Reference Well:	Heartland State H01-74-1HN	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #2 sidetrack	Database:	Landmark
Reference Design:	Sidetrack Plan D - Rev 0	Offset TVD Reference:	Offset Datum

Offset Design Existing Wells Sec.25-T4N-R65W - Shelton G 36-27 (Exist) - Wellbore #1 - Wellbore #1													Offset Site Error: 0.0 ft
Survey Program: 100-NS-GYRO-MS													Offset Well Error: 0.0 ft
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference	Offset	Semi Major Axis	Highside Toolface (°)	Offset Wellbore Centre	+N/-S (ft)	+E/-W (ft)	Distance	Minimum Separation (ft)	Warning
				(ft)	(ft)						Between Centres (ft)	Between Ellipses (ft)	
4,800.0	4,720.6	4,705.9	4,705.0	16.4	9.3	-150.01		-119.6	-465.7		299.8	278.2	13.886
4,900.0	4,818.5	4,805.9	4,804.9	16.8	9.5	-148.74		-120.4	-468.3		315.7	293.7	14.329
5,000.0	4,916.7	4,904.0	4,903.0	17.2	9.7	-148.73		-120.4	-470.5		329.8	307.4	14.714
5,100.0	5,015.2	5,005.1	5,004.0	17.6	9.9	-149.74		-118.8	-472.3		342.6	319.9	15.052
5,200.0	5,114.0	5,100.0	5,098.9	17.9	10.1	-149.08		-116.2	-473.3		353.6	330.6	15.351
5,300.0	5,213.2	5,194.5	5,193.4	18.2	10.2	-147.70		-113.7	-473.0		363.7	340.4	15.635
5,400.0	5,312.7	5,290.8	5,289.6	18.4	10.2	-144.39		-111.3	-471.5		372.5	349.1	15.882
5,500.0	5,412.4	5,382.7	5,381.4	18.7	10.3	-138.25		-109.0	-468.8		380.4	356.8	16.098
5,600.0	5,512.2	5,480.7	5,479.4	18.9	10.4	-148.59		-108.0	-465.0		387.8	363.9	16.276
5,700.0	5,612.2	5,584.0	5,582.7	19.0	10.5	-174.84		-108.2	-461.8		394.3	370.2	16.380
5,800.0	5,712.1	5,688.9	5,687.5	19.2	10.6	165.60		-108.3	-459.9		398.5	374.2	16.389
5,900.0	5,812.1	5,791.8	5,790.4	19.3	10.7	110.61		-107.6	-458.8		400.0	375.4	16.281
6,000.0	5,912.1	5,893.2	5,891.8	19.5	10.8	-168.28		-106.6	-458.2		402.0	377.1	16.154
6,100.0	6,012.1	5,997.5	5,996.1	19.6	11.0	-165.03		-105.6	-458.3		404.4	379.2	16.035
6,200.0	6,112.0	6,097.6	6,096.2	19.8	11.2	-159.95		-105.1	-459.2		405.5	379.9	15.840
6,300.0	6,212.0	6,198.2	6,196.8	19.9	11.4	-101.71		-104.6	-460.2		405.6	379.6	15.617
6,400.0	6,311.6	6,297.3	6,295.9	20.1	11.6	-74.12		-103.9	-461.2		402.3	376.1	15.356
6,500.0	6,409.4	6,393.8	6,392.4	20.2	11.8	-80.96		-103.6	-462.0		397.4	370.9	15.007
6,600.0	6,504.6	6,487.5	6,486.1	20.4	12.0	-82.64		-103.6	-462.5		391.8	365.1	14.668
6,700.0	6,595.2	6,579.0	6,577.5	20.6	12.2	-89.99		-103.7	-462.9		388.5	361.3	14.321
6,715.2	6,608.4	6,592.4	6,591.0	20.6	12.3	-90.11		-103.8	-463.0		388.4	361.2	14.292
6,800.0	6,678.3	6,661.7	6,660.3	20.8	12.4	-92.21		-103.8	-463.4		390.0	362.5	14.199
6,900.0	6,752.1	6,734.6	6,733.1	21.0	12.6	-98.98		-103.9	-463.7		397.6	369.7	14.245
7,000.0	6,816.9	6,798.6	6,797.2	21.4	12.7	-106.05		-103.9	-463.8		423.7	395.4	14.976
7,100.0	6,865.8	6,847.9	6,846.4	21.9	12.8	-106.23		-104.0	-463.8		468.7	439.6	16.138
7,200.0	6,901.9	6,884.4	6,883.0	22.5	12.9	-108.50		-104.1	-463.8		528.1	498.4	17.739
7,300.0	6,935.6	6,918.6	6,917.2	23.3	13.0	-112.78		-104.2	-463.9		597.8	567.6	19.807
7,400.0	6,968.6	6,952.0	6,950.6	24.2	13.0	-113.86		-104.3	-463.9		673.5	642.4	21.676
7,500.0	6,994.6	6,978.5	6,977.1	25.2	13.1	-110.00		-104.4	-463.8		754.4	721.5	22.932
7,600.0	7,012.2	6,996.8	6,995.4	26.3	13.1	-104.09		-104.5	-463.8		839.4	804.5	23.998
7,700.0	7,021.5	7,006.4	7,005.0	27.5	13.1	-96.05		-104.6	-463.8		927.3	890.5	25.171

Company:	Noble Energy Inc.- Weld County, CO (Grid North)	Local Co-ordinate Reference:	Well Heartland State H01-74-1HN
Project:	Sec.25-T4N-R65W	TVD Reference:	WELL @ 4850.0ft (Precision 829 - RKB 16')
Reference Site:	Heartland State G36-75-1HN Pad Sec.25-T4N-R65W	MD Reference:	WELL @ 4850.0ft (Precision 829 - RKB 16')
Site Error:	0.0ft	North Reference:	Grid
Reference Well:	Heartland State H01-74-1HN	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #2 sidetrack	Database:	Landmark
Reference Design:	Sidetrack Plan D - Rev 0	Offset TVD Reference:	Offset Datum

Offset Design Existing Wells Sec.25-T4N-R65W - Shelton H 1-23 (Exist) - Wellbore #1 - Wellbore #1													Offset Site Error:	0.0 ft
Survey Program: 100-NS-GYRO-MS													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		
15,500.0	6,955.5	6,979.6	6,976.6	168.6	12.2	-90.50	-9,585.3	-400.7	950.9	770.7	180.16	5.278		
15,600.0	6,954.6	6,978.6	6,975.6	170.5	12.2	-90.36	-9,585.3	-400.7	861.8	679.7	182.07	4.733		
15,700.0	6,953.8	6,977.6	6,974.6	172.4	12.2	-90.22	-9,585.3	-400.7	775.3	591.4	183.97	4.214		
15,800.0	6,952.9	6,976.6	6,973.6	174.3	12.2	-90.08	-9,585.3	-400.7	692.5	506.7	185.87	3.726		
15,900.0	6,952.0	6,975.5	6,972.6	176.2	12.2	-89.94	-9,585.3	-400.7	614.9	427.1	187.78	3.275		
16,000.0	6,951.2	6,974.5	6,971.5	178.1	12.2	-89.79	-9,585.3	-400.8	544.6	354.9	189.68	2.871		
16,100.0	6,950.3	6,973.5	6,970.5	180.0	12.2	-89.65	-9,585.3	-400.8	484.8	293.2	191.58	2.531		
16,200.0	6,949.4	6,972.4	6,969.5	181.9	12.2	-89.50	-9,585.3	-400.8	439.9	246.4	193.48	2.274		
16,300.0	6,948.5	6,971.4	6,968.4	183.8	12.1	-89.35	-9,585.3	-400.8	414.7	219.3	195.38	2.123		
16,357.7	6,948.0	6,970.8	6,967.8	184.9	12.1	-89.27	-9,585.3	-400.8	410.7	214.2	196.47	2.090	CC, ES, SF	
16,400.0	6,947.7	6,970.3	6,967.4	185.7	12.1	-89.21	-9,585.3	-400.8	412.9	215.6	197.27	2.093		
16,500.0	6,946.8	6,969.2	6,966.3	187.6	12.1	-89.06	-9,585.3	-400.8	434.6	235.5	199.17	2.182		
16,600.0	6,945.9	6,968.2	6,965.2	189.5	12.1	-88.91	-9,585.3	-400.8	476.8	275.8	201.06	2.372		
16,700.0	6,945.1	6,967.1	6,964.1	191.4	12.1	-88.75	-9,585.3	-400.8	534.6	331.7	202.96	2.634		
16,800.0	6,944.2	6,966.0	6,963.0	193.3	12.1	-88.60	-9,585.3	-400.9	603.6	398.7	204.85	2.946		
16,900.0	6,943.3	6,964.9	6,961.9	195.2	12.1	-88.45	-9,585.3	-400.9	680.3	473.5	206.74	3.290		
17,000.0	6,942.4	6,963.7	6,960.8	197.1	12.1	-88.29	-9,585.3	-400.9	762.4	553.7	208.63	3.654		
17,100.0	6,941.6	6,962.6	6,959.7	199.0	12.1	-88.13	-9,585.3	-400.9	848.3	637.8	210.52	4.030		
17,200.0	6,940.7	6,961.5	6,958.5	200.9	12.1	-87.97	-9,585.3	-400.9	937.1	724.7	212.40	4.412		

Company:	Noble Energy Inc.- Weld County, CO (Grid North)	Local Co-ordinate Reference:	Well Heartland State H01-74-1HN
Project:	Sec.25-T4N-R65W	TVD Reference:	WELL @ 4850.0ft (Precision 829 - RKB 16')
Reference Site:	Heartland State G36-75-1HN Pad Sec.25-T4N-R65W	MD Reference:	WELL @ 4850.0ft (Precision 829 - RKB 16')
Site Error:	0.0ft	North Reference:	Grid
Reference Well:	Heartland State H01-74-1HN	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #2 sidetrack	Database:	Landmark
Reference Design:	Sidetrack Plan D - Rev 0	Offset TVD Reference:	Offset Datum

Offset Design												Existing Wells Sec.25-T4N-R65W - State G36-16 (Exist) - Wellbore #1 - Wellbore #1		Offset Site Error:		0.0 ft	
Survey Program: 7254-UNKNOWN														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)						
11,600.0	6,989.5	7,003.5	7,003.5	94.8	140.1	-90.03	-4,887.7	152.6	994.6	760.8	233.85	4.253					
11,663.2	6,988.9	7,002.9	7,002.9	96.0	140.1	-90.00	-4,887.7	152.6	992.6	757.6	235.04	4.223 CC					
11,700.0	6,988.6	7,002.6	7,002.6	96.7	140.1	-89.98	-4,887.7	152.6	993.3	757.6	235.72	4.214 ES, SF					

Company:	Noble Energy Inc.- Weld County, CO (Grid North)	Local Co-ordinate Reference:	Well Heartland State H01-74-1HN
Project:	Sec.25-T4N-R65W	TVD Reference:	WELL @ 4850.0ft (Precision 829 - RKB 16')
Reference Site:	Heartland State G36-75-1HN Pad Sec.25-T4N-R65W	MD Reference:	WELL @ 4850.0ft (Precision 829 - RKB 16')
Site Error:	0.0ft	North Reference:	Grid
Reference Well:	Heartland State H01-74-1HN	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #2 sidetrack	Database:	Landmark
Reference Design:	Sidetrack Plan D - Rev 0	Offset TVD Reference:	Offset Datum

Offset Design													Existing Wells Sec.25-T4N-R65W - Stroh H 12-27 (Exist) - Wellbore #1 - Wellbore #1		Offset Site Error:		0.0 ft
Survey Program: 100-NS-GYRO-MS															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					
16,800.0	6,944.2	6,961.8	6,960.0	193.3	12.2	-89.98	-10,952.0	-461.2	985.2	780.2	205.01	4.805					
16,900.0	6,943.3	6,961.6	6,959.8	195.2	12.2	-89.95	-10,952.0	-461.2	892.1	685.1	206.92	4.311					
17,000.0	6,942.4	6,961.4	6,959.6	197.1	12.2	-89.92	-10,952.0	-461.2	800.6	591.8	208.83	3.834					
17,100.0	6,941.6	6,961.2	6,959.4	199.0	12.2	-89.88	-10,952.0	-461.2	711.5	500.7	210.74	3.376					
17,200.0	6,940.7	6,961.0	6,959.2	200.9	12.2	-89.85	-10,952.0	-461.2	625.6	413.0	212.65	2.942					
17,300.0	6,939.8	6,960.8	6,959.0	202.9	12.2	-89.81	-10,952.0	-461.2	544.6	330.1	214.56	2.538					
17,400.0	6,939.0	6,960.6	6,958.8	204.8	12.2	-89.78	-10,952.0	-461.2	471.0	254.5	216.47	2.176					
17,500.0	6,938.1	6,960.4	6,958.6	206.7	12.2	-89.74	-10,952.0	-461.2	408.7	190.3	218.38	1.872					
17,521.8	6,937.9	6,960.3	6,958.6	207.1	12.2	-89.73	-10,952.0	-461.2	397.2	178.4	218.80	1.815 CC, ES, SF					

Company:	Noble Energy Inc.- Weld County, CO (Grid North)	Local Co-ordinate Reference:	Well Heartland State H01-74-1HN
Project:	Sec.25-T4N-R65W	TVD Reference:	WELL @ 4850.0ft (Precision 829 - RKB 16')
Reference Site:	Heartland State G36-75-1HN Pad Sec.25-T4N-R65W	MD Reference:	WELL @ 4850.0ft (Precision 829 - RKB 16')
Site Error:	0.0ft	North Reference:	Grid
Reference Well:	Heartland State H01-74-1HN	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #2 sidetrack	Database:	Landmark
Reference Design:	Sidetrack Plan D - Rev 0	Offset TVD Reference:	Offset Datum

Offset Design Existing Wells Sec.25-T4N-R65W - UPRC 1-10J (Exist) - Wellbore #1 - Wellbore #1														Offset Site Error:	0.0 ft
Survey Program: 100-NS-GYRO-MS														Offset Well Error:	0.0 ft
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference	Offset	Semi Major Axis	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	
14,700.0	6,962.5	7,002.4	7,001.4	153.3	12.5	91.32	91.32	-8,828.6	-1,194.9	972.8	807.6	165.12	5.891		
14,800.0	6,961.6	7,001.5	7,000.5	155.2	12.5	91.18	91.18	-8,828.6	-1,194.9	881.5	714.5	167.04	5.277		
14,900.0	6,960.7	7,000.6	6,999.6	157.1	12.5	91.04	91.04	-8,828.6	-1,194.9	792.4	623.4	168.96	4.690		
15,000.0	6,959.9	6,999.7	6,998.6	159.0	12.5	90.90	90.90	-8,828.6	-1,194.9	706.2	535.3	170.87	4.133		
15,100.0	6,959.0	6,998.8	6,997.7	160.9	12.5	90.76	90.76	-8,828.6	-1,194.9	624.1	451.3	172.79	3.612		
15,200.0	6,958.1	6,997.9	6,996.8	162.8	12.5	90.62	90.62	-8,828.6	-1,194.9	548.0	373.3	174.71	3.137		
15,300.0	6,957.2	6,996.9	6,995.9	164.7	12.5	90.48	90.48	-8,828.6	-1,194.9	480.7	304.1	176.63	2.722		
15,400.0	6,956.4	6,996.0	6,995.0	166.7	12.5	90.35	90.35	-8,828.6	-1,194.9	426.5	248.0	178.54	2.389		
15,500.0	6,955.5	6,995.1	6,994.1	168.6	12.5	90.21	90.21	-8,828.6	-1,194.9	390.8	210.3	180.46	2.166		
15,596.0	6,954.7	6,994.3	6,993.2	170.4	12.5	90.08	90.08	-8,828.6	-1,194.9	378.8	196.5	182.30	2.078 CC		
15,600.0	6,954.6	6,994.2	6,993.2	170.5	12.5	90.07	90.07	-8,828.6	-1,194.9	378.8	196.5	182.37	2.077 ES, SF		
15,700.0	6,953.8	6,993.3	6,992.3	172.4	12.5	89.94	89.94	-8,828.6	-1,194.9	392.8	208.6	184.29	2.132		
15,800.0	6,952.9	6,992.4	6,991.4	174.3	12.5	89.80	89.80	-8,828.6	-1,194.9	430.3	244.1	186.20	2.311		
15,900.0	6,952.0	6,991.5	6,990.5	176.2	12.5	89.67	89.67	-8,828.6	-1,194.9	485.7	297.6	188.11	2.582		
16,000.0	6,951.2	6,990.7	6,989.6	178.1	12.5	89.54	89.54	-8,828.6	-1,194.9	553.8	363.8	190.02	2.914		
16,100.0	6,950.3	6,989.8	6,988.7	180.0	12.5	89.40	89.40	-8,828.6	-1,194.9	630.5	438.5	191.93	3.285		
16,200.0	6,949.4	6,988.9	6,987.9	181.9	12.5	89.27	89.27	-8,828.6	-1,194.9	712.9	519.1	193.84	3.678		
16,300.0	6,948.5	6,988.0	6,987.0	183.8	12.5	89.14	89.14	-8,828.6	-1,194.9	799.4	603.7	195.75	4.084		
16,400.0	6,947.7	6,987.2	6,986.1	185.7	12.5	89.01	89.01	-8,828.6	-1,194.9	888.7	691.1	197.66	4.496		
16,500.0	6,946.8	6,986.3	6,985.3	187.6	12.5	88.88	88.88	-8,828.6	-1,194.9	980.1	780.6	199.57	4.911		

Company:	Noble Energy Inc.- Weld County, CO (Grid North)	Local Co-ordinate Reference:	Well Heartland State H01-74-1HN
Project:	Sec.25-T4N-R65W	TVD Reference:	WELL @ 4850.0ft (Precision 829 - RKB 16')
Reference Site:	Heartland State G36-75-1HN Pad Sec.25-T4N-R65W	MD Reference:	WELL @ 4850.0ft (Precision 829 - RKB 16')
Site Error:	0.0ft	North Reference:	Grid
Reference Well:	Heartland State H01-74-1HN	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #2 sidetrack	Database:	Landmark
Reference Design:	Sidetrack Plan D - Rev 0	Offset TVD Reference:	Offset Datum

Offset Design Existing Wells Sec.25-T4N-R65W - UPRC 1-15J (Exist) - Wellbore #1 - Wellbore #1													Offset Site Error: 0.0 ft
Survey Program: 100-NS-GYRO-MS													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	
16,300.0	6,948.5	6,966.1	6,964.6	183.8	13.7	90.62	-10,418.5	-1,245.2	988.4	791.4	196.95	5.019	
16,400.0	6,947.7	6,965.6	6,964.2	185.7	13.7	90.57	-10,418.5	-1,245.2	899.9	701.0	198.86	4.525	
16,500.0	6,946.8	6,965.2	6,963.8	187.6	13.7	90.51	-10,418.5	-1,245.2	814.0	613.3	200.77	4.055	
16,600.0	6,945.9	6,964.8	6,963.3	189.5	13.7	90.46	-10,418.5	-1,245.2	731.8	529.1	202.69	3.610	
16,700.0	6,945.1	6,964.4	6,962.9	191.4	13.7	90.40	-10,418.5	-1,245.2	654.5	449.9	204.60	3.199	
16,800.0	6,944.2	6,963.9	6,962.5	193.3	13.7	90.35	-10,418.5	-1,245.2	584.2	377.7	206.52	2.829	
16,900.0	6,943.3	6,963.5	6,962.1	195.2	13.7	90.29	-10,418.5	-1,245.2	523.6	315.2	208.43	2.512	
17,000.0	6,942.4	6,963.1	6,961.6	197.1	13.7	90.23	-10,418.5	-1,245.2	476.5	266.1	210.34	2.265	
17,100.0	6,941.6	6,962.6	6,961.2	199.0	13.7	90.18	-10,418.5	-1,245.2	447.1	234.8	212.26	2.106	
17,185.7	6,940.8	6,962.2	6,960.8	200.7	13.7	90.13	-10,418.5	-1,245.2	438.8	224.9	213.90	2.051 CC	
17,200.0	6,940.7	6,962.2	6,960.7	200.9	13.7	90.12	-10,418.5	-1,245.2	439.0	224.9	214.17	2.050 ES, SF	
17,300.0	6,939.8	6,961.7	6,960.3	202.9	13.7	90.06	-10,418.5	-1,245.2	453.4	237.4	216.09	2.098	
17,400.0	6,939.0	6,961.3	6,959.8	204.8	13.7	90.00	-10,418.5	-1,245.2	488.3	270.3	218.00	2.240	
17,500.0	6,938.1	6,960.8	6,959.3	206.7	13.7	89.94	-10,418.5	-1,245.2	539.8	319.9	219.91	2.454	
17,521.8	6,937.9	6,960.7	6,959.2	207.1	13.7	89.92	-10,418.5	-1,245.2	552.7	332.4	220.33	2.509	

Company:	Noble Energy Inc.- Weld County, CO (Grid North)	Local Co-ordinate Reference:	Well Heartland State H01-74-1HN
Project:	Sec.25-T4N-R65W	TVD Reference:	WELL @ 4850.0ft (Precision 829 - RKB 16')
Reference Site:	Heartland State G36-75-1HN Pad Sec.25-T4N-R65W	MD Reference:	WELL @ 4850.0ft (Precision 829 - RKB 16')
Site Error:	0.0ft	North Reference:	Grid
Reference Well:	Heartland State H01-74-1HN	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #2 sidetrack	Database:	Landmark
Reference Design:	Sidetrack Plan D - Rev 0	Offset TVD Reference:	Offset Datum

Offset Design														Offset Site Error:	0.0 ft
Survey Program: 0-Reference														Offset Well Error:	0.0 ft
GERRITY STATE PAD (EXISTING) - GERRITY STATE G36-01 - Wellbore #1 - VERT															
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Semi Major Axis Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Distance Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning		
0.0	0.0	7.0	7.0	0.0	0.0	171.62	-934.9	137.8	945.0						
100.0	100.0	107.0	107.0	0.1	0.1	-54.19	-934.9	137.8	944.9	944.7	0.23	4,179.044			
200.0	200.0	207.0	207.0	0.2	0.3	-54.20	-934.9	137.8	944.8	944.2	0.56	1,676.713			
300.0	300.0	307.0	307.0	0.3	0.6	-54.23	-934.9	137.8	944.5	943.6	0.90	1,048.453			
400.0	400.0	407.0	407.0	0.5	0.8	-58.35	-934.9	137.8	944.1	942.8	1.28	734.971			
500.0	500.0	507.0	507.0	0.7	1.0	-73.47	-934.9	137.8	943.9	942.2	1.71	550.483			
554.6	554.6	561.6	561.6	0.8	1.1	-90.00	-934.9	137.8	943.9	941.9	1.95	484.163			
600.0	600.0	607.0	607.0	0.9	1.2	-111.24	-934.9	137.8	943.9	941.7	2.14	440.076			
700.0	700.0	707.0	707.0	1.1	1.5	-161.12	-934.9	137.8	944.1	941.5	2.58	366.631			
800.0	800.0	807.0	807.0	1.3	1.7	-60.06	-934.9	137.8	944.2	941.2	3.01	313.978			
900.0	900.0	907.0	907.0	1.5	1.9	-84.38	-934.9	137.8	944.0	940.6	3.44	274.115			
1,000.0	1,000.0	1,007.0	1,007.0	1.7	2.1	-77.03	-934.9	137.8	943.9	940.0	3.88	243.169			
1,100.0	1,100.0	1,107.0	1,107.0	2.0	2.4	-80.93	-934.9	137.8	943.8	939.5	4.32	218.666 CC			
1,159.2	1,159.2	1,166.2	1,166.2	2.1	2.5	-106.30	-934.9	137.8	943.8	939.3	4.57	206.458			
1,200.0	1,200.0	1,207.0	1,207.0	2.2	2.6	-114.65	-934.9	137.8	943.8	939.1	4.75	198.810 ES			
1,300.0	1,299.9	1,306.9	1,306.9	2.4	2.8	-131.92	-934.9	137.8	945.3	940.1	5.18	182.333			
1,400.0	1,399.8	1,406.8	1,406.8	2.6	3.0	-137.89	-934.9	137.8	949.4	943.8	5.63	168.729			
1,500.0	1,499.3	1,506.3	1,506.3	2.8	3.3	-132.99	-934.9	137.8	956.5	950.5	6.08	157.451			
1,600.0	1,598.4	1,605.4	1,605.4	3.1	3.5	-121.94	-934.9	137.8	964.6	958.1	6.54	147.449			
1,700.0	1,697.4	1,704.4	1,704.4	3.4	3.7	-109.00	-934.9	137.8	970.8	963.8	7.03	138.128			
1,800.0	1,796.0	1,803.0	1,803.0	3.6	3.9	-104.98	-934.9	137.8	975.3	967.8	7.53	129.449			
1,900.0	1,894.3	1,901.3	1,901.3	4.0	4.1	-102.53	-934.9	137.8	979.8	971.8	8.06	121.516			
2,000.0	1,992.5	1,999.5	1,999.5	4.3	4.4	-101.20	-934.9	137.8	983.8	975.2	8.61	114.210			
2,100.0	2,090.1	2,097.1	2,097.1	4.7	4.6	-102.65	-934.9	137.8	988.3	979.1	9.20	107.447			
2,200.0	2,187.5	2,194.5	2,194.5	5.1	4.8	-104.69	-934.9	137.8	993.8	984.0	9.80	101.406 SF			

Company:	Noble Energy Inc.- Weld County, CO (Grid North)	Local Co-ordinate Reference:	Well Heartland State H01-74-1HN
Project:	Sec.25-T4N-R65W	TVD Reference:	WELL @ 4850.0ft (Precision 829 - RKB 16')
Reference Site:	Heartland State G36-75-1HN Pad Sec.25-T4N-R65W	MD Reference:	WELL @ 4850.0ft (Precision 829 - RKB 16')
Site Error:	0.0ft	North Reference:	Grid
Reference Well:	Heartland State H01-74-1HN	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #2 sidetrack	Database:	Landmark
Reference Design:	Sidetrack Plan D - Rev 0	Offset TVD Reference:	Offset Datum

Offset Design		Heartland State G36-75-1HN Pad Sec.25-T4N-R65W - Heartland G25-73-1HN - Wellbore #1 - Plan B -										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	1.0	1.0	0.0	0.0	89.41	0.5	44.6	44.6	44.6	0.00	N/A CC		
100.0	100.0	101.0	101.0	0.1	0.1	-136.48	0.5	44.6	44.7	44.5	0.23	196.701		
200.0	200.0	201.0	201.0	0.2	0.3	-136.74	0.5	44.6	44.9	44.4	0.56	79.563		
300.0	300.0	301.0	301.0	0.3	0.6	-137.17	0.5	44.6	45.3	44.4	0.90	50.209		
400.0	400.0	401.0	401.0	0.5	0.8	-141.80	0.5	44.6	45.8	44.5	1.29	35.602		
500.0	500.0	501.0	501.0	0.7	1.0	-157.21	0.5	44.6	46.2	44.5	1.72	26.918		
600.0	600.0	601.0	601.0	0.9	1.2	164.99	0.5	44.6	46.5	44.3	2.15	21.662		
700.0	700.0	701.0	701.0	1.1	1.5	115.32	0.5	44.6	46.7	44.1	2.58	18.118		
800.0	800.0	801.0	801.0	1.3	1.7	-143.53	0.5	44.6	46.9	43.9	3.01	15.592 ES		
900.0	900.0	901.0	901.0	1.5	1.9	-168.04	0.5	44.6	47.4	43.9	3.44	13.754		
1,000.0	1,000.0	1,001.0	1,001.0	1.7	2.1	-160.89	0.5	44.6	48.0	44.1	3.88	12.363		
1,100.0	1,100.0	1,101.0	1,101.0	2.0	2.4	-164.98	0.5	44.6	48.7	44.3	4.32	11.272		
1,200.0	1,200.0	1,201.0	1,201.0	2.2	2.6	161.28	0.5	44.6	49.3	44.6	4.75	10.388		
1,300.0	1,299.9	1,300.9	1,300.9	2.4	2.8	145.52	0.5	44.6	51.6	46.4	5.18	9.959 SF		
1,400.0	1,399.8	1,400.8	1,400.8	2.6	3.0	143.28	0.5	44.6	56.1	50.4	5.62	9.976		
1,500.0	1,499.3	1,500.3	1,500.3	2.8	3.3	153.42	0.5	44.6	64.4	58.3	6.05	10.633		
1,600.0	1,598.4	1,599.4	1,599.4	3.1	3.5	168.63	0.5	44.6	76.7	70.2	6.48	11.834		
1,700.0	1,697.4	1,698.4	1,698.4	3.4	3.7	-176.82	0.5	44.6	91.0	84.1	6.91	13.164		
1,800.0	1,796.0	1,797.0	1,797.0	3.6	3.9	-172.86	0.5	44.6	107.2	99.9	7.33	14.621		
1,900.0	1,894.3	1,895.3	1,895.3	4.0	4.1	-170.54	0.5	44.6	125.4	117.6	7.77	16.136		
2,000.0	1,992.5	1,993.5	1,993.5	4.3	4.4	-169.50	0.5	44.6	144.4	136.2	8.20	17.608		
2,100.0	2,090.1	2,091.1	2,091.1	4.7	4.6	-171.13	0.5	44.6	165.5	156.9	8.63	19.183		
2,200.0	2,187.5	2,188.5	2,188.5	5.1	4.8	-173.00	0.5	44.6	188.2	179.1	9.08	20.737		
2,300.0	2,284.7	2,285.7	2,285.7	5.5	5.0	-175.66	0.5	44.6	211.6	202.0	9.53	22.208		
2,400.0	2,381.8	2,382.8	2,382.8	5.9	5.2	-174.02	0.5	44.6	235.2	225.3	9.98	23.568		
2,500.0	2,478.9	2,479.9	2,479.9	6.4	5.5	-173.63	0.5	44.6	259.1	248.6	10.44	24.816		
2,600.0	2,576.0	2,583.0	2,583.0	6.8	5.7	-172.37	0.7	43.8	282.1	271.2	10.91	25.866		
2,700.0	2,673.1	2,688.8	2,688.7	7.2	5.9	-176.48	1.6	40.1	302.6	291.2	11.36	26.636		
2,800.0	2,770.2	2,795.7	2,795.4	7.7	6.1	-179.26	3.4	33.6	320.1	308.3	11.82	27.093		
2,900.0	2,867.1	2,903.4	2,902.7	8.1	6.4	179.65	5.8	24.0	336.1	323.9	12.27	27.401		
3,000.0	2,963.9	3,008.7	3,007.2	8.6	6.6	-179.26	9.0	12.1	350.1	337.3	12.74	27.473		
3,100.0	3,060.7	3,107.7	3,105.5	9.1	6.8	-177.77	12.1	0.2	363.2	350.0	13.23	27.453		
3,200.0	3,158.0	3,207.0	3,204.0	9.5	7.1	-174.27	15.2	-11.8	374.5	360.8	13.73	27.277		
3,300.0	3,255.7	3,306.4	3,302.6	9.9	7.3	-174.76	18.3	-23.7	383.9	369.7	14.21	27.012		
3,400.0	3,353.7	3,406.0	3,401.5	10.3	7.6	178.35	21.4	-35.7	391.5	376.8	14.71	26.625		
3,500.0	3,452.2	3,505.8	3,500.5	10.7	7.9	175.02	24.6	-47.7	396.8	381.7	15.19	26.132		
3,600.0	3,551.1	3,605.8	3,599.7	11.0	8.1	167.46	27.7	-59.7	400.0	384.4	15.66	25.551		
3,700.0	3,649.9	3,705.7	3,698.9	11.3	8.4	168.31	30.8	-71.7	403.2	387.1	16.11	25.024		
3,800.0	3,748.5	3,805.6	3,798.0	11.7	8.7	168.94	34.0	-83.7	407.5	390.9	16.56	24.601		
3,900.0	3,846.6	3,905.4	3,896.9	12.1	9.0	170.84	37.1	-95.6	414.9	397.9	16.99	24.416		
4,000.0	3,944.0	4,004.8	3,995.6	12.6	9.2	169.01	40.2	-107.6	425.5	408.1	17.43	24.409		
4,100.0	4,040.7	4,103.9	4,094.0	13.1	9.5	169.80	43.3	-119.5	438.6	420.7	17.88	24.529		
4,200.0	4,137.4	4,203.0	4,192.3	13.6	9.8	172.53	46.4	-131.4	452.1	433.7	18.41	24.561		
4,300.0	4,234.4	4,302.2	4,290.7	14.1	10.1	174.94	49.6	-143.3	464.8	445.9	18.90	24.595		
4,400.0	4,331.3	4,401.4	4,389.1	14.6	10.4	176.03	52.7	-155.2	477.6	458.2	19.40	24.614		
4,500.0	4,428.6	4,500.7	4,487.7	15.0	10.7	176.97	55.8	-167.2	489.0	469.0	19.93	24.533		
4,600.0	4,525.9	4,593.2	4,579.5	15.5	10.9	175.63	58.6	-177.9	500.7	480.3	20.40	24.545		
4,700.0	4,623.3	4,681.2	4,667.0	15.9	11.1	174.86	60.8	-186.3	514.1	493.3	20.84	24.674		
4,800.0	4,720.6	4,768.5	4,754.2	16.4	11.3	175.10	62.5	-192.7	529.8	508.5	21.29	24.880		
4,900.0	4,818.5	4,855.6	4,841.1	16.8	11.5	178.06	63.6	-197.2	545.1	523.4	21.76	25.058		
5,000.0	4,916.7	4,942.4	4,927.8	17.2	11.6	179.58	64.3	-199.7	561.0	538.9	22.17	25.308		

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

Company:	Noble Energy Inc.- Weld County, CO (Grid North)	Local Co-ordinate Reference:	Well Heartland State H01-74-1HN
Project:	Sec.25-T4N-R65W	TVD Reference:	WELL @ 4850.0ft (Precision 829 - RKB 16')
Reference Site:	Heartland State G36-75-1HN Pad Sec.25-T4N-R65W	MD Reference:	WELL @ 4850.0ft (Precision 829 - RKB 16')
Site Error:	0.0ft	North Reference:	Grid
Reference Well:	Heartland State H01-74-1HN	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #2 sidetrack	Database:	Landmark
Reference Design:	Sidetrack Plan D - Rev 0	Offset TVD Reference:	Offset Datum

Offset Design										Heartland State G36-75-1HN Pad Sec.25-T4N-R65W - Heartland G25-73-1HN - Wellbore #1 - Plan B -				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)					
5,100.0	5,015.2	5,030.7	5,016.2	17.6	11.8	-179.69	64.5	-200.4	577.8	555.2	22.61	25.552				
5,200.0	5,114.0	5,129.6	5,115.0	17.9	12.0	-177.46	64.5	-200.4	592.9	569.9	23.05	25.721				
5,300.0	5,213.2	5,228.8	5,214.2	18.2	12.2	-174.68	64.5	-200.4	605.7	582.2	23.50	25.777				
5,400.0	5,312.7	5,328.2	5,313.7	18.4	12.4	-170.15	64.5	-200.4	615.7	591.8	23.92	25.741				
5,500.0	5,412.4	5,427.9	5,413.4	18.7	12.6	-162.97	64.5	-200.4	623.3	599.0	24.33	25.623				
5,600.0	5,512.2	5,527.8	5,513.2	18.9	12.8	-172.54	64.5	-200.4	628.5	603.8	24.72	25.422				
5,700.0	5,612.2	5,627.7	5,613.2	19.0	13.0	161.59	64.5	-200.4	632.2	607.1	25.12	25.170				
5,800.0	5,712.1	5,727.7	5,713.1	19.2	13.2	142.21	64.5	-200.4	634.4	608.9	25.49	24.893				
5,900.0	5,812.1	5,827.7	5,813.1	19.3	13.4	87.37	64.5	-200.4	634.8	609.0	25.86	24.545				
5,901.2	5,813.3	5,828.9	5,814.3	19.3	13.4	90.00	64.5	-200.4	634.8	609.0	25.87	24.539				
6,000.0	5,912.1	5,927.6	5,913.1	19.5	13.6	168.69	64.5	-200.4	636.5	610.2	26.33	24.172				
6,100.0	6,012.1	6,027.6	6,013.1	19.6	13.8	172.21	64.5	-200.4	639.3	612.6	26.73	23.915				
6,200.0	6,112.0	6,127.6	6,113.0	19.8	14.0	177.42	64.5	-200.4	641.5	614.4	27.13	23.643				
6,300.0	6,212.0	6,227.6	6,213.0	19.9	14.3	-124.21	64.5	-200.4	643.0	615.4	27.53	23.358				
6,400.0	6,311.6	6,324.2	6,309.6	20.1	14.5	-96.03	66.5	-200.4	643.9	616.0	27.95	23.036				
6,500.0	6,409.4	6,411.5	6,396.0	20.2	14.7	-102.01	78.3	-200.4	649.0	620.6	28.43	22.826				
6,600.0	6,504.6	6,485.9	6,468.1	20.4	14.8	-102.00	96.6	-200.5	659.3	630.4	28.88	22.826				
6,700.0	6,595.2	6,544.0	6,522.9	20.6	15.0	-105.41	116.0	-200.6	679.3	650.1	29.22	23.248				
6,800.0	6,678.3	6,584.7	6,560.2	20.8	15.1	-100.67	132.2	-200.7	711.1	681.6	29.55	24.062				
6,900.0	6,752.1	6,609.8	6,582.7	21.0	15.2	-99.51	143.3	-200.8	751.7	721.8	29.91	25.130				
7,000.0	6,816.9	6,623.7	6,595.0	21.4	15.2	-97.60	149.7	-200.8	807.2	776.6	30.61	26.371				
7,100.0	6,865.8	6,624.8	6,596.0	21.9	15.2	-87.38	150.2	-200.8	873.3	841.9	31.45	27.770				
7,200.0	6,901.9	6,618.4	6,590.3	22.5	15.2	-82.81	147.2	-200.8	944.8	912.6	32.20	29.341				

Heartland State G36-75-1HN Pad Sec.25-T4N-R65W - Heartland State G36-75-1HN - Wellbore #1 - We													Offset Site Error:	0.0 ft
Survey Program: 352-Flexi-Shot, 788-MWD, 7621-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	-90.56	-0.2	-22.3	22.3					
100.0	100.0	99.9	99.9	0.1	0.1	43.77	-0.2	-22.4	22.4	22.1	0.23	97.537		
200.0	200.0	199.9	199.9	0.2	0.2	44.13	-0.3	-22.8	22.5	22.1	0.46	49.121		
300.0	300.0	299.8	299.8	0.3	0.4	44.72	-0.4	-23.4	22.8	22.1	0.69	33.118		
400.0	400.0	399.8	399.8	0.5	0.5	41.35	-0.6	-24.2	23.1	22.1	1.00	23.006		
500.0	500.0	499.9	499.9	0.7	0.7	26.52	-0.7	-24.8	23.3	21.9	1.41	16.525		
600.0	600.0	599.9	599.9	0.9	0.9	-11.50	-0.9	-25.2	23.4	21.6	1.82	12.874		
700.0	700.0	700.0	700.0	1.1	1.1	-62.17	-1.1	-25.4	23.4	21.2	2.23	10.500		
800.0	800.0	800.1	800.0	1.3	1.3	37.51	-1.6	-25.3	23.1	20.5	2.57	8.977		
900.0	900.0	900.1	900.1	1.5	1.3	10.48	-2.8	-24.9	22.2	19.4	2.82	7.887		
1,000.0	1,000.0	999.9	999.9	1.7	1.3	15.61	-3.8	-24.6	21.4	18.3	3.09	6.937		
1,014.4	1,014.4	1,014.3	1,014.2	1.8	1.4	14.97	-3.9	-24.7	21.4	18.3	3.13	6.840 CC, ES		
1,100.0	1,100.0	1,099.6	1,099.5	2.0	1.4	12.50	-3.8	-25.9	22.0	18.6	3.39	6.497		
1,200.0	1,200.0	1,199.0	1,198.9	2.2	1.6	-16.09	-2.0	-29.0	24.4	20.7	3.71	6.572		
1,300.0	1,299.9	1,298.1	1,297.8	2.4	1.7	-29.48	1.0	-35.1	28.3	24.2	4.06	6.957		
1,400.0	1,399.8	1,396.8	1,396.0	2.6	1.9	-34.99	4.8	-43.9	32.8	28.4	4.43	7.400		
1,500.0	1,499.3	1,494.9	1,493.0	2.8	2.1	-32.95	8.9	-57.5	38.9	34.0	4.82	8.055		
1,600.0	1,598.4	1,593.5	1,590.0	3.1	2.4	-26.02	11.6	-75.0	45.2	39.9	5.24	8.627		
1,700.0	1,697.4	1,692.8	1,687.5	3.4	2.7	-16.87	11.0	-94.1	51.1	45.5	5.66	9.029		
1,800.0	1,796.0	1,791.8	1,784.4	3.6	3.1	-13.43	10.4	-113.9	55.2	49.1	6.10	9.056		
1,900.0	1,894.3	1,890.3	1,880.4	4.0	3.4	-11.66	8.5	-135.9	59.6	53.1	6.56	9.094		
2,000.0	1,992.5	1,989.0	1,976.2	4.3	3.9	-10.94	5.1	-159.6	65.1	58.1	7.03	9.254		
2,100.0	2,090.1	2,087.9	2,071.8	4.7	4.4	-12.43	1.7	-185.0	69.9	62.4	7.53	9.284		
2,200.0	2,187.5	2,187.6	2,167.9	5.1	4.9	-14.81	-2.0	-211.3	74.3	66.2	8.07	9.207		
2,300.0	2,284.7	2,287.6	2,264.1	5.5	5.3	-18.01	-4.9	-238.0	78.3	69.7	8.63	9.078		
2,400.0	2,381.8	2,387.7	2,360.5	5.9	5.8	-15.97	-6.2	-265.1	81.8	72.7	9.17	8.926		
2,500.0	2,478.9	2,487.9	2,457.0	6.4	6.4	-14.26	-6.7	-292.1	84.7	75.0	9.69	8.748		
2,600.0	2,576.0	2,587.5	2,552.9	6.8	6.9	-10.89	-6.8	-319.1	87.5	77.3	10.18	8.596		
2,700.0	2,673.1	2,688.7	2,650.5	7.2	7.4	-13.76	-7.9	-345.8	89.9	79.2	10.71	8.397		
2,800.0	2,770.2	2,788.5	2,747.1	7.7	7.8	-17.31	-10.4	-370.9	92.1	80.8	11.29	8.157		
2,900.0	2,867.1	2,886.5	2,841.5	8.1	8.4	-20.01	-13.6	-396.8	95.0	83.1	11.95	7.952		
3,000.0	2,963.9	2,986.0	2,936.9	8.6	8.9	-18.99	-14.8	-425.0	98.7	86.1	12.58	7.845		
3,100.0	3,060.7	3,086.7	3,033.3	9.1	9.5	-15.72	-14.0	-454.0	102.2	89.1	13.10	7.803		
3,200.0	3,158.0	3,188.1	3,130.9	9.5	10.0	-10.23	-14.0	-481.8	105.9	92.3	13.57	7.801		
3,300.0	3,255.7	3,290.1	3,229.4	9.9	10.5	-8.29	-14.4	-507.9	109.7	95.7	14.01	7.830		
3,400.0	3,353.7	3,392.9	3,329.4	10.3	11.0	-13.34	-14.3	-532.0	113.4	98.9	14.46	7.839		
3,500.0	3,452.2	3,493.5	3,427.7	10.7	11.4	-16.83	-16.2	-553.4	117.9	102.9	15.00	7.862		
3,600.0	3,551.1	3,593.2	3,525.2	11.0	11.8	-25.59	-18.6	-574.0	124.6	109.0	15.60	7.988		
3,700.0	3,649.9	3,691.1	3,620.6	11.3	12.3	-24.86	-18.5	-595.9	132.3	116.1	16.14	8.194		
3,800.0	3,748.5	3,789.3	3,715.9	11.7	12.8	-23.75	-16.8	-619.5	140.3	123.6	16.67	8.414		
3,900.0	3,846.6	3,887.2	3,810.6	12.1	13.3	-21.32	-14.4	-644.2	146.1	128.9	17.20	8.490		
4,000.0	3,944.0	3,983.4	3,903.1	12.6	13.8	-22.63	-11.6	-670.4	150.9	133.2	17.75	8.503		
4,100.0	4,040.7	4,078.9	3,994.2	13.1	14.4	-22.19	-9.6	-698.8	156.3	137.9	18.37	8.510		
4,200.0	4,137.4	4,177.7	4,088.0	13.6	15.0	-20.09	-9.3	-730.0	163.2	144.1	19.05	8.568		
4,300.0	4,234.4	4,280.6	4,186.1	14.1	15.6	-18.24	-10.7	-761.0	169.8	150.1	19.72	8.612		
4,400.0	4,331.3	4,381.7	4,283.0	14.6	16.1	-17.86	-13.3	-789.7	174.6	154.1	20.41	8.551		
4,500.0	4,428.6	4,483.4	4,380.7	15.0	16.7	-16.84	-14.9	-818.0	179.7	158.7	21.03	8.545		
4,600.0	4,525.9	4,583.5	4,476.9	15.5	17.3	-17.44	-14.0	-845.8	184.3	162.7	21.56	8.548		
4,700.0	4,623.3	4,681.6	4,570.8	15.9	17.8	-17.17	-12.1	-874.1	190.0	168.0	22.03	8.625		
4,800.0	4,720.6	4,784.3	4,669.2	16.4	18.4	-16.56	-11.0	-903.1	195.5	172.9	22.58	8.659		
4,900.0	4,818.5	4,885.3	4,766.7	16.8	18.9	-13.45	-11.2	-929.8	201.6	178.5	23.11	8.723		

Heartland State G36-75-1HN Pad Sec.25-T4N-R65W - Heartland State G36-75-1HN - Wellbore #1 - We													Offset Site Error:	0.0 ft
Survey Program: 352-Flexi-Shot, 788-MWD, 7621-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	
5,000.0	4,916.7	4,983.4	4,861.1	17.2	19.5	-11.11	-10.8	-956.2	209.6	186.1	23.55	8.902		
5,100.0	5,015.2	5,082.1	4,956.0	17.6	20.0	-9.33	-9.7	-983.6	219.4	195.5	23.94	9.166		
5,200.0	5,114.0	5,179.9	5,049.8	17.9	20.6	-6.07	-9.1	-1,011.0	232.0	207.7	24.31	9.542		
5,300.0	5,213.2	5,272.3	5,138.2	18.2	21.1	-2.52	-10.1	-1,037.9	248.4	223.7	24.68	10.067		
5,400.0	5,312.7	5,378.6	5,239.9	18.4	21.7	2.65	-12.8	-1,068.6	267.4	242.3	25.07	10.664		
5,500.0	5,412.4	5,482.4	5,340.1	18.7	22.3	10.33	-16.3	-1,095.9	286.3	260.9	25.44	11.254		
5,600.0	5,512.2	5,587.0	5,441.7	18.9	22.8	1.41	-19.8	-1,120.3	304.6	278.8	25.79	11.814		
5,700.0	5,612.2	5,680.1	5,532.1	19.0	23.2	-23.98	-20.9	-1,142.6	324.9	298.8	26.12	12.438		
5,800.0	5,712.1	5,774.8	5,623.7	19.2	23.7	-43.45	-23.1	-1,166.4	348.2	321.7	26.49	13.142		
5,900.0	5,812.1	5,868.3	5,714.1	19.3	24.2	-98.18	-24.8	-1,190.4	373.4	346.5	26.87	13.899		
6,000.0	5,912.1	5,973.8	5,815.9	19.5	24.7	-16.64	-26.1	-1,217.8	397.9	370.4	27.44	14.499		
6,100.0	6,012.1	6,072.1	5,911.4	19.6	25.2	-12.94	-26.8	-1,241.2	418.8	391.0	27.85	15.040		
6,200.0	6,112.0	6,167.7	6,004.1	19.8	25.7	-7.69	-29.0	-1,264.4	441.0	412.8	28.26	15.604		
6,300.0	6,212.0	6,260.4	6,093.9	19.9	26.2	50.72	-30.7	-1,287.5	464.5	435.9	28.67	16.202		
6,400.0	6,311.6	6,352.4	6,182.7	20.1	26.6	78.73	-32.7	-1,311.2	489.0	459.8	29.25	16.716		
6,500.0	6,409.4	6,444.0	6,271.0	20.2	27.1	75.78	-36.2	-1,335.3	511.1	481.5	29.64	17.243		
6,600.0	6,504.6	6,514.3	6,338.2	20.4	27.5	78.85	-42.1	-1,355.3	535.1	505.2	29.96	17.860		
6,700.0	6,595.2	6,603.2	6,420.9	20.6	28.1	77.96	-58.5	-1,383.2	561.2	530.8	30.37	18.477		
6,800.0	6,678.3	6,723.0	6,529.6	20.8	28.8	83.41	-95.8	-1,416.5	583.7	552.8	30.81	18.941		
6,900.0	6,752.1	6,838.8	6,629.6	21.0	29.4	84.68	-147.4	-1,443.3	606.2	574.7	31.48	19.256		
7,000.0	6,816.9	6,933.0	6,708.5	21.4	29.8	83.76	-194.8	-1,463.3	623.0	590.2	32.80	18.994		
7,100.0	6,865.8	7,052.2	6,794.4	21.9	30.5	85.80	-273.6	-1,486.9	636.8	602.4	34.40	18.511		
7,200.0	6,901.9	7,232.7	6,891.9	22.5	31.3	88.62	-424.2	-1,501.6	637.9	601.0	36.96	17.260		
7,275.2	6,927.3	7,295.0	6,919.6	23.1	31.6	89.27	-479.9	-1,504.8	637.1	598.8	38.32	16.625		
7,300.0	6,935.6	7,314.8	6,927.6	23.3	31.7	89.39	-498.0	-1,506.1	637.2	598.4	38.78	16.432		
7,400.0	6,968.6	7,396.0	6,955.7	24.2	32.2	89.62	-573.8	-1,513.1	639.9	599.3	40.59	15.766		
7,500.0	6,994.6	7,545.6	6,975.1	25.2	33.4	88.08	-720.9	-1,523.3	642.8	599.6	43.18	14.886		
7,600.0	7,012.2	7,650.2	6,973.7	26.3	35.3	86.52	-825.5	-1,524.5	642.0	596.8	45.23	14.193		
7,604.2	7,012.8	7,654.2	6,973.7	26.4	35.3	86.48	-829.5	-1,524.6	642.0	596.7	45.32	14.167		
7,700.0	7,021.5	7,749.7	6,975.3	27.5	35.9	85.91	-925.0	-1,525.7	642.8	595.5	47.27	13.599		
7,800.0	7,022.6	7,851.3	6,977.7	28.8	36.5	85.99	-1,026.5	-1,526.5	644.4	594.8	49.54	13.007		
7,900.0	7,021.7	7,952.6	6,978.6	30.1	37.1	86.16	-1,127.8	-1,527.3	646.3	594.1	52.13	12.396		
8,000.0	7,020.9	8,093.9	6,978.3	31.5	38.1	86.24	-1,269.1	-1,524.0	645.3	590.0	55.38	11.653		
8,100.0	7,020.0	8,207.5	6,977.4	32.9	38.9	86.20	-1,382.3	-1,515.0	638.6	580.1	58.45	10.965		
8,200.0	7,019.1	8,283.8	6,976.6	34.4	39.5	86.17	-1,458.5	-1,509.7	633.1	572.0	61.09	10.323		
8,257.0	7,018.6	8,320.9	6,976.3	35.3	39.8	86.16	-1,495.5	-1,508.7	632.2	569.7	62.52	10.111		
8,300.0	7,018.3	8,360.5	6,975.8	35.9	40.2	86.15	-1,535.1	-1,508.5	632.6	568.8	63.78	9.919		
8,400.0	7,017.4	8,469.7	6,974.4	37.5	41.2	86.10	-1,644.3	-1,505.9	631.4	564.4	66.99	9.424		
8,437.5	7,017.1	8,501.4	6,973.8	38.1	41.5	86.07	-1,675.9	-1,505.3	631.2	563.1	68.08	9.271		
8,500.0	7,016.5	8,555.0	6,972.9	39.1	42.0	86.04	-1,729.6	-1,505.0	631.6	561.7	69.92	9.034		
8,600.0	7,015.6	8,646.0	6,971.9	40.7	42.9	86.03	-1,820.5	-1,506.0	634.0	561.0	72.96	8.689		
8,700.0	7,014.8	8,747.3	6,973.2	42.4	44.1	86.24	-1,921.7	-1,507.7	636.8	560.6	76.20	8.357		
8,800.0	7,013.9	8,854.2	6,974.8	44.1	45.3	86.48	-2,028.7	-1,508.8	639.0	559.4	79.59	8.029		
8,900.0	7,013.0	8,958.6	6,976.2	45.8	46.5	86.70	-2,133.0	-1,508.8	640.1	557.1	82.98	7.715		
9,000.0	7,012.1	9,060.3	6,976.6	47.5	47.8	86.82	-2,234.7	-1,508.4	640.9	554.5	86.36	7.421		
9,100.0	7,011.3	9,179.4	6,974.7	49.2	49.3	86.74	-2,353.9	-1,506.1	640.4	550.3	90.08	7.109		
9,200.0	7,010.4	9,289.8	6,973.9	51.0	50.7	86.73	-2,464.0	-1,500.3	636.3	542.6	93.68	6.792		
9,300.0	7,009.5	9,374.3	6,976.4	52.7	51.8	87.01	-2,548.4	-1,496.8	633.3	536.4	96.85	6.539		
9,365.3	7,009.0	9,429.6	6,977.3	53.9	52.6	87.13	-2,603.8	-1,495.9	632.9	533.9	98.92	6.398		
9,400.0	7,008.7	9,463.5	6,977.8	54.5	53.0	87.20	-2,637.7	-1,495.5	632.9	532.8	100.10	6.323		

Company:	Noble Energy Inc.- Weld County, CO (Grid North)	Local Co-ordinate Reference:	Well Heartland State H01-74-1HN
Project:	Sec.25-T4N-R65W	TVD Reference:	WELL @ 4850.0ft (Precision 829 - RKB 16')
Reference Site:	Heartland State G36-75-1HN Pad Sec.25-T4N-R65W	MD Reference:	WELL @ 4850.0ft (Precision 829 - RKB 16')
Site Error:	0.0ft	North Reference:	Grid
Reference Well:	Heartland State H01-74-1HN	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #2 sidetrack	Database:	Landmark
Reference Design:	Sidetrack Plan D - Rev 0	Offset TVD Reference:	Offset Datum

Offset Design										Heartland State G36-75-1HN Pad Sec.25-T4N-R65W - Heartland State G36-75-1HN - Wellbore #1 - We			Offset Site Error:		0.0 ft
Survey Program: 352-Flexi-Shot, 788-MWD, 7621-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)	Offset Wellbore Centre +E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor			
9,500.0	7,007.8	9,562.6	6,979.4	56.2	54.4	87.43	-2,736.7	-1,494.6	633.1	529.6	103.53	6.115			
9,600.0	7,006.9	9,652.3	6,980.6	58.0	55.7	87.61	-2,826.4	-1,494.3	634.0	527.1	106.83	5.934			
9,700.0	7,006.0	9,749.9	6,980.9	59.8	57.1	87.73	-2,924.0	-1,495.5	636.4	526.2	110.28	5.771			
9,800.0	7,005.2	9,854.1	6,981.1	61.6	58.6	87.83	-3,028.2	-1,496.3	638.4	524.5	113.87	5.606			
9,900.0	7,004.3	9,955.7	6,981.7	63.4	60.1	87.97	-3,129.8	-1,496.5	639.9	522.5	117.41	5.450			
10,000.0	7,003.4	10,056.0	6,982.5	65.2	61.7	88.12	-3,230.1	-1,496.4	641.0	520.0	120.96	5.299			
10,100.0	7,002.5	10,140.2	6,982.7	67.1	63.0	88.21	-3,314.3	-1,497.7	643.7	519.4	124.23	5.181			
10,200.0	7,001.7	10,245.9	6,982.9	68.9	64.6	88.32	-3,419.9	-1,499.8	646.9	519.1	127.87	5.060			
10,300.0	7,000.8	10,349.9	6,982.7	70.7	66.2	88.39	-3,523.9	-1,501.3	649.6	518.1	131.51	4.940			
10,400.0	6,999.9	10,459.7	6,982.1	72.6	68.0	88.42	-3,633.7	-1,501.7	651.2	516.0	135.28	4.814			
10,500.0	6,999.1	10,555.0	6,981.4	74.4	69.5	88.44	-3,729.1	-1,501.2	652.0	513.2	138.79	4.698			
10,600.0	6,998.2	10,648.7	6,981.3	76.2	71.0	88.51	-3,822.7	-1,502.0	654.1	511.8	142.23	4.598			
10,700.0	6,997.3	10,755.4	6,984.0	78.1	72.7	88.83	-3,929.4	-1,503.0	656.2	510.3	145.92	4.497			
10,800.0	6,996.4	10,850.0	6,986.7	79.9	74.2	89.14	-4,023.9	-1,503.7	658.1	508.7	149.40	4.405			
10,900.0	6,995.6	10,939.0	6,988.3	81.7	75.6	89.35	-4,112.9	-1,505.8	661.4	508.5	152.94	4.325			
11,000.0	6,994.7	11,042.6	6,988.3	83.6	77.3	89.43	-4,216.4	-1,508.6	664.7	508.1	156.59	4.245			
11,100.0	6,993.8	11,151.1	6,987.7	85.4	79.1	89.47	-4,324.9	-1,510.2	666.8	506.4	160.36	4.158			
11,200.0	6,993.0	11,250.6	6,987.7	87.3	80.8	89.55	-4,424.4	-1,510.7	667.9	504.0	163.98	4.073			
11,300.0	6,992.1	11,349.8	6,988.3	89.2	82.4	89.67	-4,523.6	-1,512.0	669.9	502.3	167.56	3.998			
11,400.0	6,991.2	11,458.7	6,988.4	91.0	84.2	89.76	-4,632.5	-1,512.4	670.8	499.5	171.35	3.915			
11,500.0	6,990.3	11,566.0	6,987.6	92.9	86.4	89.78	-4,759.8	-1,509.4	669.0	493.5	175.49	3.812			
11,600.0	6,989.5	11,695.0	6,988.3	94.8	88.2	89.93	-4,868.6	-1,504.0	664.7	485.4	179.32	3.707			
11,700.0	6,988.6	11,785.9	6,989.4	96.7	89.8	90.08	-4,959.4	-1,498.6	659.5	476.7	182.82	3.607			
11,800.0	6,987.7	11,869.1	6,988.5	98.5	91.2	90.08	-5,042.5	-1,496.6	657.5	471.3	186.17	3.532			
11,900.0	6,986.9	11,972.5	6,987.5	100.4	92.9	90.07	-5,145.9	-1,494.3	655.9	466.1	189.89	3.454			
12,000.0	6,986.0	12,077.9	6,987.0	102.3	94.7	90.10	-5,251.3	-1,491.5	653.9	460.2	193.68	3.376			
12,100.0	6,985.1	12,181.8	6,986.6	104.2	96.6	90.15	-5,355.1	-1,487.8	651.0	453.5	197.45	3.297			
12,200.0	6,984.2	12,286.6	6,986.4	106.0	98.4	90.21	-5,459.8	-1,483.4	647.3	446.1	201.23	3.217			
12,261.8	6,983.7	12,323.0	6,986.3	107.2	99.0	90.23	-5,496.2	-1,481.7	645.4	442.4	203.05	3.179			
12,300.0	6,983.4	12,323.0	6,986.3	107.9	99.0	90.23	-5,496.2	-1,481.7	646.5	442.8	203.78	3.173 SF			
12,400.0	6,982.5	12,323.0	6,986.3	109.8	99.0	90.23	-5,496.2	-1,481.7	660.0	454.4	205.68	3.209			
12,500.0	6,981.6	12,323.0	6,986.3	111.7	99.0	90.23	-5,496.2	-1,481.7	688.0	480.4	207.57	3.314			
12,600.0	6,980.8	12,323.0	6,986.3	113.6	99.0	90.23	-5,496.2	-1,481.7	728.7	519.2	209.47	3.479			
12,700.0	6,979.9	12,323.0	6,986.3	115.5	99.0	90.23	-5,496.2	-1,481.7	780.1	568.7	211.37	3.691			
12,800.0	6,979.0	12,323.0	6,986.3	117.3	99.0	90.23	-5,496.2	-1,481.7	840.4	627.1	213.27	3.940			
12,900.0	6,978.1	12,323.0	6,986.3	119.2	99.0	90.23	-5,496.2	-1,481.7	907.7	692.5	215.17	4.218			
13,000.0	6,977.3	12,323.0	6,986.3	121.1	99.0	90.23	-5,496.2	-1,481.7	980.6	763.5	217.07	4.517			

Company:	Noble Energy Inc.- Weld County, CO (Grid North)	Local Co-ordinate Reference:	Well Heartland State H01-74-1HN
Project:	Sec.25-T4N-R65W	TVD Reference:	WELL @ 4850.0ft (Precision 829 - RKB 16')
Reference Site:	Heartland State G36-75-1HN Pad Sec.25-T4N-R65W	MD Reference:	WELL @ 4850.0ft (Precision 829 - RKB 16')
Site Error:	0.0ft	North Reference:	Grid
Reference Well:	Heartland State H01-74-1HN	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #2 sidetrack	Database:	Landmark
Reference Design:	Sidetrack Plan D - Rev 0	Offset TVD Reference:	Offset Datum

Offset Design		Heartland State G36-75-1HN Pad Sec.25-T4N-R65W - Heartland State H01-73-1HN - Wellbore #1 - Pla										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	89.41	0.2	22.3	22.3					
100.0	100.0	100.0	100.0	0.1	0.1	-136.56	0.2	22.3	22.4	22.2	0.23	99.493		
200.0	200.0	200.0	200.0	0.2	0.3	-137.09	0.2	22.3	22.6	22.1	0.56	40.200		
300.0	300.0	300.0	300.0	0.3	0.6	-137.93	0.2	22.3	23.0	22.1	0.90	25.535		
400.0	400.0	400.0	400.0	0.5	0.8	-143.06	0.2	22.3	23.5	22.2	1.28	18.284		
500.0	500.0	500.0	500.0	0.7	1.0	-158.74	0.2	22.3	23.9	22.2	1.71	13.937		
600.0	600.0	600.0	600.0	0.9	1.2	163.42	0.2	22.3	24.2	22.0	2.14	11.281		
700.0	700.0	700.0	700.0	1.1	1.5	113.96	0.2	22.3	24.4	21.8	2.57	9.466		
800.0	800.0	800.0	800.0	1.3	1.7	-144.82	0.2	22.3	24.6	21.6	3.01	8.182 ES		
900.0	900.0	900.0	900.0	1.5	1.9	-169.49	0.2	22.3	25.1	21.6	3.44	7.284		
1,000.0	1,000.0	1,000.0	1,000.0	1.7	2.1	-162.51	0.2	22.3	25.7	21.8	3.88	6.623		
1,100.0	1,100.0	1,100.0	1,100.0	2.0	2.4	-166.77	0.2	22.3	26.4	22.0	4.31	6.110		
1,200.0	1,200.0	1,200.0	1,200.0	2.2	2.6	159.50	0.2	22.3	27.0	22.3	4.74	5.694		
1,300.0	1,299.9	1,299.9	1,299.9	2.4	2.8	144.96	0.2	22.3	29.3	24.1	5.18	5.655		
1,400.0	1,399.8	1,399.8	1,399.8	2.6	3.0	145.18	0.2	22.3	33.8	28.2	5.62	6.015		
1,500.0	1,499.3	1,499.3	1,499.3	2.8	3.3	157.61	0.2	22.3	42.4	36.3	6.05	7.003		
1,600.0	1,598.4	1,598.4	1,598.4	3.1	3.5	173.30	0.2	22.3	55.0	48.5	6.48	8.491		
1,700.0	1,697.4	1,698.7	1,698.7	3.4	3.7	-172.17	-0.4	21.2	68.4	61.5	6.89	9.930		
1,800.0	1,796.0	1,799.2	1,799.1	3.6	3.9	-167.55	-2.2	17.8	81.7	74.4	7.28	11.227		
1,900.0	1,894.3	1,900.0	1,899.7	4.0	4.1	-163.93	-5.4	12.0	94.9	87.2	7.69	12.340		
2,000.0	1,992.5	2,001.2	2,000.4	4.3	4.3	-161.14	-9.8	3.8	106.8	98.7	8.11	13.173		
2,100.0	2,090.1	2,102.1	2,100.7	4.7	4.5	-160.76	-15.5	-6.6	118.9	110.3	8.55	13.910		
2,200.0	2,187.5	2,201.3	2,199.0	5.1	4.7	-160.89	-21.4	-17.6	131.8	122.8	9.02	14.622		
2,300.0	2,284.7	2,300.3	2,297.3	5.5	5.0	-162.13	-27.4	-28.6	145.6	136.1	9.50	15.323		
2,400.0	2,381.8	2,399.3	2,395.5	5.9	5.2	-159.48	-33.3	-39.5	159.6	149.6	10.00	15.951		
2,500.0	2,478.9	2,498.3	2,493.7	6.4	5.5	-158.29	-39.3	-50.5	173.6	163.1	10.52	16.501		
2,600.0	2,576.0	2,597.4	2,592.0	6.8	5.8	-156.38	-45.2	-61.5	187.3	176.3	11.05	16.961		
2,700.0	2,673.1	2,696.4	2,690.2	7.2	6.1	-159.70	-51.2	-72.4	201.3	189.7	11.56	17.413		
2,800.0	2,770.2	2,795.4	2,788.4	7.7	6.3	-161.58	-57.1	-83.4	215.3	203.2	12.08	17.817		
2,900.0	2,867.1	2,894.2	2,886.4	8.1	6.6	-161.81	-63.0	-94.4	230.6	218.0	12.61	18.280		
3,000.0	2,963.9	2,993.0	2,984.4	8.6	6.9	-159.93	-69.0	-105.3	246.3	233.1	13.18	18.687		
3,100.0	3,060.7	3,091.8	3,082.5	9.1	7.2	-157.79	-74.9	-116.3	261.5	247.7	13.76	19.008		
3,200.0	3,158.0	3,190.9	3,180.8	9.5	7.5	-153.63	-80.9	-127.2	274.6	260.3	14.34	19.146		
3,300.0	3,255.7	3,290.3	3,279.4	9.9	7.8	-153.37	-86.9	-138.3	285.5	270.6	14.90	19.162		
3,400.0	3,353.7	3,389.8	3,378.1	10.3	8.1	-159.41	-92.8	-149.3	295.1	279.6	15.45	19.095		
3,500.0	3,452.2	3,489.5	3,477.0	10.7	8.4	-161.69	-98.8	-160.3	303.1	287.1	16.03	18.914		
3,600.0	3,551.1	3,589.0	3,575.7	11.0	8.7	-168.05	-104.8	-171.3	310.0	293.3	16.61	18.664		
3,700.0	3,649.9	3,688.6	3,674.5	11.3	9.0	-165.97	-110.8	-182.4	317.1	299.9	17.20	18.440		
3,800.0	3,748.5	3,785.4	3,770.6	11.7	9.3	-164.30	-116.4	-192.8	325.6	307.9	17.75	18.343		
3,900.0	3,846.6	3,879.6	3,864.3	12.1	9.5	-161.88	-120.9	-201.1	338.5	320.2	18.23	18.570		
4,000.0	3,944.0	3,973.0	3,957.5	12.6	9.7	-163.78	-124.3	-207.3	355.6	337.0	18.64	19.077		
4,100.0	4,040.7	4,065.4	4,049.7	13.1	9.9	-163.46	-126.6	-211.5	376.9	357.9	19.05	19.782		
4,200.0	4,137.4	4,156.9	4,141.2	13.6	10.1	-161.57	-127.8	-213.7	399.7	380.2	19.52	20.484		
4,300.0	4,234.4	4,250.1	4,234.4	14.1	10.3	-160.03	-128.0	-214.1	422.7	402.8	19.92	21.221		
4,400.0	4,331.3	4,347.0	4,331.3	14.6	10.4	-159.84	-128.0	-214.1	445.9	425.5	20.33	21.936		
4,500.0	4,428.6	4,444.3	4,428.6	15.0	10.6	-159.69	-128.0	-214.1	467.6	446.8	20.75	22.534		
4,600.0	4,525.9	4,541.6	4,525.9	15.5	10.8	-161.73	-128.0	-214.1	489.5	468.4	21.14	23.156		
4,700.0	4,623.3	4,639.0	4,623.3	15.9	11.0	-163.18	-128.0	-214.1	511.2	489.6	21.54	23.733		
4,800.0	4,720.6	4,736.3	4,720.6	16.4	11.2	-163.70	-128.0	-214.1	533.2	511.2	21.97	24.267		
4,900.0	4,818.5	4,834.2	4,818.5	16.8	11.4	-161.44	-128.0	-214.1	552.7	530.3	22.43	24.642		
5,000.0	4,916.7	4,932.5	4,916.7	17.2	11.6	-160.49	-128.0	-214.1	570.4	547.6	22.85	24.967		

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

Offset Design		Heartland State G36-75-1HN Pad Sec.25-T4N-R65W - Heartland State H01-73-1HN - Wellbore #1 - Pla										Offset Site Error:		0.0 ft
Survey Program: 0-MWD												Offset Well Error:		0.0 ft
Reference		Offset		Semi Major Axis			Distance							
Measured Depth	Vertical Depth	Measured Depth	Vertical Depth	Reference	Offset	Highside Toolface	Offset Wellbore Centre		Between Centres	Between Ellipses	Minimum Separation	Separation Factor	Warning	
(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(°)	+N/-S (ft)	+E/-W (ft)	(ft)	(ft)	(ft)			
5,100.0	5,015.2	5,030.9	5,015.2	17.6	11.7	-160.42	-128.0	-214.1	587.0	563.7	23.28	25.211		
5,200.0	5,114.0	5,129.8	5,114.0	17.9	11.9	-158.72	-128.0	-214.1	601.2	577.5	23.69	25.372		
5,300.0	5,213.2	5,228.9	5,213.2	18.2	12.1	-156.38	-128.0	-214.1	613.0	588.9	24.10	25.440		
5,400.0	5,312.7	5,328.4	5,312.7	18.4	12.3	-152.18	-128.0	-214.1	622.2	597.7	24.48	25.415		
5,500.0	5,412.4	5,428.1	5,412.4	18.7	12.5	-145.23	-128.0	-214.1	628.9	604.0	24.85	25.306		
5,600.0	5,512.2	5,528.0	5,512.2	18.9	12.7	-154.95	-128.0	-214.1	633.3	608.1	25.22	25.116		
5,700.0	5,612.2	5,627.9	5,612.2	19.0	12.9	179.08	-128.0	-214.1	637.0	611.4	25.60	24.884		
5,800.0	5,712.1	5,727.9	5,712.1	19.2	13.1	159.63	-128.0	-214.1	639.4	613.4	25.96	24.631		
5,900.0	5,812.1	5,827.8	5,812.1	19.3	13.3	104.77	-128.0	-214.1	640.1	613.7	26.33	24.309		
6,000.0	5,912.1	5,927.8	5,912.1	19.5	13.5	-173.95	-128.0	-214.1	641.9	615.1	26.78	23.971		
6,100.0	6,012.1	6,027.8	6,012.1	19.6	13.7	-170.51	-128.0	-214.1	644.7	617.5	27.16	23.734		
6,200.0	6,112.0	6,127.8	6,112.0	19.8	13.9	-165.36	-128.0	-214.1	646.9	619.3	27.55	23.480		
6,300.0	6,212.0	6,227.7	6,212.0	19.9	14.1	-107.03	-128.0	-214.1	648.1	620.2	27.92	23.212		
6,400.0	6,311.6	6,317.4	6,301.6	20.1	14.3	-78.63	-129.4	-214.1	647.1	618.9	28.20	22.947		
6,442.9	6,353.9	6,350.0	6,334.1	20.1	14.4	-80.99	-132.2	-214.1	646.7	618.3	28.37	22.795		
6,500.0	6,409.4	6,400.0	6,383.6	20.2	14.5	-82.99	-139.4	-214.0	647.2	618.6	28.59	22.634		
6,600.0	6,504.6	6,482.4	6,463.7	20.4	14.7	-80.77	-158.7	-213.9	647.7	618.8	28.96	22.366		
6,700.0	6,595.2	6,566.0	6,542.1	20.6	15.0	-82.76	-187.5	-213.7	649.2	619.7	29.53	21.983		
6,800.0	6,678.3	6,650.0	6,616.9	20.8	15.2	-79.22	-225.5	-213.4	650.2	620.4	29.79	21.822		
6,900.0	6,752.1	6,735.5	6,688.1	21.0	15.6	-80.77	-272.9	-213.1	646.4	615.9	30.55	21.159		
6,932.6	6,774.1	6,763.6	6,710.1	21.2	15.7	-82.09	-290.3	-213.0	646.0	615.0	30.97	20.855		
7,000.0	6,816.9	6,822.3	6,753.9	21.4	16.1	-84.32	-329.3	-212.7	647.5	615.6	31.91	20.292		
7,100.0	6,865.8	6,909.7	6,812.9	21.9	16.6	-85.64	-393.7	-212.3	650.4	617.2	33.16	19.614		
7,200.0	6,901.9	7,000.0	6,865.1	22.5	17.3	-87.68	-467.3	-211.8	653.8	618.8	34.93	18.718		
7,300.0	6,935.6	7,093.6	6,909.1	23.3	18.2	-88.88	-549.9	-211.2	659.8	622.8	36.94	17.863		
7,400.0	6,968.6	7,189.7	6,942.5	24.2	19.3	-88.75	-639.9	-210.6	666.3	627.3	39.09	17.045		
7,500.0	6,994.6	7,285.6	6,963.7	25.2	20.4	-87.88	-733.4	-210.0	671.7	630.4	41.31	16.258		
7,600.0	7,012.2	7,383.0	6,973.8	26.3	21.7	-86.92	-830.2	-209.4	675.4	631.8	43.68	15.464		
7,700.0	7,021.5	7,480.9	6,980.6	27.5	23.1	-86.55	-927.9	-208.7	677.1	631.0	46.17	14.666		
7,800.0	7,022.6	7,579.2	6,981.4	28.8	24.5	-86.51	-1,026.2	-208.0	677.0	628.1	48.88	13.849		
7,900.0	7,021.7	7,679.2	6,981.1	30.1	26.0	-86.55	-1,126.2	-207.4	676.3	624.4	51.95	13.019		
8,000.0	7,020.9	7,779.2	6,980.7	31.5	27.6	-86.60	-1,226.2	-206.7	675.7	620.6	55.11	12.261		
8,100.0	7,020.0	7,879.2	6,980.4	32.9	29.2	-86.64	-1,326.2	-206.0	675.1	616.7	58.35	11.569		
8,200.0	7,019.1	7,979.2	6,980.0	34.4	30.9	-86.68	-1,426.2	-205.4	674.5	612.8	61.66	10.938		
8,300.0	7,018.3	8,079.2	6,979.7	35.9	32.6	-86.72	-1,526.2	-204.7	673.8	608.8	65.03	10.362		
8,400.0	7,017.4	8,179.2	6,979.3	37.5	34.3	-86.76	-1,626.2	-204.0	673.2	604.8	68.45	9.835		
8,500.0	7,016.5	8,279.2	6,979.0	39.1	36.0	-86.80	-1,726.2	-203.3	672.6	600.7	71.91	9.353		
8,600.0	7,015.6	8,379.2	6,978.6	40.7	37.7	-86.84	-1,826.2	-202.7	671.9	596.5	75.41	8.911		
8,700.0	7,014.8	8,479.2	6,978.3	42.4	39.5	-86.89	-1,926.1	-202.0	671.3	592.4	78.94	8.505		
8,800.0	7,013.9	8,579.2	6,977.9	44.1	41.3	-86.93	-2,026.1	-201.3	670.7	588.2	82.49	8.130		
8,900.0	7,013.0	8,679.2	6,977.6	45.8	43.1	-86.97	-2,126.1	-200.7	670.1	584.0	86.07	7.785		
9,000.0	7,012.1	8,779.2	6,977.2	47.5	44.8	-87.01	-2,226.1	-200.0	669.4	579.8	89.68	7.465		
9,100.0	7,011.3	8,879.2	6,976.9	49.2	46.7	-87.05	-2,326.1	-199.3	668.8	575.5	93.30	7.169		
9,200.0	7,010.4	8,979.2	6,976.5	51.0	48.5	-87.10	-2,426.1	-198.6	668.2	571.3	96.94	6.893		
9,300.0	7,009.5	9,079.2	6,976.2	52.7	50.3	-87.14	-2,526.1	-198.0	667.6	567.0	100.59	6.636		
9,400.0	7,008.7	9,179.2	6,975.8	54.5	52.1	-87.18	-2,626.1	-197.3	666.9	562.7	104.26	6.397		
9,500.0	7,007.8	9,279.2	6,975.5	56.2	54.0	-87.22	-2,726.1	-196.6	666.3	558.4	107.94	6.173		
9,600.0	7,006.9	9,379.2	6,975.1	58.0	55.8	-87.27	-2,826.1	-196.0	665.7	554.1	111.63	5.963		
9,700.0	7,006.0	9,479.2	6,974.8	59.8	57.6	-87.31	-2,926.1	-195.3	665.1	549.7	115.33	5.767		
9,800.0	7,005.2	9,579.2	6,974.4	61.6	59.5	-87.35	-3,026.1	-194.6	664.5	545.4	119.04	5.582		

Offset Design		Heartland State G36-75-1HN Pad Sec.25-T4N-R65W - Heartland State H01-73-1HN - Wellbore #1 - Pla										Offset Site Error:		0.0 ft
Survey Program: 0-MWD												Offset Well Error:		0.0 ft
Reference		Offset		Semi Major Axis			Distance							
Measured Depth	Vertical Depth	Measured Depth	Vertical Depth	Reference	Offset	Highside Toolface	Offset Wellbore Centre		Between Centres	Between Ellipses	Minimum Separation	Separation Factor	Warning	
(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(°)	+N/-S (ft)	+E/-W (ft)	(ft)	(ft)	(ft)			
9,900.0	7,004.3	9,679.2	6,974.1	63.4	61.4	-87.39	-3,126.1	-193.9	663.8	541.1	122.76	5.408		
10,000.0	7,003.4	9,779.2	6,973.7	65.2	63.2	-87.44	-3,226.1	-193.3	663.2	536.7	126.48	5.243		
10,100.0	7,002.5	9,879.2	6,973.4	67.1	65.1	-87.48	-3,326.1	-192.6	662.6	532.4	130.21	5.088		
10,200.0	7,001.7	9,979.2	6,973.0	68.9	66.9	-87.52	-3,426.1	-191.9	662.0	528.0	133.95	4.942		
10,300.0	7,000.8	10,079.2	6,972.7	70.7	68.8	-87.57	-3,526.0	-191.3	661.3	523.6	137.70	4.803		
10,400.0	6,999.9	10,179.2	6,972.3	72.6	70.7	-87.61	-3,626.0	-190.6	660.7	519.3	141.45	4.671		
10,500.0	6,999.1	10,279.1	6,972.0	74.4	72.6	-87.65	-3,726.0	-189.9	660.1	514.9	145.20	4.546		
10,600.0	6,998.2	10,379.1	6,971.6	76.2	74.4	-87.70	-3,826.0	-189.2	659.5	510.5	148.96	4.427		
10,700.0	6,997.3	10,479.1	6,971.3	78.1	76.3	-87.74	-3,926.0	-188.6	658.9	506.1	152.72	4.314		
10,800.0	6,996.4	10,579.1	6,970.9	79.9	78.2	-87.78	-4,026.0	-187.9	658.2	501.8	156.49	4.206		
10,895.8	6,995.6	10,674.9	6,970.6	81.7	80.0	-87.82	-4,121.8	-187.3	658.0	497.8	160.15	4.108		
10,900.0	6,995.6	10,679.1	6,970.6	81.7	80.1	-87.82	-4,126.0	-187.2	657.9	497.6	160.31	4.104		
11,000.0	6,994.7	10,779.1	6,970.2	83.6	82.0	-87.87	-4,226.0	-186.6	657.9	493.8	164.09	4.010		
11,100.0	6,993.8	10,879.1	6,969.9	85.4	83.8	-87.91	-4,326.0	-185.9	658.0	490.1	167.86	3.920		
11,200.0	6,993.0	10,979.1	6,969.5	87.3	85.7	-87.96	-4,426.0	-185.2	658.0	486.4	171.64	3.834		
11,300.0	6,992.1	11,079.1	6,969.2	89.2	87.6	-88.01	-4,526.0	-184.5	658.1	482.6	175.42	3.751		
11,400.0	6,991.2	11,179.1	6,968.8	91.0	89.5	-88.05	-4,626.0	-183.9	658.1	478.9	179.21	3.672		
11,500.0	6,990.3	11,279.1	6,968.5	92.9	91.4	-88.10	-4,726.0	-183.2	658.2	475.2	182.99	3.597		
11,600.0	6,989.5	11,379.1	6,968.1	94.8	93.3	-88.14	-4,826.0	-182.5	658.2	471.4	186.78	3.524		
11,700.0	6,988.6	11,479.1	6,967.8	96.7	95.2	-88.19	-4,926.0	-181.9	658.3	467.7	190.57	3.454		
11,800.0	6,987.7	11,579.1	6,967.4	98.5	97.1	-88.23	-5,026.0	-181.2	658.3	463.9	194.37	3.387		
11,900.0	6,986.9	11,679.1	6,967.1	100.4	99.0	-88.28	-5,126.0	-180.5	658.3	460.2	198.16	3.322		
12,000.0	6,986.0	11,779.1	6,966.7	102.3	100.9	-88.32	-5,226.0	-179.8	658.4	456.4	201.96	3.260		
12,100.0	6,985.1	11,879.1	6,966.4	104.2	102.8	-88.37	-5,326.0	-179.2	658.4	452.7	205.76	3.200		
12,200.0	6,984.2	11,979.1	6,966.0	106.0	104.6	-88.42	-5,426.0	-178.5	658.5	448.9	209.56	3.142		
12,300.0	6,983.4	12,079.1	6,965.7	107.9	106.5	-88.46	-5,526.0	-177.8	658.5	445.2	213.36	3.087		
12,400.0	6,982.5	12,179.1	6,965.3	109.8	108.4	-88.51	-5,625.9	-177.2	658.6	441.4	217.16	3.033		
12,500.0	6,981.6	12,279.1	6,965.0	111.7	110.3	-88.55	-5,725.9	-176.5	658.6	437.7	220.97	2.981		
12,600.0	6,980.8	12,379.1	6,964.6	113.6	112.2	-88.60	-5,825.9	-175.8	658.7	433.9	224.77	2.930		
12,700.0	6,979.9	12,479.1	6,964.3	115.5	114.1	-88.64	-5,925.9	-175.1	658.7	430.2	228.58	2.882		
12,800.0	6,979.0	12,579.1	6,963.9	117.3	116.0	-88.69	-6,025.9	-174.5	658.8	426.4	232.39	2.835		
12,900.0	6,978.1	12,679.1	6,963.6	119.2	117.9	-88.73	-6,125.9	-173.8	658.8	422.6	236.19	2.789		
13,000.0	6,977.3	12,779.1	6,963.3	121.1	119.8	-88.78	-6,225.9	-173.1	658.9	418.9	240.00	2.745		
13,100.0	6,976.4	12,879.1	6,962.9	123.0	121.8	-88.83	-6,325.9	-172.5	658.9	415.1	243.81	2.703		
13,200.0	6,975.5	12,979.1	6,962.6	124.9	123.7	-88.87	-6,425.9	-171.8	659.0	411.4	247.63	2.661		
13,300.0	6,974.7	13,079.1	6,962.2	126.8	125.6	-88.92	-6,525.9	-171.1	659.1	407.6	251.44	2.621		
13,400.0	6,973.8	13,179.1	6,961.9	128.7	127.5	-88.96	-6,625.9	-170.4	659.1	403.9	255.25	2.582		
13,500.0	6,972.9	13,279.1	6,961.5	130.6	129.4	-89.01	-6,725.9	-169.8	659.2	400.1	259.07	2.544		
13,600.0	6,972.1	13,379.1	6,961.2	132.5	131.3	-89.05	-6,825.9	-169.1	659.2	396.3	262.88	2.508		
13,700.0	6,971.2	13,479.1	6,960.8	134.4	133.2	-89.10	-6,925.9	-168.4	659.3	392.6	266.70	2.472		
13,800.0	6,970.3	13,579.1	6,960.5	136.3	135.1	-89.14	-7,025.9	-167.8	659.3	388.8	270.51	2.437		
13,900.0	6,969.4	13,679.1	6,960.1	138.2	137.0	-89.19	-7,125.9	-167.1	659.4	385.1	274.33	2.404		
14,000.0	6,968.6	13,779.1	6,959.8	140.1	138.9	-89.23	-7,225.9	-166.4	659.4	381.3	278.15	2.371		
14,100.0	6,967.7	13,879.1	6,959.4	142.0	140.8	-89.28	-7,325.9	-165.7	659.5	377.5	281.96	2.339		
14,200.0	6,966.8	13,979.1	6,959.1	143.8	142.7	-89.33	-7,425.9	-165.1	659.6	373.8	285.78	2.308		
14,300.0	6,966.0	14,079.1	6,958.7	145.7	144.6	-89.37	-7,525.9	-164.4	659.6	370.0	289.60	2.278		
14,400.0	6,965.1	14,179.1	6,958.4	147.6	146.5	-89.42	-7,625.9	-163.7	659.7	366.2	293.42	2.248		
14,500.0	6,964.2	14,279.1	6,958.0	149.5	148.4	-89.46	-7,725.9	-163.1	659.7	362.5	297.24	2.219		
14,600.0	6,963.3	14,379.1	6,957.7	151.4	150.3	-89.51	-7,825.9	-162.4	659.8	358.7	301.06	2.192		
14,700.0	6,962.5	14,479.1	6,957.3	153.3	152.2	-89.55	-7,925.9	-161.7	659.8	355.0	304.88	2.164		
14,800.0	6,961.6	14,579.1	6,957.0	155.2	154.2	-89.60	-8,025.8	-161.0	659.9	351.2	308.70	2.138		

Offset Design		Heartland State G36-75-1HN Pad Sec.25-T4N-R65W - Heartland State H01-73-1HN - Wellbore #1 - Pla										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	
14,900.0	6,960.7	14,679.1	6,956.6	157.1	156.1	-89.64	-8,125.8	-160.4	660.0	347.4	312.52	2.112		
15,000.0	6,959.9	14,779.1	6,956.3	159.0	158.0	-89.69	-8,225.8	-159.7	660.0	343.7	316.35	2.086		
15,100.0	6,959.0	14,879.1	6,955.9	160.9	159.9	-89.73	-8,325.8	-159.0	660.1	339.9	320.17	2.062		
15,200.0	6,958.1	14,979.1	6,955.6	162.8	161.8	-89.78	-8,425.8	-158.4	660.1	336.2	323.99	2.038		
15,300.0	6,957.2	15,079.1	6,955.2	164.7	163.7	-89.82	-8,525.8	-157.7	660.2	332.4	327.81	2.014		
15,400.0	6,956.4	15,179.1	6,954.9	166.7	165.6	-89.87	-8,625.8	-157.0	660.3	328.6	331.63	1.991		
15,500.0	6,955.5	15,279.1	6,954.5	168.6	167.5	-89.91	-8,725.8	-156.3	660.3	324.9	335.46	1.968		
15,600.0	6,954.6	15,379.1	6,954.2	170.5	169.4	-89.96	-8,825.8	-155.7	660.4	321.1	339.28	1.946		
15,700.0	6,953.8	15,479.1	6,953.8	172.4	171.3	-90.01	-8,925.8	-155.0	660.5	317.4	343.10	1.925		
15,800.0	6,952.9	15,579.1	6,953.5	174.3	173.2	-90.05	-9,025.8	-154.3	660.5	313.6	346.93	1.904		
15,900.0	6,952.0	15,679.1	6,953.1	176.2	175.2	-90.10	-9,125.8	-153.7	660.6	309.8	350.75	1.883		
16,000.0	6,951.2	15,779.1	6,952.8	178.1	177.1	-90.14	-9,225.8	-153.0	660.6	306.1	354.57	1.863		
16,100.0	6,950.3	15,879.1	6,952.4	180.0	179.0	-90.19	-9,325.8	-152.3	660.7	302.3	358.40	1.844		
16,200.0	6,949.4	15,979.1	6,952.1	181.9	180.9	-90.23	-9,425.8	-151.6	660.8	298.6	362.22	1.824		
16,300.0	6,948.5	16,079.1	6,951.7	183.8	182.8	-90.28	-9,525.8	-151.0	660.8	294.8	366.04	1.805		
16,400.0	6,947.7	16,179.1	6,951.4	185.7	184.7	-90.32	-9,625.8	-150.3	660.9	291.0	369.87	1.787		
16,500.0	6,946.8	16,279.1	6,951.0	187.6	186.6	-90.37	-9,725.8	-149.6	661.0	287.3	373.69	1.769		
16,600.0	6,945.9	16,379.1	6,950.7	189.5	188.5	-90.41	-9,825.8	-149.0	661.0	283.5	377.51	1.751		
16,700.0	6,945.1	16,479.1	6,950.3	191.4	190.4	-90.46	-9,925.8	-148.3	661.1	279.8	381.34	1.734		
16,800.0	6,944.2	16,579.1	6,950.0	193.3	192.4	-90.50	-10,025.8	-147.6	661.2	276.0	385.16	1.717		
16,900.0	6,943.3	16,679.1	6,949.6	195.2	194.3	-90.55	-10,125.8	-146.9	661.2	272.3	388.99	1.700		
17,000.0	6,942.4	16,779.1	6,949.3	197.1	196.2	-90.59	-10,225.8	-146.3	661.3	268.5	392.81	1.684		
17,100.0	6,941.6	16,879.1	6,948.9	199.0	198.1	-90.64	-10,325.7	-145.6	661.4	264.7	396.63	1.667		
17,200.0	6,940.7	16,979.1	6,948.6	200.9	200.0	-90.68	-10,425.7	-144.9	661.5	261.0	400.46	1.652		
17,300.0	6,939.8	17,079.0	6,948.2	202.9	201.9	-90.73	-10,525.7	-144.3	661.5	257.2	404.28	1.636		
17,400.0	6,939.0	17,179.0	6,947.9	204.8	203.8	-90.77	-10,625.7	-143.6	661.6	253.5	408.10	1.621		
17,500.0	6,938.1	17,279.0	6,947.5	206.7	205.7	-90.82	-10,725.7	-142.9	661.7	249.7	411.93	1.606		
17,521.8	6,937.9	17,300.8	6,947.5	207.1	206.2	-90.83	-10,747.5	-142.8	661.7	248.9	412.76	1.603 SF		

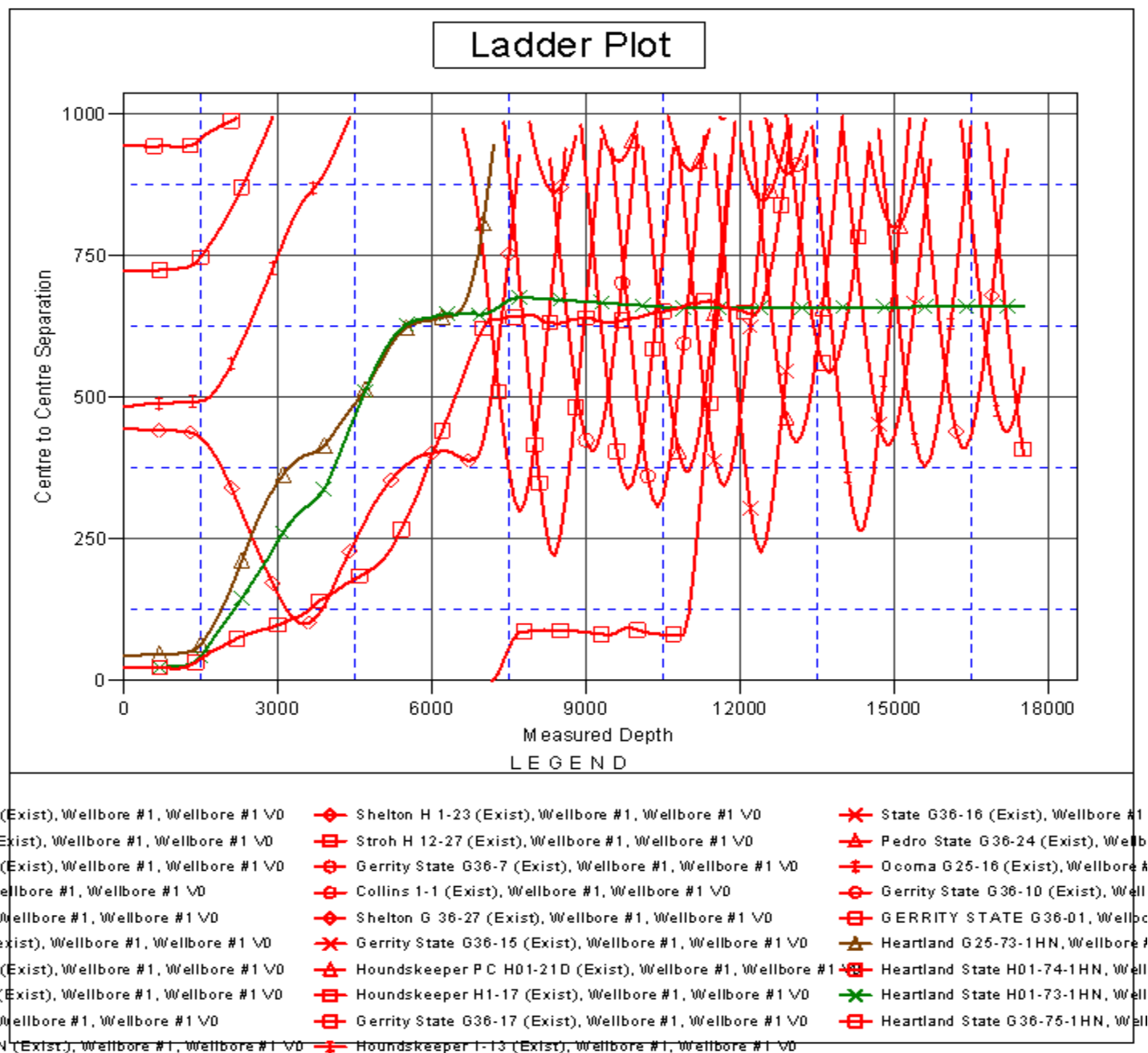
Offset Design		Heartland State G36-75-1HN Pad Sec.25-T4N-R65W - Heartland State H01-74-1HN - Wellbore #1 - We										Offset Site Error:		0.0 ft
Survey Program:		350-MWD										Offset Well Error:		0.0 ft
Reference		Offset		Semi Major Axis			Distance							
Measured Depth (ft)	Vertical Depth (ft)	Measured 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	
7,158.0	6,888.1	7,158.0	6,887.5	0.0	0.0	-37.49	-409.0	-862.0	0.9	0.9	0.00	4,602.460	CC	
7,200.0	6,901.9	7,200.0	6,900.9	0.6	0.6	-38.62	-448.8	-863.5	1.2	0.4	0.79	1.531	ES	
7,300.0	6,935.6	7,298.0	6,921.9	2.0	2.0	-19.77	-544.5	-865.7	14.7	12.7	2.03	7.250		
7,400.0	6,968.6	7,394.0	6,932.4	3.3	3.3	-12.98	-639.8	-868.5	37.2	34.3	2.86	12.988		
7,500.0	6,994.6	7,488.0	6,936.7	4.7	4.7	-9.25	-733.6	-871.8	58.6	55.1	3.45	16.957		
7,600.0	7,012.2	7,585.9	6,936.7	6.2	6.1	-6.59	-831.5	-875.1	76.0	72.0	3.99	19.065		
7,700.0	7,021.5	7,685.0	6,936.3	7.6	7.4	-4.95	-930.6	-877.2	85.5	80.9	4.56	18.731		
7,800.0	7,022.6	7,784.6	6,935.7	9.1	8.8	-4.93	-1,030.1	-876.3	87.2	81.9	5.33	16.376		
7,826.0	7,022.4	7,810.5	6,935.6	9.5	9.1	-5.22	-1,056.0	-875.5	87.2	81.6	5.61	15.545		
7,900.0	7,021.7	7,884.5	6,935.1	10.7	10.1	-7.03	-1,129.9	-871.8	87.3	80.8	6.47	13.494		
8,000.0	7,020.9	7,984.2	6,935.2	12.2	11.5	-11.70	-1,229.3	-863.5	87.5	79.5	8.01	10.928		
8,100.0	7,020.0	8,083.8	6,934.7	13.8	12.9	-15.81	-1,328.5	-855.8	88.6	78.7	9.94	8.919		
8,200.0	7,019.1	8,184.7	6,934.0	15.4	14.4	-18.74	-1,429.3	-849.8	89.9	77.9	12.01	7.484		
8,300.0	7,018.3	8,285.8	6,933.6	17.1	15.9	-19.12	-1,530.4	-848.0	89.6	76.0	13.62	6.581		
8,400.0	7,017.4	8,385.5	6,933.2	18.7	17.4	-18.88	-1,630.1	-847.4	88.9	73.8	15.10	5.892		
8,500.0	7,016.5	8,485.3	6,932.3	20.4	19.0	-18.25	-1,729.8	-847.1	88.7	72.2	16.48	5.384		
8,600.0	7,015.6	8,585.6	6,931.1	22.1	20.6	-17.01	-1,830.2	-847.7	88.4	70.8	17.62	5.017		
8,700.0	7,014.8	8,685.6	6,930.4	23.8	22.1	-16.19	-1,930.1	-847.8	87.9	69.0	18.87	4.655		
8,800.0	7,013.9	8,785.5	6,929.8	25.6	23.7	-16.31	-2,030.0	-846.5	87.6	67.1	20.46	4.281		
8,900.0	7,013.0	8,886.0	6,929.5	27.3	25.3	-15.99	-2,130.5	-845.8	86.9	65.0	21.90	3.969		
9,000.0	7,012.1	8,986.2	6,928.7	29.1	26.9	-13.71	-2,230.7	-848.2	85.9	63.3	22.54	3.810		
9,100.0	7,011.3	9,086.7	6,928.2	30.9	28.5	-11.04	-2,331.1	-851.0	84.6	61.5	23.07	3.667		
9,200.0	7,010.4	9,186.4	6,928.1	32.7	30.1	-7.89	-2,430.8	-854.5	83.1	59.5	23.60	3.523		
9,300.0	7,009.5	9,286.0	6,927.8	34.5	31.8	-6.34	-2,530.4	-855.6	82.3	57.6	24.67	3.335		
9,400.0	7,008.7	9,385.9	6,927.4	36.3	33.4	-5.86	-2,630.3	-855.1	81.7	55.7	25.98	3.144		
9,437.2	7,008.3	9,422.7	6,927.2	37.0	34.0	-6.00	-2,667.0	-854.4	81.6	55.1	26.53	3.076		
9,500.0	7,007.8	9,484.5	6,926.6	38.1	35.1	-7.40	-2,728.8	-851.6	81.9	54.2	27.73	2.954		
9,600.0	7,006.9	9,581.5	6,923.8	39.9	36.7	-12.89	-2,825.2	-841.9	85.4	54.0	31.35	2.724		
9,700.0	7,006.0	9,681.7	6,920.0	41.8	38.4	-18.91	-2,924.7	-830.2	91.1	54.4	36.71	2.483		
9,800.0	7,005.2	9,786.1	6,916.9	43.6	40.2	-20.87	-3,028.8	-824.7	94.5	54.5	39.98	2.364		
9,900.0	7,004.3	9,890.2	6,915.4	45.4	41.9	-16.57	-3,132.7	-830.6	92.8	54.3	38.50	2.409		
10,000.0	7,003.4	9,990.3	6,915.2	47.3	43.6	-8.83	-3,232.2	-842.1	89.3	53.8	35.54	2.513		
10,100.0	7,002.5	10,090.4	6,915.6	49.1	45.2	-1.15	-3,331.7	-852.8	86.9	51.6	35.37	2.457		
10,200.0	7,001.7	10,190.4	6,916.9	51.0	46.9	5.04	-3,431.3	-860.7	85.1	47.0	38.15	2.232		
10,300.0	7,000.8	10,290.4	6,918.3	52.8	48.6	9.47	-3,531.2	-865.7	83.6	41.6	42.02	1.990		
10,400.0	6,999.9	10,390.2	6,919.4	54.7	50.3	12.06	-3,630.9	-867.9	82.3	36.9	45.46	1.811		
10,500.0	6,999.1	10,490.1	6,920.4	56.5	52.0	15.08	-3,730.9	-870.6	81.4	31.7	49.71	1.638		
10,569.3	6,998.5	10,558.8	6,921.0	57.8	53.2	17.14	-3,799.5	-872.5	81.1	28.2	52.90	1.533		
10,600.0	6,998.2	10,589.3	6,921.0	58.4	53.8	18.05	-3,830.0	-873.3	81.1	26.8	54.38	1.492	Level 3	
10,700.0	6,997.3	10,689.7	6,921.1	60.3	55.5	20.46	-3,930.3	-875.3	81.4	22.5	58.83	1.383	Level 3	
10,759.1	6,996.8	10,748.7	6,921.5	61.4	56.5	22.03	-3,989.4	-876.6	81.2	19.4	61.78	1.315	Level 3	
10,800.0	6,996.4	10,789.1	6,921.7	62.1	57.2	23.20	-4,029.7	-877.7	81.3	17.4	63.96	1.272	Level 3	
10,900.0	6,995.6	10,888.9	6,921.2	63.9	58.9	25.31	-4,129.5	-879.8	82.2	13.6	68.61	1.199	Level 2, SF	
11,000.0	6,994.7	10,907.0	6,921.0	65.8	59.3	25.39	-4,147.6	-879.8	116.6	46.6	69.93	1.667		
11,100.0	6,993.8	10,907.0	6,921.0	67.7	59.3	25.39	-4,147.6	-879.8	200.2	129.2	70.97	2.821		
11,200.0	6,993.0	10,907.0	6,921.0	69.6	59.3	25.39	-4,147.6	-879.8	294.2	222.2	72.01	4.086		
11,300.0	6,992.1	10,907.0	6,921.0	71.4	59.3	25.39	-4,147.6	-879.8	391.2	318.2	73.05	5.356		
11,400.0	6,991.2	10,907.0	6,921.0	73.3	59.3	25.39	-4,147.6	-879.8	489.5	415.4	74.09	6.606		
11,500.0	6,990.3	10,907.0	6,921.0	75.2	59.3	25.39	-4,147.6	-879.8	588.3	513.1	75.13	7.830		
11,600.0	6,989.5	10,907.0	6,921.0	77.1	59.3	25.39	-4,147.6	-879.8	687.4	611.3	76.17	9.024		
11,700.0	6,988.6	10,907.0	6,921.0	79.0	59.3	25.39	-4,147.6	-879.8	786.8	709.6	77.22	10.189		

Company:	Noble Energy Inc.- Weld County, CO (Grid North)	Local Co-ordinate Reference:	Well Heartland State H01-74-1HN
Project:	Sec.25-T4N-R65W	TVD Reference:	WELL @ 4850.0ft (Precision 829 - RKB 16')
Reference Site:	Heartland State G36-75-1HN Pad Sec.25-T4N-R65W	MD Reference:	WELL @ 4850.0ft (Precision 829 - RKB 16')
Site Error:	0.0ft	North Reference:	Grid
Reference Well:	Heartland State H01-74-1HN	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #2 sidetrack	Database:	Landmark
Reference Design:	Sidetrack Plan D - Rev 0	Offset TVD Reference:	Offset Datum

Offset Design													Heartland State G36-75-1HN Pad Sec.25-T4N-R65W - Heartland State H01-74-1HN - Wellbore #1 - We	Offset Site Error:	0.0 ft
Survey Program: 350-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	
11,800.0	6,987.7	10,907.0	6,921.0	80.9	59.3	25.39	-4,147.6	-879.8	886.3	808.0	78.26	11.325			
11,900.0	6,986.9	10,907.0	6,921.0	82.7	59.3	25.39	-4,147.6	-879.8	985.9	906.6	79.31	12.432			

Company:	Noble Energy Inc.- Weld County, CO (Grid North)	Local Co-ordinate Reference:	Well Heartland State H01-74-1HN
Project:	Sec.25-T4N-R65W	TVD Reference:	WELL @ 4850.0ft (Precision 829 - RKB 16')
Reference Site:	Heartland State G36-75-1HN Pad Sec.25-T4N-R65W	MD Reference:	WELL @ 4850.0ft (Precision 829 - RKB 16')
Site Error:	0.0ft	North Reference:	Grid
Reference Well:	Heartland State H01-74-1HN	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #2 sidetrack	Database:	Landmark
Reference Design:	Sidetrack Plan D - Rev 0	Offset TVD Reference:	Offset Datum

Reference Depths are relative to WELL @ 4850.0ft (Precision 829 - RKCoordinates are relative to: Heartland State H01-74-1HN
Offset Depths are relative to Offset Datum
Central Meridian is -105.500000 °
Coordinate System is US State Plane 1983, Colorado Northern Zone
Grid Convergence at Surface is: 0.58°



Reference Depths are relative to WELL @ 4850.0ft (Precision 829 - RKCoordinates are relative to: Heartland State H01-74-1HN
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: 0.58°

