

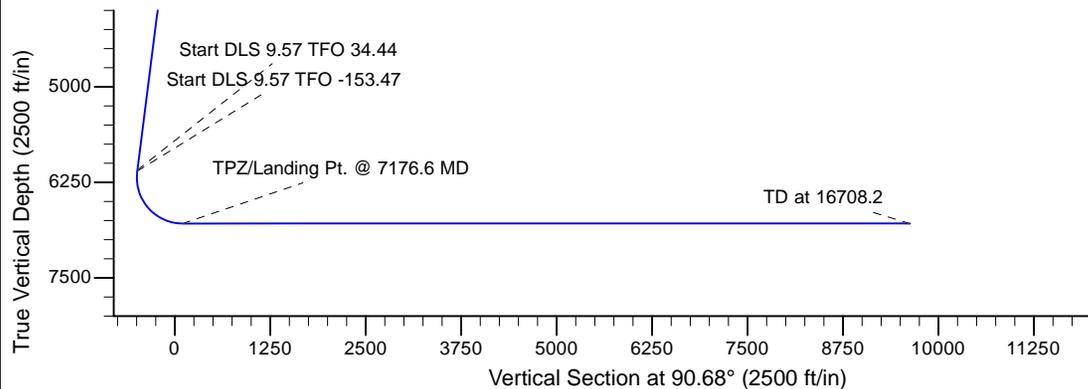
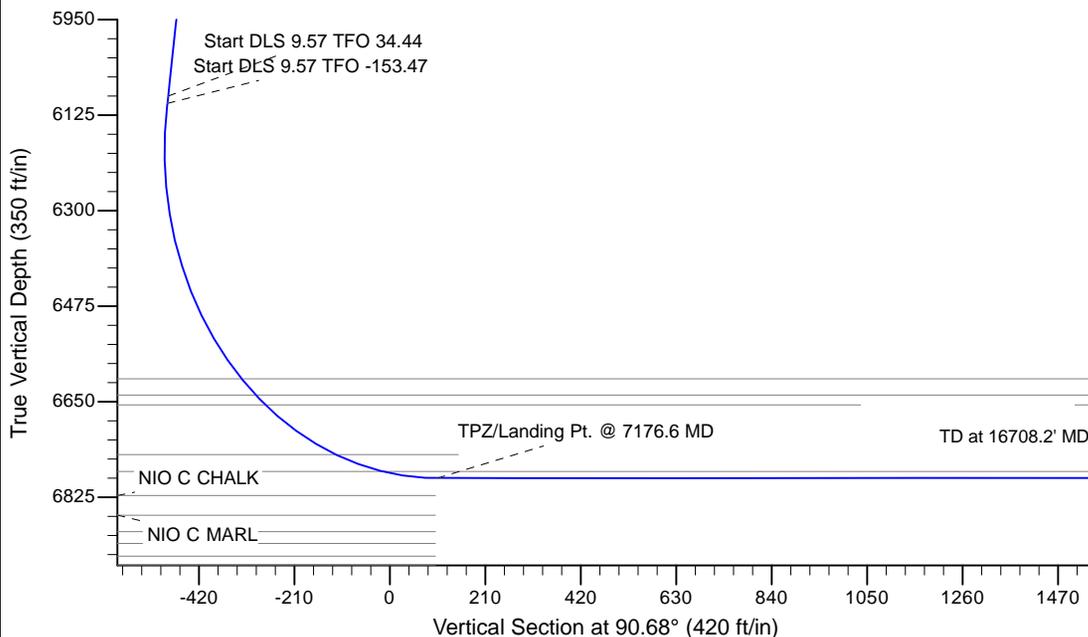
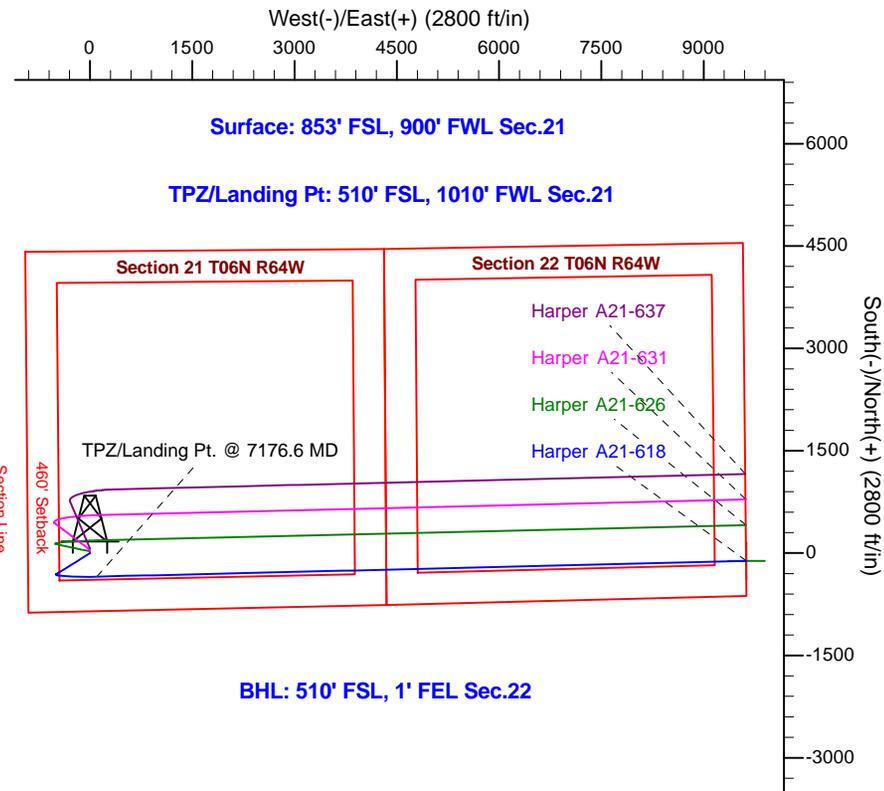
Project: Wells Ranch
 Site: A Section 21-T6N-R64W Weld County, CO
 Well: Harper A21-618
 Wellbore: Original Drilling
 Design: APD - Rev 0

Northern Region - DJ Basin

Geodetic System: US State Plane 1983
 Datum: North American Datum 1983
 Ellipsoid: GRS 1980
 Zone: Colorado Northern Zone
 System Datum: Mean Sea Level

SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSec	Target
1	0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.0	
2	2000.0	0.00	0.00	2000.0	0.0	0.0	0.00	0.00	0.0	
3	2425.0	8.50	238.00	2423.4	-16.7	-26.7	2.00	238.00	-26.5	
4	6132.3	8.50	238.00	6090.0	-307.1	-491.4	0.00	0.00	-487.7	
5	6145.8	9.60	242.40	6103.4	-308.1	-493.2	9.57	34.44	-489.5	
6	7176.6	90.00	88.61	6790.0	-345.0	100.0	9.57	-153.47	104.1	
7	16708.2	90.00	88.62	6790.0	-114.8	9628.9	0.00	90.00	9629.5	Harper A21-618 BHL 510'FSL, 1'FEL



T G M

Azimuths to Grid North
 True North: -0.61°
 Magnetic North: 7.55°

Magnetic Field
 Strength: 52502.0snT
 Dip Angle: 66.95°
 Date: 12/29/2016
 Model: IGRF2015

WELL DETAILS: Harper A21-618					
0.0	0.0	1414201.29	3261156.52	Ground Elevation: 4727.0 Latitude: 40.4665900	Longitude: -104.5613700

Plan: APD - Rev 0 (Harper A21-618/Original Drilling)
 Created By: Shailey Jewell Date: 11:46, December 29 2016

OK to submit with 2A as per Noble Drilling
 12/29/2016 12:04

Northern Region - DJ Basin

Wells Ranch

A Section 21

Harper A21-618

Original Drilling

APD - Rev 0

Anticollision Summary Report

29 December, 2016

Anticollision Summary Report

Company:	Northern Region - DJ Basin	Local Co-ordinate Reference:	Well Harper A21-618
Project:	Wells Ranch	TVD Reference:	WELL @ 4757.0ft (Original Well Elev.)
Reference Site:	A Section 21	MD Reference:	WELL @ 4757.0ft (Original Well Elev.)
Site Error:	0.0 ft	North Reference:	Grid
Reference Well:	Harper A21-618	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 ft	Output errors are at	2.79 sigma
Reference Wellbore	Original Drilling	Database:	EDM Production
Reference Design:	APD - Rev 0	Offset TVD Reference:	Offset Datum

Reference	APD - Rev 0		
Filter type:	NO GLOBAL FILTER: Using user defined selection & filtering criteria		
Interpolation Method:	Stations	Error Model:	ISCWSA
Depth Range:	Unlimited	Scan Method:	Closest Approach 3D
Results Limited by:	Maximum center-center distance of 10,000.0 ft	Error Surface:	Pedal Curve
Warning Levels Evaluated at:	2.79 Sigma	Casing Method:	Not applied

Survey Tool Program	Date	12/29/2016		
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description
0.0	16,708.2	APD - Rev 0 (Original Drilling)	MWD+IFR1+MS_WY	Fixed:v2:Rockies, crustal dec + 3-axis correction

Site Name	Reference Measured Depth (ft)	Offset Measured Depth (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Separation Factor	Warning
Summary						
Offset Well - Wellbore - Design						
A Section 19						
Anderson 03-19 (PA) - Original Drilling - Original Drilling -	6,214.7	6,087.8	9,699.3	9,509.5	51.098	CC
Anderson 03-19 (PA) - Original Drilling - Original Drilling -	6,250.0	6,122.9	9,700.3	9,509.4	50.817	ES
Anderson 03-19 (PA) - Original Drilling - Original Drilling -	6,800.0	6,591.8	9,938.4	9,733.7	48.550	SF
Ley 07-19 - Original Drilling - Original Drilling - As Drilled	6,221.4	6,128.9	8,142.0	8,107.3	234.703	CC, ES
Ley 07-19 - Original Drilling - Original Drilling - As Drilled	6,700.0	6,615.7	8,311.1	8,274.4	226.918	SF
Ley 08-19 - Original Drilling - Original Drilling - As Drilled	6,207.5	6,027.7	7,047.1	7,012.5	204.111	CC, ES
Ley 08-19 - Original Drilling - Original Drilling - As Drilled	6,650.0	6,518.9	7,190.4	7,154.0	197.330	SF
Luppens 05-19 - Original Drilling - Original Drilling - As D						Out of range
Roth 11-19 - Original Drilling - Original Drilling - As Drilled	6,229.7	6,124.2	9,138.0	9,102.9	260.730	CC
Roth 11-19 - Original Drilling - Original Drilling - As Drilled	6,250.0	6,144.4	9,138.3	9,102.9	257.777	ES
Roth 11-19 - Original Drilling - Original Drilling - As Drilled	7,000.0	6,702.4	9,562.8	9,516.9	208.103	SF
Roth 14-19 (PA) - Original Drilling - Original Drilling - As D	6,235.0	6,108.9	8,953.5	8,763.5	47.120	CC
Roth 14-19 (PA) - Original Drilling - Original Drilling - As D	6,250.0	6,123.9	8,953.7	8,763.2	47.008	ES
Roth 14-19 (PA) - Original Drilling - Original Drilling - As D	6,800.0	6,592.8	9,200.9	8,996.6	45.030	SF
Roth 19-19 - Original Drilling - Original Drilling - As Drilled	194.7	110.6	9,580.7	9,580.2	10,000.000	CC
Roth 19-19 - Original Drilling - Original Drilling - As Drilled	400.0	256.8	9,581.2	9,579.6	6,137.961	ES
Roth 19-19 - Original Drilling - Original Drilling - As Drilled	6,600.0	6,476.9	9,742.9	9,705.9	263.284	SF
Roth 22-19 - Original Drilling - Original Drilling - As Drilled	100.0	0.0	9,549.4	9,549.3	10,000.000	CC
Roth 22-19 - Original Drilling - Original Drilling - As Drilled	200.0	73.2	9,549.7	9,549.2	10,000.000	ES
Roth 22-19 - Original Drilling - Original Drilling - As Drilled	6,850.0	6,850.0	9,987.1	9,948.4	258.137	SF
Roth 23-19 - Original Drilling - Original Drilling - As Drilled	4,838.3	3,766.7	8,850.0	8,825.2	355.520	CC
Roth 23-19 - Original Drilling - Original Drilling - As Drilled	4,900.0	3,800.0	8,850.1	8,825.0	351.821	ES
Roth 23-19 - Original Drilling - Original Drilling - As Drilled	6,600.0	6,400.0	8,996.7	8,960.7	250.210	SF
Roth 25-19 - Original Drilling - Original Drilling - As Drilled	6,229.1	6,270.3	8,616.8	8,580.6	237.490	CC, ES
Roth 25-19 - Original Drilling - Original Drilling - As Drilled	6,700.0	6,760.2	8,786.0	8,747.9	230.354	SF
Roth A19-12 - Original Drilling - Original Drilling - As Drill						Out of range
Roth A19-13 (PA) - Original Drilling - Original Drilling - As						Out of range
Weber 04-19 (PA) - Original Drilling - Original Drilling - As						Out of range
Winter 09-19 - Original Drilling - Original Drilling - As Dril	6,217.7	6,040.1	6,522.9	6,488.5	189.724	CC, ES
Winter 09-19 - Original Drilling - Original Drilling - As Dril	6,600.0	6,440.8	6,636.6	6,600.6	184.241	SF
Winter 15-19 - Original Drilling - Original Drilling - As Dril	6,234.7	6,108.7	7,825.0	7,634.9	41.181	CC
Winter 15-19 - Original Drilling - Original Drilling - As Dril	6,250.0	6,123.9	7,825.1	7,634.7	41.082	ES
Winter 15-19 - Original Drilling - Original Drilling - As Dril	6,750.0	6,561.8	8,033.3	7,829.8	39.487	SF
Winter 15-19-0 (PA) - Original Drilling - Original Drilling -	4,100.0	3,999.0	8,085.7	7,961.8	65.248	SF
Winter 15-19-0 (PA) - Original Drilling - Original Drilling -	4,837.0	3,700.0	8,057.6	7,940.4	68.743	CC, ES
Winters 10-19 - Original Drilling - Original Drilling - As Dr	6,217.9	6,004.1	8,253.1	8,218.3	237.375	CC, ES
Winters 10-19 - Original Drilling - Original Drilling - As Dr	6,650.0	6,426.1	8,398.3	8,361.7	229.520	SF

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

Anticollision Summary Report

Company:	Northern Region - DJ Basin	Local Co-ordinate Reference:	Well Harper A21-618
Project:	Wells Ranch	TVD Reference:	WELL @ 4757.0ft (Original Well Elev.)
Reference Site:	A Section 21	MD Reference:	WELL @ 4757.0ft (Original Well Elev.)
Site Error:	0.0 ft	North Reference:	Grid
Reference Well:	Harper A21-618	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 ft	Output errors are at	2.79 sigma
Reference Wellbore	Original Drilling	Database:	EDM Production
Reference Design:	APD - Rev 0	Offset TVD Reference:	Offset Datum

Summary						
Site Name	Reference Measured Depth (ft)	Offset Measured Depth (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Separation Factor	Warning
A Section 20						
Foe 16-20 - Original Drilling - Original Drilling - As Drilled	6,234.0	6,150.4	1,076.7	1,042.1	31.189	CC, ES
Foe 16-20 - Original Drilling - Original Drilling - As Drilled	6,300.0	6,216.2	1,080.3	1,045.4	31.003	SF
Foe 33-20 - Original Drilling - Original Drilling - As Drilled	6,215.8	6,152.8	2,613.9	2,579.0	74.942	CC, ES
Foe 33-20 - Original Drilling - Original Drilling - As Drilled	6,450.0	6,398.7	2,653.6	2,617.6	73.809	SF
Foe 34-20 (PA) - Original Drilling - Original Drilling - As D	6,236.6	6,136.5	2,386.2	2,195.5	12.510	CC
Foe 34-20 (PA) - Original Drilling - Original Drilling - As D	6,250.0	6,149.9	2,386.4	2,195.2	12.484	ES
Foe 34-20 (PA) - Original Drilling - Original Drilling - As D	6,450.0	6,344.8	2,423.9	2,226.9	12.303	SF
Foe 43-20 - Original Drilling - Original Drilling - As Drilled	6,170.9	6,121.2	1,802.1	1,767.2	51.561	CC, ES
Foe 43-20 - Original Drilling - Original Drilling - As Drilled	6,400.0	6,343.4	1,823.2	1,787.2	50.632	SF
Linda Rae 1 - Original Drilling - Original Drilling - As Drille	6,239.1	6,204.5	6,580.8	6,540.3	162.453	CC
Linda Rae 1 - Original Drilling - Original Drilling - As Drille	6,250.0	6,215.4	6,580.9	6,540.1	161.519	ES
Linda Rae 1 - Original Drilling - Original Drilling - As Drille	6,950.0	6,760.1	6,954.9	6,902.9	133.911	SF
Simmons 42-20D - Original Drilling - Original Drilling - As	1,704.3	1,708.0	2,876.4	2,866.5	292.002	CC
Simmons 42-20D - Original Drilling - Original Drilling - As	2,000.0	1,982.9	2,877.6	2,866.0	248.379	ES
Simmons 42-20D - Original Drilling - Original Drilling - As	6,600.0	6,575.5	3,051.6	3,009.9	73.304	SF
Snider 1-20EG - Original Drilling - Original Drilling - As D	6,232.1	6,123.7	3,704.6	3,670.1	107.547	CC, ES
Snider 1-20EG - Original Drilling - Original Drilling - As D	6,450.0	6,275.5	3,745.3	3,710.0	106.146	SF
Stump A20-11 - Original Drilling - Original Drilling - As Dr	6,237.1	6,256.0	4,063.8	4,028.5	115.026	CC, ES
Stump A20-11 - Original Drilling - Original Drilling - As Dr	6,500.0	6,528.6	4,117.2	4,080.6	112.713	SF
Stump A20-12 - Original Drilling - Original Drilling - As Dr	6,218.5	6,116.2	5,134.3	5,099.7	148.167	CC, ES
Stump A20-12 - Original Drilling - Original Drilling - As Dr	6,800.0	6,812.8	5,380.3	5,343.1	144.942	SF
Stump A20-13 - Original Drilling - Original Drilling - As Dr	6,233.5	6,126.3	4,993.5	4,959.2	145.261	CC, ES
Stump A20-13 - Original Drilling - Original Drilling - As Dr	6,500.0	6,401.2	5,051.5	5,015.9	141.998	SF
Winter 20-19 - Original Drilling - Original Drilling - As Dril	6,228.3	6,201.0	6,894.0	6,858.7	195.093	CC, ES
Winter 20-19 - Original Drilling - Original Drilling - As Dril	6,550.0	6,500.0	6,977.3	6,940.7	190.401	SF
Winter 24-19 - Original Drilling - Original Drilling - As Dril	6,220.8	6,462.9	6,984.3	6,940.4	159.180	CC, ES
Winter 24-19 - Original Drilling - Original Drilling - As Dril	6,500.0	6,700.0	7,045.6	7,000.7	157.224	SF
Winter 39-19 - Original Drilling - Original Drilling - As Dril	6,239.3	6,360.3	5,726.8	5,690.2	156.202	CC, ES
Winter 39-19 - Original Drilling - Original Drilling - As Dril	6,500.0	6,550.0	5,783.5	5,745.9	153.781	SF
Winter 40-19 - Original Drilling - Original Drilling - As Dril	6,220.5	6,464.6	5,839.3	5,793.8	128.353	CC, ES
Winter 40-19 - Original Drilling - Original Drilling - As Dril	6,500.0	6,750.8	5,900.5	5,854.0	126.999	SF

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

Anticollision Summary Report

Company:	Northern Region - DJ Basin	Local Co-ordinate Reference:	Well Harper A21-618
Project:	Wells Ranch	TVD Reference:	WELL @ 4757.0ft (Original Well Elev.)
Reference Site:	A Section 21	MD Reference:	WELL @ 4757.0ft (Original Well Elev.)
Site Error:	0.0 ft	North Reference:	Grid
Reference Well:	Harper A21-618	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 ft	Output errors are at	2.79 sigma
Reference Wellbore	Original Drilling	Database:	EDM Production
Reference Design:	APD - Rev 0	Offset TVD Reference:	Offset Datum

Summary						
Site Name	Reference Measured Depth (ft)	Offset Measured Depth (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Separation Factor	Warning
A Section 21						
Culbreath 23-21 - Original Drilling - Original Drilling - As D	8,405.2	6,777.7	1,538.9	1,485.3	28.694	CC, ES
Culbreath 23-21 - Original Drilling - Original Drilling - As D	8,800.0	6,778.3	1,588.7	1,530.1	27.097	SF
Culbreath 33-21 (PA) - Original Drilling - Original Drilling	9,458.9	6,751.0	1,404.4	1,161.4	5.780	CC
Culbreath 33-21 (PA) - Original Drilling - Original Drilling	9,500.0	6,751.0	1,405.0	1,161.4	5.767	ES
Culbreath 33-21 (PA) - Original Drilling - Original Drilling	9,600.0	6,751.0	1,411.5	1,166.4	5.760	SF
Harper A21-626 - Original Drilling - APD - Rev 0	2,000.0	2,000.0	25.5	13.4	2.102	CC, ES
Harper A21-626 - Original Drilling - APD - Rev 0	16,708.2	16,770.7	529.6	153.1	1.407	Level 3, SF
Harper A21-631 - Original Drilling - APD - Rev 0	2,000.0	2,000.0	47.4	35.2	3.903	CC, ES
Harper A21-631 - Original Drilling - APD - Rev 0	16,708.2	16,711.3	899.9	520.4	2.371	SF
Harper A21-637 - Original Drilling - APD - Rev 0	2,000.0	2,000.0	69.2	57.1	5.704	CC, ES
Harper A21-637 - Original Drilling - APD - Rev 0	16,708.2	16,551.3	1,276.6	901.1	3.400	SF
Kona A19-616 - Original Drilling - APD - Rev 0	7,288.4	6,994.1	98.9	54.5	2.225	CC, ES
Kona A19-616 - Original Drilling - APD - Rev 0	7,300.0	6,983.3	99.0	54.5	2.225	SF
Kona A19-624 - Original Drilling - APD - Rev 0	2,000.0	2,004.0	151.8	139.7	12.500	CC, ES
Kona A19-624 - Original Drilling - APD - Rev 0	7,700.0	6,813.0	427.1	378.5	8.789	SF
Kona A19-630 - Original Drilling - APD - Rev 0	2,000.0	2,004.0	157.5	145.4	12.969	CC, ES
Kona A19-630 - Original Drilling - APD - Rev 0	2,200.0	2,190.9	165.8	152.5	12.497	SF
Kona A19-636 - Original Drilling - APD - Rev 0	1,900.0	1,896.0	165.4	153.9	14.391	CC, ES
Kona A19-636 - Original Drilling - APD - Rev 0	2,100.0	2,085.4	173.2	160.6	13.687	SF
Kona A19-640 - Original Drilling - APD - Rev 0	2,083.7	2,124.6	1,416.5	1,403.8	111.726	CC
Kona A19-640 - Original Drilling - APD - Rev 0	2,100.0	2,143.0	1,416.5	1,403.7	110.884	ES
Kona A19-640 - Original Drilling - APD - Rev 0	8,100.0	6,650.0	1,594.4	1,543.3	31.178	SF
Kona A19-646 - Original Drilling - APD - Rev 0	2,000.0	2,015.0	1,439.2	1,427.1	118.150	CC, ES
Kona A19-646 - Original Drilling - APD - Rev 0	8,400.0	6,531.1	2,057.6	2,002.4	37.336	SF
Kona A19-652 - Original Drilling - APD - Rev 0	2,000.0	2,015.0	1,464.5	1,452.3	120.223	CC, ES
Kona A19-652 - Original Drilling - APD - Rev 0	8,600.0	6,400.0	2,404.1	2,347.0	42.103	SF
Kona A19-662 - Original Drilling - APD - Rev 0	2,000.0	2,017.0	1,529.4	1,517.2	125.490	CC, ES
Kona A19-662 - Original Drilling - APD - Rev 0	9,100.0	6,367.4	3,196.1	3,132.1	49.935	SF
Kona A19-670 - Original Drilling - APD - Rev 0	1,809.8	1,826.8	1,551.1	1,540.1	141.070	CC
Kona A19-670 - Original Drilling - APD - Rev 0	1,900.0	1,900.0	1,551.2	1,539.7	134.804	ES
Kona A19-670 - Original Drilling - APD - Rev 0	9,500.0	6,058.1	3,782.9	3,713.8	54.715	SF
Kona A19-679 - Original Drilling - APD - Rev 0	2,000.0	2,016.0	1,486.1	1,473.9	121.968	CC, ES
Kona A19-679 - Original Drilling - APD - Rev 0	10,300.0	6,019.8	4,094.5	4,013.8	50.706	SF
Kona A19-685 - Original Drilling - APD - Rev 0	2,000.0	2,016.0	1,507.8	1,495.6	123.745	CC, ES
Kona A19-685 - Original Drilling - APD - Rev 0	10,500.0	5,907.0	4,357.2	4,274.3	52.559	SF
McKee 12-21 (PA) - Original Drilling - Original Drilling - A	2,000.0	1,997.0	2,214.9	2,153.1	35.849	CC
McKee 12-21 (PA) - Original Drilling - Original Drilling - A	2,200.0	2,196.8	2,217.7	2,149.8	32.660	ES
McKee 12-21 (PA) - Original Drilling - Original Drilling - A	7,100.0	6,782.1	2,561.3	2,350.1	12.130	SF
McKee 21-21 (PA) - Original Drilling - Original Drilling - A	2,000.0	2,013.0	3,764.3	3,702.0	60.489	CC
McKee 21-21 (PA) - Original Drilling - Original Drilling - A	8,500.0	6,803.0	3,871.7	3,643.4	16.965	ES
McKee 21-21 (PA) - Original Drilling - Original Drilling - A	9,300.0	6,803.0	3,971.6	3,731.5	16.538	SF
McKee 22-21 - Original Drilling - Original Drilling - As Dril	0.0	0.0	2,506.1			
McKee 22-21 - Original Drilling - Original Drilling - As Dril	500.0	478.7	2,507.5	2,505.0	1,008.985	ES
McKee 22-21 - Original Drilling - Original Drilling - As Dril	9,400.0	6,788.1	2,926.9	2,861.1	44.464	SF
McKee 31-21 - Original Drilling - Original Drilling - As Dril	9,458.9	6,979.0	4,229.0	4,157.4	59.097	CC
McKee 31-21 - Original Drilling - Original Drilling - As Dril	9,500.0	6,978.0	4,229.2	4,156.9	58.531	ES
McKee 31-21 - Original Drilling - Original Drilling - As Dril	11,500.0	6,931.5	4,695.6	4,596.6	47.446	SF
McKee 32-21 - Original Drilling - Original Drilling - As Dril	9,451.4	6,801.8	2,687.5	2,616.2	37.677	CC
McKee 32-21 - Original Drilling - Original Drilling - As Dril	9,500.0	6,801.9	2,688.0	2,615.8	37.256	ES
McKee 32-21 - Original Drilling - Original Drilling - As Dril	10,400.0	6,804.6	2,850.0	2,766.0	33.912	SF
McKee 41-21 - Original Drilling - Original Drilling - As Dril	10,757.0	6,666.9	4,156.6	4,062.3	44.099	CC
McKee 41-21 - Original Drilling - Original Drilling - As Dril	10,800.0	6,667.2	4,156.8	4,061.8	43.746	ES
McKee 41-21 - Original Drilling - Original Drilling - As Dril	12,300.0	6,678.0	4,433.8	4,317.9	38.276	SF

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Reference Wellbore	Original Drilling	Database:	EDM Production
Reference Design:	APD - Rev 0	Offset TVD Reference:	Offset Datum

Summary						
Site Name	Reference Measured Depth (ft)	Offset Measured Depth (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Separation Factor	Warning
A Section 21						
McKee 42-21 - Original Drilling - Original Drilling - As Dril	10,807.3	6,787.5	2,497.5	2,401.7	26.053	CC, ES
McKee 42-21 - Original Drilling - Original Drilling - As Dril	11,400.0	6,786.5	2,566.9	2,462.9	24.690	SF
Sexton 43-21 (PA) - Original Drilling - Original Drilling - A	10,751.4	6,743.0	1,618.3	1,352.3	6.083	CC
Sexton 43-21 (PA) - Original Drilling - Original Drilling - A	10,800.0	6,743.0	1,619.0	1,352.2	6.068	ES
Sexton 43-21 (PA) - Original Drilling - Original Drilling - A	10,900.0	6,743.0	1,625.1	1,356.9	6.058	SF
Wells Trust 13-21 - Original Drilling - Original Drilling - As	2,075.4	2,056.5	997.8	986.6	88.834	CC
Wells Trust 13-21 - Original Drilling - Original Drilling - As	2,100.0	2,080.4	997.9	986.5	87.817	ES
Wells Trust 13-21 - Original Drilling - Original Drilling - As	6,900.0	6,710.1	1,260.2	1,222.7	33.523	SF
Wells Trust 14-21 - Original Drilling - Original Drilling - As	5,648.5	5,568.7	23.1	-8.7	0.727	Level 1, CC, ES, SF
Wells Trust 24-21 - Original Drilling - Original Drilling - As	7,491.4	6,736.7	198.0	156.7	4.791	CC, ES
Wells Trust 24-21 - Original Drilling - Original Drilling - As	7,500.0	6,736.8	198.2	156.8	4.787	SF

Anticollision Summary Report

Company:	Northern Region - DJ Basin	Local Co-ordinate Reference:	Well Harper A21-618
Project:	Wells Ranch	TVD Reference:	WELL @ 4757.0ft (Original Well Elev.)
Reference Site:	A Section 21	MD Reference:	WELL @ 4757.0ft (Original Well Elev.)
Site Error:	0.0 ft	North Reference:	Grid
Reference Well:	Harper A21-618	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 ft	Output errors are at	2.79 sigma
Reference Wellbore	Original Drilling	Database:	EDM Production
Reference Design:	APD - Rev 0	Offset TVD Reference:	Offset Datum

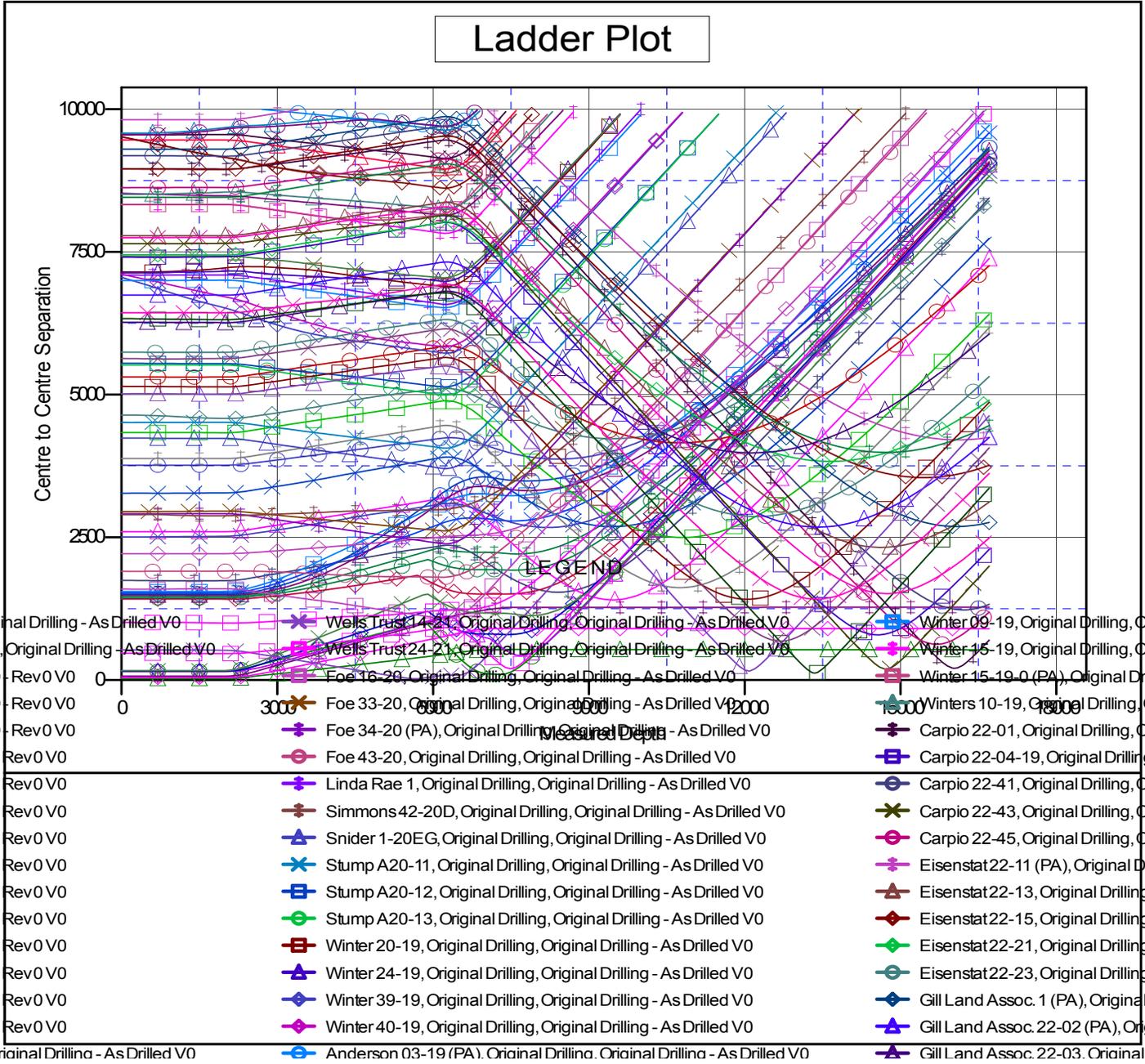
Summary						
Site Name	Reference Measured Depth (ft)	Offset Measured Depth (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Separation Factor	Warning
A Section 22						
Offset Well - Wellbore - Design						
Carpio 22-01 - Original Drilling - Original Drilling - As Drill	16,041.4	6,733.5	205.1	11.4	1.059	Level 2, CC, ES, SF
Carpio 22-04-19 - Original Drilling - Original Drilling - As Drill	14,560.9	6,752.9	790.8	620.4	4.641	CC, ES
Carpio 22-04-19 - Original Drilling - Original Drilling - As Drill	14,600.0	6,752.8	791.7	620.9	4.634	SF
Carpio 22-41 - Original Drilling - Original Drilling - As Drill	16,209.8	6,736.3	1,228.1	996.3	5.298	CC, ES
Carpio 22-41 - Original Drilling - Original Drilling - As Drill	16,300.0	6,735.9	1,231.4	998.5	5.288	SF
Carpio 22-43 - Original Drilling - Original Drilling - As Drill	14,720.4	6,766.4	190.2	21.8	1.130	Level 2, CC, ES, SF
Carpio 22-45 - Original Drilling - Original Drilling - As Drill	15,694.4	6,732.0	625.9	439.3	3.353	CC
Carpio 22-45 - Original Drilling - Original Drilling - As Drill	15,700.0	6,732.0	626.0	439.2	3.352	ES, SF
Eisenstat 22-11 (PA) - Original Drilling - Original Drilling - Original Drilling	16,108.6	6,757.0	4,208.3	3,841.5	11.474	CC
Eisenstat 22-11 (PA) - Original Drilling - Original Drilling - Original Drilling	16,200.0	6,757.0	4,209.2	3,840.8	11.425	ES
Eisenstat 22-11 (PA) - Original Drilling - Original Drilling - Original Drilling	16,708.2	6,757.0	4,250.8	3,874.8	11.307	SF
Eisenstat 22-13 - Original Drilling - Original Drilling - As Drill	14,628.0	6,765.8	2,324.2	2,157.4	13.938	CC
Eisenstat 22-13 - Original Drilling - Original Drilling - As Drill	14,700.0	6,765.5	2,325.3	2,157.3	13.843	ES
Eisenstat 22-13 - Original Drilling - Original Drilling - As Drill	14,900.0	6,764.9	2,340.1	2,169.5	13.716	SF
Eisenstat 22-15 - Original Drilling - Original Drilling - As Drill	15,448.2	6,738.5	3,546.6	3,364.4	19.473	CC
Eisenstat 22-15 - Original Drilling - Original Drilling - As Drill	15,500.0	6,738.8	3,546.9	3,363.9	19.376	ES
Eisenstat 22-15 - Original Drilling - Original Drilling - As Drill	16,100.0	6,741.6	3,606.0	3,414.8	18.860	SF
Eisenstat 22-21 - Original Drilling - Original Drilling - As Drill	13,647.2	6,839.0	3,831.2	3,682.8	25.825	CC
Eisenstat 22-21 - Original Drilling - Original Drilling - As Drill	13,700.0	6,838.6	3,831.6	3,682.3	25.664	ES
Eisenstat 22-21 - Original Drilling - Original Drilling - As Drill	14,600.0	6,832.9	3,947.9	3,786.5	24.455	SF
Eisenstat 22-23 - Original Drilling - Original Drilling - As Drill	12,229.4	6,771.1	2,864.6	2,742.9	23.541	CC
Eisenstat 22-23 - Original Drilling - Original Drilling - As Drill	12,300.0	6,771.6	2,865.4	2,742.5	23.312	ES
Eisenstat 22-23 - Original Drilling - Original Drilling - As Drill	12,900.0	6,775.9	2,942.0	2,811.3	22.502	SF
Gill Land Assoc. 1 (PA) - Original Drilling - Original Drilling	16,087.3	6,758.0	2,689.6	2,323.2	7.341	CC
Gill Land Assoc. 1 (PA) - Original Drilling - Original Drilling	16,100.0	6,758.0	2,689.7	2,323.0	7.336	ES
Gill Land Assoc. 1 (PA) - Original Drilling - Original Drilling	16,300.0	6,758.0	2,698.0	2,328.3	7.298	SF
Gill Land Assoc. 22-02 (PA) - Original Drilling - Original Drilling	13,411.6	6,768.0	2,679.4	2,363.2	8.473	CC
Gill Land Assoc. 22-02 (PA) - Original Drilling - Original Drilling	13,500.0	6,768.0	2,680.9	2,363.1	8.437	ES
Gill Land Assoc. 22-02 (PA) - Original Drilling - Original Drilling	13,700.0	6,768.0	2,694.9	2,374.2	8.404	SF
Gill Land Assoc. 22-03 - Original Drilling - Original Drilling	12,135.7	6,773.5	3,979.7	3,859.5	33.089	CC
Gill Land Assoc. 22-03 - Original Drilling - Original Drilling	12,200.0	6,773.4	3,980.2	3,858.8	32.781	ES
Gill Land Assoc. 22-03 - Original Drilling - Original Drilling	13,300.0	6,771.9	4,146.5	4,010.1	30.380	SF
Gill Land Assoc. 22-04 (PA) - Original Drilling - Original Drilling	14,717.0	6,766.0	3,988.3	3,647.6	11.705	CC
Gill Land Assoc. 22-04 (PA) - Original Drilling - Original Drilling	14,800.0	6,766.0	3,989.2	3,646.9	11.657	ES
Gill Land Assoc. 22-04 (PA) - Original Drilling - Original Drilling	15,300.0	6,766.0	4,030.7	3,680.9	11.525	SF
Gruen 22-01 - Original Drilling - Original Drilling - As Drill	12,053.5	6,776.5	1,415.4	1,296.9	11.949	CC, ES
Gruen 22-01 - Original Drilling - Original Drilling - As Drill	12,200.0	6,777.1	1,422.9	1,302.5	11.819	SF
Gruen 22-02 - Original Drilling - Original Drilling - As Drill	13,346.3	6,769.8	120.2	-22.3	0.844	Level 1, CC, ES, SF
Gruen 22-31 - Original Drilling - Original Drilling - As Drill	13,378.2	6,784.8	1,418.3	1,275.2	9.907	CC
Gruen 22-31 - Original Drilling - Original Drilling - As Drill	13,400.0	6,784.7	1,418.5	1,275.0	9.883	ES
Gruen 22-31 - Original Drilling - Original Drilling - As Drill	13,500.0	6,784.3	1,423.6	1,278.7	9.831	SF
Gruen 22-33 - Original Drilling - Original Drilling - As Drill	12,080.4	6,754.7	158.1	39.3	1.330	Level 3, CC, ES, SF
Gruen 22-35 - Original Drilling - Original Drilling - As Drill	12,696.9	6,675.0	680.9	550.8	5.234	CC
Gruen 22-35 - Original Drilling - Original Drilling - As Drill	12,700.0	6,675.0	680.9	550.8	5.232	ES, SF
Ottinger 22-01 - Original Drilling - Original Drilling - As Drill	14,732.1	6,774.3	1,514.9	1,346.2	8.982	CC, ES
Ottinger 22-01 - Original Drilling - Original Drilling - As Drill	14,900.0	6,774.7	1,524.2	1,353.5	8.930	SF

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

Anticollision Summary Report

Company: Northern Region - DJ Basin	Local Co-ordinate Reference: Well Harper A21-618	
Project: Wells Ranch	TVD Reference: WELL @ 4757.0ft (Original Well Elev.)	
Reference Site: A Section 21	MD Reference: WELL @ 4757.0ft (Original Well Elev.)	
Site Error: 0.0 ft	North Reference: Grid	
Reference Well: Harper A21-618	Survey Calculation Method: Minimum Curvature	
Well Error: 0.0 ft	Output errors are at 2.79 sigma	
Reference Wellbore Original Drilling	Database: EDM Production	
Reference Design: APD - Rev 0	Offset TVD Reference: Offset Datum	

Reference Depths are relative to WELL @ 4757.0ft (Original Well Elev.) Coordinates are relative to: Harper A21-618
 Offset Depths are relative to Offset Datum Coordinate System is US State Plane 1983, Colorado Northern Zone
 Central Meridian is -105.5000000 Grid Convergence at Surface is: 0.61°

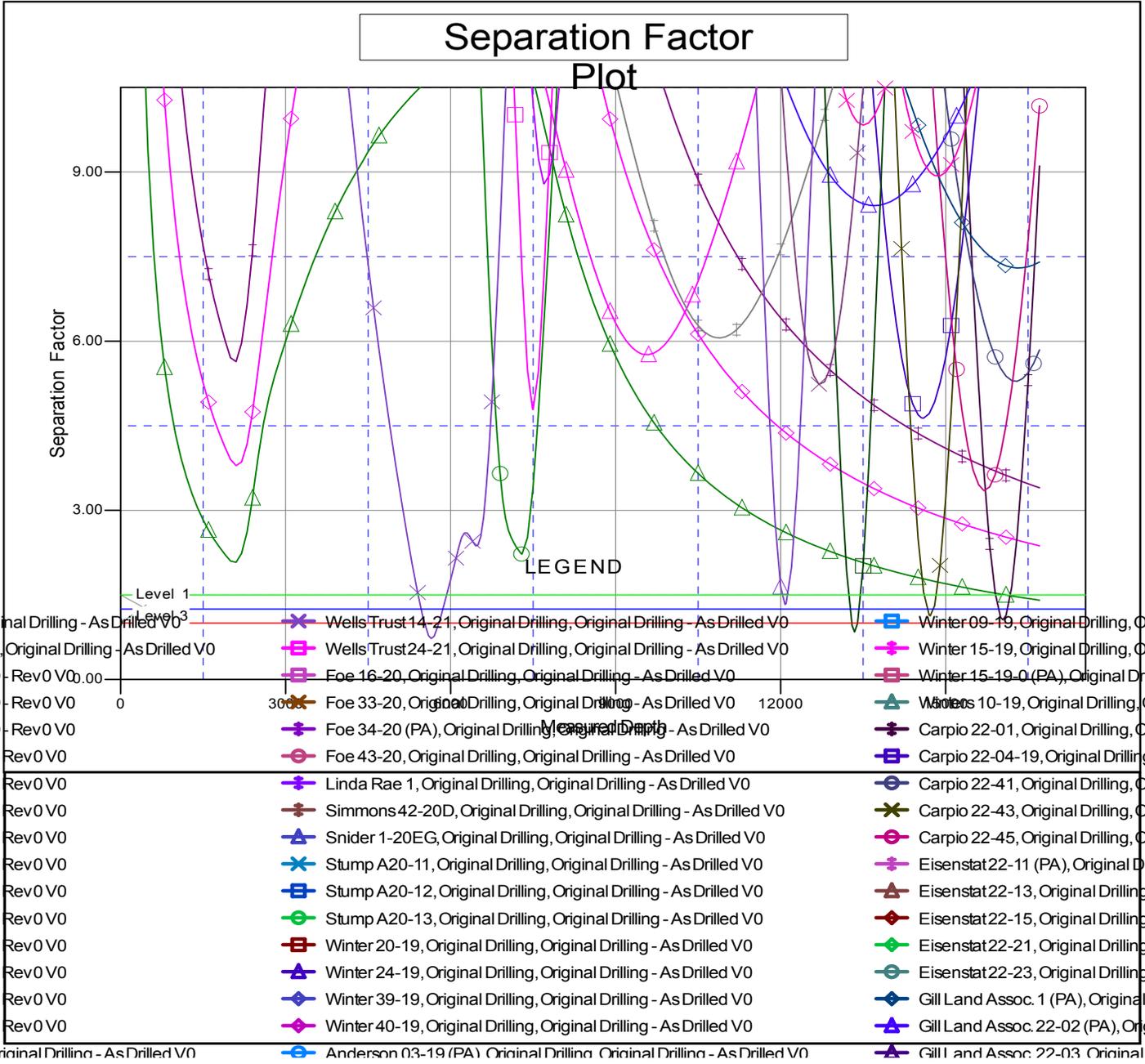


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Anticollision Summary Report

Company:	Northern Region - DJ Basin	Local Co-ordinate Reference:	Well Harper A21-618
Project:	Wells Ranch	TVD Reference:	WELL @ 4757.0ft (Original Well Elev.)
Reference Site:	A Section 21	MD Reference:	WELL @ 4757.0ft (Original Well Elev.)
Site Error:	0.0 ft	North Reference:	Grid
Reference Well:	Harper A21-618	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 ft	Output errors are at	2.79 sigma
Reference Wellbore	Original Drilling	Database:	EDM Production
Reference Design:	APD - Rev 0	Offset TVD Reference:	Offset Datum

Reference Depths are relative to WELL @ 4757.0ft (Original Well Elev.) Coordinates are relative to: Harper A21-618
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